Source: **T1**

Title: **CR's to TS 34.121 v3.7.0 for approval**

Agenda item: **5.1.3**

Document for: **Approval**

This document contains 18 CRs to TS 34.121 v3.7.0. These CRs have been agreed by T1 and are put forward to TSG T for approval.

CRs related to maintenance of R99:

Spec	CR	Rev	Release	Subject	Cat	Version Current	Version -New	Doc-2nd-Level
34.121	127		R99	Correction of power terms and definitions	F	3.7.0	3.8.0	T1-020133
34.121	128		R99	Creation of common default messages for RRM test cases in Annex I	F	3.7.0	3.8.0	T1-020134
34.121	129		R99	Transmit ON/OFF time mask, Change of TFC and Power setting in uplink compressed mode	F	3.7.0	3.8.0	T1-020135
34.121	130		R99	Maintenance of Annex B	F	3.7.0	3.8.0	T1-020136
34.121	131		R99	Correction of minimum test times under fading	F	3.7.0	3.8.0	T1-020137
34.121	132		R99	Addition of test case description for SFN-CFN observed time difference	F	3.7.0	3.8.0	T1-020138
34.121	133		R99	Addition of test case description for SFN-SFN observed time difference type 1	F	3.7.0	3.8.0	T1-020139
34.121	134		R99	Corrections for TS 34.121 subclause 8.7.6	F	3.7.0	3.8.0	T1-020140
34.121	135		R99	Correction changes in clause 8.7	F	3.7.0	3.8.0	T1-020141
34.121	136		R99	Update of RRM Cell reselection delay tests in idle mode	F	3.7.0	3.8.0	T1-020142
34.121	137		R99	Implementation of test tolerances to test cases in subclause 7	F	3.7.0	3.8.0	T1-020143
34.121	138		R99	RRM AnnexF	F	3.7.0	3.8.0	T1-020144
34.121	139		R99	Connection Diagrams for RRM tests cell re-selection in idle mode	F	3.7.0	3.8.0	T1-020145
34.121	140		R99	Statistical testing of RRM delay performance	F	3.7.0	3.8.0	T1-020146
34.121	141		R99	RRM Hard handover test cases	F	3.7.0	3.8.0	T1-020147
34.121	142		R99	System Simulator and Test System definition	F	3.7.0	3.8.0	T1-020148
34.121	143		R99	WCDMA 1800 and 1900 additions	F	3.7.0	3.8.0	T1-020170
34.121	144		R99	Correction of power spectral density	F	3.7.0	3.8.0	T1-020171

3GPP TSG-T1 Meeting #14
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Tdoc T1-020133

CR-Form-v5

CHANGE REQUEST

⌘ **34.121** **CR** **127** ⌘ **rev** **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of power terms and definitions
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-13
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ The existing requirements relating to power are incomplete, inconsistent and ambiguous. The proposed changes remove the possibility of misinterpreting the specification.

Summary of change: ⌘

3.1 Introduction of definitions for maximum output power, nominal maximum output power, mean power for a W-CDMA modulated signal, RRC filtered mean power.

5.2 Maximum output power – aligned definition with 25.101. This definition allows the use of a broadband (thermal) power meter.

5.3 Some editorial changes.

5.4.1 Open loop power defined as mean power according to 25.101.

5.4.2 Inner loop power control defined as mean power according to 25.101. Table 5.4.2.2 title “average” -> “aggregate”.

5.4.3 Minimum output power defined as mean power according to 25.101.

5.5.1 Transmit off power defined as RRC filtered average power according to 25.101. Duplicate definition removed from 5.5.1.2.

5.5.2 Transmit on power defined as mean power, off power defined as RRC filtered average power according to 25.101. Removed duplicate requirements and incorrect objective from end of minimum requirements subclause 5.5.2.2. Removed unnecessary note in 5.5.32.4 regarding measurement sampling.

5.6.2 Change of TFC defined as mean power according to 25.101.

5.7.1 Power setting in uplink compressed mode defined as mean power according to 25.101. Replaced average with aggregate in table 5.7.3.

5.7.4 Mean output power for transmission gap changed to RRC filtered average power according to 25.101.

5.9.1 Spectrum emission mask reference power defined as RRC filtered average

		power according to 25.101. 5.9.2/5.9.5 Added comment about noise bandwidth of integrated method according to 25.101. 5.10.1/5.10.4 ACLR defined as RRC filtered average power according to 25.101. 5.12.1 Transmit intermodulation reference power and the IM product are defined as RRC filtered average power according to 25.101. 5.13 Removed confusing references to power control group since timeslot is sufficient. 6.2.1 Receiver sensitivity level editorial changes according to 2.101. 6.2.3 "does" replaced with "shall". Replaced obsolete reference to table 6.2 with table 6.2.1. 6.3.1/6.3.4 Maximum input level – defined as mean power according to 2.101. 6.4 / 6.5 / 6.6 / 6.7 “Average transmit output” changed to “mean”. Table format changes. Table 6.4.1 & 6.4.2 I_{oac} (modulated) defined as mean power in dBm. Table 6.5.1 & 6.5.3 $I_{blocking}$ (modulated) defined as mean power in dBm. Table 6.7.1 & 6.7.2 I_{ouw1} (modulated) defined as mean power in dBm. All according to 25.101.
Consequences if not approved:	⌘	Existing power specifications are incomplete, inconsistent and ambiguous which will lead to different interpretation of power quantities (e.g. maximum power, SEM, Interferer levels etc.). This will lead to inconsistent performance measurement results. Isolated impact statement: Correction of conformance tests. Will not affect UE implementation.

Clauses affected:	⌘	3,6 & 7		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions, symbols, abbreviations and equations

Definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [5] and TR 25.990 [6].

Terms are listed in alphabetical order in this clause.

3.1 Definitions

For the purpose of the present document, the following additional terms and definitions apply:

~~**Average power:** [TBD]~~**Maximum Output Power:** This is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

Nominal Maximum Output Power: This is the nominal power defined by the UE power class.

Mean power: When applied to a W-CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot unless otherwise stated.

RRC filtered mean power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

NOTE 1: The RRC filtered mean power of a perfectly modulated W-CDMA signal is 0.246 dB lower than the mean power of the same signal.

NOTE 2: The roll-off factor α is defined in 25.101 section 6.8.1.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

[…]	Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken

5 Transmitter Characteristics

5.1 General

Transmitting performance test of the UE is implemented during communicating with the SS via air interface. The procedure is using normal call protocol until the UE is communicating on traffic channel basically. On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function. (Refer to TS 34.109 [4]).

Transmitting or receiving bit/symbol rate for test channel is shown in table 5.1.

Table 5.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	UL DPCH bit rate	Remarks
12,2 kbps reference measurement channel	12,2 kbps	30 ksps	60 kbps	Standard Test

Unless detailed the transmitter characteristic are specified at the antenna connector of the UE. For UE with integral antenna only, a reference antenna with a gain of 0 dBi is assumed. Transmitter characteristics for UE(s) with multiple antennas/antenna connectors are FFS.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 5 are defined using the UL reference measurement channel (12,2 kbps) specified in clause C.2.1 and unless stated otherwise, with the UL power control ON.

The common RF test conditions of Tx Characteristics are defined in clause E.3.1, and each test conditions in this clause (clause 5) should refer clause E.3.1. Individual test conditions are defined in the paragraph of each test.

5.2 Maximum Output Power

5.2.1 Definition and applicability

The nominal maximum output power and its tolerance are defined according to the Power Class of the UE.

The maximum output power ~~refers to the measure power when averaged over the transmit slot at the maximum power control setting.~~is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.2.2 Minimum Requirements

The UE maximum output power shall be within the ~~shown value~~ nominal value and tolerance specified in table 5.2.1 even for the multi-code transmission mode.

Table 5.2.1: Nominal Maximum Output Power

Power Class	Nominal ~~M~~maximum output power	Tolerance
1	+33 dBm	+1/–3 dB
2	+27 dBm	+1/–3 dB
3	+24 dBm	+1/–3 dB
4	+21 dBm	±2 dB

The normative reference for this requirement is TS 25.101 [1] clause 6.2.1.

5.2.3 Test purpose

To verify that the error of the UE maximum output power does not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

5.2.4 Method of test

5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE.
2) Measure the ~~output~~ mean power of the UE ~~by Tester~~in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The ~~output~~ mean power shall be averaged over ~~the transmit~~ at least one timeslot.

5.2.5 Test requirements

The ~~error of measured~~ maximum output power, derived in step 2), shall not exceed the range prescribed by the nominal maximum output power and tolerance in table 5.2.2.

Table 5.2.2: Nominal Maximum Output Power

Power Class	Nominal ~~M~~maximum output power	Tolerance
1	+33 dBm	+1,7/–3,7 dB
2	+27 dBm	+1,7/–3,7 dB
3	+24 dBm	+1,7/–3,7 dB
4	+21 dBm	±2,7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.3 Frequency Error

5.3.1 Definition and applicability

The frequency error is the difference between the RF modulated carrier frequency transmitted from the UE with AFC ON and assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the Node B. These signals will have an apparent error due to Node B frequency error and Doppler shift. In the later case, signals from the Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the above ±0,1 ppm figure.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.3.2 Minimum Requirements

The UE modulated carrier frequency shall be accurate to within ±0,1 ppm compared to the carrier frequency received from the Node B.

The normative reference for this requirement is TS 25.101 [1] clause 6.3.

5.3.3 Test purpose

To verify that the UE carrier frequency error does not exceed ±0,1 ppm.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of receiver to derive correct frequency information for transmitter.

5.3.4 Method of test

5.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure, and RF parameters (DPCH_Ec and $\hat{I}_{or}$) are set up according to table 5.3. The relative power level of other downlink physical channels to the DPCH_Ec are set up according to clause E.3.1.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 5.3: Test parameters for Frequency Error

Parameter	Level / Status	Unit
DPCH_Ec	–117	dBm / 3,84 MHz
$\hat{I}_{or}$	–106,7	dBm / 3,84 MHz

5.3.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE ~~output power shall be maximum level~~reaches its maximum output power.

2) Measure the frequency error delta f, at the UE antenna connector ~~by Tester~~ using the Global In-Channel-Tx-test (annex B). ~~Since counter method leads an incorrect result, EVM method shall be used.~~

5.3.5 Test Requirements

For all measurements~~d bursts~~, the frequency error, derived in step 2), shall not exceed ±(0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4 Output Power Dynamics in the Uplink

Power control is used to limit the interference level.

5.4.1 Open Loop Power Control in the Uplink

5.4.1.1 Definition and applicability

Open loop power control in the uplink is the ability of the UE transmitter to set its output power to a specific value. This function is used for PRACH transmission and based on the information from Node B using BCCH and the downlink received signal power level of the CPICH. The information from Node B includes transmission power of CPICH and uplink interference power level.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.1.2 Minimum requirements

The UE open loop power is defined as the ~~average~~ mean power in a timeslot or ON power duration, whichever is available~~, and they are measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate~~.

The UE open loop power control tolerance is given in table 5.4.1.1.

Table 5.4.1.1: Open loop power control tolerance

Normal conditions	±9 dB
Extreme conditions	±12 dB

The reference for this requirement is TS 25.101 [1] clause 6.4.1.

5.4.1.3 Test purpose

The power measured by the UE of the received signal and the signalled BCCH information are used by the UE to control the power of the UE transmitted signal with the target to transmit at the lowest power acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power correctly over the receiver dynamic range.

The test purpose is to verify that the UE open loop power control tolerance does not exceed the described value shown in table 5.4.1.1.

An excess error of the open loop power control decreases the system capacity.

5.4.1.4 Method of test

5.4.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure, and $\hat{I}_{or}$ is set up according to table 5.4.1.2. The relative power level of downlink physical channels to I_{or} are set up according to clause E.2.1. The RACH procedure within the call setup is used for the test.

See TS 34.108 [3] for details regarding generic call setup procedure.

Table 5.4.1.2: Test parameters for Open Loop Power Control (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See table 5.4.1.3	dBm / 3,84 MHz

Table 5.4.1.3: Test parameters for Open Loop Power Control (SS)

Parameter	RX Upper dynamic end	RX-middle	RX-Sensitivity level
$\hat{I}_{or}$ (note 3)	–25,0 dBm / 3,84 MHz	–65,7 dBm / 3,84 MHz	–106,7 dBm / 3,84 MHz
CPICH_RSCP (notes 3 and 4)	–28,3 dBm	–69 dBm	–110 dBm
Primary CPICH DL TX power	+19 dBm	+28 dBm	+19 dBm
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	+47,3 dB	+97 dB	+129 dB
UL interference	–75 dBm	–101 dBm	–110 dBm
Constant Value	–10 dB	–10 dB	–10 dB
Expected nominal UE TX power (note 5)	-37,7 dBm	-14 dBm	+9 dBm (note 2)
NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameters: Primary CPICH DL TX power, UL interference, Constant Value are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE. NOTE 2: Nominal TX output power 9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9 dBm + 12 dB = 21 dBm = max power class 4). NOTE 3: The power level of S-CCPCH should be defined because S-CCPCH is transmitted during Preamble RACH transmission period. The power level of S-CCPCH is temporarily set to –10,3 dB relative to I_{or}. However, it is necessary to check whether the above S-CCPCH level is enough to establish a connection with the reference measurement channels. NOTE 4: The purpose of this parameter is to calculate the Expected nominal UE TX power. NOTE 5: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.9 Open Loop Power Control of TS 25.331 [8].			

5.4.1.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to table 5.4.1.3 (–25 dBm / 3,84 MHz).

2) Measure the first RACH preamble ~~output~~ mean power of the UE ~~according to annex B~~.

3) Repeat the above measurement for all SS levels in table 5.4.1.3.

5.4.1.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (table 5.4.1.3), derived in step 2), shall not exceed the prescribed tolerance in table 5.4.1.1.

5.4.2 Inner Loop Power Control in the Uplink

5.4.2.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.2.2 Minimum requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1 dB, 2 dB and 3 dB according to the value of Δ_{TPC} or $\Delta_{RP\text{-}TPC}$, in the slot immediately after the TPC_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in table 5.4.2.1.

b) The transmitter ~~average~~ aggregate output power step due to inner loop power control shall be within the range shown in table 5.4.2.2. Here a TPC_cmd group is a set of TPC_cmd values derived from a corresponding sequence of TPC commands of the same duration.

The inner loop power step is defined as the relative power difference between the ~~average~~ mean power of the original (reference) timeslot and the ~~average~~ mean power of the target timeslot, not including the transient duration. The transient duration is from 25µs before the slot boundary to 25µs after the slot boundary. ~~The power is measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate.~~

Table 5.4.2.1: Transmitter power control range~~tolerance~~

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,5	+1,5	+1	+3	+1,5	+4,5
0	–0,5	+0,5	–0,5	+0,5	–0,5	+0,5
–1	–0,5	–1,5	–1	–3	–1,5	–4,5

Table 5.4.2.2: Transmitter ~~average~~ aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+8	+12	+16	+24	+16	+26
0	–1	+1	–1	+1	–1	+1
–1	–8	–12	–16	–24	–16	–26
0,0,0,0,+1	+6	+14	N/A	N/A	N/A	N/A
0,0,0,0,–1	–6	–14	N/A	N/A	N/A	N/A

The UE shall meet the above requirements for inner loop power control over the power range bounded by the Minimum output power as defined in clause 5.4.3.2, and the Maximum output power supported by the UE (i.e. the actual power as would be measured assuming no measurement error). This power shall be in the range specified for the power class of the UE in clause 5.2.2.

NOTE: 3 dB inner loop power control steps are only used in compressed mode.

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1.

The requirements for the derivation of TPC_cmd are detailed in TS 25.214 [5] clauses 5.1.2.2.2 and 5.1.2.2.3.

5.4.2.3 Test purpose

- To verify that the UE inner loop power control size and response is meet to the described value shown in clause 5.4.2.2.
- To verify that TPC_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

The UE shall be tested for the requirements for inner loop power control over the power range bounded by the Min power threshold for test and the Max power threshold for test.

The Min power threshold for test is defined as the Minimum Output Power Test Requirement (clause 5.4.3.5).

The Max power threshold for test is defined as the Measured Maximum output power of the UE in the relevant Step of the test (using the same method as in clause 5.2.4.2 step 2) minus the Test Tolerance specified for test 5.2 Maximum Output Power in table F.2.1.

For the final power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

5.4.2.4 Method of test

5.4.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.2.4.2 Procedure

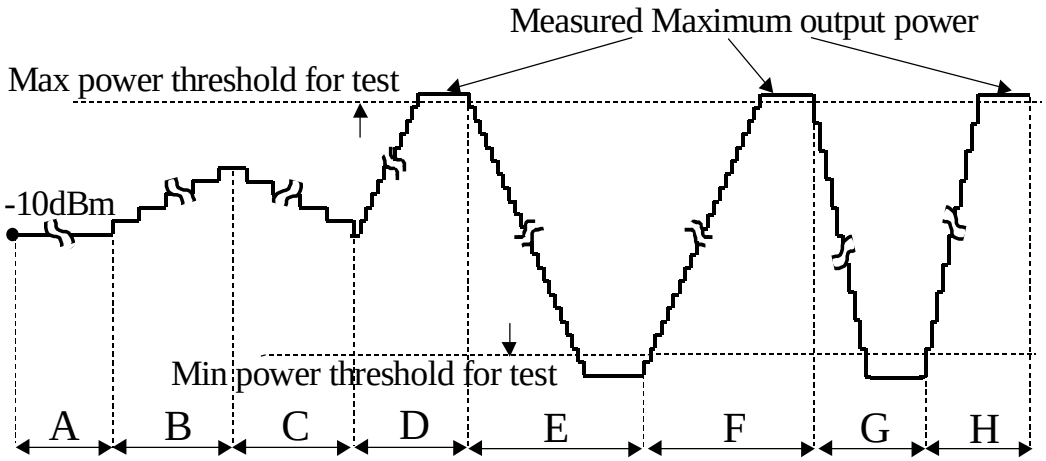

Figure 5.4.2.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE, measured at the UE antenna connector, to be in the range –10 ± 9 dBm. This may be achieved by setting the downlink signal ($\hat{I}_{or}$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

   - no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;
   - at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;
   - at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

   The following is an example of a suitable sequence of TPC commands:

   1000001010101011111010000010101010111110100000101010101111 10

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Reconfigure the uplink channel to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. When the reconfiguration is complete, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150 (note) TPC commands with the value 0.

7) Step F: Transmit a sequence of 150 (note) TPC commands with the value 1.

8) Step G: Reconfigure the uplink channel to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). When the reconfiguration is complete, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75 (note) TPC commands with the value 0.

9) Step H: Transmit a sequence of 75 (note) TPC commands with the value 1.

10) During steps A to H the mean ~~output~~ power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the ~~output~~ mean power is not required in slots after the 10th slot after the mean ~~output~~ power has exceeded the maximum power threshold;

- In steps E and G, measurement of the ~~output~~ mean power is not required in slots after the 10th slot after the mean ~~output~~ power has fallen below the minimum power threshold.

The transient periods of 25 µs before each slot boundary and 25 µs after each slot boundary shall not be included in the power measurements.

NOTE: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in figure 5.4.2.4.

5.4.2.5 Test requirements

a) During Step A, the difference in mean ~~output~~ power between adjacent slots shall be within the prescribed range for a TPC_cmd of 0, as given in table 5.4.2.1.

b) During Step A, the change in mean ~~output~~ power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of 0, as given in table 5.4.2.2.

c) During Step B, the difference in mean ~~output~~ power between adjacent slots shall be within the prescribed range given in table 5.4.2.1, given that every 5th TPC_cmd should have the value +1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

d) During Step B, the change in mean ~~output~~ power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,+1}, as given in table 5.4.2.2.

e) During Step C, the difference in mean ~~output~~ power between adjacent slots shall be within the prescribed range given in table 5.4.2.1, given that every 5th TPC_cmd should have the value –1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

f) During Step C, the change in mean ~~output~~ power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,-1}, as given in table 5.4.2.2.

g) During Step E, the difference in mean ~~output~~ power between adjacent slots shall be within the prescribed range given in table 5.4.2.1 for a TPC_cmd of –1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

h) During Step E, the change in mean ~~output~~ power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of –1, and step size of 1 dB as given in table 5.4.2.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step D. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

i) During Step F, the difference in mean ~~output~~ power between adjacent slots shall be within the prescribed range given in table 5.4.2.1 for a TPC_cmd of +1 and step size of 1 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

j) During Step F, the change in mean ~~output~~ power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 1 dB as given in table 5.4.2.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

k) During Step G, the difference in mean ~~output~~ power between adjacent slots shall be within the prescribed range given in table 5.4.2.1 for a TPC_cmd of −1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

l) During Step G, the change in mean ~~output~~ power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of −1, and step size of 2 dB as given in table 5.4.2.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step F. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots.

m) During Step H, the difference in mean ~~output~~ power between adjacent slots shall be within the prescribed range given in table 5.4.2.1 for a TPC_cmd of +1 and step size of 2 dB. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. For the power step adjacent to the Min or Max power threshold for test, the lower step size requirement does not apply.

n) During Step H, the change in mean ~~output~~ power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of +1, and step size of 2 dB as given in table 5.4.2.2. This applies when the original (reference) timeslot power and the target timeslot power are between the Min power threshold for test and the Max power threshold for test derived from the Measured Maximum output power in Step H. The power step adjacent to the Min or Max power threshold for test should not be part of the 10 consecutive slots tested.

5.4.3 Minimum Output Power

5.4.3.1 Definition and applicability

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.3.2 Minimum Requirements

The minimum ~~transmit~~ output power is defined as ~~an averaged~~ the mean power in ~~a~~one time ~~-~~slot ~~measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate~~. The minimum transmit power shall be ~~better~~ less than −50 dBm.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.3.1.

5.4.3.3 Test purpose

To verify that the UE minimum transmit power is ~~below~~ less than −50 dBm.

An excess minimum output power increases the interference to other channels, and decreases the system capacity.

5.4.3.4 Method of test

5.4.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.3.4.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Measure the ~~output~~ mean power of the UE ~~by Tester~~.

5.4.3.5 Test requirements

The measured ~~output~~ mean power, derived in step 2), shall be ~~below~~ less than –49 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.4.4 Out-of-synchronisation handling of output power

5.4.4.1 Definition and applicability

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.214 [5]. The thresholds Q_{out} and Q_{in} specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the thresholds Q_{out} and Q_{in} for the purpose of monitoring synchronization. The threshold Q_{out} should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 30%. The threshold Q_{in} should correspond to a level of DPCCH quality where detection of the TPC commands transmitted on the downlink DPCCH is significantly more reliable than at Q_{out}. This can be at a TPC command error ratio level of e.g. 20%.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.4.2 Minimum Requirements

When the UE estimates the DPCCH quality over the last 160 ms period to be worse than a threshold Q_{out}, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCCH quality exceeds an acceptable level Q_{in}. When the UE estimates the DPCCH quality over the last 160 ms period to be better than a threshold Q_{in}, the UE shall again turn its transmitter on within 40 ms.

The UE transmitter shall be considered “off” if the transmitted power is below the level defined in subclause 6.5.1 (Transmit off power). Otherwise the transmitter shall be considered as “on”.

The normative reference for this requirement is TS 25.101 [1] clause 6.4.4.1.

The quality levels at the thresholds Q_{out} and Q_{in} correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.4.1, a signal with the quality at the level Q_{out} can be generated by a DPCCH_Ec/Ior ratio of –25 dB, and a signal with Q_{in} by a DPCCH_Ec/Ior ratio of –21 dB. The DL reference measurement channel (12.2) kbps specified in subclause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 5.4.4.1, are as specified in table E.3.3 of Annex E.

Table 5.4.4.1: DCH parameters for test of Out-of-synch handling test case

Parameter	Value	Unit
$\hat{I}_{or}/I_{oc}$	–1	dB
I_{oc}	–60	dBm / 3,84 MHz
$\frac{DPDCH_E_c}{I_{or}}$	See Figure 5.4.4.1: Before point A –16,6 After point A Not defined[1)]	dB
$\frac{DPCCH_E_c}{I_{or}}$	See table 5.4.4.2	dB
Information Data Rate	12,2	kbps

Table 5.4.4.2: Minimum Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4.1	DPCCH_Ec/Ior	Unit
Before A	-16,6	dB
A to B	-22,0	dB
B to D	-28,0	dB
D to E	-24,0	dB
After E	-18,0	dB

Figure 5.4.4.1 shows an example scenario where the DPCCH_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off and then back up to a level above Q_{in} where the UE shall turn the power back on.

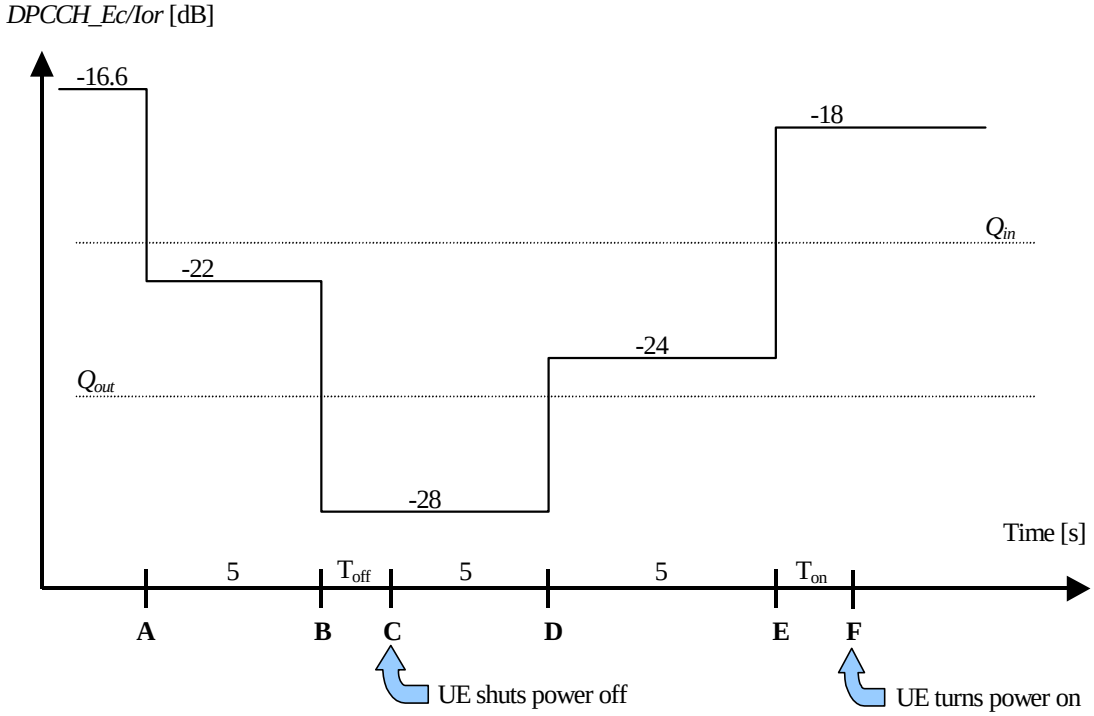

Figure 5.4.4.1: Test case for out-of-synch handling in the UE.

In this test case, the requirements for the UE are that:

1. The UE shall not shut its transmitter off before point B.
2. The UE shall shut its transmitter off before point C, which is Toff = 200 ms after point B.
3. The UE shall not turn its transmitter on between points C and E.
4. The UE shall turn its transmitter on before point F, which is Ton = 200 ms after point E.

The reference for this test case is TS 25.101 [1] clause 6.4.4.2.

5.4.4.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.4.1.

NOTE: DPDCH_Ec/I_{or} after point A is not defined in table 5.4.4.1. However it is assumed that DPDCH and DPCCH power level are same on DL 12,2 kbps reference measurement channel for testing. (PO1, PO2, and PO3 are zero.)

5.4.4.4 Method of test

5.4.4.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure, and DCH parameters are set up according to table 5.4.4.1 with DPCCH_Ec/Ior ratio level at –16,6 dB. The other RF parameters are set up according to clause E.3.3.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.4.4.4.2 Procedure

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reach maximum level.

2) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'A to B' as defined in table 5.4.4.3. The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched off during this time.

3) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'B to D' as defined in table 5.4.4.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched off.

4) The SS monitors the UE transmitted power for 5 seconds and verifies that the UE transmitter is not switched on during this time.

5) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'D to E' as defined in table 5.4.4.3. The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

6) The SS controls the DPCCH_Ec/Ior ratio level according to clause 'After E' as defined in table 5.4.4.3. The SS waits 200 ms and then verifies that the UE transmitter has been switched on.

5.4.4.5 Test requirements

Table 5.4.4.3: Test Requirements for DPCCH_Ec/Ior levels

Clause from figure 5.4.4.1	DPCCH_Ec/Ior	Unit
Before A	-16,6	dB
A to B	-21,6	dB
B to D	-28,4	dB
D to E	-24,4	dB
After E	-17,6	dB

To pass the test, steps 1 through 6 of the procedure in clause 5.4.4.4.2 must be fulfilled.

The UE transmitter off criterion and its tolerances is defined in clause 5.5.1 (Transmit off power).

The UE transmitter on criterion and its tolerances is defined in clause 5.4.3 (Minimum Output Power). The UE transmitter is considered to be on if the UE transmitted power is higher than minimum output power.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Test Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.5 Transmit ON/OFF Power

5.5.1 Transmit OFF Power

5.5.1.1 Definition and applicability

~~The transmit OFF power state is when the UE does not transmit except during uplink compressed mode. This parameter is defined as the maximum output transmit power within the channel bandwidth when the transmitter is OFF.~~Transmit OFF power is defined as the RRC filtered mean power when the transmitter is off. The transmit OFF power state is when the UE does not transmit. During transmission gaps in UL compressed mode, the UE is not considered to be in the OFF state.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.5.1.2 Minimum Requirements

~~The transmit OFF power is defined as an averaged power at least in a timeslot duration, excluding any transient periods, measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate~~. The requirement for the transmit OFF power shall be ~~better~~ less than −56 dBm.

The normative reference for this requirement is TS 25.101 [1] clause 6.5.1.1.

5.5.1.3 Test purpose

To verify that the UE transmit OFF power is ~~below~~ less than −56 dBm.

An excess transmit OFF power increases the interference to other channels, and decreases the system capacity.

5.5.1.4 Method of test

This test is covered by clause 5.5.2 Transmit ON/OFF Time mask.

5.5.1.5 Test requirements

The measured ~~leakage~~ RRC filtered mean power shall be ~~below~~ less than −55 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.5.2 Transmit ON/OFF Time mask

5.5.2.1 Definition and applicability

The time mask for transmit ON/OFF defines the ramping time allowed for the UE between transmit OFF power and transmit ON power. Possible ON/OFF scenarios are PRACH, CPCH or uplink compressed mode.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.5.2.2 Minimum requirements

The transmit power levels versus time shall meet the mask specified in figure 5.5.1 for PRACH preambles, and the mask in figure 5.5.2 for all other cases. The off signal is ~~measured~~ defined as the RRC filtered mean power~~with a filter that has a Root Raised Cosine (RRC) filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate~~.

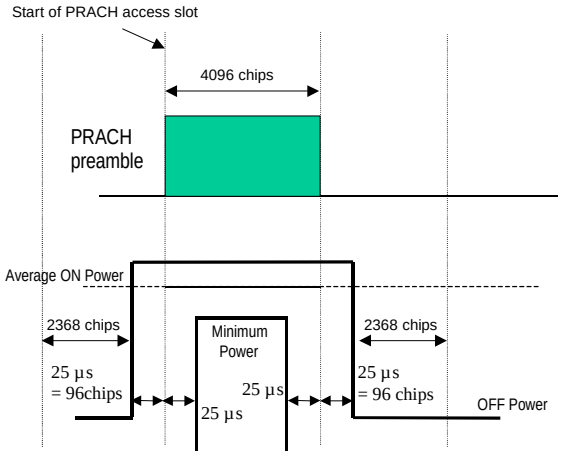

Figure 5.5.1: Transmit ON/OFF template for PRACH preambles

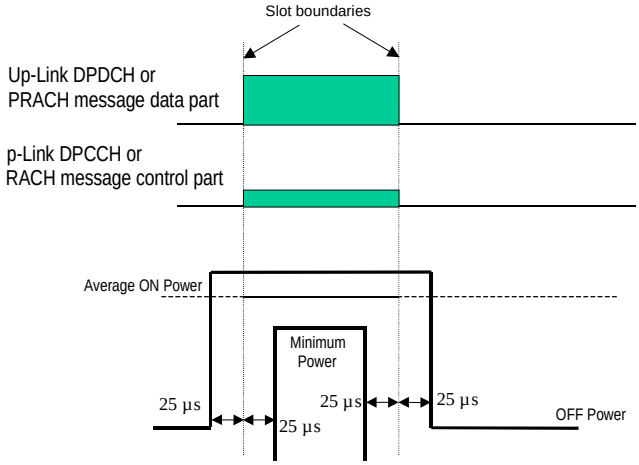

Figure 5.5.2: Transmit ON/OFF template for all other On/Off cases

OFF Power is defined in ~~figure~~ subclause 5.5.1.2.

ON power is defined as the mean power~~either case as follows~~. The specification depends on each possible case.

- First preamble of PRACH: Open loop accuracy (table 5.4.1.1).
- During preamble ramping of the RACH and between final RACH preamble and RACH message part: Accuracy depending on size of the required power difference (table 5.5.2.1).
- After transmission gaps in compressed mode: Accuracy as in table 5.7.1.

- Power step to Maximum Power: Maximum power accuracy (table 5.2.1).

Table 5.5.2.1: Transmitter power difference tolerance for RACH preamble ramping, and between final RACH preamble and RACH message part

Power difference size ΔP [dB]	Transmitter power difference tolerance [dB]
0	±1 dB
1	±1 dB
2	±1,5 dB
3	±2 dB
4 ≤ ΔP ≤ 10	±2,5 dB
11 ≤ ΔP ≤ 15	±3,5 dB
16 ≤ ΔP ≤ 20	±4,5 dB
21 ≤ ΔP	±6,5 dB

The reference for this requirement is TS 25.101 [1] clause 6.5.2.1.

This is tested using PRACH operation.

~~The minimum requirement for ON power is defined in clause 5.4.1.2.~~

~~The minimum requirement for OFF power is defined in clause 5.5.1.2.~~

~~NOTE: The main objective for this test case is to check the ramp-up/down power shape.~~

5.5.2.3 Test purpose

To verify that the UE transmit ON/OFF power levels versus time meets the described mask shown in figure 5.5.1 and figure 5.5.2.

An excess error of transmit ON/OFF response increases the interference to other channels, or increases transmission errors in the up link own channel.

5.5.2.4 Method of test

5.5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure, and $\hat{I}_{or}$ is are set up according to table 5.5.2.2. The relative power level of downlink physical channels to I_{or} are set up according to clause E.2.1.

The RACH procedure within the call setup is used for the test. The number of the available subchannels should be limited to one. This ensures that the preamble sequence is known to the SS. The preamble retransmission shall be at least 3. The power ramping step size shall be 1 dB. Note that the maximum number of preamble retransmissions is limited to 5 due to the fact that the commanded uplink power exceeds the allowed uplink power of more than 6 dB. The SS shall not send either an ACK or a NACK.

See TS 34.108 [3] for details regarding generic call setup procedure.

Table 5.5.2.2: Test parameters for Transmit ON/OFF Time mask (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See table 5.5.2.3	dBm / 3,84 MHz

Table 5.5.2.3: Test parameters for Transmit ON/OFF Time mask (SS)

Parameter	Power Class 1	Power Class 2	Power Class 3	Power Class 4	Unit
$\hat{I}_{or}$ (note 1)	–106,7	–106,7	–106,7	–106,7	dBm / 3,84 MHz
CPICH_RSCP (notes 1 and 2)	–110	–110	–110	–110	dBm
Primary CPICH DL TX power	+19	+19	+19	+19	dBm
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	+129	+129	+129	+129	dB
UL interference	–86	–92	–95	–98	dBm
Constant Value	–10	–10	–10	–10	dB
Expected nominal UE TX power (note 3)	+33	+27	+24	+21	dBm

NOTE 1: The power level of S-CCPCH should be defined because S-CCPCH is transmitted during Preamble RACH transmission period. The power level of S-CCPCH is temporarily set to –10,3 dB relative to I_{or}. However, it is necessary to check whether the above S-CCPCH level is enough to establish a connection with the reference measurement channels.
NOTE 2: The purpose of this parameter is to calculate the Expected nominal UE TX power.
NOTE 3: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.9 Open Loop Power Control of TS 25.331 [8].

5.5.2.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector and select the test parameters of table 5.5.2.3 according to the power class. $\hat{I}_{or}$ shall be according to table 5.5.2.3 (–106,7 dBm / 3,84 MHz).

2) Measure the ~~output~~ mean power (ON power) of the UE on the first RACH preamble or two consecutive RACH preambles. The measurements shall not include the transient periods. From the occurrence of the first RACH preamble the SS shall predict the following RACH preamble timing.

3) ~~Record~~ Measure the RRC filtered mean power (OFF power) in a 2~~-~~368 chip time interval before a transient period of 25 µs (96 chips) prior to a RACH preamble (ON power) ~~averaging (see note) through a matched filter (RRC 0.22, BW equal to the chiprate)~~. ~~Record~~ Measure the RRC filtered mean power (OFF power) in a 2368 chip time interval after a transient period of 25 µs (96 chips) after a RACH preamble (ON power). ~~averaging through a matched filter (RRC 0.22, BW equal to the chiprate).~~

~~NOTE: OFF power measurement with averaging requires an enough sampling speed to cover the signal bandwidth (e.g. 3,84 MHz times 1,22 = 4,6848 MHz BW).~~

5.5.2.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (table 5.5.2.3), derived in step 2), shall not exceed the prescribed upper tolerance in table 5.2.2 (clause 5.2.5) and lower tolerance in table 5.4.1.1. (clause 5.4.1.2) for the first preamble, or shall meet the tolerance in table 5.5.2.1 for two consecutive preambles.

The measured ~~leakage~~ RRC filtered mean power, derived in step 3), shall be ~~below~~ less than –55 dBm. (clause 5.5.1.5).

5.6 Change of TFC

5.6.1 Definition and applicability

A change of TFC (Transport Format Combination) in uplink means that the power in the uplink varies according to the change in data rate. DTX, where the DPCH is turned off, is a special case of variable data, which is used to minimise the interference between UE(s) by reducing the UE transmit power when voice, user or control information is not present.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.6.2 Minimum requirements

A change of output power is required when the TFC, and thereby the data rate, is changed. The ratio of the amplitude between the DPDCH codes and the DPCCH code will vary. The power step due to a change in TFC shall be calculated in the UE so that the power transmitted on the DPCCH shall follow the inner loop power control. The step in total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude. The accuracy of the power step, given the step size is specified in table 5.6.1. The power change due to a change in TFC is defined as the relative power difference between the ~~average~~ mean power of the original (reference) timeslot and the ~~average~~ mean power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary. ~~The power is measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll-off α = 0,22 and a bandwidth equal to the chip rate.~~

Table 5.6.1: Transmitter power step tolerance

Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance
0	±0,5 dB
1	±0,5 dB
2	±1,0 dB
3	±1,5 dB
4 ≤ ΔP ≤ 10	±2,0 dB
11 ≤ ΔP ≤ 15	±3,0 dB
16 ≤ ΔP ≤ 20	±4,0 dB
21 ≤ ΔP	±6,0 dB

Clause C.2.1 defines the UL reference measurement channels (12,2 kbps) for TX test and the power ratio between DPCCH and DPDCH as −5,46 dB. Therefore, only one power control step size is selected as minimum requirement from table 5.6.1. The accuracy of the power step, given the step size is specified in table 5.6.2.

Table 5.6.2: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance
β_c = 0,5333, β_d = 1,0	7	±2 dB

The transmit power levels versus time shall meet the mask specified in figure 5.6.1.

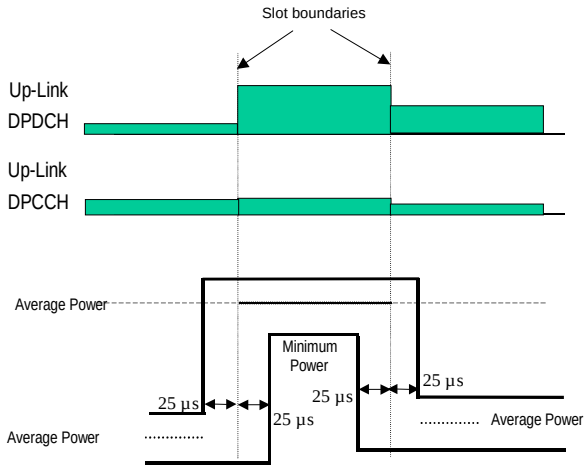

Figure 5.6.1: Transmit template during TFC change

The UL reference measurement channel (12,2 kbps) is a fixed rate channel. Therefore, DTX, where the DPDCH is turned off, is tested, as shown in figure 5.6.2.

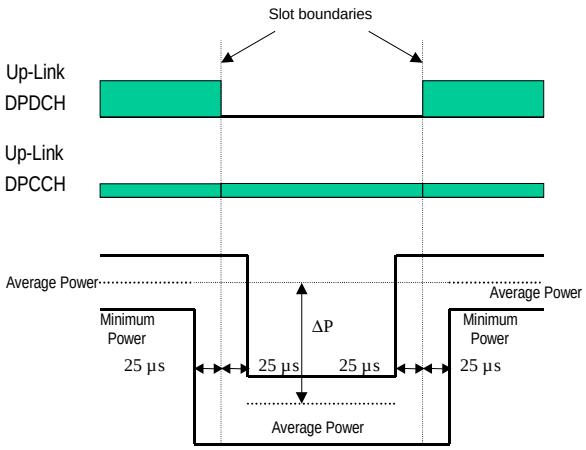

Figure 5.6.2: Transmit template during DTX

The reference for this requirement is TS 25.101 [1] clause 6.5.3.1.

5.6.3 Test purpose

To verify that the tolerance of power control step size does not exceed the described value shown in table 5.6.2.

To verify that the DTX ON/OFF power levels versus time meets the described mask shown in figure 5.6.2.

5.6.4 Method of test

5.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.6.4.2 Procedure

1) Set the attenuation in the downlink signal ($\hat{I}_{or}$) to yield an open loop output power, measured at the UE antenna connector, of 0 dBm.
2) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.
3) Using the Tester, measure the ~~average output~~ mean power at the antenna connector of the UE in two cases, both DPDCH and DPCCH are ON and only DPCCH is ON. The measurements shall not include the transient periods.

5.6.5 Test requirements

The difference in mean ~~output~~ power between DPDCH ON and OFF, derived in step 3), shall not exceed the prescribed range in table 5.6.2.

5.7 Power setting in uplink compressed mode

5.7.1 Definition and applicability

Compressed mode in uplink means that the power in uplink is changed.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.7.2 Minimum requirements

A change of output power is required during uplink compressed frames since the transmission of data is performed in a shorter interval. The ratio of the amplitude between the DPDCH codes and the DPCCH code will also vary. The power step due to compressed mode shall be calculated in the UE so that the energy transmitted on the pilot bits during each transmitted slot shall follow the inner loop power control.

Thereby, the power during compressed mode, and immediately afterwards, shall be such that the mean power of~~n~~ the DPCCH follows the steps due to inner loop power control combined with additional steps of $10Log_{10}(N_{pilot.prev} / N_{pilot.curr})$ dB where $N_{pilot.prev}$ is the number of pilot bits in the previously transmitted slot, and $N_{pilot.curr}$ is the current number of pilot bits per slot.

The resulting step in total transmitted power (DPCCH +DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the power step, given the step size, is specified in table 5.6.1 in clause 5.6.2. The power step is defined as the relative power difference between the ~~average~~ mean power of the original (reference) timeslot and the ~~average~~ mean power of the target timeslot, when neither the original timeslot nor the reference timeslot are in a transmission gap. The transient duration is not included, and is from 25 µs before the slot boundary to 2 5µs after the slot boundary. ~~The relative power is measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate.~~

In addition to any power change due to the ratio $N_{pilot.prev} / N_{pilot.curr,}$ the ~~average~~ mean power of the DPCCH in the first slot after a compressed mode transmission gap shall differ from the ~~average~~ mean power of the DPCCH in the last slot before the transmission gap by an amount Δ_{RESUME}, where Δ_{RESUME} is calculated as described in clause 5.1.2.3 of TS 25.214 [5].

The resulting difference in the total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power difference exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the resulting difference in the total transmitted power (DPCCH + DPDCH) after a transmission gap of up to 14 slots shall be as specified in table 5.7.1.

Table 5.7.1: Transmitter power difference tolerance after a transmission gap of up to 14 slots

Tolerance on required difference in total transmitter power after a transmission gap
±3 dB

The power difference is defined as the ~~relative power~~ difference between the ~~average~~ mean power of the original (reference) timeslot before the transmission gap and the ~~average~~ mean power of the target timeslot after the transmission gap, not including the transient durations. The transient durations at the start and end of the transmission gaps are each from 25 µs before the slot boundary to 25 µs after the slot boundary. ~~The relative power is measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate.~~

The transmit power levels versus time shall meet the mask specified in figure 5.7.1.

The reference for this requirement is TS 25.101 [1] clause 6.5.4.1.

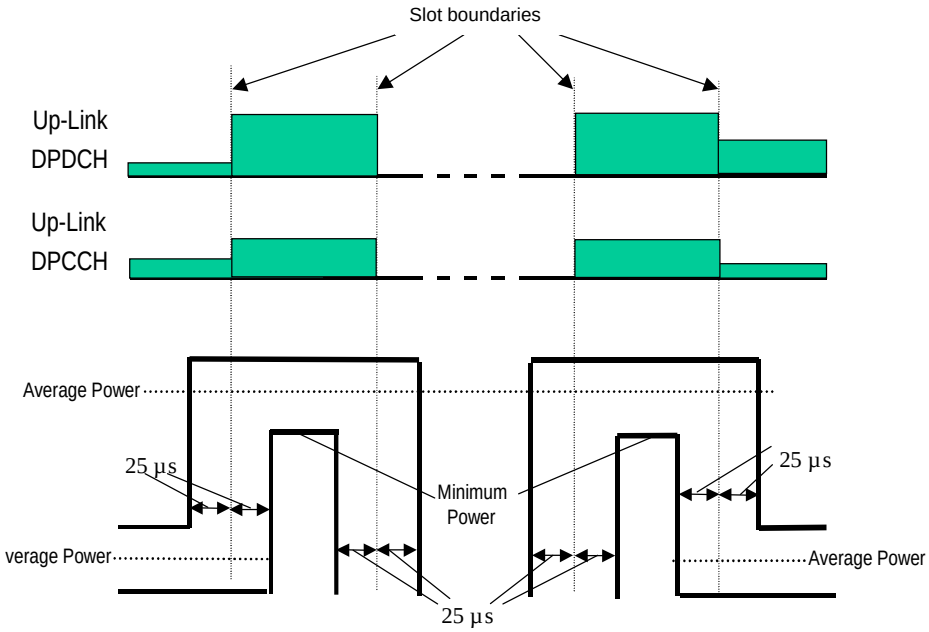

Figure 5.7.1: Transmit template during Compressed mode

For RPL (Recovery Period Length) slots after the transmission gap, where RPL is the minimum out of the transmission gap length and 7 slots, the UE shall use the power control algorithm and step size specified by the signalled Recovery Period Power Control Mode (RPP), as detailed in TS 25.214 [5] clause 5.1.2.3.

When nominal 3 dB power control steps are used in the recovery period, the transmitter ~~output~~ mean power steps due to inner loop power control shall be within the range shown in table 5.7.2, and the transmitter ~~average output~~ aggregate mean power step due to inner loop power control shall be within the range shown in table 5.7.3, excluding any other power changes due, for example, to changes in spreading factor or number of pilot bits.

Table 5.7.2: Transmitter power control range for 3dB step size

TPC_cmd	Transmitter power control range for 3dB step size	
	Lower	Upper
+1	+1,5 dB	+4,5 dB
0	–0,5 dB	+0,5 dB
–1	–1,5 dB	–4,5 dB

Table 5.7.3: Transmitter ~~average~~ aggregate power control range for 3dB step size

TPC_cmd group	Transmitter power control range after 7 equal TPC_cmd groups	
	Lower	Upper
+1	+16 dB	+26 dB
0	–1 dB	+1 dB
–1	–16 dB	–26 dB

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1.

5.7.3 Test purpose

To verify that the changes in uplink transmit power in compressed mode are within the prescribed tolerances.

Excess error in transmit power setting in compressed mode increases the interference to other channels, or increases transmission errors in the uplink.

5.7.4 Method of test

5.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure. The 12,2 kbps UL reference measurement channel is used, with gain factors $\beta_c = 0{,}5333$ and $\beta_d = 1{,}0$ in non-compressed frames. Slot formats 0, 0A and 0B are used on the uplink DPCCH.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.7.4.2 Procedure

NOTE: CFNs are given in this procedure for reference as examples only. A fixed offset may be applied to the CFNs.

1) Before proceeding with paragraph (4) below, set the output power of the UE, measured at the UE antenna connector, to be in the range -34 ± 9 dBm. This may be achieved by setting the downlink signal ($\hat{I}or$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Signal the uplink power control parameters to use Algorithm 1 and a step size of 2 dB.

3) Signal the set of compressed mode parameters shown in table 5.7.5. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of 3 dB output power steps and the implementation of a power change when resuming transmission after a compressed mode gap.

Table 5.7.5: Parameters for pattern A for compressed mode test

Parameter	Meaning	Value
TGPRC	Number of transmission gap patterns within the Transmission Gap Pattern Sequence	1
TGCFN	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence	0
TGSN	Slot number of the first transmission gap slot within the TGCFN	10
TGL1	Length of first transmission gap within the transmission gap pattern	10 slots
TGL2	Length of second transmission gap within the transmission gap pattern	5 slots
TGD	Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern	20 slots
TGPL1	Duration of transmission gap pattern 1	3 frames
TGPL2	Duration of transmission gap pattern 2	Omit
RPP	Recovery Period Power Control Mode	Mode 1
ITP	Initial Transmit Power Mode	Mode 1
UL/DL Mode	Defines whether only DL, only UL, or combined UL/DL compressed mode is used	UL/DL
Downlink Compressed Mode Method	Method for generating downlink compressed mode gap	SF/2
Uplink Compressed Mode Method	Method for generating uplink compressed mode gap	SF/2
Scrambling code change	Indicates whether the alternative scrambling code is used	No code change
Downlink frame type	Downlink compressed frame structure	A
DeltaSIR	Delta in DL SIR target value to be set in the UE during compressed frames	0
DeltaSIRafter	Delta in DL SIR target value to be set in the UE one frame after the compressed frames	0

The resulting compressed mode pattern is shown in figure 5.7.2.

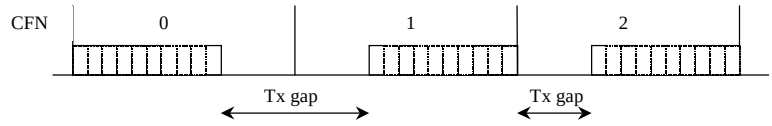

Figure 5.7.2: Pattern A for compressed mode test

4) Transmit TPC commands on the downlink as shown in table 5.7.6.

Table 5.7.6: TPC commands transmitted in downlink

CFN	TPC commands in downlink
0	1 1 1 1 1 1 1 1 1 1 - - - - -
1	- - - - - 1 1 1 1 1 1 1 1 0 0
2	- - - - - 0 1 0 1 0 1 0 1 0 1

5) Measure the mean ~~output~~ power in the following slots, not including the 25 µs transient periods at the start and end of each slot:

CFN 1: Slots # 5,6,7,8,9,10,11,12,14
CFN 2: Slot # 5

6) Re-start the test. Before proceeding with step (8) below, set the output power of the UE, measured at the UE antenna connector, to be in the range 3 ± 9 dBm. This may be achieved by, setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

7) Repeat steps (2) and (3) above, with the exception that TGCFN = 3.

8) Transmit TPC commands on the downlink as shown in table 5.7.7.

Table 5.7.7: TPC commands transmitted in downlink

CFN	TPC commands in downlink
3	0 0 0 0 0 0 0 0 0 0 - - - - -
4	- - - - - 0 0 0 0 0 0 0 0 1 1
5	- - - - - 1 0 1 0 1 0 1 0 1 0

9) Measure the mean ~~output~~ power in the following slots, not including the 25 µs transient periods at the start and end of each slot:

CFN 4: Slots # 5,6,7,8,9,10,11,12,14
CFN 5: Slot # 5

10) Re-start the test. Before proceeding with step (13) below, set the output power of the UE, measured at the UE antenna connector, to be in the range –10 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

11) Signal the uplink power control parameters to use Algorithm 1 and a step size of 1 dB.

12) Signal the set of compressed mode parameters shown in table 5.7.8. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of power steps at the start and end of compressed frames, and the implementation of a zero power change when resuming transmission after a compressed mode gap.

Table 5.7.8: Parameters for pattern B for compressed mode test

Parameter	Meaning	Value
TGPRC	Number of transmission gap patterns within the Transmission Gap Pattern Sequence	1
TGCFN	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence	7
TGSN	Slot number of the first transmission gap slot within the TGCFN	8
TGL1	Length of first transmission gap within the transmission gap pattern	14 slots
TGL2	Length of second transmission gap within the transmission gap pattern	omit
TGD	Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern	0
TGPL1	Duration of transmission gap pattern 1	4 frames
TGPL2	Duration of transmission gap pattern 2	Omit
RPP	Recovery Period Power Control Mode	Mode 0
ITP	Initial Transmit Power Mode	Mode 0
UL/DL Mode	Defines whether only DL, only UL, or combined UL/DL compressed mode is used	UL/DL
Downlink Compressed Mode Method	Method for generating downlink compressed mode gap	SF/2
Uplink Compressed Mode Method	Method for generating uplink compressed mode gap	SF/2
Scrambling code change	Indicates whether the alternative scrambling code is used	No code change
Downlink frame type	Downlink compressed frame structure	A
DeltaSIR	Delta in DL SIR target value to be set in the UE during compressed frames	0
DeltaSIRafter	Delta in DL SIR target value to be set in the UE one frame after the compressed frames	0

The resulting compressed mode pattern is shown in figure 5.7.3.

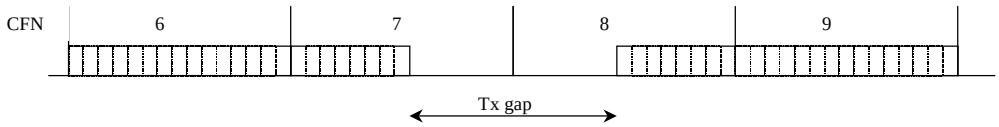

Figure 5.7.3: Pattern B for compressed mode test

13) Transmit TPC commands on the downlink as shown in table 5.7.8.

Table 5.7.8: TPC commands transmitted in downlink

CFN	TPC commands in downlink
6	0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1
7	1 1 1 1 1 1 1 1 - - - - - - -
8	- - - - - - - 0 0 0 0 0 0 0 0
9	0 0 0 1 1 1 1 1 1 1 1 1 1 1 1

14) Measure the mean ~~output~~ power in the following slots, not including the 25 µs transient periods at the start and end of each slot:

CFN 6: Slot # 14
CFN 7: Slots # 0 and 7
CFN 8: Slots # 7 and 14
CFN 9: Slot # 0

5.7.5 Test requirements

For ease of reference, the following uplink output power measurements are defined in figure 5.7.4. In this figure:

- P_g is the RRC filtered mean power in an uplink transmission gap, excluding the 25 μs transient periods.
- P_a is the mean power in the last slot before a compressed frame (or pair of compressed frames), excluding the 25 μs transient periods.
- P_b is the mean power in the first slot of a compressed frame, excluding the 25 μs transient periods.
- P_c is the mean power in the last slot before a transmission gap, excluding the 25 μs transient periods.
- P_d is the mean power in the first slot after a transmission gap, excluding the 25 μs transient periods.
- P_e is the mean power in the last slot of a compressed frame, excluding the 25 μs transient periods.
- P_f is the mean power in the first slot after a compressed frame (or pair of compressed frames), excluding the 25 μs transient periods.

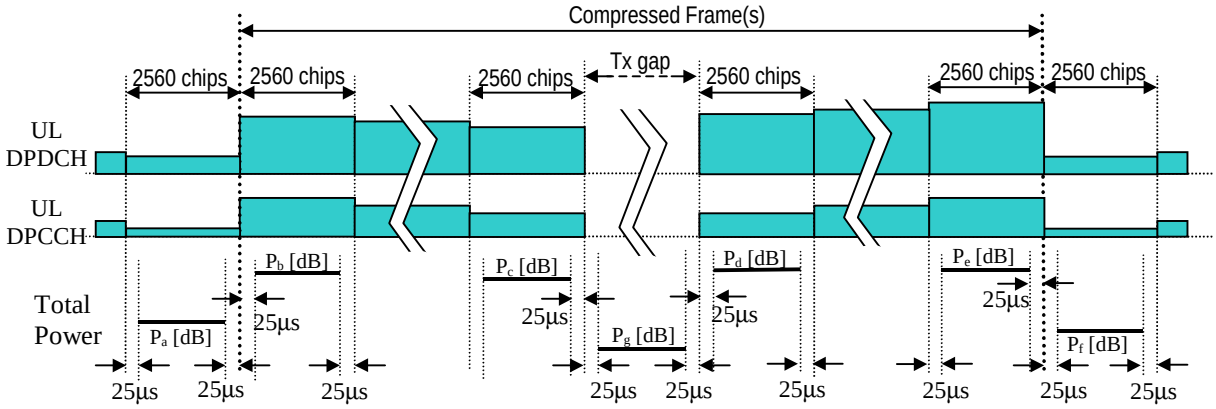

Figure 5.7.4: Uplink transmit power in uplink compressed mode

1. At the boundary between CFN 6 and CFN 7, $P_b - P_a$ shall be within the range +4 ± 2 dB.
2. In slot #5 of CFN 2, the power difference $P_d - P_c$ from the power in slot #14 of CFN 1 shall be within the range -6 ± 3 dB.
3. In slot #5 of CFN 5, the power difference $P_d - P_c$ from the power in slot #14 of CFN 4 shall be within the range +6 ± 3 dB.
4. In slot #7 of CFN 8, the power difference $P_d - P_c$ from the power in slot #7 of CFN 7 shall be within the range 0 ± 3 dB.
5. (void)
6. At the boundary between CFN 8 and CFN 9, $P_f - P_e$ shall be within the range -4 ± 2 dB.
7. In the slots between slot #6 of CFN 1 and slot #12 of CFN 1 inclusive, the change in mean ~~output~~ power from the previous slot shall be within the range given in table 5.7.2 for TPC_cmd = +1.
8. The aggregate change in mean ~~output~~ power from slot #5 of CFN 1 to slot #12 of CFN 1 shall be within the range given in table 5.7.3 for TPC_cmd = +1.
9. In the slots between slot #6 of CFN 4 and slot #12 of CFN 4 inclusive, the change in mean ~~output~~ power from the previous slot shall be within the range given in table 5.7.2 for TPC_cmd = -1.
10. The aggregate change in mean ~~output~~ power from slot #5 of CFN 4 to slot #12 of CFN 4 shall be within the range given in table 5.7.3 for TPC_cmd = -1.

5.8 Occupied Bandwidth (OBW)

5.8.1 Definition and applicability

Occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power of the transmitted spectrum, centred on the assigned channel frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.8.2 Minimum Requirements

The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

The normative reference for this requirement is TS 25.101 [1] clause 6.6.1.

5.8.3 Test purpose

To verify that the UE occupied channel bandwidth is less than 5 MHz based on a chip rate of 3,84 Mcps.

Excess occupied channel bandwidth increases the interference to other channels or to other systems.

5.8.4 Method of test

5.8.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.8.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the power spectrum distribution within two times or more range over the requirement for Occupied Bandwidth specification centring on the current carrier frequency with 30 kHz or less RBW. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter).
3) Calculate the total power within the range of all frequencies measured in '2)' and save this value as "Total Power".
4) Sum up the power upward from the lower boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Lower Frequency".
5) Sum up the power downward from the upper boundary of the measured frequency range in '2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Upper Frequency".
6) Calculate the difference ("Upper Frequency" – "Lower Frequency" = "Occupied Bandwidth") between two limit frequencies obtained in '4)' and '5)'.

5.8.5 Test Requirements

The measured Occupied Bandwidth, derived in step 6), shall not exceed 5 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.9 Spectrum emission mask

5.9.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier~~output power measured in a 3,84 MHz bandwidth~~.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.9.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in table 5.9.1.

Table 5.9.1: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement	Measurement bandwidth
2,5 to 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	30 kHz (note 2)
3,5 to 7,5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	1 MHz (note 3)
7,5 to 8,5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	1 MHz (note 3)
8,5 to 12,5	–49 dBc	1 MHz (note 3)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz. NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.		
The lower limit shall be –50 dBm/3,84 MHz or which ever is higher.		

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.1.1.

5.9.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in table 5.9.1.

Excess emission increases the interference to other channels or to other systems.

5.9.4 Method of test

5.9.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.9.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9.2. Measurements with an offset from the carrier centre frequency between 2,515 MHz and 3,485 MHz shall use a 30 kHz measurement filter. Measurements with an offset from the carrier centre frequency between 4 MHz and 12 MHz shall use 1 MHz measurement bandwidth and the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9.2. The measured power shall be recorded for each step.

3) Measure the ~~wanted output~~ RRC filtered mean power centered on the assigned channel frequency~~according to annex B~~.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5.9.5 Test requirements

The result of clause 5.9.4.2 step 4) shall fulfil the requirements of table 5.9.2.

Table 5.9.2: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement	Measurement bandwidth
2,5 to 3,5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	30 kHz (note 2)
3,5 to 7,5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	1 MHz (note 3)
7,5 to 8,5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	1 MHz (note 3)
8,5 to 12,5	–47,5 dBc	1 MHz (note 3)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz. NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.		
The lower limit shall be –48,5 dBm/3,84 MHz or which ever is higher.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.10 Adjacent Channel Leakage Power Ratio (ACLR)

5.10.1 Definition and applicability

ACLR is the ratio of the ~~transmitted~~ RRC filtered mean power centered on the assigned channel frequency to the RRC filtered mean power ~~measured in~~ centered on an adjacent channel frequency. ~~Both the transmitted power and the adjacent channel power are measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α = 0,22 and a bandwidth equal to the chip rate.~~

The requirements and this test apply to all types of UTRA for the FDD UE.

5.10.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than −50dBm then the ACLR ~~should~~ shall be higher than the value specified in table 5.10.1.

Table 5.10.1: UE ACLR due to modulation

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	33 dB
	+10 MHz or –10 MHz	43 dB
4	+5 MHz or –5 MHz	33 dB
	+10 MHz or –10 MHz	43 dB

The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1.

5.10.3 Test purpose

To verify that the UE ACLR due to modulation does not exceed prescribed limit shown in table 5.10.1.

Excess ACLR increase the interference to other channels or to other systems.

5.10.4 Method of test

5.10.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.10.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the RRC filtered mean power ~~within the bandwidth of current carrier through a matched filter (RRC 0.22)~~.
3) Measure the RRC filtered mean power ~~fallen in the bandwidth~~ of the first adjacent channels and the second adjacent channels ~~through a matched filter (RRC 0.22)~~.
4) Calculate the ratio of the power between the values measured in '2)'and '3)'.

5.10.5 Test requirements

If the measured adjacent channel RRC filtered mean power, derived in step 3), is greater than –50 dBm then the measured ACLR, derived in step 4), shall be higher than the limit in table 5.10.2.

Table 5.10.2: UE ACLR due to modulation

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	32,2 dB
	+10 MHz or –10 MHz	42,2 dB
4	+5 MHz or –5 MHz	32,2 dB
	+10 MHz or –10 MHz	42,2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.11 Spurious Emissions

5.11.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.11.2 Minimum Requirements

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

Table 5.11.1a: General spurious emissions requirements

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	–36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	–36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	–36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	–30 dBm

Table 5.11.1b: Additional spurious emissions requirements

Paired band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
For operation in frequency bands as defined in clause 4.2(a)	1 893,5 MHz < f < 1 919,6 MHz	300 kHz	–41 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz	–67 dBm (note)
	935 MHz < f ≤ 960 MHz	100 kHz	–79 dBm (note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 dBm (note)
NOTE: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted for each UARFCN used in the measurement			

The normative reference for this requirement is TS 25.101 [1] clause 6.6.3.1.

5.11.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11.1a and table 5.11.1b.

Excess spurious emissions increase the interference to other systems.

5.11.4 Method of test

5.11.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.8.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

5.11.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11.2a and 5.11.2b.

These requirements are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency.

Table 5.11.2a: General spurious emissions test requirements

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	–36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	–36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	–36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	–30 dBm

Table 5.11.2b: Additional spurious emissions test requirements

Paired band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
For operation in frequency bands as defined in clause 4.2(a)	1 893,5 MHz < f < 1 919,6 MHz	300 kHz	–41 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz	–67 dBm (note)
	935 MHz < f ≤ 960 MHz	100 kHz	–79 dBm (note)
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	–71 dBm (note)
NOTE: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.2a are permitted for each UARFCN used in the measurement			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.12 Transmit Intermodulation

5.12.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

UE(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or Node B receive band as an unwanted interfering signal. The UE transmit intermodulation attenuation is defined by the ratio of the ~~output~~ RRC filtered mean power of the wanted signal to the ~~output~~ RRC filtered mean power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal. ~~Both the wanted signal power and the IM product power are measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α = 0,22 and a bandwidth equal to the chip rate.~~

The requirements and this test apply to all types of UTRA for the FDD UE.

5.12.2 Minimum Requirements

The UE transmit intermodulation shall not exceed the described value in table 5.12.1.

Table 5.12.1: Transmit Intermodulation

CW Signal Frequency Offset from Transmitting Carrier	5MHz	10MHz
Interference CW Signal Level	–40 dBc	
Intermodulation Product	–31 dBc	–41 dBc

The normative reference for this requirement is TS 25.101 [1] clause 6.7.1.

5.12.3 Test purpose

To verify that the UE transmit intermodulation does not exceed the described value in table 5.12.1.

An excess transmit intermodulation increases transmission errors in the up link own channel when other transmitter exists nearby.

5.12.4 Method of test

5.12.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.2.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.12.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Set the frequency of the CW generator to the offset 1 or offset 2 as shown in table 5.12.2.

3) Measure the ~~average output~~ RRC filtered mean power of the UE ~~by spectrum analyzer (or equivalent equipment) through RRC filter~~.

4) Search the intermodulation product signal, then measure the ~~average~~ RRC filtered mean power of transmitting intermodulation ~~through RRC filter~~, and calculate the ratio with the power measured in step 3) ~~to the average output power of UE~~.

5) Repeat the measurement with another tone offset.

5.12.5 Test requirements

The ~~measured average power of transmit intermodulation,~~ ratio derived in step 4), shall not exceed the described value in table 5.12.2.

Table 5.12.2: Transmit Intermodulation

CW Signal Frequency Offset from Transmitting Carrier	5MHz	10MHz
Interference CW Signal Level	–40 dBc	
Intermodulation Product	[–31 + TT] dBc	[–41 + TT] dBc

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13 Transmit Modulation

5.13.1 Error Vector Magnitude (EVM)

5.13.1.1 Definition and applicability

The Error Vector Magnitude (EVM) is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one ~~power control group (~~timeslot~~)~~.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.13.1.2 Minimum Requirements

The EVM shall not exceed 17,5 % for the parameters specified in table 5.13.1.

Table 5.13.1: Parameters for EVM

Parameter	Level / Status	Unit
Output power	≥ –20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.101 [1] clause 6.8.2.1.

5.13.1.3 Test purpose

To verify that the EVM does not exceed 17,5 % for the specified parameters in table 5.13.1.

An excess EVM increases transmission errors in the up link own channel.

5.13.1.4 Method of test

5.13.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.13.1.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the EVM using Global In-Channel Tx-Test (annex B).
3) Set the power level of UE to –20dBm or send Down power control commands (1dB step size should be used.) to the UE until UE output power shall be –20dBm with ±1dB tolerance.
4) Repeat step 2).

5.13.1.5 Test requirements

The measured EVM, derived in step 2) and 4), shall not exceed 17,5 %. for parameters specified in table 5.13.1 Parameters for EVM.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.13.2 Peak code domain error

5.13.2.1 Definition and applicability

The Peak Code Domain Error is computed by projecting power of the error vector (as defined in clause 5.13.1.1) onto the code domain at a specific spreading factor. The Code Domain Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes. The measurement interval is one ~~power control group (~~timeslot~~)~~.

The requirements and this test apply only to the UE in which the multi-code transmission is provided.

5.13.2.2 Minimum Requirements

The peak code domain error shall not exceed -15 dB at spreading factor 4 for the parameters specified in table 5.13.3.The requirements are defined using the UL reference measurement channel (768 kbps) specified in clause C.2.5.

Table 5.13.3: Parameters for Peak code domain error

Parameter	Level / Status	Unit
Output power	≥ –20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.101 [1] clause 6.8.3.1.

5.13.2.3 Test purpose

To verify that the UE peak code domain error does not exceed -15 dB for the specified parameters in table 5.13.3.

An excess peak code domain error increases transmission errors in the up link own channel.

5.13.2.4 Method of test

5.13.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 5.13.4.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 5.13.4: Test parameters for Peak code domain error

Parameter	Level / Status	Unit
Operating conditions	Normal conditions	
Uplink signal	multi-code	
Information bit rate	2*384	kbps
Power control step size	1	dB

5.13.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the Peak code Domain error using Global In-Channel Tx-Test (annex B).
3) Set the power level of UE to –20dBm or send Down power control commands (1dB step size should be used.) to the UE until UE output power shall be–20dBm with ±1dB tolerance.
4) Repeat step 2).

5.13.2.5 Test requirements

The measured Peak code domain error, derived in step 2) and 4), shall not exceed -14 dB.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4

6 Receiver Characteristics

6.1 General

Receiving performance test of the UE is implemented during communicating with the SS via air interface. The procedure is using normal call protocol until the UE is communicating on traffic channel basically. On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function (Refer to TS 34.109 [4])

Transmitting or receiving bit/symbol rate for test channel is shown in table 6.1.

Table 6.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	UL DPCH bit rate	Remarks
12,2 kbps reference measurement channel	12,2 kbps	30 ksps	60 kbps	Standard Test

Unless otherwise stated the receiver characteristics are specified at the antenna connector of the UE. For UE(s) with an integral antenna only, a reference antenna with a gain of 0 dBi is assumed. UE with an integral antenna may be taken into account by converting these power levels into field strength requirements, assuming a 0 dBi gain antenna. Receiver characteristics for UE(s) with multiple antennas/antenna connectors are FFS.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 6 are defined using the DL reference measurement channel (12,2 kbps) specified in clause C.3.1 and unless stated otherwise, with DL power control OFF.

The common RF test conditions of Rx Characteristics are defined in clause E.3.2, and each test conditions in this clause (clause 6) should refer clause E.3.2. Individual test conditions are defined in the paragraph of each test.

All Bit Error ratio (BER) measurements in clause 6 shall be performed according to the general rules for statistical testing in Annex F.6

6.2 Reference Sensitivity Level

6.2.1 Definition and applicability

The reference sensitivity level is the minimum ~~receiver input~~ mean power ~~measured~~ received at the UE antenna port at which the Bit Error Ratio (BER) ~~does~~ shall not exceed a specific value

The requirements and this test apply to all types of UTRA for the FDD UE.

6.2.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.2.1.

Table 6.2.1: Test parameters for Reference Sensitivity Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	–106,7	dBm / 3,84 MHz
DPCH_Ec	–117	dBm / 3,84 MHz
NOTE 1: For Power class 3, this shall be at the maximum output power. NOTE 2: For Power class 4, this shall be at the maximum output power.		

The normative reference for this requirement is TS 25.101 [1] clause 7.3.1.

6.2.3 Test purpose

To verify that the UE BER ~~does~~ shall not exceed 0,001 for the parameters specified in table 6.2.1.

The lack of the reception sensitivity decreases the coverage area at the far side from Node B.

6.2.4 Method of test

6.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.3.
2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.2.2.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the BER of DCH received from the UE at the SS.

6.2.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0,001.

Table 6.2.2: Test parameters for Reference Sensitivity Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	–106	dBm / 3,84 MHz
DPCH_Ec	–116,3	dBm / 3,84 MHz
NOTE 1: For Power class 3, this shall be at the maximum output power. NOTE 2: For Power class 4, this shall be at the maximum output power.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.3 Maximum Input Level

6.3.1 Definition and applicability

This is defined as the maximum ~~receiver input~~ mean power received at the UE antenna port, which ~~does~~ shall not degrade the specified BER performance.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.3.2 Minimum requirements

The BER shall not exceed 0.001 for the parameters specified in table 6.3.

The reference for this requirement is TS 25.101 [1] clause 7.4.1.

NOTE: Since the spreading factor is large (10log(SF)=21dB), the majority of the total input signal consists of the OCNS interference. The structure of OCNS signal is defined in clause E.3.3.

6.3.3 Test purpose

To verify that the UE BER ~~does~~ shall not exceed 0,001 for the parameters specified in table 6.3.

The lack of the maximum input level decreases the coverage area at the near side from Node B.

6.3.4 Method of test

6.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.3.
2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.3 and table E.3.3.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

Table 6.3: Test parameters for Maximum Input Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	–25	dBm / 3,84MHz
$\frac{DPCH_E_c}{I_{or}}$	–19	dB
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~		

6.3.4.2 Procedure

1) Measure the BER of DCH received from the UE at the SS.

6.3.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

6.4 Adjacent Channel Selectivity (ACS)

6.4.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply to all types of UTRA for the FDD UE.

6.4.2 Minimum Requirements

For the UE of power class 3 and 4, the BER shall not exceed 0,001 for the parameters specified in table 6.4.1. This test condition is equivalent to the ACS value 33 dB.

Table 6.4.1: Test parameters for Adjacent Channel Selectivity

Parameter	Level / Status	Unit
DPCH_Ec	–103	dBm / 3,84 MHz
$\hat{I}_{or}$	–92,7	dBm / 3,84 MHz
I_{oac} mean power (modulated)	–52	dBm~~/ 3,84 MHz~~
F_{uw} (offset)	–5 or +5	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm~~.		

The normative reference for this requirement is TS 25.101 [1] clause 7.5.1.

NOTE: The I_{oac} (modulated) signal consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

6.4.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the test parameters specified in table 6.4.1.

The lack of the ACS decreases the coverage area when other transmitter exists in the adjacent channel.

6.4.4 Method of test

6.4.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.4.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.4.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.4.4.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 6.4.2.

2) Measure the BER of DCH received from the UE at the SS.

6.4.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

Table 6.4.2: Test parameters for Adjacent Channel Selectivity

Parameter	Level / Status	Unit
DPCH_Ec	–103	dBm / 3,84 MHz
$\hat{I}_{or}$	–92,7	dBm / 3,84 MHz
I_{oac} mean power (modulated)	–52	dBm ~~/ 3,84 MHz~~
F_{uw} (offset)	–5 or +5	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5 Blocking Characteristics

6.5.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.5.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.5.1 and table 6.5.2. For table 6.5.2 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

The normative reference for this requirement is TS 25.101 [1] clause 7.6.1.

NOTE: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E3.6.

Table 6.5.1: Test parameters for In-band blocking characteristics

~~Parameter~~	~~10 MHz offset~~	~~15 MHz offset~~	~~Unit~~
~~DPCH_Ec~~	~~–114~~	~~–114~~	~~dBm / 3,84 MHz~~
~~$\hat{I}_{or}$~~	~~–103,7~~	~~–103.7~~	~~dBm / 3,84 MHz~~
~~$I_{blocking}$ (modulated)~~	~~–56~~	~~–44~~	~~dBm / 3,84 MHz~~
~~F_{uw} (offset)~~	~~+10 or –10~~	~~+15 or –15~~	~~MHz~~
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~			

Parameter	Unit	Level	
DPCH_Ec	dBm/3.84 MHz	-114	
$\hat{I}_{or}$	dBm/3.84 MHz	-103.7	
$I_{blocking}$ mean power (modulated)	dBm	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	

Table 6.5.2: Test parameters for Out of band blocking characteristics

Parameter	Band 1	Band 2	Band 3	Unit
DPCH_Ec	–114	–114	–114	dBm / 3,84MHz
$\hat{I}_{or}$	–103,7	–103,7	–103,7	dBm / 3,84MHz
$I_{blocking}$ (CW)	–44	–30	–15	dBm
F_{uw} For operation in frequency bands as defined in clause 4.2(a)	2 050 < f < 2 095 2 185 < f < 2 230	2 025 < f < 2 050 2 230 < f < 2 255	1 < f < 2 025 2 255 < f < 12 750	MHz
F_{uw} For operation in frequency bands as defined in clause 4.2(b)	1 870 < f < 1 915 2 005 < f < 2 050	1 845 < f < 1 870 2 050 < f < 2 075	1 < f < 1 845 2 075 < f < 12 750	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)			dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm~~				
For operation in bands referenced in 4.2(a), 2 095 < f < 2 110 MHz and 2 170 < f < 2 185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4 and table 6.5.1 shall be applied.				
For operation in bands referenced in 4.2(b), 1 915 < f < 1 930 MHz and 1 990 < f < 2 005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4 and table 6.5.1 shall be applied				

6.5.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.5.1 and table 6.5.2. For table 6.5.2 up to (24) exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

The lack of the blocking ability decreases the coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5.4 Method of test

6.5.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.5.
2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.5.3 and table 6.5.4.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5.3 and table 6.5.4. For table 6.5.4, the frequency step size is 1 MHz.
2) Measure the BER of DCH received from the UE at the SS.
3) For table 6.5.4, record the frequencies for which BER exceed the test requirements.

6.5.5 Test requirements

For table 6.5.3, the measured BER, derived in step 2), shall not exceed 0.001. For table 6.5.4, the measured BER, derived in step 2) shall not exceed 0,001 except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24.

Table 6.5.3: Test parameters for In-band blocking characteristics

~~Parameter~~	~~10 MHz offset~~	~~15 MHz offset~~	~~Unit~~
~~DPCH_Ec~~	~~–114~~	~~–114~~	~~dBm / 3,84 MHz~~
~~$\hat{I}_{or}$~~	~~–103.7~~	~~–103.7~~	~~dBm / 3,84 MHz~~
~~$I_{blocking}$ (modulated)~~	~~–56~~	~~–44~~	~~dBm / 3,84 MHz~~
~~F_{uw} (offset)~~	~~±10 or –10~~	~~±15 or –15~~	~~MHz~~
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~			

Parameter	**Unit**	**Level**	
DPCH_Ec	dBm/3.84 MHz	-114	
$\hat{I}_{or}$	dBm/3.84 MHz	-103.7	
$I_{blocking}$ mean power (modulated)	dBm	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	

Table 6.5.4: Test parameters for Out of band blocking characteristics

Parameter	Band 1	Band 2	Band 3	Unit
DPCH_Ec	–114	–114	–114	dBm / 3,84MHz
$\hat{I}_{or}$	–103.7	–103.7	–103.7	dBm / 3,84MHz
$I_{blocking}$ (CW)	–44	–30	–15	dBm
F_{uw} For operation in frequency bands as defined in clause 4.2(a)	2 050 < f < 2 095 2 185 < f < 2 230	2 025 < f < 2 050 2 230 < f < 2 255	1 < f < 2 025 2 255 < f < 12 750	MHz
F_{uw} For operation in frequency bands as defined in clause 4.2(b)	1 870 < f < 1 915 2 005 < f < 2 050	1 845 < f < 1 870 2 050 < f < 2 075	1 < f < 1 845 2 075 < f < 12 750	MHz
UE transmitted mean power		20 (for Power class 3) 18 (for Power class 4)		dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~				
For operation in bands referenced in 4.2(a), 2 095 < f < 2 110 MHz and 2 170 < f < 2 185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4 and table 6.5.3 shall be applied.				
For operation in bands referenced in 4.2(b), 1 915 < f < 1 930 MHz and 1 990 < f < 2 005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4 and table 6.5.3 shall be applied				

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.6 Spurious Response

6.6.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the blocking limit is not met.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.6.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.6.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.7.1.

Table 6.6.1: Test parameters for Spurious Response

Parameter	Level	Unit
DPCH_Ec	–114	dBm / 3,84MHz
$\hat{I}_{or}$	–103.7	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~		

6.6.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.6.1.

The lack of the spurious response ability decreases the coverage area when other unwanted interfering signal exists at any other frequency.

6.6.4 Method of test

6.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.6.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.6.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6.2. The spurious response frequencies are determined in step 3) of clause 6.5.4.2.

2) Measure the BER of DCH received from the UE at the SS.

6.6.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0,001.

Table 6.6.2: Test parameters for Spurious Response

Parameter	Level	Unit
DPCH_Ec	–114	dBm / 3,84MHz
$\hat{I}_{or}$	–103.7	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.7 Intermodulation Characteristics

6.7.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted

signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.7.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.7.1.

The normative reference for this requirement is TS 25.101 [1] clause 7.8.1.

NOTE: I_{ouw2} (modulated) consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

Table 6.7.1: Test parameters for Intermodulation Characteristics

Parameter	Level		Unit
DPCH_Ec	–114		dBm / 3,84 MHz
$\hat{I}_{or}$	–103.7		dBm / 3,84 MHz
I_{ouw1} (CW)	–46		dBm
I_{ouw2} mean power (modulated)	–46		dBm ~~/ 3,84 MHz~~
F_{uw1} (offset)	10	-10	MHz
F_{uw2} (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)		dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~			

6.7.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.7.1.

The lack of the intermodulation response rejection ability decreases the coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

6.7.4 Method of test

6.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.7.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.7.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7.2.

2) Measure the BER of DCH received from the UE at the SS.

6.7.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

Table 6.7.2: Test parameters for Intermodulation Characteristics

Parameter	Level		Unit
DPCH_Ec	–114		dBm / 3.84 MHz
$\hat{I}_{or}$	–103.7		dBm / 3.84 MHz
I_{ouw1} (CW)	–46		dBm
I_{ouw2} mean power (modulated)	–46		dBm ~~/ 3.84 MHz~~
F_{uw1} (offset)	10	-10	MHz
F_{uw2} (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)		dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.8 Spurious Emissions

6.8.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector.

The requirements and this test apply to all types of UTRA for the FDD UE.

3GPP TSG-T1 Meeting #14
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CR-Form-v5

CHANGE REQUEST

⌘ **34.121 CR 144** ⌘ **rev -** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of power spectral density definition
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-13
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ The existing requirements relating to power spectral density are incomplete. The bandwidth over which the power spectral density should be integrated is missing. The assumption that this should be 3.84 MHz is incorrect for signals containing information since the energy of the signal extends to (1+α) times the chip rate. For band limited white noise, it is correct to assume a (noise) bandwidth equal to the chip rate. Without these clarifications, it will not be possible to correctly generate or measure any of the quantities involved.

Summary of change: ⌘

3.2 Abbreviations: I_{oac}, I_{oc} and $\hat{I}_{or}$ definitions clarified and note added. (The $\hat{I}_{or}$ definition was incorrectly labelled as I_{or}). The I_{or} definition was missing and has been added.

Sections 7 and 8: The term "DPCH_Ec/Ior power" changed to "DPCH_Ec/Ior power ratio". Average power and average output power changed to mean power. Other misuses of power changed to power ratio. Table 8.7.6.1.2 Ior defined as power spectral density, not power. All units for I_o corrected to be dBm/3.84 MHz, not dBm.

Consequences if not approved: ⌘ The incomplete requirements can be interpreted differently causing an incorrect understanding of UE performance.

Isolated impact statement: Correction of conformance tests. Will not affect UE implementation.

Clauses affected: ⌘ 3, 7 & 8

Other specs affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions, symbols, abbreviations and equations

Definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [5] and TR 25.990 [6].

Terms are listed in alphabetical order in this clause.

3.1 Definitions

For the purpose of the present document, the following additional terms and definitions apply:

Average power: [TBD]

3.2 Symbols

For the purposes of the present document, the following symbols apply:

[…]	Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken

3.3 Abbreviations

For the purpose of the present document, the following additional abbreviations apply:

AFC	Automatic Frequency Control
ASD	Acceleration Spectral Density
ATT	Attenuator
BER	Bit Error Ratio
BLER	Block Error Ratio
BTFD	Blind Transport Format Detection
EVM	Error Vector Magnitude
FDR	False transmit format Detection Ratio
HYB	Hybrid
IM	Intermodulation
ITP	Initial Transmission Power control mode
OBW	Occupied Bandwidth
OCNS	Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink
PAR	Peak to Average Ratio
P-CCPCH	Primary Common Control Physical Channel
P-CPICH	Primary Common Pilot Channel
PCDE	Peak Code Domain Error
RBW	Resolution Bandwidth
RRC	Root-Raised Cosine
S-CCPCH	Secondary Common Control Physical Channel
S-CPICH	Secondary Common Pilot Channel
SCH	Synchronisation Channel consisting of Primary and Secondary synchronisation channels
SS	System Simulator
TGCFN	Transmission Gap Connection Frame Number
TGD	Transmission Gap Distance
TGL	Transmission Gap Length
TGPL	Transmission Gap Pattern Length
TGPRC	Transmission Gap Pattern Repetition Count
TGSN	Transmission Gap Starting Slot Number

3.4 Equations

For the purpose of the present document, the following additional equations apply:

$\frac{CPICH_E_c}{I_{or}}$ The ratio of the received energy per PN chip of the CPICH to the total transmit power spectral density at the Node B (SS) antenna connector.

$\frac{DPCH_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPCH to the total transmit power spectral density at the Node B (SS) antenna connector.

$\frac{DPCCH_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPCCH to the total transmit power spectral density at the Node B (SS) antenna connector.

$\frac{DPDCH_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPDCH to the total transmit power spectral density at the Node B (SS) antenna connector.

F_{uw} Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or a frequency offset from the assigned channel frequency.

I_{Node_B} Interference signal power level at Node B in dBm, which is broadcasted on BCH.

I_{oac} The power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the adjacent frequency channel as measured at the UE antenna connector.

I_{oc} The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector.

I_{or} The total transmit power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal at the Node B antenna connector

$\hat{I}_{or}$ The received power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the down-link signal as measured at the UE antenna connector.

I_{ouw} Unwanted signal power level.

$P\text{-}CCPCH_E_c$ Average (note) energy per PN chip for P-CCPCH.

$P-CCPCH\frac{E_c}{I_o}$ The ratio of the received P-CCPCH energy per chip to the total received power spectral density at the UE antenna connector.

$\frac{P-CCPCH_E_c}{I_{or}}$ The ratio of the average (note) transmit energy per PN chip for the P-CCPCH to the total transmit power spectral density.

$P\text{-}CPICH_E_c$ Average (note) energy per PN chip for P-CPICH.

$PICH_E_c$ Average (note) energy per PN chip for PICH.

$\frac{PICH_E_c}{I_{or}}$ The ratio of the received energy per PN chip of the PICH to the total transmit power spectral density at the Node B (SS) antenna connector.

SCH_E_c Average (note) energy per PN chip for SCH.

$S\text{-}CPICH_E_c$ Average (note) energy per PN chip for S-CPICH.

NOTE: Averaging period for energy/power of discontinuously transmitted channels should be defined.

NOTE: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH_E_c and P-CPICH_E_c) and others defined in terms of PSD (I_{oac}, I_{oc}, and $\hat{I}_{or}$). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_E_c/I_{or}, E_c/I_{or} etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

7 Performance requirements

7.1 General

The performance requirements for the UE in this clause are specified for the measurement channels specified in annex C and table 7.1.1, the propagation conditions specified in clause 7.1.2 and the Down link Physical channels specified in annex D. Unless stated otherwise, DL power control is OFF.

The method for Block Error Ratio (BLER) measurement is specified in 3GPP TS 34.109 [4].

Table 7.1.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	DL DPCH bit rate	TTI (ms)
12,2 kbps reference measurement channel	12,2 kbps	30 ksps	60 kbps	20
64/144/384 kbps reference measurement channel	64 kbps	120 ksps	240 kbps	20
144kbps reference measurement channel	144 kbps	240 ksps	480 kbps	20
384 kbps reference measurement channel	384 kbps	480 ksps	960 kbps	10

The common RF test conditions of Performance requirement are defined in clause E.3.3, and each test conditions in this clause (clause 7) should refer clause E.3.3. Individual test conditions are defined in the paragraph of each test.

All Block Error ratio (BLER) measurements in clause 7 shall be performed according to the general rules for statistical testing in Annex F.6

7.1.1 Measurement Configurations

In all measurements UE should transmit with maximum power while receiving signals from Node B. Transmission Power Control is always disable during the measurements. Chip Rate is specified to be 3,84 MHz.

It as assumed that fields inside DPCH have the same energy per PN chip. Also, if the power of S-CCPCH is not specified in the test parameter table, it should be set to zero. The power of OCNS should be adjusted that the power ratios (E_c/I_{or}) of all specified forward channels add up to one.

Measurement configurations for different scenarios are shown in figure A.9, figure A.10 and figure A.11.

7.1.2 Definition of Additive White Gaussian Noise (AWGN) Interferer

The minimum bandwidth of the AWGN interferer shall be 1,5 times chip rate of the radio access mode (e.g. 5,76 MHz for a chip rate of 3,84 Mcps). The flatness across this minimum bandwidth shall be less than ±0,5 dB and the peak to average ratio at a probability of 0,001 % shall exceed 10 dB.

7.2 Demodulation in Static Propagation conditions

7.2.1 Demodulation of Dedicated Channel (DCH)

7.2.1.1 Definition and applicability

The receive characteristic of the Dedicated Channel (DCH) in the static environment is determined by the Block Error Ratio (BLER). BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.2.1.2 Minimum requirements

For the parameters specified in table 7.2.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.2.1.2. These requirements are applicable for TFCS size 16.

Table 7.2.1.1: DCH parameters in static propagation conditions

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–1				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.2.1.2: DCH requirements in static propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–16,6 dB	10^{-2}
2	–13,1 dB	10^{-1}
	–12,8 dB	10^{-2}
3	–9,9 dB	10^{-1}
	–9,8 dB	10^{-2}
4	–5,6 dB	10^{-1}
	–5,5 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.2.3.1.

7.2.1.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a static propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.2.1.4 Method of test

7.2.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS and an AWGN noise source to the UE antenna connector as shown in figure A.9.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters for test 1-5 as specified in table 7.2.1.1.
4. Enter the UE into loopback test mode and start the loopback test.

7.2.1.4.2 Procedures

1. Measure BLER of DCH.

7.2.1.5 Test requirements

For the parameters specified in table 7.2.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.2.1.2.

7.3 Demodulation of DCH in Multi-path Fading Propagation conditions

7.3.1 Single Link Performance

7.3.1.1 Definition and applicability

The receive characteristics of the Dedicated Channel (DCH) in different multi-path fading environments are determined by the Block Error Ratio (BLER) values. BLER is measured for the each of the individual data rate specified for the DPCH. DCH is mapped into in Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.3.1.2 Minimum requirements

For the parameters specified in tables 7.3.1.1, 7.3.1.3, 7.3.1.5, 7.3.1.7 and 7.3.1.9 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in tables 7.3.1.2, 7.3.1.4, 7.3.1.6, 7.3.1.8 and 7.3.1.10. These requirements are applicable for TFCS size 16.

Table 7.3.1.1: DCH parameters in multi-path fading propagation conditions (Case 1)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	9				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.2: DCH requirements in multi-path fading propagation conditions (Case 1)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–15,0 dB	10^{-2}
2	–13,9 dB	10^{-1}
	–10,0 dB	10^{-2}
3	–10,6 dB	10^{-1}
	–6,8 dB	10^{-2}
4	–6,3 dB	10^{-1}
	–2,2 dB	10^{-2}

Table 7.3.1.3: DCH parameters in multi-path fading propagation conditions (Case 2)

Parameter	Test 5	Test 6	Test 7	Test 8	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–3	–3	3	6	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.4: DCH requirements in multi-path fading propagation conditions (Case 2)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
5	–7,7 dB	10^{-2}
6	–6,4 dB	10^{-1}
	–2,7 dB	10^{-2}
7	–8,1 dB	10^{-1}
	–5,1 dB	10^{-2}
8	–5,5 dB	10^{-1}
	–3,2 dB	10^{-2}

Table 7.3.1.5: DCH parameters in multi-path fading propagation conditions (Case 3)

Parameter	Test 9	Test 10	Test 11	Test 12	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–3	–3	3	6	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.6: DCH requirements in multi-path fading propagation conditions (Case 3)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
9	–11,8 dB	10^{-2}
10	–8,1 dB	10^{-1}
	–7,4 dB	10^{-2}
	–6,8 dB	10^{-3}
11	–9,0 dB	10^{-1}
	–8,5 dB	10^{-2}
	–8,0 dB	10^{-3}
12	–5,9 dB	10^{-1}
	–5,1 dB	10^{-2}
	–4,4 dB	10^{-3}

Table 7.3.1.7: DCH parameters in multi-path fading propagation conditions (Case 1) with S-CPICH

Parameter	Test 13	Test 14	Test 15	Test 16	Unit
Phase reference	S-CPICH				
$\hat{I}_{or}/I_{oc}$	9				dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.8: DCH requirements in multi-path fading propagation conditions (Case 1) with S-CPICH

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
13	-15,0 dB	10^{-2}
14	-13,9 dB	10^{-1}
	-10,0 dB	10^{-2}
15	-10,6 dB	10^{-1}
	-6,8 dB	10^{-2}
16	-6,3 dB	10^{-1}
	-2,2 dB	10^{-2}

Table 7.3.1.9: DCH parameters in multi-path fading propagation conditions (Case 6)

Parameter	Test 17	Test 18	Test 19	Test 20	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	-3	-3	3	6	dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.10: DCH requirements in multi-path fading propagation conditions (Case 6)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
17	-8,8 dB	10^{-2}
18	-5,1 dB	10^{-1}
	-4,4 dB	10^{-2}
	-3,8 dB	10^{-3}
19	-6,0 dB	10^{-1}
	-5,5 dB	10^{-2}
	-5,0 dB	10^{-3}
20	-2,9 dB	10^{-1}
	-2,1 dB	10^{-2}
	-1,4 dB	10^{-3}

The reference for this requirement is TS 25.101 [1] clause 8.3.1.1.

7.3.1.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a multi-path fading propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.3.1.4 Method of test

7.3.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS, multi-path fading simulator and an AWGN noise source to the UE antenna connector as shown in figure A.10.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters for test 1-20 as specified table 7.3.1.1, table 7.3.1.3, table 7.3.1.5, table 7.3.1.7 and table 7.3.1.9.
4. Enter the UE into loopback test mode and start the loopback test.
5. Setup fading simulators as fading condition case 1, case 2, case 3 and case 6, which are described in table D.2.2.1.

7.3.1.4.2 Procedures

1. Measure BLER of DCH.

7.3.1.5 Test requirements

For the parameters specified in table 7.3.1.1, table 7.3.1.3, table 7.3.1.5, table 7.3.1.7 and table 7.3.1.9 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.3.1.2, table 7.3.1.4, table 7.3.1.6, table 7.3.1.8 and table 7.3.1.10.

7.4 Demodulation of DCH in Moving Propagation conditions

7.4.1 Single Link Performance

7.4.1.1 Definition and applicability

The receive single link performance of the Dedicated Channel (DCH) in dynamic moving propagation conditions are determined by the Block Error Ratio (BLER) values. BLER is measured for the each of the individual data rate specified for the DPCH. DCH is mapped into Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.4.1.2 Minimum requirements

For the parameters specified in table 7.4.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.4.1.2.

Table 7.4.1.1: DCH parameters in moving propagation conditions

Parameter	Test 1	Test 2	Unit
Phase reference	P-CPICH		
$\hat{I}_{or}/I_{oc}$	–1		dB
I_{oc}	–60		dBm / 3,84 MHz
Information Data Rate	12,2	64	kbps

Table 7.4.1.2: DCH requirements in moving propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–14,5 dB	10^{-2}
2	–10,9 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.4.1.1.

7.4.1.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a moving propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.4.1.4 Method of test

7.4.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS and an AWGN noise source to the UE antenna connector as shown in figure A.10.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters as specified in table 7.4.1.1.
4. Enter the UE into loopback test mode and start the loopback test.
5. Setup fading simulator as moving propagation condition, which is described in clause D.2.3.

7.4.1.4.2 Procedures

1. Measure BLER of DCH.

7.4.1.5 Test requirements

For the parameters specified in table 7.4.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.4.1.2.

7.5 Demodulation of DCH in Birth-Death Propagation conditions

7.5.1 Single Link Performance

7.5.1.1 Definition and applicability

The receive single link performance of the Dedicated Channel (DCH) in dynamic birth-death propagation conditions are determined by the Block Error Ratio (BLER) values. BLER is measured for the each of the individual data rate specified for the DPCH. DCH is mapped into Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.5.1.2 Minimum requirements

For the parameters specified in table 7.5.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.5.1.2.

Table 7.5.1.1: DCH parameters in birth-death propagation conditions

Parameter	Test 1	Test 2	Unit
Phase reference	P-CPICH		
$\hat{I}_{or}/I_{oc}$	−1		dB
I_{oc}	−60		dBm / 3,84 MHz
Information Data Rate	12,2	64	kbps

Table 7.5.1.2: DCH requirements in birth-death propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–12,6 dB	10^{-2}
2	-8,7 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.5.1.1.

7.5.1.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a birth-death propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.5.1.4 Method of test

7.5.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS and an AWGN noise source to the UE antenna connector as shown in figure A.10.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters as specified in table 7.5.1.1.
4. Enter the UE into loopback test mode and start the loopback test.
5. Setup fading simulator as birth-death propagation condition, which is described in clause D.2.4.

7.5.1.4.2 Procedures

1. Measure BLER of DCH.

7.5.1.5 Test requirements

For the parameters specified in table 7.5.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.5.1.2.

7.6 Demodulation of DCH in downlink Transmit diversity modes

7.6.1 Demodulation of DCH in open-loop transmit diversity mode

7.6.1.1 Definition and applicability

The receive characteristic of the Dedicated Channel (DCH) in open loop transmit diversity mode is determined by the Block Error Ratio (BLER). DCH is mapped into in Dedicated Physical Channel (DPCH).

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.1.2 Minimum requirements

For the parameters specified in table 7.6.1.1 the average downlink ~~$DPCH_E_c$~~ power ratio shall be below the specified value for the BLER shown in table 7.6.1.2.

Table 7.6.1.1: Test parameters for DCH reception in a open-loop transmit diversity scheme (Propagation condition: Case 1)

Parameter	Test 1	Unit
Phase reference	P-CPICH	
$\hat{I}_{or}/I_{oc}$	9	dB
I_{oc}	–60	dBm / 3,84 MHz
Information data rate	12,2	kbps

Table 7.6.1.2: Test requirements for DCH reception in open-loop transmit diversity scheme

Test Number	$\frac{DPCH_E_c}{I_{or}}$ **(antenna 1/2)**	BLER
1	–16,8 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.6.1.1.

7.6.1.3 Test purpose

To verify that UE reliably demodulates the DPCH of the Node B while open loop transmit diversity is enabled during the connection.

7.6.1.4 Method of test

7.6.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in figure A.12.
2) Set up a call according to the Generic call setup procedure.
3) RF parameters are set up according to table 7.6.1.1 and table E 3.4.
4) Enter the UE into loopback test mode and start the loopback test.
5) Activate open loop Tx diversity function.
6) Set up fading simulators as fading condition case 1, which is described in table D.2.2.1.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.6.1.4.2 Procedure

1) Measure BLER in points specified in table 7.6.1.2.

7.6.1.5 Test Requirements

For the parameters specified in table 7.6.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.6.1.2.

7.6.2 Demodulation of DCH in closed loop transmit diversity mode

7.6.2.1 Definition and applicability

The receive characteristic of the dedicated channel (DCH) in closed loop transmit diversity mode is determined by the Block Error Ratio (BLER). DCH is mapped into in Dedicated Physical Channel (DPCH).

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.2.2 Minimum requirements

For the parameters specified in table 7.6.2.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.6.2.2.

Table 7.6.2.1: Test Parameters for DCH Reception in closed loop transmit diversity mode (Propagation condition: Case 1)

Parameter	Test 1 (Mode 1)	Test 2 (Mode 2)	Unit
$\hat{I}_{or}/I_{oc}$	9	9	dB
I_{oc}	–60	–60	dBm / 3,84 MHz
Information data rate	12,2	12,2	kbps
Feedback error ratio	4	4	%

Table 7.6.2.2: Test requirements for DCH reception in feedback transmit diversity mode

Test Number	$\frac{DPCH_E_c}{I_{or}}$ (see note)	BLER
1	–18,0 dB	10^{-2}
2	–18,3 dB	10^{-2}
NOTE: This is the total power from both antennas. Power sharing between antennas are closed loop mode dependent as specified in TS 25.214 [5].		

The reference for this requirement is TS 25.101 [1] clause 8.6.2.1.

7.6.2.3 Test purpose

To verify that UE reliably demodulates the DPCH of the Node B while closed loop transmit diversity is enabled during the connection.

7.6.2.4 Method of test

7.6.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in figure A.12.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.6.2.1 and table E 3.5.

4) Enter the UE into loopback test mode and start the loopback test.

5) Activate closed loop Tx diversity function.

6) Set up fading simulators as fading condition case 1, which is described in table D.2.2.1.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.6.2.4.2 Procedure

1) Measure BLER in points specified in table 7.6.2.2.

7.6.2.5 Test Requirements

For the parameters specified in table 7.6.2.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.6.2.2.

7.6.3 Demodulation of DCH in Site Selection Diversity Transmission Power Control mode

7.6.3.1 Definition and applicability

The bit error characteristics of UE receiver is determined in Site Selection Diversity Transmission Power Control (SSDT) mode. Two Node B emulators are required for this performance test. The delay profiles of signals received from different base stations are assumed to be the same but time shifted by 10 chip periods.

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.3.2 Minimum requirements

The downlink physical channels and their relative power to Ior are the same as those specified in clause E.3.3 irrespective of Node Bs and the test cases. DPCH_Ec/Ior value applies whenever DPDCH in the cell is transmitted. In Test 1 and Test 3, the received powers at UE from two Node Bs are the same, while 3dB offset is given to one that comes from one of Node Bs for Test 2 and Test 4 as specified in table 7.6.3.1.

For the parameters specified in table 7.6.3.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.6.3.2.

Table 7.6.3.1: DCH parameters in multi-path propagation conditions during SSDT mode (Propagation condition: Case 1)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or1}/I_{oc}$	0	-3	0	0	dB
$\hat{I}_{or2}/I_{oc}$	0	0	0	-3	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	12,2	12,2	12,2	kbps
Feedback error rate (note)	4	4	4	4	%
Number of FBI bits assigned to "S" Field	1	1	2	2	
Code word Set	Long	Long	Short	Short	
NOTE: Feedback error rate is defined as FBI bit error rate.					

Table 7.6.3.2: DCH requirements in multi-path propagation conditions during SSDT Mode

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–7,5 dB	10^{-2}
2	–6,5 dB	10^{-2}
3	–10,5 dB	10^{-2}
4	–9,2 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.6.3.1.

7.6.3.3 Test purpose

To verify that UE reliably demodulates the DPCH of the selected Node B while site selection diversity is enabled during soft handover.

7.6.3.4 Method of test

7.6.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect two SS's, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in figure A.11.
2) Set up a call according to the Generic call setup procedure, and RF parameters are set up according to table 7.6.3.1 and table 7.6.3.2.
3) Enter the UE into loopback test mode and start the loopback test.
4) Activate SSDT function.
5) Set up fading simulators as fading condition case 1, which is described in table D.2.2.1.

7.6.3.4.2 Procedure

Measure BLER in points specified in table 7.6.3.2.

7.6.3.5 Test Requirements

BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.6.3.2.

7.7 Demodulation in Handover conditions

7.7.1 Demodulation of DCH in Inter-Cell Soft Handover

7.7.1.1 Definition and applicability

The bit error ratio characteristics of UE is determined during an inter-cell soft handover. During the soft handover a UE receives signals from different Base Stations. A UE has to be able to demodulate two P-CCPCH channels and to combine the energy of DCH channels. Delay profiles of signals received from different Base Stations are assumed to be the same but time shifted by 10 chips.

The receive characteristics of the different channels during inter-cell handover are determined by the Block Error Ratio (BLER) values.

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.7.1.2 Minimum requirements

For the parameters specified in table 7.7.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.7.1.2.

Table 7.7.1.1: DCH parameters in multi-path propagation conditions during Soft Handoff (Case 3)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	0	0	3	6	dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.7.1.2: DCH requirements in multi-path propagation conditions during Soft Handoff (Case 3)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–15,2 dB	10^{-2}
2	–11,8 dB	10^{-1}
	–11,3 dB	10^{-2}
3	–9,6 dB	10^{-1}
	–9,2 dB	10^{-2}
4	–6,0 dB	10^{-1}
	–5,5 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.7.1.1.

7.7.1.3 Test purpose

To verify that the BLER does not exceed the value at the DPCH_Ec/Ior specified in table 7.7.1.2.

7.7.1.4 Method of test

7.7.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

[TBD]

7.7.1.4.2 Procedures

1) Connect the SS, multi-path fading simulator and an AWGN noise source to the UE antenna connector as shown in figure A.11.

2) Set up the call.

3) Set the test parameters for test 1-5 as specified in table 7.7.1.1.

4) Count, at the SS, the number of information blocks transmitted and the number of correctly received information blocks at the UE.

5) Measure BLER of DCH channel.

7.7.1.5 Test requirements

For the parameters specified in table 7.7.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.7.1.2.

7.7.2 Combining of TPC commands from radio links of different radio link sets

7.7.2.1 Definition and applicability

When a UE is in soft handover, multiple TPC commands may be received in each slot from different cells in the active set. In general, the TPC commands transmitted in the same slot in the different cells may be different and need to be combined to give TPC_cmd as specified in TS 25.214 [5], in order to determine the required uplink power step.

The requirements and this test apply to all types of UTRA for the FDD UE.

7.7.2.2 Minimum requirements

Test parameters are specified in table 7.7.2.1. The delay profiles of the signals received from the different cells are the same but time-shifted by 10 chips.

For Test 1, the uplink power changes between adjacent slots shall be as shown in table 7.7.2.2 over the 4 consecutive slots. Note that this case is without an additional noise source I_{oc}.

For Test 2, the Cell1 and Cell2 TPC patterns are repeated a number of times. If the transmitted power of a given slot is increased compared to the previous slot, then a variable "Transmitted power UP" is increased by one, otherwise a variable "Transmitted power DOWN" is increased by one. The requirements for "Transmitted power UP" and "Transmitted power DOWN" are shown in table 7.7.2.3.

Table 7.7.2.1: Parameters for TPC command combining

Parameter	Test 1	Test 2	Unit
Phase reference	P-CPICH		-
DPCH_Ec/Ior	–12		dB
$\hat{I}_{or1}$ and $\hat{I}_{or2}$	–60		dBm / 3,84 MHz
I_{oc}	-	-60	dBm / 3,84 MHz
Power-Control-Algorithm	Algorithm 1		-
Cell 1 TPC commands over 4 slots	{0,0,1,1}		-
Cell 2 TPC commands over 4 slots	{0,1,0,1}		-
Information Data Rate	12,2		Kbps
Propagation condition	Static without AWGN source I_{oc}	Multi-path fading case 3	-

Table 7.7.2.2: Requirements for Test 1

Test Number	Required power changes over the 4 consecutive slots
1	Down, Down, Down, Up

Table 7.7.2.3: Requirements for Test 2

Test Number	Ratio (Transmitted power UP) / (Total number of slots)	Ratio (Transmitted power DOWN) / (Total number of slots)
2	≥0,25	≥0,5

The reference for this requirement is TS 25.101 [1] clause 8.7.2.1.

7.7.2.3 Test purpose

To verify that the combining of TPC commands received in soft handover results in TPC_cmd being derived so as to meet the requirements stated in tables 7.7.2.2 and 7.7.2.3.

7.7.2.4 Method of test

7.7.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect two SS's to the UE antenna connector as shown in figure A.13.
2) Set the test parameters as specified in table 7.7.2.1 for Test 1.
3) Set up a call according to the Generic Call Setup procedure.
4) Signal the uplink DPCH power control parameters to use Algorithm 1 and a step size of 1dB.
5) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding the generic call setup procedure and loopback test.

7.7.2.4.2 Procedures

1) Before proceeding with paragraph (2), set the output power of the UE, measured at the UE antenna connector, to be in the range –10 ± 9 dBm. This may be achieved by setting the downlink signal ($\hat{I}_{or}$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SSs.
2) Send the following sequences of TPC commands in the downlink from each SS over a period of 5 timeslots:

	Downlink TPC commands				
	Slot #0	Slot #1	Slot #2	Slot #3	Slot #4
SS1	0	0	0	1	1
SS2	0	0	1	0	1

3) Measure the ~~average output~~ mean power at the UE antenna connector in timeslots # 0, 1, 2, 3 and 4, not including the 25 µs transient periods at the start and end of each slot.
4) End test 1 and disconnect UE.
5) Connect two SS's and an AWGN source to the UE antenna connector as shown in figure A.11.
6) Initialise variables "Transmitted power UP" and "Transmitted power DOWN" to zero.
7) Set the test parameters as specified in table 7.7.2.1 for Test 2.
8) Set up a call according to the Generic Call Setup procedure.
9) Signal the uplink DPCH power control parameters to use Algorithm 1 and a step size of 1 dB.
10) Enter the UE into loopback test mode and start the loopback test.

11) Perform the following steps a) to d) [15] times:

a) Before proceeding with step b), set the output power of the UE, measured at the UE antenna connector, to be in the range –10 ± 9 dBm. This may be achieved by generating suitable downlink TPC commands from the SSs.

b) Send the following sequences of TPC commands in the downlink from each SS over a period of 33 timeslots:

	Downlink TPC commands
SS1	1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1
SS2	1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1

c) Measure the ~~average output~~ mean power at the UE antenna connector in each timeslot, not including the 25 µs transient periods at the start and end of each slot.

d) For each timeslot from the 2nd timeslot to the 33rd timeslot inclusive:

– if the ~~average~~ mean power in that timeslot is greater than or equal to the ~~average~~ mean power in the previous timeslot plus 0,5 dB, increment "Transmitted power UP" by 1;

– if the ~~average~~ mean power in that timeslot is less than or equal to the ~~average~~ mean power in the previous timeslot minus 0,5 dB, increment "Transmitted power DOWN" by 1.

7.7.2.5 Test requirements

1) In Step 2) of clause 7.7.2.4.2, the ~~average~~ mean power in slot #1 shall be less than or equal to the ~~average~~ mean power in slot #0 minus 0,5 dB.

2) In Step 2) of clause 7.7.2.4.2, the ~~average~~ mean power in slot #2 shall be less than or equal to the ~~average~~ mean power in slot #1 minus 0,5 dB.

3) In Step 2) of clause 7.7.2.4.2, the ~~average~~ mean power in slot #3 shall be less than or equal to the ~~average~~ mean power in slot #2 minus 0,5 dB.

4) In Step 2) of clause 7.7.2.4.2, the ~~average~~ mean power in slot #4 shall be greater than or equal to the ~~average~~ mean power in slot #3 plus 0,5 dB.

5) At the end of the test, "Transmitted power UP" shall be greater than or equal to [95] and "Transmitted power DOWN" shall be greater than or equal to [210].

NOTE: The test limits in requirements (4) and (5) have been computed to give a confidence level of [99,7] % that a UE which follows the core requirements will pass. The number of timeslots has been chosen to get a good compromise between the test time and the risk of passing a bad UE.

7.8 Power control in downlink

Power control in the downlink is the ability of the UE receiver to converge to required link quality set by the network while using as low power as possible in downlink. If a BLER target has been assigned to a DCCH (See clause C.3), then it has to be such that outer loop is based on DTCH and not on DCCH.

7.8.1 Power control in the downlink, constant BLER target

7.8.1.1 Definition and applicability

Power control in the downlink is the ability of the UE receiver to converge to required link quality set by the network while using as low power as possible in downlink. If a BLER target has been assigned to a DCCH (See clause C.3), then it has to be such that outer loop is based on DTCH and not on DCCH. The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.1.2 Minimum requirements

For the parameters specified in table 7.8.1.1 the downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio measured values, which are averaged over one slot, shall be below the specified value in table 7.8.1.2 more than 90% of the time. BLER shall be as shown in table 7.8.1.2. Power control in downlink is ON during the test.

Table 7.8.1.1: Test parameter for downlink power control, constant BLER target

Parameter	Test 1	Test 2	Unit
$\hat{I}_{or}/I_{oc}$	9	-1	dB
I_{oc}	–60		dBm / 3,84 MHz
Information Data Rate	12,2		kbps
Target quality on DTCH	0,01		BLER
Propagation condition	Case 4		
Maximum_DL_Power (note)	7		dB
Minimum_DL_Power (note)	-18		dB
DL Power Control step size, Δ_{TPC}	1		dB
Limited Power Increase	"Not used"		-
NOTE: Power is compared to P-CPICH as specified in [9].			

Table 7.8.1.2: Requirements in downlink power control, constant BLER target

Parameter	Test 1	Test 2	Unit
$\frac{DPCH_E_c}{I_{or}}$	-16,0	-9,0	dB
Measured quality on DTCH	0,01 ± 30 %	0,01 ± 30 %	BLER

The reference for this requirement is TS 25.101 [1] clause 8.8.1.1.

7.8.1.3 Test purpose

To verify that the UE receiver is capable of converging to required link quality set by network while using as low power as possible.

7.8.1.4 Method of test

7.8.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.8.1.1.

4) Enter the UE into loopback test mode and start the loopback test.

5) SS signals to UE target quality value on DTCH as specified in table 7.8.1.1. SS will vary the physical channel power in downlink according to the TPC commands from UE. Downlink power control mode (DPC_MODE) 0 shall be used. At the same time BLER is measured. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.8.1.4.2 Procedure

1) After the target quality on DTCH is met, BLER is measured. Simultaneously the downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio averaged over one slot is measured. This is repeated until adequate amount of measurements is done to reach the required confidence level.

2) The measured quality on DTCH (BLER) and the measured downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio values averaged over one slot are compared to limits in table 7.8.1.2.

7.8.1.5 Test Requirements

a) The measured quality on DTCH does not exceed the values in table 7.8.1.2.

b) The downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio values, which are averaged over one slot, shall be below the values in table 7.8.1.2 more than 90 % of the time.

7.8.2 Power control in the downlink, initial convergence

7.8.2.1 Definition and applicability

This requirement verifies that DL power control works properly during the first seconds after DPCH connection is established. The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.2.2 Minimum requirements

For the parameters specified in table 7.8.2.1 the downlink DPCH_Ec/Ior power ratio measured values, which are averaged over 50 ms, shall be within the range specified in table 7.8.2.2 more than 90 % of the time. T1 equals to 500 ms and it starts 10 ms after the DPDCH connection is initiated. T2 equals to 500 ms and it starts when T1 has expired. Power control is ON during the test.

Table 7.8.2.1: Test parameters for downlink power control, initial convergence

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Target quality value on DTCH	0,01	0,01	0,1	0,1	BLER
Initial DPCH_Ec/Ior	-5,9	-25,9	-2,1	-22,1	dB
Information Data Rate	12,2	12,2	64	64	kbps
$\hat{I}_{or}/I_{oc}$	-1				dB
I_{oc}	-60				dBm/3,84 MHz
Propagation condition	Static				
Maximum_DL_Power (note)	7				dB
Minimum_DL_Power (note)	-18				dB
DL Power Control step size, Δ_{TPC}	1				dB
Limited Power Increase	"Not used"				
NOTE: Power is compared to P-CPICH as specified in [9].					

Table 7.8.2.2: Requirements in downlink power control, initial convergence

Parameter	Test 1 and Test 2	Test 3 and Test 4	Unit
$\frac{DPCH_E_c}{I_{or}}$ during T1	-18,9 ≤ DPCH_Ec/Ior ≤ -11,9	-15,1 ≤ DPCH_Ec/Ior ≤ -8,1	dB
$\frac{DPCH_E_c}{I_{or}}$ during T2	-18,9 ≤ DPCH_Ec/Ior ≤ -14,9	-15,1 ≤ DPCH_Ec/Ior ≤ -11,1	dB

The reference for this requirement is TS 25.101 [1] clause 8.8.2.1.

7.8.2.3 Test purpose

To verify that DL power control works properly during the first seconds after DPCH connection is established.

7.8.2.4 Method of test

7.8.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

7.8.2.4.2 Procedure

1) Set up call using test parameters according to table 7.8.2.1.

2) SS signals to UE target quality value on DTCH as specified in table 7.8.2.1. SS will vary the physical channel power in downlink according to the TPC commands from UE. Downlink power control mode (DPC_MODE) 0 shall be used.

3) Measure $\frac{DPCH_E_c}{I_{or}}$ power ratio averaged over 50 ms during T1. T1 starts 10 ms after DPDCH connection is initiated and T1 equals to 500 ms.

4) Measure $\frac{DPCH_E_c}{I_{or}}$ power ratio averaged over 50 ms during T2. T2 starts, when T1 has expired and T2 equals to 500 ms.

7.8.2.5 Test Requirements

a) The downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio values shall be within the range specified in table 7.8.2.2 during T1 more than 90 % of the time.

b) The downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio values shall be within the range specified in table 7.8.2.2 during T2 more than 90 % of the time.

7.8.3 Power control in the downlink, wind up effects

7.8.3.1 Definition and applicability

This requirement verifies that, after the downlink maximum power is limited in the UTRAN and it has been released again, the downlink power control in the UE does not have a wind up effect, i.e. the required DL power has increased

during time period the DL power was limited. The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.3.2 Minimum requirements

This test is run in three stages where stage 1 is for convergence of the power control loop, in stage two the maximum downlink power for the dedicated channel is limited not to be higher than the parameter specified in table 7.8.3.1. All parameters used in the three stages are specified in table 7.8.3.1. The downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio measured values, which are averaged over one slot, during stage 3 shall be lower than the value specified in table 7.8.3.2 more than 90 % of the time. Power control of the UE is ON during the test.

Table 7.8.3.1: Test parameter for downlink power control, wind-up effects

Parameter	Test 1			Unit
	Stage 1	Stage 2	Stage 3	
Time in each stage	>15	5	0,5	s
$\hat{I}_{or}/I_{oc}$	5			dB
I_{oc}	-60			dBm/3,84 MHz
Information Data Rate	12,2			kbps
Quality target on DTCH	0,01			BLER
Propagation condition	Case 4			
Maximum_DL_Power (note)	7	-6,2	7	dB
Minimum_DL_Power (note)	-18			dB
DL Power Control step size, Δ_{TPC}	1			dB
Limited Power Increase	"Not used"			-
NOTE: Power is compared to P-CPICH as specified in [9].				

Table 7.8.3.2: Requirements in downlink power control, wind-up effects

Parameter	Test 1, stage 3	Unit
$\frac{DPCH_E_c}{I_{or}}$	-13,3	dB

The reference for this requirement is TS 25.101 [1] clause 8.8.3.1.

7.8.3.3 Test purpose

To verify that the UE downlink power control does not require too high downlink power during a period after the downlink power is limited by the UTRAN.

7.8.3.4 Method of test

7.8.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.
2) Set up a call according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.
4) RF parameters are set up according to table 7.8.3.1. Stage 1 is used for the power control to converge and during Stage 2 the maximum downlink power is limited by UTRAN.
5) SS signals to UE target quality value on DTCH as specified in table 7.8.3.1. SS will vary the physical channel power in downlink according to the TPC commands from UE. Downlink power control mode (DPC_MODE) 0 shall be used.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.8.3.4.2 Procedure

1) Measure $\frac{DPCH_E_c}{I_{or}}$ power ratio during stage 3 according to table 7.8.3.1.

7.8.3.5 Test Requirements

The downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio values, which are averaged over one slot, shall be lower than the level specified in table 7.8.3.2 during stage 3 more than 90 % of the time.

7.9 Downlink compressed mode

Downlink compressed mode is used to create gaps in the downlink transmission, to allow the UE to make measurements on other frequencies.

7.9.1 Single link performance

7.9.1.1 Definition and applicability

The receiver single link performance of the Dedicated Traffic Channel (DCH) in compressed mode is determined by the Block Error Ratio (BLER) and transmitted DPCH_Ec/Ior power ratio in the downlink.

The compressed mode parameters are given in clause C.5. Tests 1 and 2 are using Set 1 compressed mode pattern parameters from table C.5.1 in clause C.5 while tests 3 and 4 are using Set 2 compressed mode patterns from the same table.

The requirements and this test apply to all types of UTRA for the FDD UE.

7.9.1.2 Minimum requirements

For the parameters specified in table 7.9.1 the downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio measured values, which are averaged over one slot, shall be below the specified value in table 7.9.2 more than 90% of the time. The measured quality on DTCH shall be as required in table 7.9.2.

Downlink power control is ON during the test. Uplink TPC commands shall be error free. System simulator shall increase the transmitted power during compressed frames by the same amount that UE is expected to increase its SIR target during those frames.

Table 7.9.1: Test parameter for downlink compressed mode

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Delta SIR1	0	3	0	3	dB
Delta SIR after1	0	3	0	3	dB
Delta SIR2	0	0	0	0	dB
Delta SIR after2	0	0	0	0	dB
$\hat{I}_{or}/I_{oc}$	9				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2				kbps
Propagation condition	Case 2				
Target quality value on DTCH	0,01				BLER
Maximum DL Power (note)	7				dB
Minimum DL Power (note)	-18				dB
DL Power Control step size, Δ_{TPC}	1				dB
Limited Power Increase	"Not used"				-
NOTE: Power is compared to P-CPICH as specified in [9].					

Table 7.9.2: Requirements in downlink compressed mode

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
$\frac{DPCH_E_c}{I_{or}}$	-15,4	No requirements	-15,4	No requirements	dB
Measured quality of compressed and recovery frames	No requirements	< 0,001	No requirements	< 0,001	BLER
Measured quality on DTCH	0,01 ± 30 %				BLER

The reference for this requirement is TS 25.101 [1] clause 8.9.1.1.

7.9.1.3 Test purpose

The purpose of this test is to verify the reception of DPCH in a UE while downlink is in a compressed mode. The UE needs to preserve the BLER using sufficient low DL power. It is also verified that UE applies the Delta SIR values, which are signaled from network, in its outer loop power control algorithm.

7.9.1.4 Method of test

7.9.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.9.1. SS shall increase the transmitted power during compressed mode frames by the same amount that UE is expected to increase its SIR target during those frames.

4) Set compressed mode parameters according to table C.5.1. Tests 1 and 2 are using Set 1 compressed mode pattern parameters and while tests 3 and 4 are using Set 2 compressed mode pattern parameters.

5) Enter the UE into loopback test mode and start the loopback test.

6) SS signals to UE target quality value on DTCH as specified in table 7.9.1. Uplink TPC commands shall be error free. SS will vary the physical channel power in downlink according to the TPC commands from UE. SS response time for UE TPC commands shall be one slot. At the same time BLER is measured. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.9.1.4.2 Procedure

1) Test 1: Measure quality on DTCH and $\frac{DPCH_E_c}{I_{or}}$ power ratio values averaged over one slot.

2) Test 2: Measure quality on DTCH and quality of compressed and recovery frames.

3) Test 3: Measure quality on DTCH and $\frac{DPCH_E_c}{I_{or}}$ power ratio values averaged over one slot.

4) Test 4: Measure quality on DTCH and quality of compressed and recovery frames.

7.9.1.5 Test requirements

a) Test 1: The downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio values averaged over one slot shall be below the values in table 7.9.2 more than 90 % of the time. The measured quality on DTCH shall be as required in table 7.9.2.

b) Test 2: Measured quality on DTCH and measured quality of compressed and recovery frames do not exceed the values in table 7.9.2.

c) Test3: The downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio values averaged over one slot shall be below the values in table 7.9.2 more than 90 % of the time. The measured quality on DTCH shall be as required in table 7.9.2.

d) Test 4: Measured quality on DTCH and measured quality of compressed and recovery frames do not exceed the values in table 7.9.2.

7.10 Blind transport format detection

7.10.1 Definition and applicability

Performance of Blind transport format detection is determined by the Block Error Ratio (BLER) values and by the measured average transmitted DPCH_Ec/Ior value.

7.10.2 Minimum requirements

For the parameters specified in table 7.10.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER and FDR shown in table 7.10.2.

Table 7.10.1: Test parameters for Blind transport format detection

Parameter	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Unit
$\hat{I}_{or}/I_{oc}$	–1			–3			dB
I_{oc}	–60						dBm / 3.84 MHz
Information Data Rate	12,2 (rate 1)	7,95 (rate 2)	1,95 (rate 3)	12,2 (rate 1)	7,95 (rate 2)	1,95 (rate 3)	kbps
propagation condition	static			multi-path fading case 3			-
TFCI	off						-

Table 7.10.2: The Requirements for DCH reception in Blind transport format detection

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER	FDR
1	–17,7dB	10^{-2}	10^{-4}
2	–17,8dB	10^{-2}	10^{-4}
3	–18,4dB	10^{-2}	10^{-4}
4	–13,0dB	10^{-2}	10^{-4}
5	–13,2dB	10^{-2}	10^{-4}
6	–13,8dB	10^{-2}	10^{-4}
NOTE: The value of DPCH_Ec/Ior, Ioc, and Ior/Ioc are defined in case of DPCH is transmitted.			

NOTE: In the test, 9 deferent Transport Format Combinations (table 7.10.3) are sent during the call set up procedure, so that UE has to detect correct transport format in this 9 candidates.

Table.7.10.3: Transport format combinations informed during the call set up procedure in the test

	1	2	3	4	5	6	7	8	9
DTCH	12,2 k	10,2 k	7,95 k	7,4 k	6,7 k	5,9 k	5,15 k	4,75 k	1,95 k
DCCH					2,4 k				

7.10.3 Test purpose

To verify the ability of the blind transport format detection to receive a predefined test signal, representing a static propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) and false transport format detection ratio (FDR) not exceeding a specified value.

To verify the ability of the blind transport format detection to receive a predefined test signal, representing a malti-path propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) and false transport format detection ratio (FDR) not exceeding a specified value.

7.10.4 Method of test

7.10.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS and AWGN noise source to the UE antenna connector as shown in figure A.9 in the case for test 1-3. Connect the SS, multipath fading simulator and an AWGN noise source to the UE antenna connector as shown in figure A.10 in the case of test 4-6.

2. Set up a call according to the Generic call setup procedure.

3. Set the test parameters for test 1-6 as specified table 7.10.1 and table 7.10.2.
4. Enter the UE into loopback test mode and start the loopback test.
5. In the case of test 4-6, Setup fading simulator as fading condition case 3 which are described in table D.2.2.1.

7.10.4.2 Procedure

Measure BLER and FDR of DCH.

7.10.5 Test requirements

BLER and FDR shall not exceed the values at the DPCH_Ec/Ior specified in table 7.10.2.

8 Requirements for support of RRM

8.1 General

8.2 Idle Mode Tasks

8.2.1 Cell Selection

Void.

8.2.2 Cell Re-Selection

8.2.2.1 Scenario 1: Single carrier case

8.2.2.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change makes the UE camp on a new cell, and starts to send preambles on the PRACH for the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the FDD UE.

8.2.2.1.2 Minimum requirement

The cell re-selection delay shall be less than 8 s with a DRX cycle length of 1.28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE: The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$	See Table 4.1 in TS 25.133 [2] clause 4.2.2.
T_{SI}	Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2.2 and A.4.2.1.

8.2.2.1.3 Test purpose

To verify that the UE meets the minimum requirement.

8.2.2.1.4 Method of test

8.2.2.1.4.1 Initial conditions

This scenario implies the presence of 1 carrier and 6 cells as given in tables 8.2.2.1.1 and 8.2.2.1.2. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1 280 ms. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.1.1: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter	Unit	Value	Comment
Access Service Class (ASC#0) - Persistence value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
DRX cycle length	s	1,28	The value shall be used for all cells in the test.
T1	s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2	s	15	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table 8.2.2.1.2: Test parameters for Cell re-selection single carrier multi cell

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0,941		-0,941		-0,941		-0,941		-0,941		-0,941	
$\hat{I}_{or}/I_{oc}$	dB	7,3	10,27	10,27	7,3	0,27		0,27		0,27		0,27	
I_{oc}	dBm / 3,84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dB	21		21		21		21		21		21	
$Qoffset2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFFSET2	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	

8.2.2.1.4.2 Procedure

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE.

b) The UE is switched on.

c) The SS waits for random access requests from the UE.

d) After 15 s, the parameters are changed as described for T2.

e) The SS waits for random access requests from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for random access requests from the UE.

h) Repeat step d) to g) [TBD] times.

8.2.2.1.5 Test requirements

1) In step c), after the UE has responded on cell 2, it shall not respond on any other cell (cell selection).

2) In step e), the UE shall respond on cell 1 within 8 s.

3) In step g), the UE shall respond on cell 2 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.2.2 Scenario 2: Multi carrier case

8.2.2.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change makes the UE camp on a new cell, and starts to send preambles on the PRACH for the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the FDD UE.

8.2.2.2.2 Minimum requirement

The cell re-selection delay shall be less than 8 s with a DRX cycle length of 1.28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE: The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$	See Table 4.1 in TS 25.133 [2] clause 4.2.2.
T_{SI}	Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2.3 and A.4.2.2.

8.2.2.2.3 Test purpose

To verify that the UE meets the minimum requirement.

8.2.2.2.4 Method of test

8.2.2.2.4.1 Initial conditions

This scenario implies the presence of 2 carriers and 6 cells as given in tables 8.2.2.2.1 and 8.2.2.2.2. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1 280 ms. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.2.1: General test parameters for Cell Re-selection in multi carrier case

Parameter	Unit	Value	Comment
Access Service Class (ASC#0) - Persistence value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
DRX cycle length	S	1,28	The value shall be used for all cells in the test.
T1	s	30	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2	s	15	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table 8.2.2.2.2: Test parameters for Cell re-selection multi carrier multi cell

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm / 3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dB	21		21		21		21		21		21	
$Qoffset2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
Sintersearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	

8.2.2.2.4.2 Procedures

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE.

b) The UE is switched on.

c) The SS waits for random access requests from the UE.

d) After 30 s, the parameters are changed as described for T2.

e) The SS waits for random access request from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for random access requests from the UE.

h) Reduce T1 to 15 s and repeat step d) to g) [TBD] times.

NOTE: T1 is initially 30 s to allow enough time for the UE to search for cells as it has no prior knowledge of these.

8.2.2.2.5 Test requirements

1) In step c), after the UE has responded on cell 2, it shall not respond on any other cell (cell selection).

2) In step e), the UE shall respond on cell 1 within 8 s.

3) In step g), the UE shall respond on cell 2 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.3 UTRAN to GSM Cell Re-Selection

8.2.3.1 Scenario 1: Both UTRA and GSM level changed

8.2.3.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change makes the UE camp on a new cell and starts to send the RR Channel Request message for location update to the new cell.

The requirements and this test apply to the combined FDD and GSM UE.

8.2.3.1.2 Minimum requirement

The cell re-selection delay shall be less than 26 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell TS 05.08 [20].

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE: The cell re-selection delay can be expressed as: 4* $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$ See Table 4.1 in TS 25.133 [2] clause 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell TS 05.08 [20]. According to [20], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2 and A.4.3.1.

8.2.3.1.3 Test purpose

To verify that the UE meets the minimum requirement.

8.2.3.1.4 Method of test

8.2.3.1.4.1 Initial conditions

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.3.1.1: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	[TBD]	
T2		s	[TBD]	

Table 8.2.3.1.2: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table 8.2.3.1.3: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

8.2.3.1.4.2 Procedure

a) The SS activates cell 1 and 2 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE.

b) The UE is switched on.

c) The SS waits for random access requests from the UE.

d) After T1 s, the parameters are changed as described for T2.

e) The SS waits for random access requests from the UE.

f) After T2 s, the parameters are changed as described for T1.

g) The SS waits for random access requests from the UE.

h) Repeat step d) to g) [TBD] times.

8.2.3.1.5 Test requirements

1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).

2) In step e), the UE shall respond on cell 2 within 28 s.

3) In step g), the UE shall respond on cell 1

For the test to pass, the total number of fulfilled test requirements in step 2) shall be at least 90% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.3.2 Scenario 2: Only UTRA level changed

8.2.3.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change makes the UE camp on a new cell and starts to send the RR Channel Request message for location update to the new cell.

The requirements and this test apply to the combined FDD and GSM UE.

8.2.3.2.2 Minimum requirement

The cell re-selection delay shall be less than 4 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell TS 05.08 [20].

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE: The cell re-selection delay can be expressed as: 3* $T_{measureFDD}$ + T_{BCCH}, where:

$T_{measureFDD}$ See Table 4.1 in TS 25.133 [2] clause 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell TS 05.08 [20]. According to [20], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 3.84 s + T_{BCCH}, allow 4 s + T_{BCCH} in the test case.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2 and A.4.3.2.

8.2.3.2.3 Test purpose

To verify that the UE meets the minimum requirement.

8.2.3.2.4 Method of test

8.2.3.2.4.1 Initial conditions

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.3.2.1: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	45	
T2		s	10	

Table 8.2.3.2.2: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	20	-9
I_{oc}	dBm/3.84 MHz	-81	
CPICH_Ec/Io	dB	-10.0	-19.5
CPICH_RSCP	dBm	-70	-100
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table 8.2.3.2.3: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-80
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

8.2.3.2.4.2 Procedure

a) The SS activates cell 1 and 2 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE.

b) The UE is switched on.

c) The SS waits for random access requests from the UE.

d) After 45 s, the parameters are changed as described for T2.

e) The SS waits for random access requests from the UE.

f) After 10 s, the parameters are changed as described for T1.

g) The SS waits for random access requests from the UE.

h) Repeat step d) to g) [TBD] times.

8.2.3.2.5 Test requirements

1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).

2) In step e), the UE shall respond on cell 2 within 6 s.

3) In step g), the UE shall respond on cell 1

For the test to pass, the total number of fulfilled test requirements in step 2) shall be at least 90% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.4 FDD/TDD cell re-selection

8.2.4.1 Definition and applicability

The cell re-selection delay is defined as the time from the cell quality levels change to the moment when this change makes the UE reselect a better ranked cell, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

This test is for the case where the UE camps on an FDD cell and reselects to a TDD cell.

The requirements and this test apply to UEs supporting both FDD and TDD.

8.2.4.2 Minimum requirement

The cell re-selection delay shall be less than 8 s with a DRX cycle length of 1,28 s. This shall be verified in more than [FFS]% of the cases with a confidence level of [FFS]%.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2.4 and A.4.4.

8.2.4.3 Test purpose

To verify that the UE meets the minimum requirement for the case where the UE camps on an FDD cell and reselects to a TDD cell.

8.2.4.4 Method of test

8.2.4.4.1 Initial conditions

This scenario implies the presence of 1 FDD and 1 TDD cell as given in tables 8.2.4.1 and 8.2.4.2.

For this test environment the ranking/mapping function indicated in the broadcast of cell 1 shall be in such a way as to enable the UE to evaluate that the FDD cell 1 is better ranked than the TDD cell 2 during T1 and the TDD cell 2 is better ranked than the FDD cell 1 during T2. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.4.1: General test parameters for FDD/TDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	FDD cell
	Neighbour cells		Cell2	TDD cell
Final condition	Active cell		Cell2	
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
DRX cycle length		S	1.28	The value shall be used for all cells in the test.
T1		S	15	Cell 1 better ranked than cell 2
T2		S	15	Cell2 better ranked than cell 1

Table 8.2.4.2: Test parameters for FDD/TDD cell re-selection

Parameter	Unit	Cell 1		Cell 2			
Timeslot Number		n.a	n.a.	0		8	
		T 1	T 2	T1	T2	T 1	T 2
UTRA RF Channel Number		Channel 1		Channel 2			
CPICH_Ec/Ior	dB	-10	-10	n.a.		n.a.	
PCCPCH_Ec/Ior	dB	-12	-12	-3	-3		
SCH_Ec/Ior	dB	-12	-12	-9	-9	-9	-9
SCH_t_{offset}		n.a.	n.a.	0	0	0	0
PICH_Ec/Ior		-15	-15			-3	-3
OCNS	dB	-0,941	-0,941	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	3	-2	-2	3	-2	3
I_{oc}	dBm/3.84 MHz	-70					
CPICH_RSCP	dBm	-77	-82	n.a.		n.a.	
PCCPCH_RSCP	dBm	n.a.	n.a.	-75	-70		
Cell_reselection_and quality _measure		CPICH_RSCP					
Treselection	s	0		0			
Propagation Condition		AWGN		AWGN			

8.2.4.4.2 Procedures

a) The SS activates cell 1 and cell 2 with T1 defined parameters and monitors them for random access requests from the UE.

b) The UE is switched on.

c) The SS waits for random access requests from the UE.

d) After 15 s, the parameters are changed as described for T2.

e) The SS waits for random access request from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for random access requests from the UE.

h) Repeat step d) to g) [TBD] times.

8.2.4.5 Test requirements

1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).

2) In step e), the UE shall respond on cell 2 within 8 s in more than [FFS]% of the cases.

3) In step g), the UE shall respond on cell 1.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3 UTRAN Connected Mode Mobility

8.3.1 FDD/FDD Soft Handover

Void

8.3.2 FDD/FDD Hard Handover

Void

8.3.3 FDD/TDD Handover

Void

8.3.4 Inter-system Handover from UTRAN FDD to GSM

Void

8.3.5 Cell Re-selection in CELL_FACH

8.3.5.1 One frequency present in neighbour list

Void

8.3.5.2 Two frequencies present in the neighbour list

Void

8.3.6 Cell Re-selection in CELL_PCH

8.3.6.1 One frequency present in the neighbour list

Void

8.3.6.2 Two frequencies present in the neighbour list

Void

8.3.7 Cell Re-selection in URA_PCH

8.3.7.1 One frequency present in the neighbour list

Void

8.3.7.2 Two frequencies present in the neighbour list

Void

8.4 RRC Connection Control

8.4.1 RRC Re-establishment delay

Void

8.4.2 Random Access

8.4.2.1 Correct behaviour when receiving an ACK

8.4.2.1.1 Definition and applicability

The random access procedure is used when establishing the layer 1 communication between the UE and UTRAN. The random access shall provide a fast access but without disturbing ongoing connections. The random access is specified in clause 6 of TS 25.214 [5] and the control of the RACH transmission is specified in clause 11.2 of TS 25.321. A random access transmit sequence is described in clause 6.7.2 of TS 25.303.

8.4.2.1.2 Minimum Requirements

The UE shall have capability to calculate initial power according to the open loop algorithm and apply this power level at the first preamble and increase the power on additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3 of TS 25.101 [1]. The relative power applied to additional preambles shall have an accuracy as specified in clause 6.5.2.1 of 25.101 [1].

The absolute power applied to the first preamble shall be -30 dBm with an accuracy as specified in clause 6.4.1.1 of TS 25.101 [1]. The accuracy is ± 9dB in the case of normal condition or ±12dB in the case of extreme condition.

There are two relative powers, one is the power difference for preamble ramping and another is the power difference between last preamble part and message part. From the test parameter in the table 8.4.2.1.2, the test requirement of the power difference for all preamble ramping is 3dB (Power offset P0). The accuracy is ±2 dB as specified in clause 6.5.2.1 of 25.101 [1]. The test requirement of the power difference between 10th preamble PRACH and message part is [3 dB] (note). The accuracy is [±2 dB] as specified in clause 6.5.2.1 of 25.101 [1].

NOTE: In order to calculate the power difference between 10th preamble PRACH and message part by using Power offset $P_{p\text{-}m}$ in the table 8.4.2.1.2, the gain factors of PRACH message part are needed. The gain factor β_d is set to15. The [temporary] gain factor β_c is set to [15].

The UE shall stop transmitting preambles upon a ACK on the AICH has been received and then transmit a message. The UE shall transmit 10 preambles and 1 message.

The normative reference for this requirements is TS 25.133 [2] clauses 6.3.2 and A.6.2.2.1.

8.4.2.1.3 Test purpose

The purpose of this test is to verify that the behaviour of the random access procedure is according to the requirements and that the PRACH power settings are within specified limits.

8.4.2.1.4 Method of test

8.4.2.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1 in the case of the PRACH power measurement. And in the case of the function test of the random access procedure, connect the SS to the UE antenna connector as shown in figure A.8. A spectrum analyzer is set to 0 span mode.

2) A call is set up according to the Generic call setup procedure. The test parameters are set up according to table 8.4.2.1.1, table 8.4.2.1.2 and table 8.4.2.1.3. The PRACH procedure within the call setup is used for the test. It is necessary that an ACK on the AICH shall be transmitted after 10 preambles have been received by the SS

See TS 34.108 [3] for details regarding generic call setup procedure.

Table 8.4.2.1.1: RF Parameters for Random Access test

Parameter	Unit	Cell 1
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
Number of other transmitted Acquisition Indicators	-	0
AICH_Ec/Ior	dB	-10
PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior when an AI is not transmitted	dB	-0,941
OCNS_Ec/Ior when an AI is transmitted	dB	-1,516
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN

The test parameters "System Information Block (SIB) type 5 (ASC #0)" defined in clause 6.1 of TS 34.108 [3], shall be used in all random access tests (see note). Crucial parameters for the test requirements are repeated in tables 8.4.2.1.2 and A.8.4.3.1.3 and these overrule the parameters defined in SIB type 5.

NOTE: A parameter of AC-to-ASC mapping(AC0-9) in SIB5 of clause 6.1 of TS 34.108 [3] shall be set to 0 in the case of all random access tests. The EFACC of Type A, which is specified in clause 8.3.2.15 of TS 34.108 [3], shall be selected.

Table 8.4.2.1.2: UE parameters for Random Access test

Parameter	Unit	Value
Access Service Class (ASC#0) *- Persistence value*	 0..1	 1
Maximum number of preamble ramping cycles (M_{max}).		2
Maximum number of preambles in one preamble ramping cycle (Preamble Retrans Max)		12
The backoff time T_{B01} N_{B01min}=N_{B01max}	ms #TTI	N/A 10
Power step when no acquisition indicator is received (Power offset P0)	dB	3
Power offset between the last transmitted preamble and the control part of the message (Power offset P p-m)	dB	0
Maximum allowed UL TX power	dBm	0

Table 8.4.2.1.3: SS parameters for Random Access test

Parameter	Unit	Value
Primary CPICH DL TX power	dBm	-8
UL interference	dBm	-102
SIR in open loop power control (Constant value)	dB	0
AICH Power Offset	dB	0

8.4.2.1.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to table 8.4.2.1.1.

2) Measure the first PRACH preamble output power, the each power difference for preamble ramping and the power difference between 10^{th} preamble PRACH and message part of the UE according to annex B.

3) Measure the number of the preamble part and the message part by using a spectrum analyzer.

8.4.2.1.5 Test requirements

The absolute power and the relative power shall meet the requirements in the minimum requirements in clause 8.4.2.1.2.

The UE shall stop transmitting preambles upon a ACK on the AICH has been received and then transmit a message. The UE shall transmit 10 preambles and 1 message.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.4.2.2 Correct behaviour when receiving an NACK

8.4.2.2.1 Definition and applicability

The random access procedure is used when establishing the layer 1 communication between the UE and UTRAN. The random access shall provide a fast access but without disturbing ongoing connections. The random access is specified in clause 6 of TS 25.214 and the control of the RACH transmission is specified in clause 11.2 of TS 25.321. A random access transmit sequence is described in clause 6.7.2 of TS 25.303.

8.4.2.2.2 Minimum Requirements

The UE shall stop transmitting preambles upon a NACK on the AICH has been received and then repeat the ramping procedure when the back off timer T_{B01} expires.

The UE shall transmit 10 preambles in the first ramping cycle and no transmission shall be done by the UE within 100 ms after the NACK has been transmitted by the SS. Then the UE shall start the second preamble ramping cycle.

The normative reference for this requirements is TS 25.133 [2] clauses 6.3.2 and A.6.2.2.2.

8.4.2.2.3 Test purpose

The purpose of this test is to verify that the behaviour of the random access procedure is according to the requirements.

8.4.2.2.4 Method of test

8.4.2.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.8. A spectrum analyzer is set to 0 span mode.

2) A call is set up according to the Generic call setup procedure. The test parameters are set up according to table 8.4.2.1.1, table 8.4.2.1.2 and table 8.4.2.1.3. The PRACH procedure within the call setup is used for the test. It is necessary that an NACK on the AICH shall be transmitted after 10 preambles have been received by the SS.

See TS 34.108 [3] for details regarding generic call setup procedure.

8.4.2.2.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to table 8.4.2.1.1.

2) Measure the number of the preamble part and the time delay between 10th preamble in the first ramping cycle and first preamble in the second ramping cycle by using a spectrum analyzer.

8.4.2.2.5 Test requirements

The UE shall stop transmitting preambles upon a NACK on the AICH has been received and then repeat the ramping procedure when the back off timer T_{B01} expires.

The UE shall transmit 10 preambles in the first ramping cycle and no transmission shall be done by the UE within 100 ms after the NACK has been transmitted by the SS. Then the UE shall start the second preamble ramping cycle.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.4.2.3 Correct behaviour at Time-out

8.4.2.3.1 Definition and applicability

The random access procedure is used when establishing the layer 1 communication between the UE and UTRAN. The random access shall provide a fast access but without disturbing ongoing connections. The random access is specified in clause 6 of TS 25.214 and the control of the RACH transmission is specified in clause 11.2 of TS 25.321. A random access transmit sequence is described in clause 6.7.2 of TS 25.303.

8.4.2.3.2 Minimum Requirements

The UE shall stop transmit preambles when reaching the maximum number of preambles allowed in a cycle. The UE shall then repeat the ramping procedure until the maximum number of preamble ramping cycles are reached. No ACK/NACK shall be sent by SS during this test.

The UE shall transmit 2 preambles cycles, consisting of 12 preambles in each preamble cycle.

The normative reference for this requirements is TS 25.133 [2] clauses 6.3.2 and A.6.2.2.3.

8.4.2.3.3 Test purpose

The purpose of this test is to verify that the behaviour of the random access procedure is according to the requirements.

8.4.2.3.4 Method of test

8.4.2.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.8. A spectrum analyzer is set to 0 span mode.

2) A call is set up according to the Generic call setup procedure. The test parameters are set up according to table 8.4.2.1.1, table 8.4.2.1.2 and table 8.4.2.1.3. The PRACH procedure within the call setup is used for the test. It is necessary that SS shall transmit no AICH.

See TS 34.108 [3] for details regarding generic call setup procedure.

8.4.2.3.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to table 8.4.2.1.1.

2) Measure the number of the preamble part by using a spectrum analyzer.

8.4.2.3.5 Test requirements

The UE shall stop transmit preambles when reaching the maximum number of preambles allowed in a cycle. The UE shall then repeat the ramping procedure until the maximum number of preamble ramping cycles are reached. No ACK/NACK shall be sent by SS during this test.

The UE shall transmit 2 preambles cycles, consisting of 12 preambles in each preamble cycle.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.4.2.4 Correct behaviour when reaching maximum transmit power

8.4.2.4.1 Definition and applicability

The random access procedure is used when establishing the layer 1 communication between the UE and UTRAN. The random access shall provide a fast access but without disturbing ongoing connections. The random access is specified in clause 6 of TS 25.214 and the control of the RACH transmission is specified in clause 11.2 of TS 25.321. A random access transmit sequence is described in clause 6.7.2 of TS 25.303.

8.4.2.4.2 Minimum Requirements

The UE shall not exceed the maximum allowed UL TX power configured by the SS. No ACK/NACK shall be sent by SS during this test.

The absolute power of any preambles belonging to the first or second preamble cycle shall not exceed 0 dBm +/-[ ] dB (or +/- [ ] dB in extreme conditions).

The normative reference for this requirements is TS 25.133 [2] clauses 6.3.2 and A.6.2.2.4.

8.4.2.4.3 Test purpose

The purpose of this test is to verify that the PRACH power settings are within specified limits.

8.4.2.4.4 Method of test

8.4.2.4.4.1 Initial condition

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure. The test parameters are set up according to table 8.4.2.1.1, table 8.4.2.1.2 and table 8.4.2.1.3. The PRACH procedure within the call setup is used for the test. It is necessary that SS shall transmit no AICH.

See TS 34.108 [3] for details regarding generic call setup procedure.

8.4.2.4.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to table 8.4.2.1.1.

2) Measure the all PRACH preamble output power of the UE according to annex B.

8.4.2.4.5 Test requirements

The UE shall not exceed the maximum allowed UL TX power configured by the SS. No ACK/NACK shall be sent by SS during this test.

The absolute power of any preambles belonging to the first or second preamble cycle shall not exceed 0 dBm +/-[] dB (or +/- [] dB in extreme conditions).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.5 Timing and Signalling Characteristics

8.5.1 UE Transmit Timing

8.5.1.1 Definition and applicability

The UE transmit timing is defined as the timing of the uplink DPCCH/DPDCH frame relative to the first significant path of the corresponding downlink DPCCH/DPDCH frame. The reference point is the antenna connector of the UE.

The requirements and this test apply to all types of UTRA of the FDD UE.

8.5.1.2 Minimum requirements

The UE transmission timing error shall be less than or equal to ±1.5 chips. The reference point for the UE initial transmit timing control requirement shall be the time when the first significant path of the corresponding downlink DPCCH/DPDCH frame is received plus T_0 chips. T_0 is defined in TS25.211 [19].

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be ¼ chip.

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 200 ms period, the UE transmit timing shall not change in excess of ±¼ chip from the timing at the beginning of this 200ms period.

The normative reference for this requirement is TS 25.133 [2] clause 7.1.2.

8.5.1.3 Test purpose

The purpose of this test is to verify that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the limits specified in 8.5.1.2.

8.5.1.4 Method of test

8.5.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For this test, two cells on the same frequency are used.

1) Connect the test system to the UE antenna connector as shown in figure A.1.

2) A call is set up with Cell 1 according to the Generic call setup procedure. The test parameters are set up according to table 8.5.1.1.

Table 8.5.1.1: Test parameters for UE Transmit Timing requirements

Parameter	Unit	Level
DPCH_Ec/ Ior, Cell 1 and Cell 2	dB	-17
CPICH_Ec/ Ior, Cell 1 and Cell 2	dB	-10
PCCPH_Ec/ Ior, Cell 1 and Cell 2	dB	-12
SCH_Ec/ Ior, Cell 1 and Cell 2	dB	-12
PICH_Ec/ Ior, Cell 1 and Cell 2	dB	-15
OCNS_Ec/ Ior, Cell 1 and Cell 2	dB	-1.05
$\hat{I}_{or,}$ Cell 1	dBm/3.84 MHz	-96
$\hat{I}_{or,}$ Cell 2	dBm/3.84 MHz	-99
Information data rate	kbps	12.2
Relative delay of path received from cell 2 with respect to cell 1	μs	+/-2
Propagation condition	AWGN	

8.5.1.4.2 Procedure

a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within T_0 ± 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

b) Test system introduces cell 2 into the test system at delay +2 μs from cell 1.

c) Test system verifies that cell 2 is added to the active set.

d) Test system shall verify that the UE transmit timing offset is still within T_0 ± 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

e) Test system switches Tx timing of cell 2 to a delay of -2 μs with respect to cell 1.

f) Test system verifies cell 2 remains in the active set.

g) Test system shall verify that the UE transmit timing offset is still within T_0 ± 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

h) Test system stops sending cell 1 signals.

i) Test system verifies that the UE does not start to adjust its Tx timing to cell 2 before it receives an active set update message notifying the UE that cell 1 is deleted from the active set.

j) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements in section 8.5.1.2 until the UE transmit timing offset is within T_0 ± 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

k) Test system shall verify that the UE transmit timing offset stays within T_0 ± 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

l) Test system starts sending cell 1 signal again with its original timing.

m) Test system verifies that cell 1 is added to the active set.

n) Test system verifies that the UE transmit timing is still within T_0 ± 1.5chips with respect to the first significant path of the downlink DPCCH/DPDCH of cell 2.

o) Test system stops sending cell 2 signals.

p) Test system verifies that the UE does not start to adjust its Tx timing to cell 1 before it receives an active set update message notifying the UE that cell 2 shall be deleted from the active set.

q) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements in section 8.5.1.2 until the UE transmit timing offset is within T_0 ± 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

r) Test system shall verify that the UE transmit timing offset stays within $T_0 \pm 1.5$ chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

8.5.1.5 Test requirements

1) In step a), d) and g), UE transmit timing offset shall be within $T_0 \pm 1.5$ chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

2) In step j), the adjustment step size and adjustment rate shall meet the requirements specified in 8.5.1.2 until the UE transmit timing offset is within $T_0 \pm 1.5$ chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

3) In step k) and n), UE transmit timing offset shall be within $T_0 \pm 1.5$ chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

4) In step q), the adjustment step size and adjustment rate shall meet the requirements specified in 8.5.1.2 until the UE transmit timing offset is within $T_0 \pm 1.5$ chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

5) In step r), UE transmit timing offset shall be within $T_0 \pm 1.5$ chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

NOTE 1: The above Test Requirement differs from the Test Requirement of TS 25.133 [2] clause A7.1.2, from which the requirements for the test system are subtracted to give the above Test Requirement.

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.6 UE Measurements Procedures

8.6.1 FDD intra frequency measurements

8.6.1.1 Event triggered reporting in AWGN propagation conditions

Void

8.6.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition

Void

8.6.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition

Void

8.6.1.4 Correct reporting of neighbours in fading propagation condition

Void

8.6.2 FDD inter frequency measurements

8.6.2.1 Correct reporting of neighbours in AWGN propagation condition

Void

8.6.2.2 Correct reporting of neighbours in Fading propagation condition

Void

8.6.3 TDD measurements

8.6.3.1 Correct reporting of TDD neighbours in AWGN propagation condition

Void

8.7 Measurements Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in Annex C, sub-clause C.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in Annex E.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

8.7.1 CPICH RSCP

8.7.1.1 Intra frequency measurements accuracy

8.7.1.1.1 Absolute accuracy requirement

8.7.1.1.1.1 Definition and applicability

The absolute accuracy of CPICH RSCP is defined as the CPICH RSCP measured from one cell compared to the actual CPICH RSCP power from same cell.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.1.1.1.2 Minimum Requirements

The accuracy requirements in table 8.7.1.1.1.1 are valid under the following conditions:

- CPICH_RSCP1 ≥ -114 dBm.
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$

Table 8.7.1.1.1.1: CPICH_RSCP Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	±6	±9	-94...-70
	dBm	±8	±11	-70...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.1.1.1 and A.9.1.1.2.

8.7.1.1.1.3 Test purpose

The purpose of this test is to verify that the CPICH RSCP absolute measurement accuracy is within the specified limits in clause 8.7.1.1.1.2. This measurement is for handover evaluation, DL open loop power control, UL open loop control and for the calculation of pathloss.

8.7.1.1.1.4 Method of test

8.7.1.1.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. CPICH RSCP intra frequency absolute accuracy requirements are tested by using test parameters in table 8.7.1.1.1.2.

Table 8.7.1.1.1.2: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-75.54		-59.98		-97.52	
Îor/Ioc	dB	4	0	9	0	0	-6.53
CPICH RSCP, Note 1	dBm	-81.5	-85.5	-60.98	-69.88	-107.5	-114.0
Io, Note 1	dBm/3.84 MHz	-69		-50		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.1.1.2.

8.7.1.1.1.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT messages.

3) SS shall check CPICH_RSCP value in MEASUREMENT REPORT messages. CPICH RSCP power of Cell 1 reported by UE is compared to actual CPICH RSCP power for each MEASUREMENT REPORT message.

4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated. After further [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated.

5) After further [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated below shall use the same content as described in default message content, with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement (Step 1):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Intra-frequency measurement -Intra-frequency cell info list -Intra-frequency measurement quantity -Filter coefficient -CHOICE mode -Measurement quantity -Intra-frequency reporting quantity -Reporting quantities for active set cells -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting quantities for monitored set cells -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting quantities for detected set cells -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -CHOICE *report criteria* -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present 0 FDD CPICH RSCP No report TRUE TRUE FDD TRUE TRUE TRUE No report FALSE TRUE FDD TRUE TRUE TRUE Not Present Report all active set cells + cells within monitored set on used frequency 2 Not Present Periodical reporting criteria Infinity 250 ms AM RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info	 Not Present

8.7.1.1.1.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.1.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.1.1.2 Relative accuracy requirement

8.7.1.1.2.1 Definition and applicability

The relative accuracy of CPICH RSCP is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on the same frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.1.1.2.2 Minimum Requirements

The accuracy requirements in table 8.7.1.1.2.1 are valid under the following conditions:

- CPICH_RSCP1,2 ≥ -114 dBm.
- $\left| CPICH_RSCP1\big|_{in\ dB} - CPICH_RSCP2\big|_{in\ dB} \right| \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$

Table 8.7.1.1.2.1: CPICH_RSCP Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	±3	±3	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.1.1.2 and A.9.1.1.2.

8.7.1.1.2.3 Test purpose

The purpose of this test is to verify that the CPICH RSCP relative measurement accuracy is within the specified limits in clause 8.7.1.1.2.2. This measurement is for handover evaluation, DL open loop power control, UL open loop control and for the calculation of pathloss.

8.7.1.1.2.4 Method of test

8.7.1.1.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. CPICH RSCP intra frequency relative accuracy requirements are tested by using test parameters in table 8.7.1.1.1.2.

1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.1.1.2.

8.7.1.1.2.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT messages.

3) SS shall check CPICH_RSCP value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. CPICH RSCP power value measured from Cell 1 is compared to CPICH RSCP power value measured from Cell 2 for each MEASUREMENT REPORT message.

4) The result of step 3) is compared to actual power level difference of CPICH RSCP of Cell 1 and Cell 2.

5) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated. After further [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated.

6) After further [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

7) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

MEASUREMENT CONTROL message for Intra frequency measurement in clause 8.7.1.1.1.4.2 is used.

8.7.1.1.2.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.1.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.1.2 Inter frequency measurement accuracy

8.7.1.2.1 Relative accuracy requirement

8.7.1.2.1.1 Definition and applicability

The relative accuracy of CPICH RSCP in inter frequency case is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on a different frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.1.2.1.2 Minimum Requirements

The accuracy requirements in table 8.7.1.2.1.1 are valid under the following conditions:

- CPICH_RSCP1,2 ≥ -114 dBm.
- $\left| CPICH_RSCP1\big|_{in\ dB} - CPICH_RSCP2\big|_{in\ dB} \right| \le 20dB$.
- | Channel 1_Io -Channel 2_Io| ≤ 20 dB.
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$.

Table 8.7.1.2.1.1: CPICH_RSCP Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	±6	±6	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.1.2.1 and A.9.1.1.2.

8.7.1.2.1.3 Test purpose

The purpose of this test is to verify that the CPICH RSCP relative measurement accuracy is within the specified limits in clause 8.7.1.2.1.2. This measurement is for handover evaluation, DL open loop power control, UL open loop control and for the calculation of pathloss.

8.7.1.2.1.4 Method of test

8.7.1.2.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, set 1 of table C.5.2 [14 slots is FFS]. CPICH RSCP inter frequency relative accuracy requirements are tested by using test parameters in table 8.7.1.2.1.2.

Table 8.7.1.2.1.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
PICH_Ec/Ior	dB	-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-60.00	-60.00	-84.00	-94.46
Îor/Ioc	dB	9.54	9.54	0	-9.54
CPICH RSCP, Note 1	dBm	-60.46	-60.46	-94.0	-114.0
Io, Note 1	dBm/3.84 MHz	-50.00	-50.00	-81.0	-94.0
Propagation condition	-	AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.					

1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.2.1.2.

8.7.1.2.1.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.

2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

3) SS shall transmit MEASUREMENT CONTROL message.

4) UE shall transmit periodically MEASUREMENT REPORT messages.

5) SS shall check CPICH_RSCP value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. CPICH RSCP power value measured from Cell 1 is compared to CPICH RSCP power value measured from Cell 2 for each MEASUREMENT REPORT message.

6) The result of step 5) is compared to actual power level difference of CPICH RSCP of Cell 1 and Cell 2.

7) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.2.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated.

8) After further [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

9) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated below shall use the same content as described in default message content, with the following exceptions:

PHYSICAL CHANNEL RECONFIGURATION message for Inter frequency measurement (step 1):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	240 CFN
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
PhyCH information elements	
-Frequency info	Not Present
Uplink radio resources	
-Maximum allowed UL TX power	Not Present
Downlink radio resources	
-CHOICE mode	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links	
-Downlink DPCH info common for all RL	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info	
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	Inactive
-TGCFN	Not Present
-Transmission gap pattern sequence configuration parameters	
-TGMP	FDD measurement
-TGPRC	Not present
-TGSN	4
-TGL1	7
-TGL2	Not Present
-TGD	0
-TGPL1	3
-TGPL2	Not Present
-RPP	Mode 0
-ITP	Mode 0
-CHOICE UL/DL mode	UL and DL
-Downlink compressed mode method	SF/2
-Uplink compressed mode method	SF/2
-Downlink frame type	B
-DeltaSIR1	3.0
-DeltaSIRafter1	3.0
-DeltaSIR2	Not Present
-DeltaSIRafter2	Not Present
-N Identify abort	Not Present
-T Reconfirm abort	Not Present
-TX Diversity Mode	Not Present
-SSDT information	Not Present
-Default DPCH Offset Value	Not Present
-Downlink information per radio link list	
-Downlink information for each radio link	
-Choice mode	FDD
-Primary CPICH info	
-Primary scrambling code	100
-PDSCH with SHO DCH Info	Not Present
-PDSCH code mapping	Not Present

-Downlink DPCH info for each RL	
-CHOICE mode	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	Not Present
-Spreading factor	64
-Code number	63
-Scrambling code change	No code change
-TPC combination index	0
-SSDT Cell Identity	Not Present
-Closed loop timing adjustment mode	Not Present
-SCCPCH Information for FACH	Not Present

MEASUREMENT CONTROL message for Inter frequency measurement (step 3):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Inter-frequency measurement -Inter-frequency cell info list -CHOICE Inter-frequency cell removal -Remove all inter-frequency cells -Remove some inter-frequency cells -Removed inter-frequency cells -Inter-frequency cell id -No inter-frequency cells removed -New inter-frequency cells -Cell for measurement -Inter-frequency measurement quantity -CHOICE reporting criteria -Filter coefficient -CHOICE mode -Measurement quantity for frequency quality estimate -Inter-frequency reporting quantity -UTRA Carrier RSSI -Frequency quality estimate -Non frequency related cell reporting quantities -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -Inter-frequency set update -CHOICE report criteria -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present Not Present Not Present Not Present Not Present Inter-frequency reporting criteria 0 FDD CPICH RSCP TRUE TRUE No report TRUE TRUE FDD TRUE TRUE TRUE Report all active set cells + cells within monitored set on used frequency 2 Not Present Not Present Periodical reporting criteria Infinity 500 ms Acknowledged mode RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info -TGPS reconfiguration CFN -Transmission gap pattern sequence -TGPSI -TGPS Status Flag -TGCFN	 240 1 Active 240

8.7.1.2.1.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.2.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.2 CPICH Ec/Io

8.7.2.1 Intra frequency measurements accuracy

8.7.2.1.1 Absolute accuracy requirement

8.7.2.1.1.1 Definition and applicability

The absolute accuracy of CPICH Ec/Io is defined as the CPICH Ec/Io measured from one cell compared to the actual CPICH_Ec/Io power ratio from same cell.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.2.1.1.2 Minimum Requirements

The accuracy requirements in table 8.7.2.1.1.1 are valid under the following conditions:

- CPICH_RSCP1 ≥ -114 dBm.
- $\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$.

Table 8.7.2.1.1.1: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	±1,5 for -14 ≤ CPICH Ec/Io ±2 for -16 ≤ CPICH Ec/Io < -14 ±3 for -20 ≤ CPICH Ec/Io < -16	±3	-94...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.2.1.1.

8.7.2.1.1.3 Test purpose

The purpose of this test is to verify that the CPICH Ec/Io absolute measurement accuracy is within the specified limits in clause 8.7.2.1.1.2. This measurement is for Cell selection/re-selection and for handover evaluation.

8.7.2.1.1.4 Method of test

8.7.2.1.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. CPICH Ec/Io intra frequency absolute accuracy requirements are tested by using the test parameters in table 8.7.2.1.1.2.

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	.2.56	-0.94
Ioc	dBm/ 3.84 MHz	-56.98		-89.07		-94.98	
Îor/Ioc	dB	3.0	3.0	-2.9	-2.9	-9.0	-9.0
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50		-86		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.2.1.1.2.

8.7.2.1.1.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT messages.

3) SS shall check CPICH_Ec/No value in MEASUREMENT REPORT messages. According to Table 8.7.2.1.1.3 the SS calculates CPICH_Ec/Io power ratio of Cell 1, which is compared to the actual CPICH Ec/Io power ratio from the same cell for each MEASUREMENT REPORT message.

4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated. After further [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated.

5) After further [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Table 8.7.2.1.1.3: CPICH Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/Io < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/Io	dB

Specific Message Contents

All messages indicated below shall use the same content as described in default message content, with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement (Step 1):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Intra-frequency measurement -Intra-frequency cell info list -Intra-frequency measurement quantity -Filter coefficient -CHOICE mode -Measurement quantity -Intra-frequency reporting quantity -Reporting quantities for active set cells -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting quantities for monitored set cells -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting quantities for detected set cells -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -CHOICE *report criteria* -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present 0 FDD CPICH RSCP No report TRUE TRUE FDD TRUE TRUE TRUE No report FALSE FALSE FDD FALSE FALSE FALSE Not Present Report all active set cells + cells within monitored set on used frequency 2 Not Present Periodical reporting criteria Infinity 250 ms AM RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info	 Not Present

8.7.2.1.1.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in clause 8.7.2.1.1.2. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in subclause 8.7.2.1.1.2 as shown in table 8.7.2.1.1.4.

Table 8.7.2.1.1.4: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	-2.7…1.5 for -14 ≤ CPICH Ec/Io –3.2…2 for -16 ≤ CPICH Ec/Io < -14 –4.2…3 for -20 ≤ CPICH Ec/Io < -16	-4.2…3	-94...-87
		± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-87...-50

The normative reference for this requirement is TS 25.133 [2] clause A.9.1.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.2.1.2 Relative accuracy requirement

8.7.2.1.2.1 Definition and applicability

The relative accuracy of CPICH Ec/Io is defined as the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on the same frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.2.1.2.2 Minimum Requirements

The accuracy requirements in table 8.7.2.1.2.1 are valid under the following conditions:

- CPICH_RSCP1,2 ≥ -114 dBm.
- $\left| CPICH_RSCP1|_{in\ dB} - CPICH_RSCP2|_{in\ dB} \right| \le 20dB$.
- $\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$.

Table 8.7.2.1.2.1: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	±1,5 for -14 ≤ CPICH Ec/Io ±2 for -16 ≤ CPICH Ec/Io < -14 ±3 for -20 ≤ CPICH Ec/Io < -16	±3	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.2.1.2 and A.9.1.2.2.

8.7.2.1.2.3 Test purpose

The purpose of this test is to verify that the CPICH Ec/Io relative measurement accuracy is within the specified limits in clause 8.7.2.1.2.2. This measurement is for Cell selection/re-selection and for handover evaluation.

8.7.2.1.2.4 Method of test

8.7.2.1.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are in the same frequency. CPICH Ec/Io intra frequency relative accuracy requirements are tested by using test parameters in table 8.7.2.1.1.2.

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.2.1.1.2.

8.7.2.1.2.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT messages.

3) SS shall check CPICH_Ec/No value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. According to Table 8.7.2.1.1.3 the SS calculates CPICH_Ec/Io power ratio of Cell 1 and Cell 2. CPICH_Ec/Io power ratio value measured from Cell 1 is compared to CPICH_Ec/Io power ratio ~~value~~ measured from Cell 2 for each MEASUREMENT REPORT message.

4) The result of step 3) is compared to actual power level difference of CPICH_Ec/Io of Cell 1 and Cell 2.

5) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated. After further [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated.

6) After further [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

7) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

MEASUREMENT CONTROL message for Intra frequency measurement in clause 8.7.2.1.1.4.2 is used.

8.7.2.1.2.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in clause 8.7.2.1.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.2.2 Inter frequency measurement accuracy

8.7.2.2.1 Absolute accuracy requirement

[TBD]

8.7.2.2.2 Relative accuracy requirement

8.7.2.2.2.1 Definition and applicability

The relative accuracy of CPICH Ec/Io in the inter frequency case is defined as the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on a different frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.2.2.2.2 Minimum Requirements

The accuracy requirements in table 8.7.2.2.2.1 are valid under the following conditions:

- CPICH_RSCP1,2 ≥ -114 dBm.
- $\left| CPICH_RSCP1|_{in\ dB} - CPICH_RSCP2|_{in\ dB} \right| \le 20dB$.
- | Channel 1_Io -Channel 2_Io| ≤ 20 dB.
- $\left. \frac{I_o}{(\hat{I}_{or})} \right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$.

Table 8.7.2.2.2.1: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	±1.5 for -14 ≤ CPICH Ec/Io ±2 for -16 ≤ CPICH Ec/Io < -14 ±3 for -20 ≤ CPICH Ec/Io < -16	±3	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.2.2.2 and A.9.1.2.2.

8.7.2.2.2.3 Test purpose

The purpose of this test is to verify that the CPICH Ec/Io relative measurement accuracy is within the specified limits in clause 8.7.2.2.2.2. This measurement is for Cell selection/re-selection and for handover evaluation.

8.7.2.2.2.4 Method of test

8.7.2.2.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, set 1 of table C.5.2 [14 slots is FFS]. CPICH Ec/Io inter frequency relative accuracy requirements are tested by using test parameters in Table 8.7.2.2.2.2.

Table 8.7.2.2.2.2: CPICH Ec/Io Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-87.27	-87.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50	-50	-86	-86	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to Table 8.7.2.2.2.2.

8.7.2.2.2.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.

2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

3) SS shall transmit MEASUREMENT CONTROL message.

4) UE shall transmit periodically MEASUREMENT REPORT messages.

5) SS shall check CPICH_Ec/No value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. According to Table 8.7.2.1.1.3 the SS calculates CPICH_Ec/Io power ratio of Cell 1 and Cell 2. CPICH_Ec/Io power ratio ~~value~~ measured from Cell 1 is compared to CPICH_Ec/Io power value measured from Cell 2 for each MEASUREMENT REPORT message.

6) The result of step 5) is compared to actual power level difference of CPICH_Ec/Io of Cell 1 and Cell 2.

7) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.2.2.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated. After further [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.2.2.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated.

8) After [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

9) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated below shall use the same content as described in default message content, with the following exceptions:

PHYSICAL CHANNEL RECONFIGURATION message for Inter frequency measurement (step 1):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	240 CFN
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
PhyCH information elements	
-Frequency info	Not Present
Uplink radio resources	
-Maximum allowed UL TX power	Not Present
Downlink radio resources	
-CHOICE mode	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links	
-Downlink DPCH info common for all RL	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info	
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	Inactive
-TGCFN	Not Present
-Transmission gap pattern sequence configuration parameters	
-TGMP	FDD measurement
-TGPRC	Not present
-TGSN	4
-TGL1	7
-TGL2	Not Present
-TGD	0
-TGPL1	3
-TGPL2	Not Present
-RPP	Mode 0
-ITP	Mode 0
-CHOICE UL/DL mode	UL and DL
-Downlink compressed mode method	SF/2
-Uplink compressed mode method	SF/2
-Downlink frame type	B
-DeltaSIR1	3.0
-DeltaSIRafter1	3.0
-DeltaSIR2	Not Present
-DeltaSIRafter2	Not Present
-N Identify abort	Not Present
-T Reconfirm abort	Not Present
-TX Diversity Mode	Not Present
-SSDT information	Not Present
-Default DPCH Offset Value	Not Present
-Downlink information per radio link list	
-Downlink information for each radio link	
-Choice mode	FDD
-Primary CPICH info	
-Primary scrambling code	100
-PDSCH with SHO DCH Info	Not Present
-PDSCH code mapping	Not Present

-Downlink DPCH info for each RL	
-CHOICE mode	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	Not Present
-Spreading factor	64
-Code number	63
-Scrambling code change	No code change
-TPC combination index	0
-SSDT Cell Identity	Not Present
-Closed loop timing adjustment mode	Not Present
-SCCPCH Information for FACH	Not Present

MEASUREMENT CONTROL message for Inter frequency measurement (step 3):

Information Element	Value/Remark
Message Type	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command	Modify
-Inter-frequency measurement	
-Inter-frequency cell info list	
-CHOICE Inter-frequency cell removal	
-Remove all inter-frequency cells	Not Present
-Remove some inter-frequency cells	Not Present
-Removed inter-frequency cells	
-Inter-frequency cell id	
-No inter-frequency cells removed	Not Present
-New inter-frequency cells	Not Present
-Cell for measurement	Not Present
-Inter-frequency measurement quantity	
-CHOICE reporting criteria	Inter-frequency reporting criteria
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity for frequency quality estimate	CPICH RSCP
-Inter-frequency reporting quantity	
-UTRA Carrier RSSI	TRUE
-Frequency quality estimate	TRUE
-Non frequency related cell reporting quantities	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting cell status	
-CHOICE reported cell	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	2
-Measurement validity	Not Present
-Inter-frequency set update	Not Present
-CHOICE report criteria	Periodical reporting criteria
-Amount of reporting	Infinity
-Reporting interval	500 ms
-Measurement Reporting Mode	
-Measurement Report Transfer Mode	Acknowledged mode RLC
-Periodical Reporting / Event Trigger Reporting Mode	Periodical reporting
-Additional measurements list	Not Present
Physical channel information elements	
-DPCH compressed mode status info	
-TGPS reconfiguration CFN	240
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	Active
-TGCFN	240

8.7.2.2.2.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in clause 8.7.2.2.2.2. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in clause 8.7.2.2.2.2 as shown in table 8.7.2.2.2.3.

Table 8.7.2.2.2.3: CPICH_Ec/Io Inter frequency relative

		Accuracy [dB]		Conditions
Parameter	**Unit**	**Normal condition**	**Extreme condition**	**Io [dBm/3.84 MHz]**
CPICH_Ec/Io	dB	-2.7…1.5 for -14 ≤ CPICH Ec/Io –3.2…2 for -16 ≤ CPICH Ec/Io < -14 –4.2…3 for -20 ≤ CPICH Ec/Io < -16	-4.2…3	-94...-87
		± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-87...-50

The normative reference for this requirement is TS 25.133 [2] clause A.9.1.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.3 UTRA Carrier RSSI

NOTE: This measurement is for Inter-frequency handover evaluation.

8.7.3.1 Absolute measurement accuracy requirement

8.7.3.1.1 Definition and applicability

The absolute accuracy of UTRA Carrier RSSI is defined as the UTRA Carrier RSSI measured from one frequency compared to the actual UTRA Carrier RSSI power of that same frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.3.1.2 Minimum Requirements

Table 8.7.3.1.1: UTRA Carrier RSSI Inter frequency absolute accuracy

Parameter	**Unit**	**Accuracy [dB]**		**Conditions**
		Normal condition	**Extreme condition**	**Io [dBm/3.84 MHz]**
UTRA Carrier RSSI	dBm	± 4	± 7	-94...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.3.1.

8.7.3.1.3 Test purpose

The purpose of this test is to verify that the UTRA Carrier RSSI measurement is within the specified limits. This measurement is for inter-frequency handover evaluation.

8.7.3.1.4 Method of test

8.7.3.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, Set 1 of table C.5.2 [14 slots is FFS]. UTRA Carrier RSSI absolute accuracy requirements are tested by using test parameters in table 8.7.3.1.2.

Table 8.7.3.1.2: UTRA Carrier RSSI Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-70.27	-70.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50	-50	-69	-69	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.3.1.2.

8.7.3.1.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.

2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

3) SS shall transmit MEASUREMENT CONTROL message.

4) UE shall transmit periodically MEASUREMENT REPORT messages.

5) SS shall check UTRA carrier RSSI value of Channel 2 in MEASUREMENT REPORT messages. UTRA carrier RSSI power of Channel 2 reported by UE is compared to actual UTRA Carrier RSSI value of Channel 2 for each MEASUREMENT REPORT message.

6) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, step 5) above is repeated. After further [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, step 5) above is repeated.

7) After further [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

8) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated below shall use the same content as described in default message content, with the following exceptions:

PHYSICAL CHANNEL RECONFIGURATION message for Inter frequency measurement (step 1):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	240 CFN
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
PhyCH information elements	
-Frequency info	Not Present
Uplink radio resources	
-Maximum allowed UL TX power	Not Present
Downlink radio resources	
-CHOICE mode	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links	
-Downlink DPCH info common for all RL	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info	
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	Inactive
-TGCFN	Not Present
-Transmission gap pattern sequence configuration parameters	
-TGMP	FDD measurement
-TGPRC	Not present
-TGSN	4
-TGL1	7
-TGL2	Not Present
-TGD	0
-TGPL1	3
-TGPL2	Not Present
-RPP	Mode 0
-ITP	Mode 0
-CHOICE UL/DL mode	UL and DL
-Downlink compressed mode method	SF/2
-Uplink compressed mode method	SF/2
-Downlink frame type	B
-DeltaSIR1	3.0
-DeltaSIRafter1	3.0
-DeltaSIR2	Not Present
-DeltaSIRafter2	Not Present
-N Identify abort	Not Present
-T Reconfirm abort	Not Present
-TX Diversity Mode	Not Present
-SSDT information	Not Present
-Default DPCH Offset Value	Not Present
-Downlink information per radio link list	
-Downlink information for each radio link	
-Choice mode	FDD
-Primary CPICH info	
-Primary scrambling code	100
-PDSCH with SHO DCH Info	Not Present
-PDSCH code mapping	Not Present

-Downlink DPCH info for each RL	
-CHOICE mode	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	Not Present
-Spreading factor	64
-Code number	63
-Scrambling code change	No code change
-TPC combination index	0
-SSDT Cell Identity	Not Present
-Closed loop timing adjustment mode	Not Present
-SCCPCH Information for FACH	Not Present

MEASUREMENT CONTROL message for Inter frequency measurement (step 3):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Inter-frequency measurement -Inter-frequency cell info list -CHOICE Inter-frequency cell removal -Remove all inter-frequency cells -Remove some inter-frequency cells -Removed inter-frequency cells -Inter-frequency cell id -No inter-frequency cells removed -New inter-frequency cells -Cell for measurement -Inter-frequency measurement quantity -CHOICE reporting criteria -Filter coefficient -CHOICE mode -Measurement quantity for frequency quality estimate -Inter-frequency reporting quantity -UTRA Carrier RSSI -Frequency quality estimate -Non frequency related cell reporting quantities -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -Inter-frequency set update -CHOICE report criteria -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present Not Present Not Present Not Present Not Present Inter-frequency reporting criteria 0 FDD CPICH RSCP TRUE TRUE Type 1 TRUE TRUE FDD TRUE TRUE TRUE Report all active set cells + cells within monitored set on used frequency 2 Not Present Not Present Periodical reporting criteria Infinity 500 ms Acknowledged mode RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info -TGPS reconfiguration CFN -Transmission gap pattern sequence -TGPSI -TGPS Status Flag -TGCFN	 240 1 Active 240

8.7.3.1.5 Test requirements

The UTRA Carrier RSSI absolute measurement accuracy shall meet the requirements in clause 8.7.3.1.2. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in subclause 8.7.3.1.2 as shown in table 8.7.3.1.3.

Table 8.7.3.1.3: UTRA Carrier RSSI absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.133 [2] clause A.9.1.3.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.3.2 Relative measurement accuracy requirement

8.7.3.2.1 Definition and applicability

The relative accuracy requirement is defined as the UTRA Carrier RSSI measured from one frequency compared to the UTRA Carrier RSSI measured from another frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.3.2.2 Minimum Requirements

The accuracy requirements in table 8.7.3.2.1 are valid under the following condition:

$| \text{Channel 1_Io}|_{\text{dBm/3.84 MHz}} - \text{Channel 2_Io}|_{\text{dBm/3.84 MHz}} | < 20$ dB.

Table 8.7.3.2.1: UTRA Carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 7	± 11	-94...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.3.2.

8.7.3.2.3 Test purpose

The purpose of this test is to verify that the UTRA Carrier RSSI measurement is within the specified limits. This measurement is for inter-frequency handover evaluation.

8.7.3.2.4 Method of test

8.7.3.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, Set 1 of table C.5.2 [14 slots is FFS]. UTRA Carrier RSSI relative accuracy requirements are tested by using test parameters in table 8.7.3.1.2.

1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.3.1.2.

8.7.3.2.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.
2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.
3) SS shall transmit MEASUREMENT CONTROL message.
4) UE shall transmit periodically MEASUREMENT REPORT messages.
5) SS shall check UTRA carrier RSSI value of Channel 1 and Channel 2 in MEASUREMENT REPORT messages. UTRA carrier RSSI power value measured from Channel 1 is compared to UTRA carrier RSSI power value measured from Channel 2 for each MEASUREMENT REPORT message.
6) The result of step 5) is compared to actual power level difference of UTRA Carrier RSSI of Channel 1 and Channel 2.
7) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated. After further [1000] MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional [1s] and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated.
8) After further [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
9) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

PHYSICAL CHANNEL RECONFIGURATION message and MEASUREMENT CONTROL message for Inter frequency measurement in clause 8.7.3.1.4.2 is used.

8.7.3.2.5 Test requirements

The UTRA Carrier RSSI relative measurement accuracy shall meet the requirements in clause 8.7.3.2.2. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in clause 8.7.3.2.2 as shown in table 8.7.3.2.2.

Table 8.7.3.2.2: UTRA Carrier RSSI relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.133 [2] clause A.9.1.3.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.4 SFN-CFN observed time difference

Void

8.7.5 SFN-SFN observed time difference

Void

8.7.6 UE Rx-Tx time difference

8.7.6.1 UE Rx-Tx time difference type 1

8.7.6.1.1 Definition and applicability

The UE Rx-Tx time difference is defined as the time difference between the UE uplink DPCCH/DPDCH frame transmission and the first detected path (in time) of the downlink DPCH frame from the measured radio link. The reference point of the UE Rx-Tx time difference shall be the antenna connector of the UE. This measurement is specified in clause 5.1.10 of TS 25.215.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.6.1.2 Minimum requirements

Table 8.7.6.1.1

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± 1.5	-94...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.9.1.1 and A.9.1.6.1.2.

8.7.6.1.3 Test purpose

The purpose of this test is to verify that the measurement accuracy of Rx-Tx time difference is within the limit specified in clause 8.7.6.1.2. This measurement is used for call setup purposes to compensate propagation delay of DL and UL.

8.7.6.1.4 Method of test

8.7.6.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS to the UE antenna connector as shown in figure A.1

2) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters are set up according to Table 8.7.6.1.2.

Table 8.7.6.1.2: UE Rx-Tx time difference type 1 intra frequency test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	-15
OCNS	dB	-1.11
Îor/Ioc	dB	10.5
Ioc	dBm/ 3.84 MHz	*Io –10.9 dB = Ioc,* Note 1
Io	dBm/3.84 MHz	-94…-50
Propagation condition	-	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.		

8.7.6.1.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT message.

3) SS shall check “UE Rx-Tx time difference type 1” value in MEASUREMENT REPORT message. The reported value shall be compared to actual UE Rx-Tx time difference value for each MEASUREMENT REPORT message.

4) SS shall count the number of MEASUREMENT REPORT messages transmitted by UE.

5) After [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated below shall use the same content as described in default message content, with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement (Step 1):

Information Element	Value/Remark
Message Type	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command	Modify
-Intra-frequency measurement	
-Intra-frequency cell info list	Not Present
-Intra-frequency measurement quantity	
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity	CPICH RSCP
-Intra-frequency reporting quantity	
-Reporting quantities for active set cells	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	FALSE
-CPICH RSCP reporting indicator	FALSE
-Pathloss reporting indicator	FALSE
-Reporting quantities for monitored set cells	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	FALSE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	FALSE
-CPICH RSCP reporting indicator	FALSE
-Pathloss reporting indicator	FALSE
-Reporting quantities for detected set cells	Not Present
-Reporting cell status	
-CHOICE reported cell	Report all active set cells
-Maximum number of reported cells	1
-Measurement validity	Not Present
-CHOICE *report criteria*	Periodical reporting criteria
-Amount of reporting	Infinity
-Reporting interval	250 ms
-Measurement Reporting Mode	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Periodical reporting
-Additional measurements list	
-CHOICE *measurement type*	UE internal measurement
-UE internal measurement quantity	
-CHOICE *mode*	FDD
-Measurement quantity	UE Tx-Rx time difference
-Filter coefficient	0
-UE internal measurement reporting quantity	
-UE transmitted power	FALSE
-CHOICE *mode*	FDD
-UE Rx-Tx time difference	TRUE
Physical channel information elements	
-DPCH compressed mode status info	Not Present

8.7.6.1.5 Test requirements

The UE Rx-Tx time difference accuracy shall meet the requirements in clause 8.7.6.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.7 Observed time difference to GSM cell

Void

8.7.8 P-CCPCH HSCP

Void

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020170

CR-Form-v5

CHANGE REQUEST

⌘ **34.121** **CR** **143** ⌘ **rev** **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	WCDMA 1800 and 1900 additions
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 20 Feb, 2002
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	UMTS 1800 and UMTS 1900 have been defined as independent of release (25.307 R99) and conformance specification has to be updated accordingly.
Summary of change:	⌘	UMTS 1800 and 1900 band specific information is included based on 25.101 REL-5 (v.5.1.0). Also corrections from 25.101CR 148 (R4-020180), 25.101CR149 (R4-020183) and 25.101CR 160 (R4-020286) are included in this CR. Changes from T1R020003 were incorporated to this CR. For spectrum emission mask test case, zero test tolerance is applied for Additional requirements for Band II due to FCC regulatory requirements. This is clarified in Annex F. Annex H was modified.
Consequences if not approved:	⌘	UMTS 1800 and 1900 band specific information is incomplete.

Clauses affected:	⌘	2, 3.4, 4.2, 4.3, 4.4, 5.2, 5.9, 5.11, 6.2, 6.5, 6.6, 6.7, 6.8, F.2, F.4 and Annex H.
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 25.101 "UE Radio transmission and reception (FDD), Release 99".

[2] 3GPP TS 25.133 "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108 "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109 "Terminal logical test interface; Special conformance testing functions".

[5] 3GPP TS 25.214 "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990 "Vocabulary".

[8] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol Specification".

[9] 3GPP TS 25.433 "UTRAN Iub Interface NBAP Signalling".

[10] ITU-R Recommendation SM.329: "Spurious emissions".

[11] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[12] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".

[13] 3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[14] 3GPP TS 25.213: "Spreading and modulation (FDD)".

[15] 3GPP TS 25.223: "Spreading and modulation (TDD)".

[16] ETSI ETR 273-1-2: "Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[17] 3GPP TR 25.926: "UE Radio Access Capabilities".

[18] 3GPP TR 21.904: "UE capability requirements".

[19] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[20] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

[23~~1~~] 3GPP TS 25.101 "UE Radio transmission and reception (FDD), Release 5".

3.4 Equations

For the purpose of the present document, the following additional equations apply:

$\frac{CPICH_E_c}{I_{or}}$ The ratio of the received energy per PN chip of the CPICH to the total transmit power spectral density at the Node B (SS) antenna connector.

$\frac{DPCH_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPCH to the total transmit power spectral density at the Node B (SS) antenna connector.

$\frac{DPCCH_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPCCH to the total transmit power spectral density at the Node B (SS) antenna connector.

$\frac{DPDCH_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPDCH to the total transmit power spectral density at the Node B (SS) antenna connector.

F_{uw} Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or a frequency offset from the assigned channel frequency.

I_{Node_B} Interference signal power level at Node B in dBm, which is broadcasted on BCH.

I_{oac} The power spectral density of the adjacent frequency channel as measured at the UE antenna connector.

I_{oc} The power spectral density of a band limited white noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector.

I_{or} The received power spectral density of the down link as measured at the UE antenna connector.

I_{ouw} Unwanted signal power level.

$P\text{-}CCPCH_E_c$ Average (note) energy per PN chip for P-CCPCH.

$P-CCPCH\frac{E_c}{I_o}$ The ratio of the received P-CCPCH energy per chip to the total received power spectral density at the UE antenna connector.

$\frac{P-CCPCH_E_c}{I_{or}}$ The ratio of the average (note) transmit energy per PN chip for the P-CCPCH to the total transmit power spectral density.

$P\text{-}CPICH_E_c$ Average (note) energy per PN chip for P-CPICH.

$PICH_E_c$ Average (note) energy per PN chip for PICH.

$\frac{PICH_E_c}{I_{or}}$ The ratio of the received energy per PN chip of the PICH to the total transmit power spectral density at the Node B (SS) antenna connector.

<REFSENS> Reference sensitivity

<REF $\hat{I}_{or}$ > Reference $\hat{I}_{or}$

SCH_E_c Average (note) energy per PN chip for SCH.

$S\text{-}CPICH_E_c$ Average (note) energy per PN chip for S-CPICH.

NOTE: Averaging period for energy/power of discontinuously transmitted channels should be defined.

4 Frequency bands and channel arrangement

4.1 General

The information presented in this clause is based on a chip rate of 3,84 Mcps.

NOTE: Other chip rates may be considered in future releases.

4.2 Frequency bands

~~UTRA/FDD is designed to operate in either of the following paired bands:~~

~~(a) 1 920 MHz to 1 980 MHz: Up link (Mobile transmit, base receive);~~

~~2 110 MHz to 2 170 MHz: Down link (Base transmit, mobile receive);~~

~~(b)* 1 850 MHz to 1 910 MHz: Up link (Mobile transmit, base receive);~~

~~1 930 MHz to 1 990 MHz: Down link (Base transmit, mobile receive).~~

~~* Used in Region 2.~~

~~Additional allocations in ITU region 2 are FFS.~~

~~Deployment in other frequency bands is not precluded.~~

a) UTRA/FDD is designed to operate in either of the following paired bands:

Operating Band	UL Frequencies UE transmit, Node B receive	DL frequencies UE receive, Node B transmit
I	1920 – 1980 MHz	2110 –2170 MHz
II	1850 –1910 MHz	1930 –1990 MHz
III	1710-1785 MHz	1805-1880 MHz

b) Deployment in other frequency bands is not precluded

4.3 TX–RX frequency separation

a) UTRA/FDD is designed to operate with the following TX-RX frequency separation.

~~Frequency~~Operating Band	TX-RX frequency separation
I~~For operation in frequency band as defined in clause 4.2 (a)~~	190 MHz
II~~For operation in frequency band as defined in clause 4.2 (b)~~	80 MHz
III	95 MHz

b) UTRA/FDD can support both fixed and variable transmit to receive frequency separation.

c) The use of other transmit to receive frequency separations in existing or other frequency bands shall not be precluded.

4.4 Channel arrangement

4.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

4.4.2 Channel raster

The channel raster is 200 kHz, which for all bands except Band II means that the centre frequency must be an integer multiple of 200 kHz. In Band II-, 12 additional centre frequencies are specified according to the table in ~~5.4.3~~ 4.1a and the centre frequencies for these channels are shifted 100 kHz relative to the normal raster.

4.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). The values of the UARFCN are as follows.

Table 4.1: UARFCN definition

Uplink	$N_u = 5 * F_{uplink}$	0,0 MHz ≤ F_{uplink} ≤ 3 276,6 MHz where F_{uplink} is the uplink frequency in MHz
Downlink	$N_d = 5 * F_{downlink}$	0,0 MHz ≤ $F_{downlink}$ ≤ 3 276,6 MHz where $F_{downlink}$ is the downlink frequency in MHz

Table 4.1a: UARFCN definition (Band II additional channels)

	UARFCN	Carrier frequency [MHz]
Uplink	$N_u = 5 * ($~~$(F_{uplink}$ – 100 kHz) – 1850)~~ (F_{uplink} – 1850.1 MHz)	F_{uplink} = 1852.5, 1857.5, 1862.5, 1867.5~~6~~, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, ~~1905~~1897.5, 1902.5, 1907.5
Downlink	$N_u = 5 * ($~~$(F_{uplink}$ – 100 kHz) – 1850)~~ ($F_{downlink}$ – 1850.1 MHz)	$F_{downlink}$ = 1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5

4.4.4 UARFCN

The following UARFCN range shall be be suppoted for each paired band.

Table 4.2: UTRA Absolute Radio Frequency Channel Number

~~Frequency~~Operating Band	Uplink UE transmit, Node B receive	Downlink UE receive, Node B transmit
~~For operation in frequency band as defined in clause 4.2 (a)~~I	9 612 to 9 888	10 562 to 10 838
~~For operation in frequency band as defined in clause 4.2 (b)~~II	9 262 to 9 538 and 12, 37, 62, 87, 112, 137, 162, 187, 212, 237, 262, 287	9 662 to 9 938 and 412, 437, 462, 487, 512, 537, 562, 587, 612, 637, 662, 687
III	8562 to 8913	9037 to 9388

5.2 Maximum Output Power

5.2.1 Definition and applicability

The maximum output power and its tolerance are defined according to the Power Class of the UE.

The maximum output power refers to the measure power when averaged over the transmit slot at the maximum power control setting.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.2.2 Minimum Requirements

The UE maximum output power shall be within the shown value in table 5.2.1 even for the multi-code transmission mode.

Table 5.2.1: Maximum Output Power

Power Class	Maximum output power	Tolerance
1	+33 dBm	+1/-3 dB
2	+27 dBm	+1/-3 dB
3	+24 dBm	+1/-3 dB
4	+21 dBm	±2 dB

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+1/-3	+27	+1/-3	+24	+1/-3	+21	+2/-2
Band II	-	-	-	-	+24	+1/-3	+21	+2/-2
Band III	-	-	-	-	+24	+1/-3	+21	+2/-2

The normative reference for this requirement is TS 25.101 [123] clause 6.2.1.

5.2.3 Test purpose

To verify that the error of the UE maximum output power does not exceed the prescribed tolerance in table 5.2.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

5.2.4 Method of test

5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE.

2) Measure the output power of the UE by Tester. The output power shall be averaged over the transmit one timeslot.

5.2.5 Test requirements

The error of measured output power, derived in step 2), shall not exceed the prescribed tolerance in table 5.2.2.

Table 5.2.2: Maximum Output Power

~~Power Class~~	~~Maximum output power~~	~~Tolerance~~
~~1~~	~~+33 dBm~~	~~+1,7/-3,7 dB~~
~~2~~	~~+27 dBm~~	~~+1,7/-3,7 dB~~
~~3~~	~~+24 dBm~~	~~+1,7/-3,7 dB~~
~~4~~	~~+21 dBm~~	~~±2,7 dB~~

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+1,7/-3,7	+27	+1,7/-3,7	+24	+1,7/-3,7	+21	+2,7/-2,7
Band II	-	-	-	-	+24	+1,7/-3,7	+21	+2,7/-2,7
Band III	-	-	-	-	+24	+1,7/-3,7	+21	+2,7/-2,7

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause

5.9 Spectrum emission mask

5.9.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the UE output power measured in a 3,84 MHz bandwidth.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.9.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in table 5.9.1.

Table 5.9.1: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	**Minimum requirement Band I, II, III**	**Additional requirements Band II**	**Measurement bandwidth**
2,5 to 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-15 dBm	30 kHz (note 2)
3,5 to 7,5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-13 dBm	1 MHz (note 3)
7,5 to 8,5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-13 dBm	1 MHz (note 3)
8,5 to 12,5	–49 dBc	-13 dBm	1 MHz (note 3)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz. NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.			
The lower limit shall be –50 dBm/3,84 MHz or which ever is higher.			

The normative reference for this requirement is TS 25.101 [~~21~~23] clause 6.6.2.1.1.

5.9.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in table 5.9.1.

Excess emission increases the interference to other channels or to other systems.

5.9.4 Method of test

5.9.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.9.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.9.2. Measurements with an offset from the carrier centre frequency between 2,515 MHz and 3,485 MHz shall use a 30 kHz measurement filter. Measurements with an offset from the carrier centre frequency between 4 MHz and 12 MHz shall use 1 MHz measurement bandwidth and the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 5.9.2. The measured power shall be recorded for each step.

3) Measure the wanted output power according to annex B.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5.9.5 Test requirements

The result of clause 5.9.4.2 step 4) shall fulfil the requirements of table 5.9.2.

Table 5.9.2: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement Band I, II, III	Additional requirements Band II	Measurement bandwidth
2,5 to 3,5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-15 dBm	30 kHz (note 2)
3,5 to 7,5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-13 dBm	1 MHz (note 3)
7,5 to 8,5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-13 dBm	1 MHz (note 3)
8,5 to 12,5	–47,5 dBc	-13 dBm	1 MHz (note 3)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz. NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.			
The lower limit shall be –48,5 dBm/3,84 MHz or which ever is higher.			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

5.11 Spurious Emissions

5.11.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.11.2 Minimum Requirements

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

Table 5.11.1a: General spurious emissions requirements

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	–36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	–36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	–36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	–30 dBm

Table 5.11.1b: Additional spurious emissions requirements

~~Paired band~~	~~Frequency Bandwidth~~	~~Measurement Bandwidth~~	~~Minimum requirement~~
~~For operation in frequency bands as defined in clause 4.2(a)~~	~~1 893,5 MHz < f < 1 919,6 MHz~~	~~300 kHz~~	~~-41 dBm~~
	~~925 MHz ≤ f ≤ 935 MHz~~	~~100 kHz~~	~~-67 dBm (note)~~
	~~935 MHz < f ≤ 960 MHz~~	~~100 kHz~~	~~-79 dBm (note)~~
	~~1 805 MHz ≤ f ≤ 1 880 MHz~~	~~100 kHz~~	~~-71 dBm (note)~~
~~NOTE: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.1a are permitted for each UARFCN used in the measurement~~			

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
I	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm *
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm *
	1893.5 MHz <f<1919.6 MHz	300 kHz	-41 dBm
II	-	-	-
III	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm *
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm *
* The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table ~~6.12~~5.11.1a are permitted for each UARFCN used in the measurement			

The normative reference for this requirement is TS 25.101 [~~21~~23~~1~~] clause 6.6.3.1.

5.11.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in table 5.11.1a and table 5.11.1b.

Excess spurious emissions increase the interference to other systems.

5.11.4 Method of test

5.11.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.8.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.11.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

5.11.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in tables 5.11.2a and 5.11.2b.

These requirements are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency.

Table 5.11.2a: General spurious emissions test requirements

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	–36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	–36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	–36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	–30 dBm

Table 5.11.2b: Additional spurious emissions test requirements

~~Paired band~~	~~Frequency Bandwidth~~	~~Measurement Bandwidth~~	~~Minimum requirement~~
~~For operation in frequency bands as defined in clause 4.2(a)~~	~~1 893,5 MHz < f < 1 919,6 MHz~~	~~300 kHz~~	~~–41 dBm~~
	~~925 MHz ≤ f ≤ 935 MHz~~	~~100 kHz~~	~~–67 dBm (note)~~
	~~935 MHz < f ≤ 960 MHz~~	~~100 kHz~~	~~–79 dBm (note)~~
	~~1805 MHz ≤ f ≤ 1880 MHz~~	~~100 kHz~~	~~–71 dBm (note)~~
~~NOTE: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.11.2a are permitted for each UARFCN used in the measurement~~			

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
I	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm *
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm *
	1893.5 MHz <f<1919.6 MHz	300 kHz	-41 dBm
II	-	-	-
III	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm *
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm *
* The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 5.11.1a are permitted for each UARFCN used in the measurement			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.2 Reference Sensitivity Level

6.2.1 Definition and applicability

The reference sensitivity <REFSENS> is the minimum receiver input power measured at the antenna port at which the Bit Error Ratio (BER) does not exceed a specific value

The requirements and this test apply to all types of UTRA for the FDD UE.

6.2.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.2.1.

Table 6.2.1: Test parameters for Reference Sensitivity Level

~~Parameter~~	~~Level / Status~~	~~Unit~~
~~$\hat{I}_{or}$~~	~~-106,7~~	~~dBm / 3,84 MHz~~
~~DPCH_Ec~~	~~-117~~	~~dBm / 3,84 MHz~~
~~NOTE 1: For Power class 3, this shall be at the maximum output power.~~ ~~NOTE 2: For Power class 4, this shall be at the maximum output power.~~		

Operating Band	Unit	DPCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I	dBm/3.84 MHz	-117	-106.7
II	dBm/3.84 MHz	-115	-104.7
III	dBm/3.84 MHz	-114	-103.7
1. For Power class 3 this shall be at the maximum output power 2. For Power class 4 this shall be at the maximum output power			

The normative reference for this requirement is TS 25.101 [~~21~~23] clause 7.3.1.

6.2.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.2.

The lack of the reception sensitivity decreases the coverage area at the far side from Node B.

6.2.4 Method of test

6.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.3.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.2.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BER of DCH received from the UE at the SS.

6.2.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0,001.

Table 6.2.2: Test parameters for Reference Sensitivity Level

~~Parameter~~	~~Level / Status~~	~~Unit~~
~~$\hat{I}_{or}$~~	~~-106~~	~~dBm / 3,84 MHz~~
~~DPCH_Ec~~	~~-116,3~~	~~dBm / 3,84 MHz~~
~~NOTE 1: For Power class 3, this shall be at the maximum output power.~~ ~~NOTE 2: For Power class 4, this shall be at the maximum output power.~~		

Operating Band	Unit	DPCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I	dBm/3.84 MHz	-116.3	-106
II	dBm/3.84 MHz	-114.3	-104
III	dBm/3.84 MHz	-113.3	-103
3. For Power class 3 this shall be at the maximum output power 4. For Power class 4 this shall be at the maximum output power			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.5 Blocking Characteristics

6.5.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements in subclause 6.5.2.1 and 6.5.2.2 and this test apply to all types of UTRA for the FDD UE.

The requirements in subclause 6.5.2.3 and this test apply to the FDD UE supporting band II or band III.

6.5.2 Minimum Requirements

6.5.2.1 Minimum Requirements (In-band blocking)

The BER shall not exceed 0,001 for the parameters specified in table 6.5.1. ~~and table 6.5.2. For table 6.5.2 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.~~

The normative reference for this requirement is TS 25.101 [~~21~~23] clause 7.6.1.

NOTE: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E3.6.

Table 6.5.1: Test parameters for In-band blocking characteristics

~~Parameter~~	~~10 MHz offset~~	~~15 MHz offset~~	~~Unit~~
~~DPCH_Ec~~	~~<REFSENS>+3 dB~~ ~~114~~	~~<REFSENS>+3 dB~~ ~~114~~	~~dBm / 3,84 MHz~~
~~$\hat{I}_{or}$~~	~~<REF$\hat{I}_{or}$> + 3 dB~~ ~~103,7~~	~~<REF$\hat{I}_{or}$> + 3 dB~~ ~~103.7~~	~~dBm / 3,84 MHz~~
~~$I_{blocking}$ (modulated)~~	~~–56~~	~~–44~~	~~dBm / 3,84 MHz~~
~~F_{uw} (offset)~~	~~±10 or –10~~	~~±15 or –15~~	~~MHz~~
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~			

Parameter	Unit	Level	
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	

6.5.~~3~~2.2 Minimum requirements (Out of-band blocking)

The BER shall not exceed 0.001 for the parameters specified in Table 6.5.2. For Table 6.5.2 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

The normative reference for this requirement is TS 25.101 [~~21~~23] clause 7.6.2.

Table 6.5.2: Test parameters for Out of band blocking characteristics

Parameter	Band 1	Band 2	Band 3	Unit
DPCH_Ec	-114	-114	-114	dBm / 3,84MHz
$\hat{I}_{or}$	-103,7	-103,7	-103,7	dBm / 3,84MHz
$I_{blocking}$ (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as defined in clause 4.2(a)	2 050 < f < 2 095 2 185 < f < 2 230	2 025 < f < 2 050 2 230 < f < 2 255	1 < f < 2 025 2 255 < f < 12 750	MHz
F_{uw} For operation in frequency bands as defined in clause 4.2(b)	1 870 < f < 1 915 2 005 < f < 2 050	1 845 < f < 1 870 2 050 < f < 2 075	1 < f < 1 845 2 075 < f < 12 750	MHz
NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm. NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm				
For operation in bands referenced in 4.2(a), 2 095 < f < 2 110 MHz and 2 170 < f < 2 185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4 and table 6.5.1 shall be applied.				
For operation in bands referenced in 4.2(b), 1 915 < f < 1 930 MHz and 1 990 < f < 2 005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4 and table 6.5.1 shall be applied				

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15
F_{uw} (Band I operation)	MHz	2050<f <2095 2185<f <2230	2025 <f <2050 2230 <f <2255	1< f <2025 2255<f<12750
F_{uw} (Band II operation)	MHz	1870<f <1915 2005<f <2050	1845 <f <1870 2050 <f <2075	1< f <1845 2075<f<12750
F_{uw}~~II~~ (Band III operation)	MHz	1745 <f <1790 1895<f <1940	1720 <f < 1745 1940<f < 1965	1< f <1720 1965<f<12750
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)		
Band I operation	For 2095<f<2110 MHz and 2170<f<2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied.			
Band II operation	For 1915<f<1930 MHz and 1990<f<2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.2 shall be applied			
Band III operation	For 1790<f<1805 MHz and 1880<f<1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.2 shall be applied.			
~~1. For Power class 3 the average transmit output power shall be +20 dBm~~ ~~2. For Power class 4 the average transmit output power shall be +18 dBm~~				

6.5.2.3~~4~~ Minimum requirements (Narrow band blocking)

The BER shall not exceed 0.001 for the parameters specified in Table 6.5.3. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing. The requirements and this test apply to UTRA for the FDD UE supporting band II or band III.

The normative reference for this requirement is TS 25.101 [~~21~~23] clause 7.6.3

Table 6.5.3: Test parameters for narrow band blocking

Parameter	Unit	Band II	Band III
DPCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset)	MHz	2.7	2.8
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	
~~1. For Power class 3 the average transmit output power shall be +20 dBm~~ ~~2. For Power class 4 the average transmit output power shall be +18 dBm~~			

NOTE: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004. It is a GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or pseudo random data stream.

6.5.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.5.1, ~~and~~ table 6.5.2 and table 6.5.3. For table 6.5.2 up to (24) exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

The lack of the blocking ability decreases the coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5.4 Method of test

6.5.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

For narrow-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.5.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.5.4~~3~~, ~~and~~ table 6.5.5~~4~~ and table 6.5.6.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.5.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in table 6.5.4, 6.5.5~~3~~ and table 6.5.6~~4~~. For table 6.5.5~~4~~, the frequency step size is 1 MHz.

2) Measure the BER of DCH received from the UE at the SS.

3) For table 6.5.5~~4~~, record the frequencies for which BER exceed the test requirements.

6.5.5 Test requirements

For table 6.5.43, the measured BER, derived in step 2), shall not exceed 0.001. For table 6.5.54, the measured BER, derived in step 2) shall not exceed 0,001 except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24. For table 6.5.6, the measured BER, derived in step 2), shall not exceed 0.001

Table 6.5.43: Test parameters for In-band blocking characteristics

Parameter	10 MHz offset	15 MHz offset	Unit
DPCH_Ec	<REFSENS>+3 dB - 114	<REFSENS>+3 dB - 114	dBm / 3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> + 3 dB - 103.7	<REF$\hat{I}_{or}$> + 3 dB - 103.7	dBm / 3,84 MHz
$I_{blocking}$ (modulated)	-56	-44	dBm / 3,84 MHz
F_{uw} (offset)	±10 or -10	±15 or -15	MHz
NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm. NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.			

Parameter	Unit	Level	
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	

Table 6.5.54: Test parameters for Out of band blocking characteristics

Parameter	Band 1	Band 2	Band 3	Unit
DPCH_Ec	-114	-114	-114	dBm / 3,84MHz
$\hat{I}_{or}$	-103.7	-103.7	-103.7	dBm / 3,84MHz
$I_{blocking}$ (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as defined in clause 4.2(a)	2 050 < f < 2 095 2 185 < f < 2 230	2 025 < f < 2 050 2 230 < f < 2 255	1 < f < 2 025 2 255 < f < 12 750	MHz
F_{uw} For operation in frequency bands as defined in clause 4.2(b)	1 870 < f < 1 915 2 005 < f < 2 050	1 845 < f < 1 870 2 050 < f < 2 075	1 < f < 1 845 2 075 < f < 12 750	MHz
NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm. NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.				
For operation in bands referenced in 4.2(a), 2 095 < f < 2 110 MHz and 2 170 < f < 2 185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4 and table 6.5.3 shall be applied.				
For operation in bands referenced in 4.2(b), 1 915 < f < 1 930 MHz and 1 990 < f < 2 005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4 and table 6.5.3 shall be applied				

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15
F_{uw} (Band I operation)	MHz	2050<f <2095 2185<f <2230	2025 <f <2050 2230 <f <2255	1< f <2025 2255<f<12750
F_{uw} (Band II operation)	MHz	1870<f <1915 2005<f <2050	1845 <f <1870 2050 <f <2075	1< f <1845 2075<f<12750
F_{uw} ~~III~~ (Band III operation)	MHz	1745 <f <1790 1895<f <1940	1720 <f < 1745 1940<f < 1965	1< f <1720 1965<f<12750
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)		
Band I operation	For 2095<f<2110 MHz and 2170<f<2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied.			
Band II operation	For 1915<f<1930 MHz and 1990<f<2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.2 shall be applied			
Band III operation	For 1790<f<1805 MHz and 1880<f<1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.2 shall be applied.			
~~1. For Power class 3 the average transmit output power shall be +20 dBm~~ ~~2. For Power class 4 the average transmit output power shall be +18 dBm~~				

Table 6.5.6: Test parameters for narrow band blocking

Parameter	Unit	Band II	Band III
DPCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset)	MHz	2.7	2.8
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	
~~1. For Power class 3 the average transmit output power shall be +20 dBm~~ ~~2. For Power class 4 the average transmit output power shall be +18 dBm~~			

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.6 Spurious Response

6.6.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit is not met.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.6.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.6.1.

The normative reference for this requirement is TS 25.101 [~~21~~23] clause 7.7.1.

Table 6.6.1: Test parameters for Spurious Response

Parameter	Level	Unit
DPCH_Ec	<REFSENS> +3 dB ~~–114~~	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB ~~–103.7~~	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~		

6.6.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.6.1.

The lack of the spurious response ability decreases the coverage area when other unwanted interfering signal exists at any other frequency.

6.6.4 Method of test

6.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in clause 6.5.4.1 for Blocking characteristics out-of-band case.

1) Connect the SS to the UE antenna connector as shown in figure A.6.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.6.2.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.6.4.2 Procedure

1) Set the parameter of the CW generator as shown in table 6.6.2. The spurious response frequencies are determined in step 3) of clause 6.5.4.2.

2) Measure the BER of DCH received from the UE at the SS.

6.6.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0,001.

Table 6.6.2: Test parameters for Spurious Response

Parameter	Level	Unit
DPCH_Ec	<REFSENS> +3 dB ~~–114~~	dBm / 3,84MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB ~~–103.7~~	dBm / 3,84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.7 Intermodulation Characteristics

6.7.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements and this test apply to all types of UTRA for the FDD UE. The test parameters in tables 6.7.2 and 6.7.4 applies to the FDD UE supporting Band II and Band II.

6.7.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.7.1 and in table 6.7.2.

The normative reference for this requirement is TS 25.101 [~~21~~23] clause 7.8.1 and clause 7.8.2.

NOTE: I_{ouw2} (modulated) consists of the common channels needed for tests as specified in table E.4.1 and 16 dedicated data channels as specified in table E.3.6.

Table 6.7.1: Test parameters for Intermodulation Characteristics

Parameter	Level		Unit
DPCH_Ec	<REFSENS> +3 dB ~~– 114~~		dBm / 3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB ~~–103.7~~		dBm / 3,84 MHz
I_{ouw1} (CW)	–46		dBm
I_{ouw2} mean power (modulated)	–46		dBm ~~/ 3,84 MHz~~
F_{uw1} (offset)	10	-10	MHz
F_{uw2} (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)		dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~			

Table 6.7.2: Test parameters for narrow band intermodulation characteristics

Parameter	Unit	Band II		Band III	
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB		[<REF$\hat{I}_{or}$> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)			
~~For Power class 3 the UE shall transmit continuously at an average power of +20 dBm~~ ~~For Power class 4 the UE shall transmit continuously at an average power of +18 dBm~~					

NOTE: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004. It is a GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or pseudo random data stream.

6.7.3 Test purpose

To verify that the UE BER does not exceed 0,001 for the parameters specified in table 6.7.1 and in table 6.7.2.

The lack of the intermodulation response rejection ability decreases the coverage area when two or more interfering signals, which have a specific frequency relationship to the wanted signal, exist.

6.7.4 Method of test

6.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.7.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 6.7.3 and table 6.7.4~~2~~.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

6.7.4.2 Procedure

1) Set the parameters of the CW generator and interference signal generator as shown in table 6.7.3 and in table 6.7.4~~2~~.

2) Measure the BER of DCH received from the UE at the SS.

6.7.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

Table 6.7.3~~2~~: Test parameters for Intermodulation Characteristics

Parameter	Level		Unit
DPCH_Ec	<REFSENS> +3 dB ~~– 114~~		dBm / 3.84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> +3 dB ~~–103.7~~		dBm / 3.84 MHz
I_{ouw1} (CW)	–46		dBm
I_{ouw2} mean power (modulated)	–46		dBm ~~/ 3.84 MHz~~
F_{uw1} (offset)	10	-10	MHz
F_{uw2} (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)		dBm
~~NOTE 1: For Power class 3, the average transmit output power shall be +20 dBm.~~ ~~NOTE 2: For Power class 4, the average transmit output power shall be +18 dBm.~~			

Table 6.7.4: Test parameters for narrow band intermodulation characteristics

Parameter	Unit	Band II		Band III	
DPCH_Ec	~~D~~dBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
$\hat{I}_{or}$	~~D~~dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB		[<REF$\hat{I}_{or}$> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)			
~~For Power class 3 the UE shall transmit continuously at an average power of +20 dBm~~ ~~For Power class 4 the UE shall transmit continuously at an average power of +18 dBm~~					

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

6.8 Spurious Emissions

6.8.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.8.2 Minimum Requirements

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in table 6.8.1 and table 6.8.2.

Table 6.8.1: General receiver spurious emission requirements

Frequency Band	Measurement Bandwidth	Maximum level	Note
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm	
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm	

Table 6.8.2: Additional receiver spurious emission requirements

Operating band	Frequency Band	Measurement Bandwidth	Maximum level	Note
~~For operation in frequency bands as defined in clause 4.2(a)~~ I	1 920 MHz ≤ f ≤ 1 980 MHz	3,84 MHz	-60 dBm	~~Mobile~~ UE transmit band in URA_PCH, Cell_PCH and idle state
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm	~~Mobile~~ UE receive band
II	1850 MHz ≤ f ≤ 1910 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	UE receive band
III	1710 MHz ≤ f ≤ 1785 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	UE receive band

The reference for this requirement is TS 25.101 [1] clause 7.9.1.

6.8.3 Test purpose

To verify that the UE spurious emission meets the specifications described in clause 6.8.2.

Excess spurious emissions increase the interference to other systems.

6.8.4 Method of test

6.8.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect a spectrum analyzer (or other suitable test equipment) to the UE antenna connector as shown in figure A.8.
2) RF parameters are setup according to table [TBD].
3) UE shall be in CELL_FACH state.
4) Neighbour cell list shall be empty. HCS is not used.
5) The timer T305 shall be set to ∞, so that no cell update is triggered during the measurement.
6) Set Qrxlevmin to –115 dBm and Qqualmin to –24 dB.
7) Set UE_TXPWR_MAX_RACH such that Pcompensation = 0.
8) Set $S_{intersearch}$, $S_{intrasearch}$ and $Ssearch_{RAT\ m}$ to zero.

NOTE: With the CELL_FACH state (3) in combination with the signalling parameters (4), (5), (6), (7), (8) and the SS level (2) it is ensured that UE continuously receives the S-CCPCH and no cell reselections are performed [see 3GPP TS 25.304, clauses 5.2.3.and 5.2.6]. No transmission of the UE will interfere the measurement.

6.8.4.2 Procedure

1) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

6.8.5 Test requirements

The all measured spurious emissions, derived in step 1), shall not exceed the maximum level specified in table 6.8.3 and table 6.8.4.

Table 6.8.3: General receiver spurious emission requirements

Frequency Band	Measurement Bandwidth	Maximum level	Note
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm	
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm	

Table 6.8.4: Additional receiver spurious emission requirements

Operating Band	Frequency Band	Measurement Bandwidth	Maximum level	Note
I ~~For operation in frequency bands as defined in clause 4.2(a)~~	1 920 MHz ≤ f ≤ 1 980 MHz	3,84 MHz	-60 dBm	~~Mobile~~ UE transmit band in URA_PCH, Cell_PCH and idle state
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm	~~Mobile~~ UE receive band
II	1850 MHz ≤ f ≤ 1910 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	UE receive band
III	1710 MHz ≤ f ≤ 1785 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	UE receive band

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4

F.2 Test Tolerances (This clause is informative)

The Test Tolerances defined in this clause have been used to relax the Minimum Requirements in the present document to derive the Test Requirements.

The Test Tolerances are derived from Test System uncertainties, regulatory requirements and criticality to system performance. As a result, the Test Tolerances may sometimes be set to zero.

The test tolerances should not be modified for any reason e.g. to take account of commonly known test system errors (such as mismatch, cable loss, etc.).

F.2.1 Transmitter

Table F.2.1: Test Tolerances for transmitter tests.

Clause	Test Tolerance
5.2 Maximum Output Power	0.7 dB
5.3 Frequency error	10 Hz
5.4.1 Open loop power control in uplink	1.0 dB
5.4.2 Inner loop power control in the uplink - One step	0.1 dB (1 dB and 0 dB step) 0.15 dB (2 dB step) 0.2 dB (3 dB step)
5.4.2 Inner loop power control in the uplink - seven and ten steps	[0.3] dB
5.4.3 Minimum Output Power	1.0 dB
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH_E_c}{I_{or}}$	0.4 dB
5.4.4 Out-of-synchronisation handling of output power: transmit ON/OFF time	0 ms
5.5.1 Transmit OFF power	1.0 dB
5.5.2 Transmit ON/OFF time mask (dynamic case)	On power +0.7 dB / -1.0 dB Off power TT [ ] dB
5.6 Change of TFC: power control step size	0.3 dB
5.7 Power setting in uplink compressed mode:-UE output power	See subset of 5.4.2
5.8 Occupied Bandwidth	0 kHz
5.9 Spectrum emission mask	1.5 dB (0 dB for additional requirements for Band II)
5.10 ACLR	0.8 dB
5.11 Spurious emissions	0 dB
5.12 Transmit Intermodulation	0 dB
5.13.1 Transmit modulation: EVM	0%
5.13.2 Transmit modulation: peak code domain error	1.0 dB

F.4 Derivation of Test Requirements (This clause is informative)

The Test Requirements in the present document have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in clause F.2. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in table F.4.

Table F.4.1: Derivation of Test Requirements (Transmitter tests)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.2 Maximum Output Power	Power class 1 (33 dBm) Tolerance = +1/-3 dB Power class 2 (27 dBm) Tolerance = +1/-3 dB Power class 3 (24 dBm) Tolerance = +1/-3 dB Power class 4 (21 dBm) Tolerance = ±2 dB	0.7 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT For power classes 1-3: Upper Tolerance limit = +1.7 dB Lower Tolerance limit = -3.7 dB For power class 4: Upper Tolerance limit = +2.7 dB Lower Tolerance limit = -2.7 dB
5.3 Frequency Error	The UE modulated carrier frequency shall be accurate to within ±0.1 ppm compared to the carrier frequency received from the Node B.	10 Hz	Formula: modulated carrier frequency error + TT modulated carrier frequency error = ±(0.1 ppm + 10 Hz).
5.4.1 Open loop power control in the uplink	Open loop power control tolerance ±9 dB (Normal) Open loop power control tolerance ±12 dB (Normal)	1.0 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT For Normal conditions: Upper Tolerance limit = +10 dB Lower Tolerance limit = -10 dB For Extreme conditions: Upper Tolerance limit = +13 dB Lower Tolerance limit = -13 dB
5.4.2 Inner loop power control in uplink	See table 5.4.2.1 and 5,4,2,2	0.25dB 0.15 dB 0.2 dB [0.3 dB]	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT
5.4.3 Minimum Output Power	UE minimum transmit power shall be less than –50 dBm	1.0 dB	Formula: UE minimum transmit power + TT UE minimum transmit power = –49 dBm

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.4.4 Out-of-synchronisation handling of output power:	$\frac{DPCCH_E_c}{I_{or}}$ levels AB: -22 dB BD: -28 dB DE: -24 dB EF: -18 dB transmit ON/OFF time 200ms $\frac{DPDCH_E_c}{I_{or}}$ = -16.6 dB I_{oc} - 60 dBm Ior/Ioc = - 1 dB	0.4 dB for $\frac{DPCCH_E}{I_{or}}$ 0 ms for timing measurement	Formulas: Ratio between A and B + TT Ratio between B and D – TT Ratio between D and E – TT Ratio between E and F + TT transmit ON/OFF time + TT timing $\frac{DPDCH_E_c}{I_{or}}$ = -16.6 dB I_{oc} - 60 dBm Ior/Ioc = - 1 dB $\frac{DPCCH_E_c}{I_{or}}$ levels: AB: -21.6 dB BD: -28.4 dB DE: -24.4 dB EF: -17.6 dB transmit ON/OFF time 200ms timing Uncertainty of OFF power measurement is handled by Transmit OFF power test and uncertainty of ON power measurement is handled by Minimum output power test.
5.5.1 Transmit OFF power (static case)	Transmit OFF power shall be less than -56 dBm	1.0 dB	Formula: Transmit OFF power + TT Transmit OFF power = –55dBm.
5.5.2 Transmit ON/OFF time mask (dynamic case)	Transmit ON power shall be the target value as defined in clause 5.5.2.2 Transmit OFF power shall be less than -56 dBm	On power upper TT = 0.7 dB On power lower TT = 1.0 dB Off power TT [ ] dB	Formula for transmit ON power: Transmit ON power target upper limit + On power upper TT Transmit ON power target lower limit - On power lower TT To calculate Transmit ON power target value range take the nominal TX power range from Table 5.5.2.3 then apply table 5.4.1.1 open limits then apply table 5.7.1 (only if there has been a transmission gap) then cap the upper value using table 5.2.1. Formula for transmit OFF power: Transmit OFF power + Off power TT Transmit OFF power = [ ]dBm
5.6 Change of TFC: power control step size	TFC step size = +5 to +9 dB	0.3 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT Upper limit = -4.7 dB Lower limit = -9.3 dB
5.7 Power setting in uplink compressed mode	Various	TBD (Subset of 5.4.2)	TBD

Test	Minimum Requirement in TS 25.101		Test Tolerance (TT)	Test Requirement in TS 34.121	
5.8 Occupied Bandwidth	The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3.84 Mcps.		0 kHz	Formula: occupied channel bandwidth: + TT occupied channel bandwidth = 5.0 MHz	
5.9 Spectrum emission mask	Minimum requirement defined in TS25.101 Table 6.10. The lower limit shall be –50 dBm / 3.84 MHz or which ever is higher.		1.5 dB	Formula: Minimum requirement + TT Lower limit + TT Add 1.5 to Minimum requirement entries in TS25.101 Table 6.10. Zero test tolerance is applied for Additional requirements for Band II due to FCC regulatory requirements. The lower limit shall be –48.5 dBm / 3.84 MHz or which ever is higher.	
5.10 Adjacent Channel Leakage Power Ratio (ACLR)	Power Classes 3 and 4: UE channel +5 MHz or -5 MHz, ACLR limit: 33 dB UE channel +10 MHz or -10 MHz, ACLR limit: 43 dB		0.8 dB	Formula: ACLR limit - TT Power Classes 3 and 4: UE channel +5 MHz or -5 MHz, ACLR limit: 32.2 dB UE channel +10 MHz or -10 MHz, ACLR limit: 42.2 dB	
5.11 Spurious Emissions				Formula: Minimum Requirement+ TT Add zero to all the values of Minimum Requirements in table 5.11.1a and 5.11.1b.	
	Frequency Band	Minimum Requirement		Frequency Band	Minimum Requirement
	9 kHz ≤ f < 150 kHz	–36dBm /1kHz	0 dB	9kHz ≤ f < 1GHz	–36dBm /1kHz
	150 kHz ≤ f < 30 MHz	–36dBm /10kHz	0 dB	150 kHz ≤ f < 30 MHz	–36dBm /10kHz
	30 MHz ≤ f < 1000 MHz	–36dBm /100kHz	0 dB	30 MHz ≤ f < 1000 MHz	–36dBm /100kHz
	1 GHz ≤ f < 12.75 GHz	–30dBm /1MHz	0 dB	1 GHz ≤ f < 2.2 GHz	–30dBm /1MHz
			0 dB	2.2 GHz ≤ f < 4 GHz	–30dBm /1MHz
			0 dB	4 GHz ≤ f < 12.75 GHz	–30dBm /1MHz
	1893.5 MHz < f < 1919.6 MHz	–41dBm /300kHz	0 dB	1893.5 MHz < f < 1919.6 MHz	–41dBm /300kHz
	925 MHz ≤ f ≤ 935 MHz	–67dBm /100kHz	0 dB	925 MHz ≤ f ≤ 935 MHz	–67dBm /100kHz
	935 MHz < f ≤ 960 MHz	–79dBm /100kHz	0 dB	935 MHz < f ≤ 960 MHz	–79dBm /100kHz
	1805 MHz ≤ f ≤ 1880 MHz	–71dBm /100kHz	0 dB	1805 MHz ≤ f ≤ 1880 MHz	–71dBm /100kHz
5.12 Transmit Intermodulation	Intermodulation Product 5MHz -31 dBc 10MHz -41 dBc CW Interferer level = -40 dBc		0 dB	Formula: CW interferer level – TT/2 Intermod Products limits remain unchanged. CW interferer level = -40 dBc	
5.13.1 Transmit modulation: EVM	The measured EVM shall not exceed 17.5%.		0%	Formula: EVM limit + TT EVM limit = 17.5 %	

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.13.2 Transmit modulation: peak code domain error	The measured Peak code domain error shall not exceed -15 dB.	1.0 dB	Formula: Peak code domain error + TT Peak code domain error = -14 dB

Table F.4.2: Derivation of Test Requirements (Receiver tests)

Test	Minimum Requirement in TS 25.101		Test Tolerance (TT)	Test Requirement in TS 34.121	
6.2 Reference sensitivity level	Îor = -106.7 dBm / 3.84 MHz DPCH_Ec = –117 dBm / 3.84 MHz BER limit = 0.001		0.7 dB	Formula: Îor+ TT DPCH_Ec + TT BER limit unchanged Îor = -106 dBm / 3.84 MHz DPCH_Ec = -116.3 dBm / 3.84 MHz	
6.3 Maximum input level	-25 dBm Ior -19 dBc DPCH_Ec/Ior		0.7 dB	Formula: Ior-TT Ior = -25.7 dBm	
6.4 Adjacent Channel Selectivity	Îor = -92.7 dBm / 3.84 MHz DPCH_Ec = –103 dBm / 3.84 MHz Ioac (modulated) = -52 dBm/3.84 MHz BER limit = 0.001		0 dB	Formula: Îor unchanged DPCH_Ec unchanged Ioac – TT BER limit unchanged Ioac = -52 dBm/3.84 MHz	
6.5 Blocking Characteristics	See Table 6.5.3 and 6.5.4. in TS34.121 BER limit = 0.001		0 dB	Formula: $I_{blocking}$ (modulated) - TT (dBm/3.84MHz) $I_{blocking}$ (CW) - TT (dBm) BER limit unchanged	
6.6 Spurious Response	Iblocking(CW) –44 dBm Fuw: Spurious response frequencies BER limit = 0.001		0 dB	Formula: $I_{blocking}$ (CW) - TT (dBm) Fuw unchanged BER limit unchanged $I_{blocking}$(CW) = -44 dBm	
6.7 Intermodulation Characteristics	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -103.7 dBm/3.84 MHz DPCH_Ec = -114 dBm/3.84 BER limit = 0.001		0 dB	Formula: Ior + TT DPCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BER limit unchanged. Ior = -114 dBm BER limit. = 0.001	
6.8 Spurious Emissions				Formula: Maximum level + TT Add zero to all the values of Maximum Level in table 6.8.1.	
	Frequency Band	Maximum level		Frequency Band	Maximum level
	9kHz ≤ f < 1GHz	-57dBm /100kHz	0 dB	9kHz ≤ f < 1GHz	-57dBm /100kHz
	1GHz ≤ f ≤ 12.75GHz	-47dBm /1MHz	0 dB	1GHz ≤ f ≤ 2.2GHz	-47dBm /1MHz
			0 dB	2.2GHz < f ≤ 4GHz	-47dBm /1MHz
			0 dB	4GHz < f ≤ 12.75GHz	-47dBm /1MHz
	1920MHz ≤ f ≤ 1980MHz	-60dBm /3.84MHz	0 dB	1920MHz ≤ f ≤ 1980MHz	-60dBm /3.84MHz
	2110MHz ≤ f ≤ 2170MHz	-60dBm /3.84MHz	0 dB	2110MHz ≤ f ≤ 2170MHz	-60dBm /3.84MHz

Table F.4.3: Derivation of Test Requirements (Performance tests)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.2 Demodulation of DPCH in static conditions	$\frac{DPCH_E_c}{I_{or}}$ -5.5 to –16.6 I_{oc} = - 60 dBm Ior/Ioc = - 1 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.3 dB for Ioc/Ior	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT Ior/Ioc + ratio + TT I_{oc} unchanged Ior/Ioc = -0.7 dB $\frac{DPCH_E_c}{I_{or}}$ -5.4 to –16.5 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions	$\frac{DPCH_E_c}{I_{or}}$ -2.2 to –15.0 I_{oc} = - 60 dBm Ior/Ioc = 9 dB to –3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for Ioc/Ior	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT Ior/Ioc + ratio + TT I_{oc} unchanged Ior/Ioc = 9.6 to –2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -2.1 to –14.9 dB:
7.4 Demodulation of DPCH in moving propagation conditions	$\frac{DPCH_E_c}{I_{or}}$ -2.2 to –15.0 I_{oc} = - 60 dBm Ior/Ioc = 9 dB to –3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for Ioc/Ior	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT Ior/Ioc + ratio + TT I_{oc} unchanged Ior/Ioc = 9.6 to –2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -2.1 to –14.9 dB:
7.5 Demodulation of DPCH birth-death propagation conditions	$\frac{DPCH_E_c}{I_{or}}$ -2.2 to –15.0 I_{oc} = - 60 dBm Ior/Ioc = 9 dB to –3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for Ioc/Ior	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT Ior/Ioc + ratio + TT I_{oc} unchanged Ior/Ioc = 9.6 to –2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -2.1 to –14.9 dB:

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.6.1 Demodulation of DPCH in transmit diversity propagation conditions	$\frac{DPCH_E_c}{I_{or}}$ -2.2 to –15.0 I_{oc} = - 60 dBm Ior/Ioc = 9 dB to –3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.8 dB for Ioc/Ior	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT Ior/Ioc + ratio + TT I_{oc} unchanged Ior/Ioc = 9.6 to –2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -2.1 to –14.9 dB:
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode			To be completed
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode			To be completed
7.7.1 Demodulation in inter-cell soft Handover			To be completed
7.7.2 Combining of TPC commands Test 1			To be completed
7.7.2 Combining of TPC commands Test 2			To be completed
7.7.2 Combining of TPC commands Test 2			To be completed
7.8.1 Power control in downlink constant BLER target			To be completed
7.8.2, Power control in downlink initial convergence			To be completed
7.8.3, Power control in downlink: wind up effects			To be completed
7.9 Downlink compressed mode			To be completed
7.10 Blind transport format detection Tests 1, 2, 3			To be completed
7.10 Blind transport format detection Tests 4, 5, 6			To be completed

Annex H (normative): UE Capabilities (FDD)

H.1 Radio Access and RF Baseline Implementation Capabilities:

NOTE 1: This clause shall be aligned with TR 25.926, UE Radio Access Capabilities regarding FDD RF parameters. These RF UE Radio Access capabilities represent options in the UE, that require signalling to the network.

NOTE 2: In addition there are options in the UE that do not require any signalling. They are designated as UE baseline capabilities, according to TR 21.904, Terminal Capability Requirements.

NOTE 3: Table H.1 provides the list of UE radio access capability parameters and possible values.

Table H.1: RF UE Radio Access Capabilities

	UE radio access capability parameter	Value range
FDD RF parameters	UE power class ([~~1~~23] 25.101 clause 6.2.1)	3, 4
	Tx/Rx frequency separation for frequency band ~~a)~~I ([~~1~~23] 25.101 clause 5.3) Not applicable if UE is not operating in frequency band ~~a)~~I	190 MHz, 174.8-205.2 MHz, 134.8-245.2 MHz

Table H.2 provides the UE baseline implementation capabilities.

Table H.2: UE RF Baseline Implementation Capabilities

UE implementation capability	Value range
Radio frequency bands ([~~1~~23] 25.101 clause 5.2)	~~a)~~I, ~~b)~~II, III ~~a+b)~~I + II I + III II + III I + II + III

- The special conformance testing functions and the logical test interface as specified in TS 34.109 [4]. This issue is currently under investigation.
- Uplink reference measurement channel 12.2 kbps (FDD), TS 25.101 [1] clause A.2.1
- Downlink reference measurement channel 12.2 kbps (FDD), TS 25.101 [1] clause A.3.1.

H.2 Service Implementation Capabilities:

- Uplink reference measurement channel 64 kbps (FDD), TS 25.101 [1] clause A.2.2
- Uplink reference measurement channel 144 kbps (FDD), TS 25.101 [1] clause A.2.3
- Uplink reference measurement channel 384 kbps (FDD), TS 25.101 [1] clause A.2.4
- Downlink reference measurement channel 64 kbps (FDD), TS 25.101 [1] clause A.3.2.
- Downlink reference measurement channel 144 kbps (FDD), TS 25.101 [1] clause A.3.3.

- Down-link reference measurement channel 384 kbps (FDD), TS 25.101 [1] clause A.3.4.

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020148

CR-Form-v5

CHANGE REQUEST

⌘ **34.121** **CR** **142** ⌘ **rev** **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	System Simulator and Test System definition
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 19-Feb-02
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The terms System Simulator and Test System are used interchangeably. Therefore there is the need to clarify them for future drafting
Summary of change:	⌘	Add a description in Annex A.
Consequences if not approved:	⌘	Possible misunderstanding of the specification in the future.

Clauses affected:	⌘	3.3, Annex A
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3.3 Abbreviations

For the purpose of the present document, the following additional abbreviations apply:

AFC	Automatic Frequency Control
ASD	Acceleration Spectral Density
ATT	Attenuator
BER	Bit Error Ratio
BLER	Block Error Ratio
BTFD	Blind Transport Format Detection
EVM	Error Vector Magnitude
FDR	False transmit format Detection Ratio
HYB	Hybrid
IM	Intermodulation
ITP	Initial Transmission Power control mode
OBW	Occupied Bandwidth
OCNS	Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink
PAR	Peak to Average Ratio
P-CCPCH	Primary Common Control Physical Channel
P-CPICH	Primary Common Pilot Channel
PCDE	Peak Code Domain Error
RBW	Resolution Bandwidth
RRC	Root-Raised Cosine
S-CCPCH	Secondary Common Control Physical Channel
S-CPICH	Secondary Common Pilot Channel
SCH	Synchronisation Channel consisting of Primary and Secondary synchronisation channels
SS	System Simulator; see Annex A for description
TGCFN	Transmission Gap Connection Frame Number
TGD	Transmission Gap Distance
TGL	Transmission Gap Length
TGPL	Transmission Gap Pattern Length
TGPRC	Transmission Gap Pattern Repetition Count
TGSN	Transmission Gap Starting Slot Number

Annex A (informative): Connection Diagrams

Definition of Terms

System Simulator or SS – A device or system, that is capable of generating simulated Node B signalling and analysing UE signalling responses on one or more RF channels, in order to create the required test environment for the UE under test. It will also include the following capabilities:

1. Measurement and control of the UE Tx output power through TPC commands
2. Measurement of Rx BLER and BER
3. Measurement of signalling timing and delays
4. Ability to simulate UTRAN and/or GERAN signalling

Test System – A combination of devices brought together into a system for the purpose of making one or more measurements on a UE in accordance with the test case requirements. A test system may include one or more System Simulators if additional signalling is required for the test case. The following diagrams are all examples of Test Systems.

Note: The above terms are logical definitions to be used to describe the test methods used in this document (TS34.121), in practice, real devices called 'System Simulators' may also include additional measurement capabilities or may only support those features required for the test cases they are designed to perform.

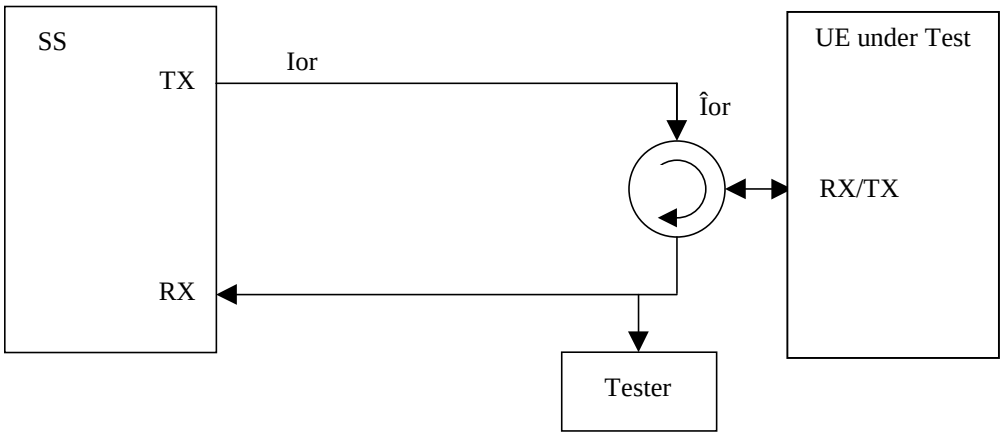

Figure A.1: Connection for Basic TX Test

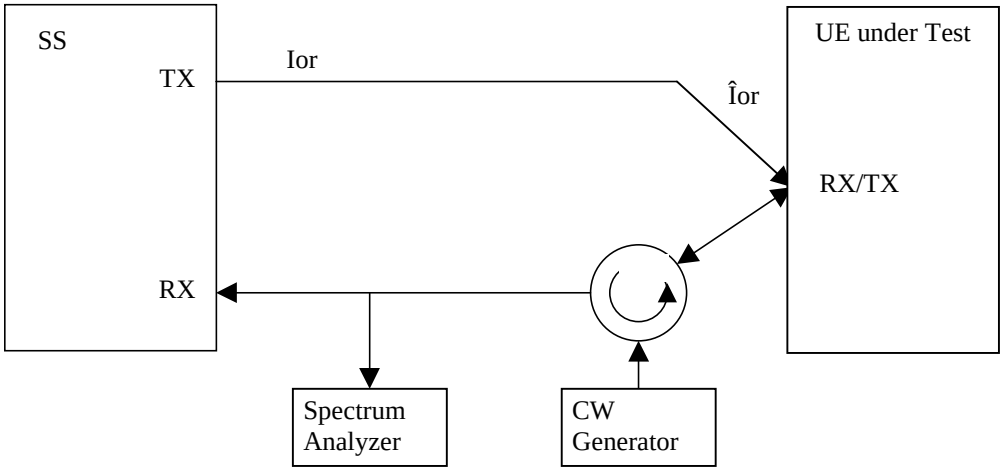

Figure A.2: Connection for TX Intermodulation Test

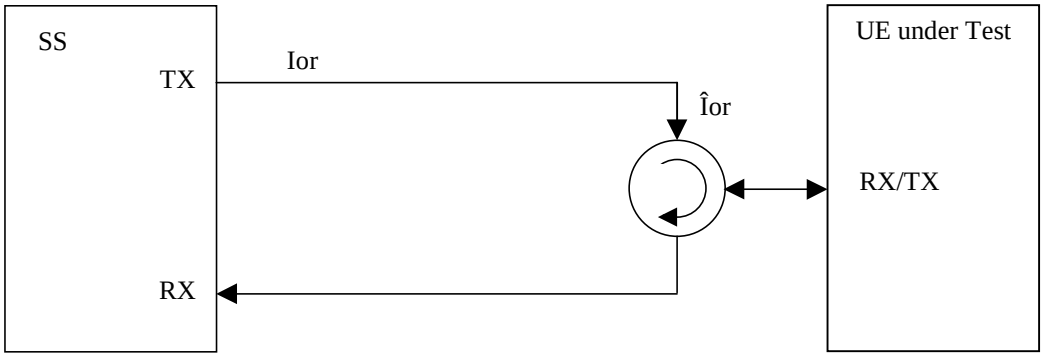

Figure A.3: Connection for Basic RX Test

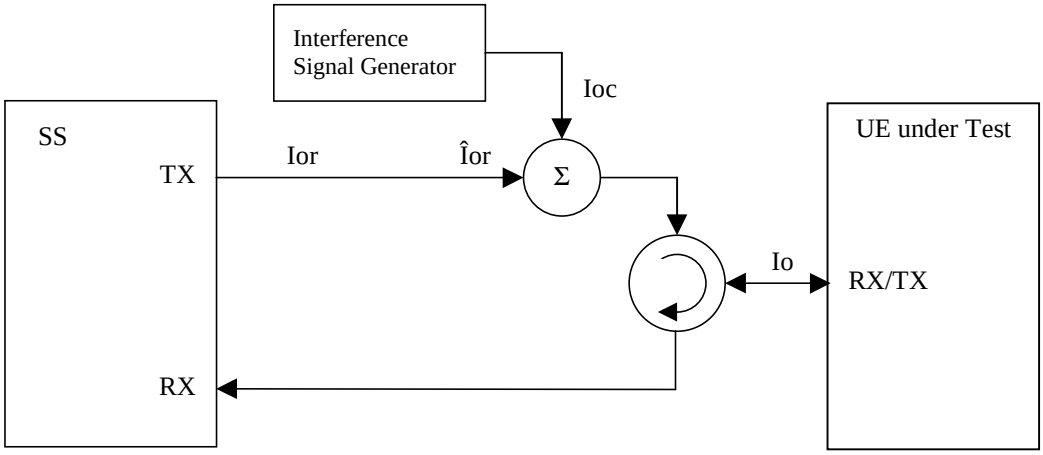

Figure A.4: Connection for RX Test with Interference

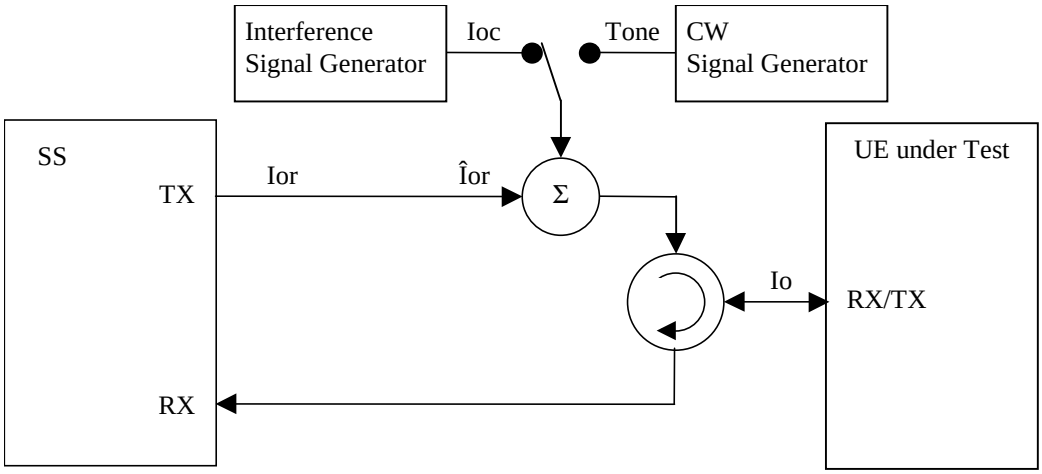

Figure A.5: Connection for RX Test with Interference or additional CW

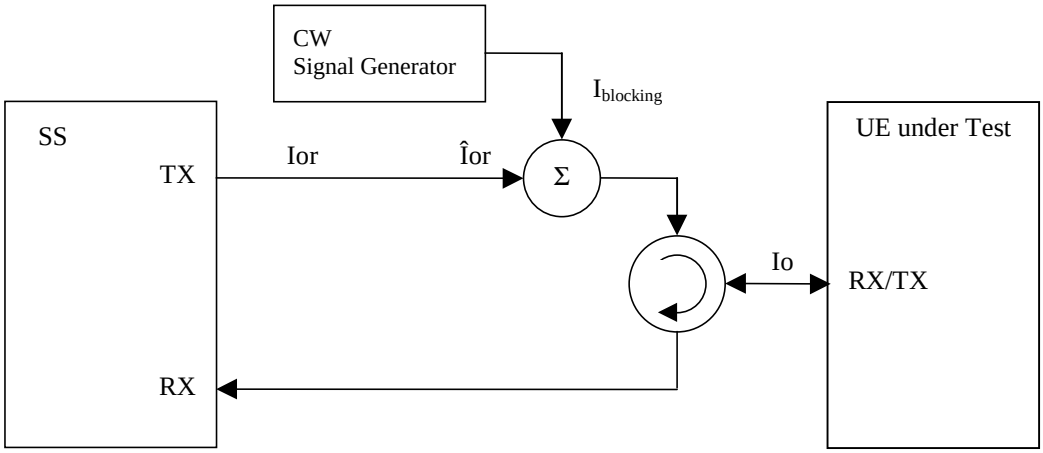

Figure A.6: Connection for RX Test with additional CW

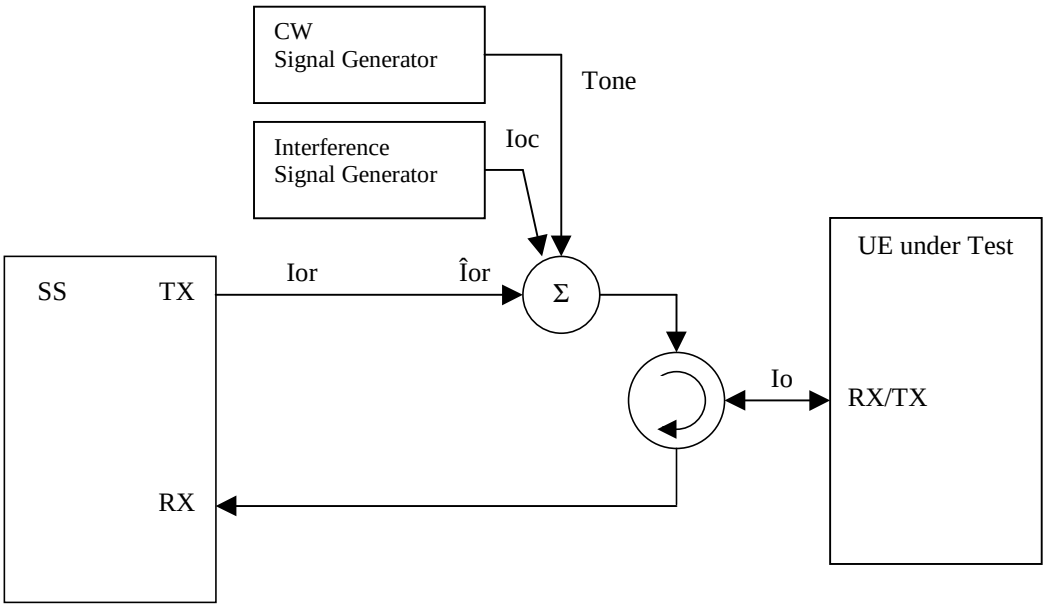

Figure A.7: Connection for RX Test with both Interference and additional CW

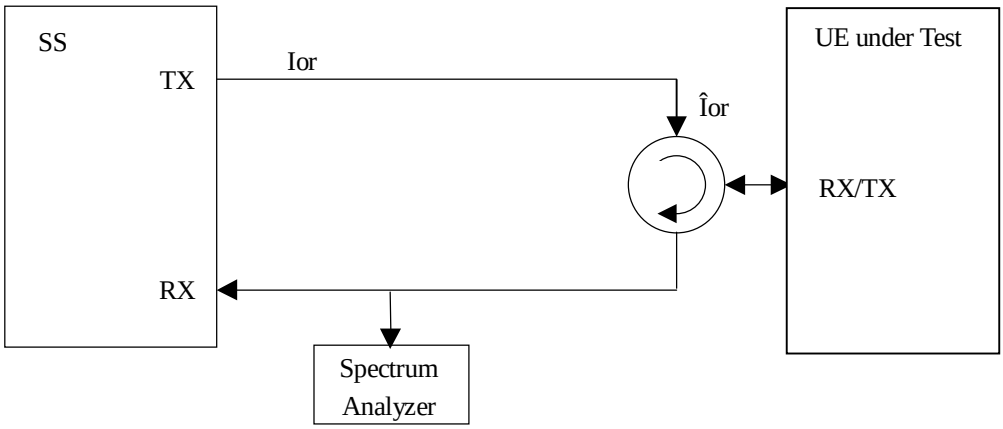

Figure A.8: Connection for Spurious Emission Test

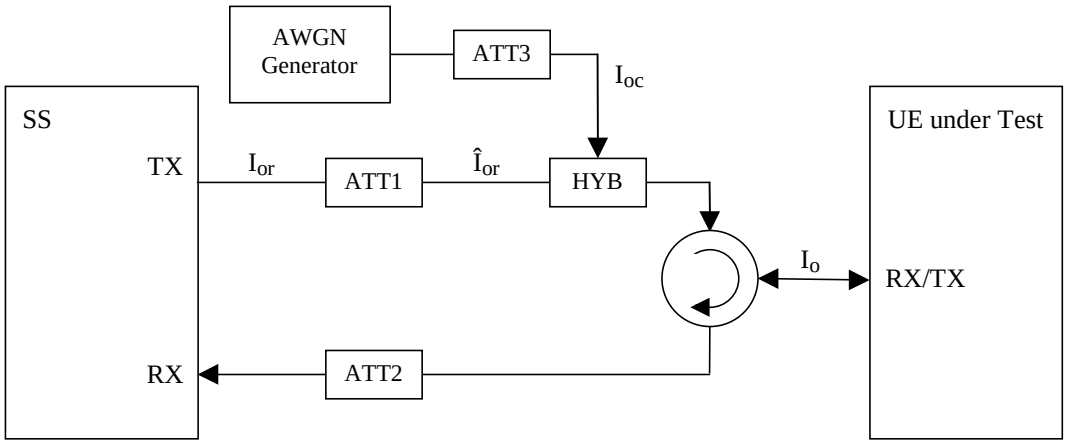

Figure A.9: Connection for Static Propagation Test

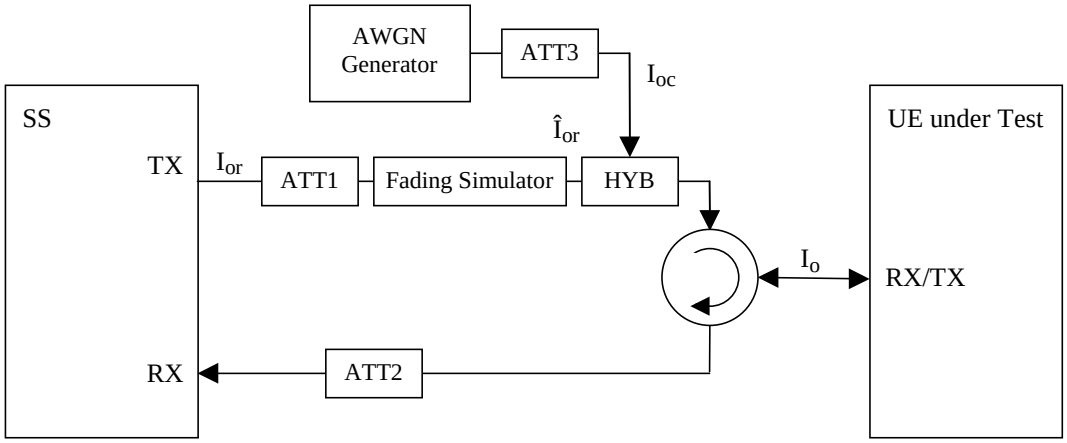

Figure A.10: Connection for Multi-path Fading Propagation Test

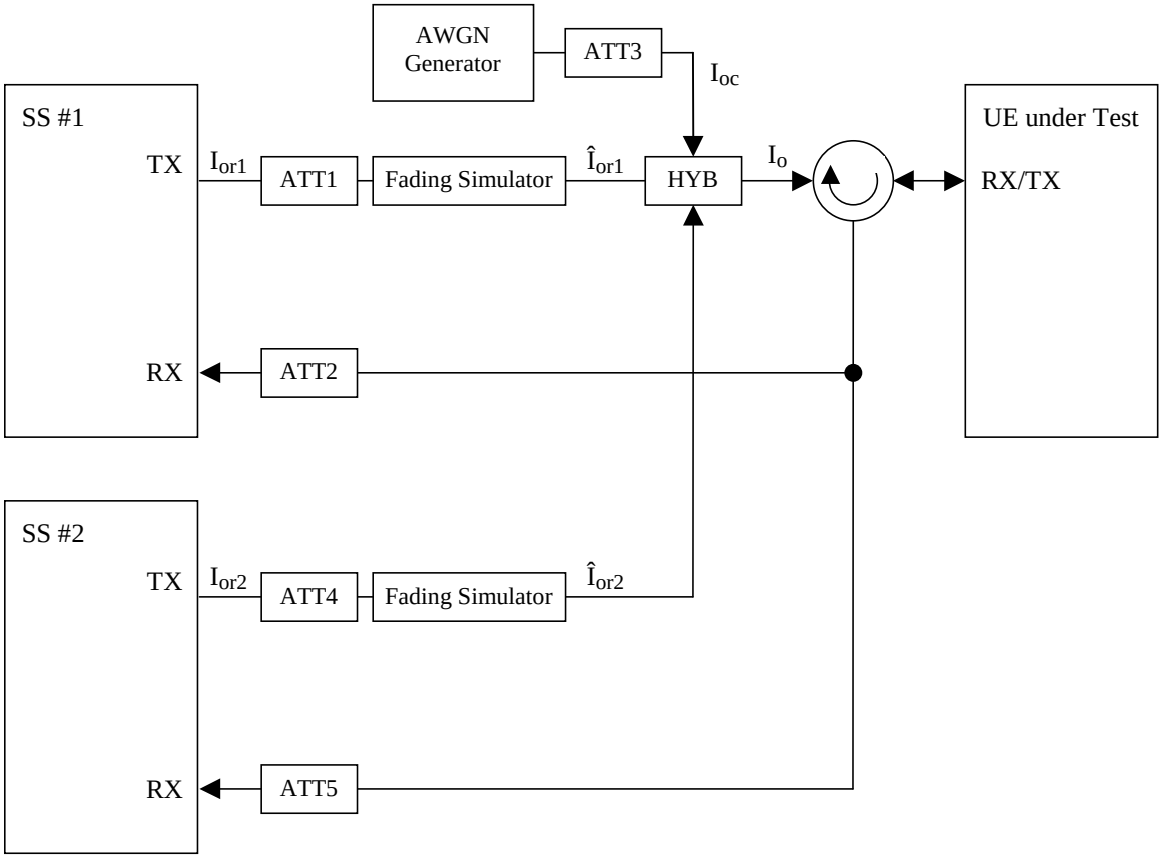

Figure A.11: Connection for Inter-Cell Soft Handover Test

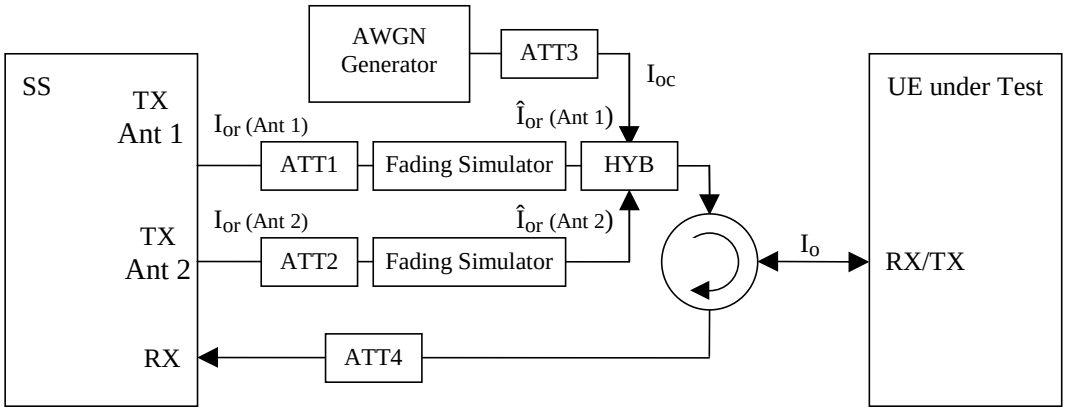

Figure A.12: Connection for Demodulation of DCH in open and closed loop transmit diversity modes

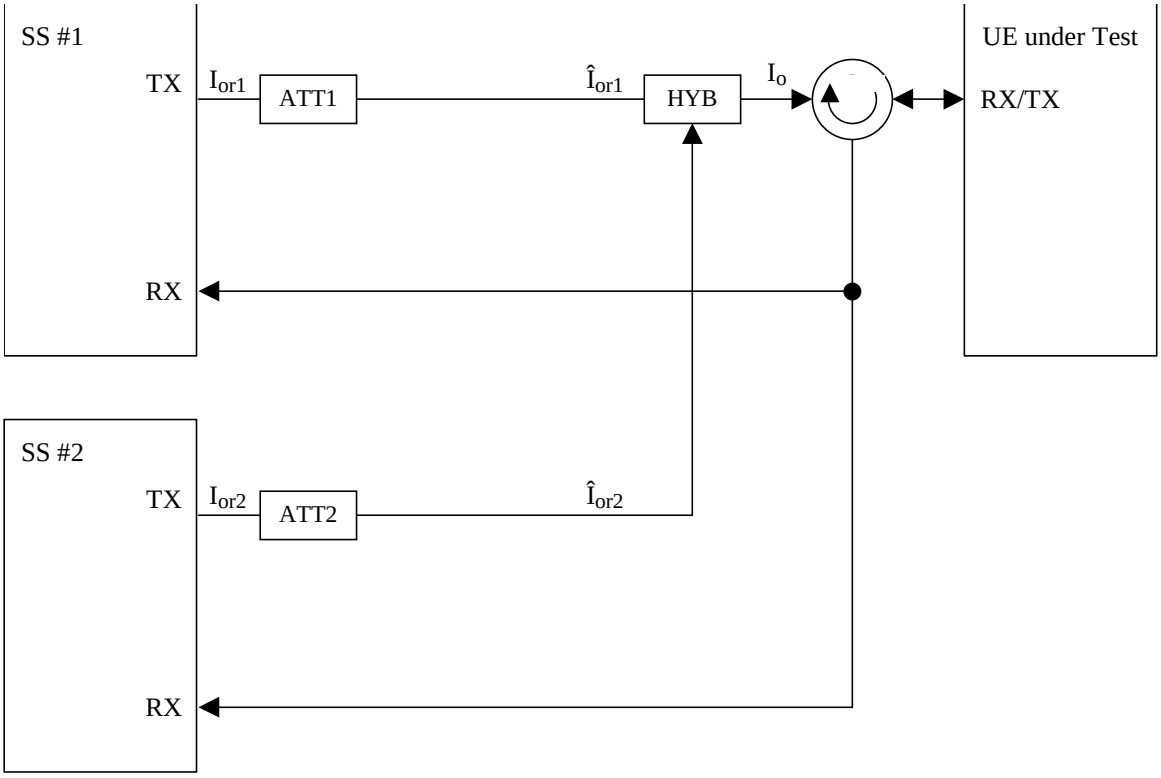

Figure A.13: Connection for Combining of TPC commands in Soft Handover Test 1

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020147

CR-Form-v3

CHANGE REQUEST

⌘ **TS 34.121 CR 141** ⌘ rev **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	RRM Hard handover test cases
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-07
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Introduction of hard handover test cases for UTRAN Connected Mode Mobility according to TS 25.133 V3.8.0.
Summary of change:	⌘	New test cases: 1. Clause 8.3.2.1: FDD/FDD Hard Handover to intra-frequency cell 2. Clause 8.3.2.2: FDD/FDD Hard Handover to inter-frequency cell 3. Clause 8.3.4: Inter-system Handover from UTRAN FDD to GSM In TS 25.133, the test scenario in clause A.5.2.2 “Hard Handover to inter-frequency cell” consists of two periods T1 and T2. The corresponding test case in TS 34.121, clause 8.3.2.2 has one more period added at the beginning of the test thus making it similar to clause 8.3.2.1.
Consequences if not approved:	⌘	Test scenarios in TS 25.133 clause A.5 (Hard handover) are not validated in TS 34.121

Clauses affected:	⌘	Clause 8.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track ch anges") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.3 UTRAN Connected Mode Mobility

8.3.1 FDD/FDD Soft Handover

Void

8.3.2 FDD/FDD Hard Handover

~~Void~~

8.3.2.1 FDD/FDD Hard Handover to intra-frequency cell

8.3.2.1.1 Definition and applicability

The hard handover delay of the UE is defined as the time from the end of the last TTI containing an RRC message implying hard handover to the transmission of the new uplink DPCCH.

The requirements and this test apply to the FDD UE.

8.3.2.1.2 Minimum requirement

The hard handover delay shall be less than 70 ms in CELL_DCH state in the single carrier case. The rate of correct handovers observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The hard handover delay $D_{handover}$ equals the RRC procedure delay defined in TS 25.331 clause 13.5.2 plus the interruption time stated in TS 25.133 clause 5.2.2.2 as follows:

The interruption time, i.e. the time between the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCCH, is depending on whether the target cell is known for the UE or not.

If intra-frequency hard handover is commanded or inter-frequency hard handover is commanded when the UE does not need compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt1}$

$T_{interrupt1}=T_{IU}+40+20*KC+150*OC$ ms

where

- T_{IU} is the interruption uncertainty when changing the timing from the old to the new cell. T_{IU} can be up to one frame (10 ms).
- KC is the number of known target cells in the message, and
- OC is the number of target cells that are not known in the message.

Note: The figure 40 ms is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

In the interruption requirement $T_{interrupt1}$ a cell is known if either or both of the following conditions are true:

- the UE has had radio links connected to the cell in the previous (old) active set
- the cell has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.

The normative reference for this requirement is TS 25.133 [2] clauses 5.2.2 and A.5.2.1.

8.3.2.1.3 Test purpose

To verify that the UE meets the minimum requirement.

8.3.2.1.4 Method of test

8.3.2.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in Table 8.3.2.1.1 and 8.3.2.1.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed timed difference shall be reported together with Event 1A. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a PHYSICAL CHANNEL RECONFIGURATION with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined in TS 25.133 [2].

Table 8.3.2.1.1: General test parameters for Handover to intra-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
Reporting range		dB	3	Applicable for event 1A and 1B
Hysteresis		dB	0	
W			1	Applicable for event 1A and 1B
Reporting deactivation threshold			0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	5	
T3		s	5	

Table 8.3.2.1.2: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
CPICH_Ec/Ior	dB	-10			-10		
PCCPCH_Ec/Ior	dB	-12			-12		
SCH_Ec/Ior	dB	-12			-12		
PICH_Ec/Ior	dB	-15			-15		
DPCH_Ec/Ior	dB	Note1	Note1	Note1	N/A	N/A	Note1
OCNS		Note2	Note2	Note2	-0.941	-0.941	Note2
$\hat{I}_{or}/I_{oc}$	dB	0	6.97		-Infinity	5.97	
I_{oc}	dBm/ 3.84 MHz	-70					
CPICH_Ec/Io	dB	-13			-Infinity	-14	
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}							

8.3.2.1.4.2 Procedure

1) The RF parameters are set up according to T1.

2) The UE is switched on.

3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.4.

[Editor's note: subclause 7.3.4 in TS 34.108 (Message sequence chart for Handover Test procedure) is not yet specified]

4) SS shall transmit a MEASUREMENT CONTROL message.

5) After 5 seconds, the SS shall switch the power settings from T1 to T2

6) UE shall transmit a MEASUREMENT REPORT message triggered by event 1A

7) SS shall transmit a PHYSICAL CHANNEL RECONFIGURATION message with activation time at T3

8) After 5 seconds, the SS shall switch the power settings from T2 to T3

9) UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the UL DCCH of cell 2. If the UE transmits the UL DPCCH to cell 2 less than 70 ms from the beginning of time period T3 then the number of successful tests is increased by one.

10) After 5 seconds, the UE is switched off. Any timing information of cell 2 is deleted in the UE.

11) Repeat step 1-10 [TBD] times

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE *Measurement type*	Intra-frequency measurement
-Intra-frequency measurement (10.3.7.36)	
-Intra-frequency measurement objects list (10.3.7.33)	Not Present
-Intra-frequency measurement quantity (10.3.7.38)	
-Filter coefficient (10.3.7.9)	0
-CHOICE mode	FDD
-Measurement quantity	CPICH Ec/N0
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE (Note 1)
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for monitored set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE (Note 1)
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	2
-Measurement validity (10.3.7.51)	Not Present
-CHOICE report criteria	Intra-frequency measurement reporting criteria
-Intra-frequency measurement reporting criteria (10.3.7.39)	
-Parameters required for each event	2
-Intra-frequency event identity	Event 1A
-Triggering condition 2	Active set cells and monitored set cells
-Reporting Range Constant	3 dB
-Cells forbidden to affect Reporting Range	Not Present
-CHOICE mode	FDD
-Primary CPICH info (10.3.6.60)	
-W	1.0
-Hysteresis	0 dB
-Threshold used frequency	Not Present
-Reporting deactivation threshold	0
-Replacement activation threshold	Not Present
-Time to trigger	0 ms
-Amount of reporting	Infinity
-Reporting interval	0 ms (Note 2)
-Reporting cell status	Not Present
-Intra-frequency event identity	Event 1B
-Triggering condition 1	Active set cells and monitored set cells
-Reporting Range Constant	3 dB
-Cells forbidden to affect Reporting Range	Not Present
-CHOICE mode	FDD
-Primary CPICH info (10.3.6.60)	
-W	1.0

Information Element/Group name	Value/Remark
-Hysteresis	0 dB
-Threshold used frequency	Not Present
-Reporting deactivation threshold	Not Present
-Replacement activation threshold	Not Present
-Time to trigger	0 ms
-Amount of reporting	Not Present
-Reporting interval	Not Present
-Reporting cell status	Not Present
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present
Note 1: The SFN-CFN observed time difference is calculated from the OFF and Tm parameters contained in the IE "Cell synchronisation information ", TS 25.331, clause 10.3.7.6. According to TS 25.331, 8.6.7.7, this IE is included in MEASUREMENT REPORT if IE "Cell synchronisation information reporting indicator" in IE "Cell reporting quantities" TS 25.331, clause 10.3.7.5 is set to TRUE in MEASUREMENT CONTROL.	
Note 2: Reporting interval = 0 ms means no periodical reporting	

PHYSICAL CHANNEL RECONFIGURATION message (step 7):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	At T3
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
>RB with PDCP information list	Not Present
>>RB with PDCP information	Not Present
PhyCH information elements	
-Frequency info (10.3.6.36)	
-CHOICE mode	FDD
-UARFCN uplink(Nu)	Same uplink UARFCN as used for cell 2
-UARFCN downlink(Nd)	Same downlink UARFCN as used for cell 2
Uplink radio resources	
-Maximum allowed UL TX power	33 dBm
-CHOICE *channel requirement*	Uplink DPCH info
-Uplink DPCH info (10.3.6.88)	
-Uplink DPCH power control info (10.3.6.91)	
-CHOICE mode	FDD
-DPCCH power offset	-6dB
- PC Preamble	1 frame
- SRB delay	7 frames
- Power Control Algorithm	Algorithm1
- TPC step size	1dB
-CHOICE mode	FDD
-Scrambling code type	Long
-Scrambling code number	0 (0 to 16777215)
-Number of DPDCH	Not Present(1)
-Spreading factor	SF is reference to TS34.108 clause 6.10 Parameter Set
-TFCI existence	TRUE
-Number of FBI bit	Not Present(0)
-Puncturing Limit	Reference to TS34.108 clause 6.10 Parameter Set
Downlink radio resources	
-CHOICE *mode*	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links (10.3.6.24)	
-Downlink DPCH info common for all RL (10.3.6.18)	
-Timing indicator	Initialise
-CFN-targetSFN frame offset	Not Present
-Downlink DPCH power control information (10.3.6.23)	
-DPC mode	0 (single)
-CHOICE mode	FDD
-Power offset $P_{Pilot-DPDCH}$	TBD
-DL rate matching restriction information	Not Present
-Spreading factor	Reference to TS34.108 clause 6.10 Parameter Set
-Fixed or Flexible Position	Flexible
-TFCI existence	TRUE
-CHOICE SF	Not Present
-Number of bits for Pilot bits(SF=128,256)	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info (10.3.6.33)	Not Present
-TX Diversity mode (10.3.6.86)	None
-SSDT information (10.3.6.77)	Not Present

Information Element	Value/Remark
-Default DPCH Offset Value (10.3.6.16)	0
-Downlink information per radio link list	1
-Downlink information for each radio link (10.3.6.27)	
-CHOICE mode	FDD
-Primary CPICH info (10.3.6.60)	
-Primary scrambling code	350
-PDSCH with SHO DCH info (10.3.6.47)	Not Present
-PDSCH code mapping (10.3.6.43)	Not Present
-Downlink DPCH info for each RL (10.3.6.21)	
-CHOICE mode	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0 chips
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	1
-Spreading factor	Reference to TS34.108 clause 6.10 Parameter Set
-Code number	SF-1(SF is reference to TS34.108 clause 6.10 Parameter Set)
-Scrambling code change	No change
-TPC combination index	0
- SSDT Cell Identity	-a
- Closed loop timing adjustment mode	Not Present
- SCCPCH information for FACH (10.3.6.70)	Not Present

MEASUREMENT REPORT message for Inter frequency test cases

This message is common for all inter frequency test cases in clause 8.7 and is described in Annex I.

8.3.2.1.5 Test requirements

For the test to pass, the total number of successful tests shall be more than 90% with a confidence level of [FFS]% of the cases.

Note: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.2.2 FDD/FDD Hard Handover to inter-frequency cell

8.3.2.2.1 Definition and applicability

The hard handover delay is defined as the time from the end of the last TTI containing an RRC message implying hard handover to the transmission of the new uplink DPCCH.

The requirements and this test apply to the FDD UE.

8.3.2.2.2 Minimum requirement

The hard handover delay shall be less than 100 ms in CELL_DCH state in the dual carrier case. The rate of correct handovers observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The hard handover delay $D_{handover}$ equals the RRC procedure delay defined in TS 25.331 clause 13.5.2 plus the interruption time stated in TS 25.133 clause 5.2.2.2 as follows:

If inter-frequency hard handover is commanded and the UE needs compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt2}$

$T_{interrupt2} = T_{IU}+40+50*KC+150*OC$ ms

In the interruption requirement $T_{interrupt2}$ a cell is known if:

- the cell has been measured by the UE during the last 5 seconds.

The phase reference is the primary CPICH.

The normative reference for this requirement is TS 25.133 [2] clauses 5.2.2 and A.5.2.2.

8.3.2.2.3 Test purpose

To verify that the UE meets the minimum requirement.

8.3.2.2.4 Method of test

8.3.2.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in Table 8.3.2.2.1 and 8.3.2.2.2 below. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 2C shall be used. The CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a PHYSICAL CHANNEL RECONFIGURATION with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined in TS 25.133 [2].

Table 8.3.2.2.1: General test parameters for Handover to inter-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 1	As specified in TS 25.101 section A.5.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold non used frequency		dB	-18	Absolute Ec/I0 threshold for event 2C
Reporting range		dB	4	Applicable for event 1A
Hysteresis		dB	0	
W			1	Applicable for event 1A
W non-used frequency			1	Applicable for event 2C
Reporting deactivation threshold			0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	10	
T3		s	5	

Table 8.3.2.2.2: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1			Channel 2		
CPICH_Ec/Ior	dB	-10			-10		
PCCPCH_Ec/Ior	dB	-12			-12		
SCH_Ec/Ior	dB	-12			-12		
PICH_Ec/Ior	dB	-15			-15		
DPCH_Ec/Ior	dB	Note1	Note1	Note1	N/A	N/A	Note1
OCNS		Note2	Note2	Note2	-0.941	-0.941	Note2
$\hat{I}_{or}/I_{oc}$	dB	0			-1.8	-1.8	-1.8
I_{oc}	dBm/ 3.84 MHz	-70					
CPICH_Ec/Io	dB	-13			-Infinity	-14	
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}							

8.3.2.2.4.2 Procedure

1) The RF parameters are set up according to T1.

2) The UE is switched on.

3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.4 with Compressed mode parameters as in Table 8.3.2.2.1.

4) SS shall transmit two MEASUREMENT CONTROL messages, one for each event type.

5) After 5 seconds, the SS shall switch the power settings from T1 to T2

6) UE shall transmit a MEASUREMENT REPORT message triggered by event 2C

7) SS shall transmit a PHYSICAL CHANNEL RECONFIGURATION message with activation time at T3

8) After 10 seconds, the SS shall switch the power settings from T2 to T3

9) UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the UL DCCH of cell 2. If the UE transmits the UL DPCCH to cell 2 less than 100 ms from the beginning of time period T3 then the number of successful tests is increased by one.

10) After 5 seconds, the UE is switched off. Any timing information of cell 2 is deleted in the UE.

11) Repeat step 1-10 [TBD] times

Specific Message Contents

All messages indicated ~~below~~above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

First MEASUREMENT CONTROL message, event 2C (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE *Measurement type*	Inter-frequency measurement
-Inter-frequency measurement (10.3.7.16)	
-Inter-frequency measurement objects list (10.3.7.13)	Not Present
-Inter-frequency measurement quantity (10.3.7.18)	
-CHOICE reporting criteria	Inter-frequency reporting criteria
-Inter-frequency reporting criteria	
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity for frequency quality estimate	CPICH Ec/N0
-Inter-frequency reporting quantity (10.3.7.21)	
-UTRA Carrier RSSI	FALSE
-Frequency quality estimate	FALSE
-Non frequency related cell reporting quantities (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	Type 1
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report cells within monitored set on non-used frequency
-Maximum number of reported cells per reported non-used frequency	1
-Measurement validity (10.3.7.51)	Not Present
-Inter-frequency set update (10.3.7.22)	Not Present
-CHOICE report criteria	Inter-frequency measurement reporting criteria
-Inter-frequency measurement reporting criteria (10.3.7.19)	
-Parameters required for each event	1
-Inter-frequency event identity (10.3.7.14)	Event 2C
-Threshold used frequency	Not Present
-W used frequency	Not Present
-Hysteresis	0 dB
-Time to trigger	0 ms
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report cells within monitored set on non-used frequency
-Maximum number of reported cells per reported non-used frequency	1
-Parameters required for each non-used frequency	1
-Threshold non-used frequency	-18 dB
-W non-used frequency	1
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

Second MEASUREMENT CONTROL message, event 1A (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE *Measurement type*	Inter-frequency measurement
-Inter-frequency measurement (10.3.7.16)	
-Inter-frequency measurement objects list (10.3.7.13)	Not Present
-Inter-frequency measurement quantity (10.3.7.18)	
-CHOICE reporting criteria	Inter-frequency reporting criteria
-Inter-frequency reporting criteria	
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity for frequency quality estimate	CPICH Ec/N0
-Inter-frequency reporting quantity (10.3.7.21)	
-UTRA Carrier RSSI	FALSE
-Frequency quality estimate	FALSE
-Non frequency related cell reporting quantities (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	Type 1
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report cells within monitored set on non-used frequency
-Maximum number of reported cells per reported non-used frequency	1
-Measurement validity (10.3.7.51)	Not Present
-Inter-frequency set update (10.3.7.22)	Not Present
-CHOICE report criteria	Intra-frequency measurement reporting criteria
-Intra-frequency measurement reporting criteria (10.3.7.39)	
-Parameters required for each event	1
-Intra-frequency event identity	Event 1A
-Triggering condition 2	Active set cells and monitored set cells
-Reporting Range Constant	4 dB
-Cells forbidden to affect Reporting Range	Not Present
-CHOICE mode	FDD
-Primary CPICH info (10.3.6.60)	
-W	1.0
-Hysteresis	0 dB
-Threshold used frequency	Not Present
-Reporting deactivation threshold	0
-Replacement activation threshold	Not Present
-Time to trigger	0 ms
-Amount of reporting	Not Present (Note 1)
-Reporting interval	0 ms (Note 2)
-Reporting cell status	Not Present
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present
Note 1: This IE is not needed as “Intra-frequency reporting criteria” is included in the IE “Inter-frequency measurement”	
Note 2: Reporting interval = 0 ms means no periodical reporting	

PHYSICAL CHANNEL RECONFIGURATION message (step 7):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	At T3
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
>RB with PDCP information list	Not Present
>>RB with PDCP information	Not Present
PhyCH information elements	
-Frequency info (10.3.6.36)	
-CHOICE mode	FDD
-UARFCN uplink(Nu)	Same uplink UARFCN as used for cell 2
-UARFCN downlink(Nd)	Same downlink UARFCN as used for cell 2
Uplink radio resources	
-Maximum allowed UL TX power	33 dBm
-CHOICE *channel requirement*	Uplink DPCH info
-Uplink DPCH info (10.3.6.88)	
-Uplink DPCH power control info (10.3.6.91)	
-CHOICE mode	FDD
-DPCCH power offset	-6dB
- PC Preamble	1 frame
- SRB delay	7 frames
- Power Control Algorithm	Algorithm1
- TPC step size	1dB
-CHOICE mode	FDD
-Scrambling code type	Long
-Scrambling code number	0 (0 to 16777215)
-Number of DPDCH	Not Present(1)
-Spreading factor	SF is reference to TS34.108 clause 6.10 Parameter Set
-TFCI existence	TRUE
-Number of FBI bit	Not Present(0)
-Puncturing Limit	Reference to TS34.108 clause 6.10 Parameter Set
Downlink radio resources	
-CHOICE *mode*	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links (10.3.6.24)	
-Downlink DPCH info common for all RL (10.3.6.18)	
-Timing indicator	Initialise
-CFN-targetSFN frame offset	Not Present
-Downlink DPCH power control information (10.3.6.23)	
-DPC mode	0 (single)
-CHOICE mode	FDD
-Power offset $P_{Pilot-DPDCH}$	TBD
-DL rate matching restriction information	Not Present
-Spreading factor	Reference to TS34.108 clause 6.10 Parameter Set
-Fixed or Flexible Position	Flexible
-TFCI existence	TRUE
-CHOICE SF	Not Present
-Number of bits for Pilot bits(SF=128,256)	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info (10.3.6.33)	Not Present (Note 1)
-TX Diversity mode (10.3.6.86)	None
-SSDT information (10.3.6.77)	Not Present

Information Element	Value/Remark
-Default DPCH Offset Value (10.3.6.16)	0
-Downlink information per radio link list	1
-Downlink information for each radio link (10.3.6.27)	
-CHOICE mode	FDD
-Primary CPICH info (10.3.6.60)	
-Primary scrambling code	350
-PDSCH with SHO DCH info (10.3.6.47)	Not Present
-PDSCH code mapping (10.3.6.43)	Not Present
-Downlink DPCH info for each RL (10.3.6.21)	
-CHOICE mode	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0 chips
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	1
-Spreading factor	Reference to TS34.108 clause 6.10 Parameter Set
-Code number	SF-1(SF is reference to TS34.108 clause 6.10 Parameter Set)
-Scrambling code change	No change
-TPC combination index	0
- SSDT Cell Identity	-a
- Closed loop timing adjustment mode	Not Present
- SCCPCH information for FACH (10.3.6.70)	Not Present
Note 1: IE "DPCH compressed mode info" is not needed as default values are applied that have previously been received in RADIO BEARER SETUP or RRC CONNECTION SETUP	

MEASUREMENT REPORT message for Inter frequency test cases

This message is common for all inter frequency test cases in clause 8.7 and is described in Annex I.

8.3.2.2.5 Test requirements

For the test to pass, the total number of successful tests shall be more than 90% with a confidence level of [FFS]% of the cases.

Note: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.3 FDD/TDD Handover

Void

8.3.4 Inter-system Handover from UTRAN FDD to GSM

~~Void~~

8.3.4.1 Definition and applicability

The UTRAN to GSM cell handover delay is defined as the time from the end of the last TTI containing an RRC message implying hard handover to the transmission on the channel of the new RAT.

The requirements and this test apply to the combined FDD and GSM UE.

8.3.4.2 Minimum requirement

The hard handover delay shall be less than 40 ms. The rate of correct handovers observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The hard handover delay as listed in Table 8.3.4.1 equals the RRC procedure delay plus the interruption time listed in Table 8.3.4.2. The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms.

Table 8.3.4.1: FDD/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	90
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	190

Table 8.3.4.2: FDD/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	40
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	140

The normative reference for this requirement is TS 25.133 [2] clauses 5.4.2 and A.5.4.

8.3.4.3 Test purpose

To verify that the UE meets the minimum requirement.

8.3.4.4 Method of test

8.3.4.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

[Editor's Note: Annex G.2 must be specified also for GSM; for instance as a reference to TS 51.010-1 clause A1.2]

The test parameters are given in Table 8.3.4.3, 8.3.4.4 and 8.3.4.5 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used.. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a HANDOVER FROM UTRAN COMMAND well in advance to T3 with activation time at T3. In GSM Handover command contained in that message, IE starting time shall not be included.

Table 8.3.4.3: General test parameters for Correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 [1] section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement - GSM Initial BSIC identification - GSM BSIC re-confirmation		 DL Compressed mode reference pattern 2 in Set 2 Pattern 2 Pattern 2	 As specified in TS 25.101 [1] section A.5, table A.22 As specified in section TS 25.133 [2] 8.1.2.5.2.1 table 8.7. As specified in section TS 25.133 [2] 8.1.2.5.2.2 table 8.8.
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for event 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.
N Identify abort		65	Taken from TS 25.133 [2] 8.1.2.5.2.1 table 8.7.
T Reconfirm abort		5.0	Taken from TS 25.133 [2] 8.1.2.5.2.2 table 8.8.
T1	s	20	
T2	s	5	
T3	s	5	

Table 8.3.4.4: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)
		T1, T2, T3
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DCH_Ec/Ior	dB	Note 1
OCNS_Ec/Ior	dB	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}		

Table 8.3.4.5: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

8.3.4.4.2 Procedure

1) The RF parameters for cell 1 are set up according to T1.

2) The UE is switched on

3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.4

4) The RF parameters for cell 2 are set up according to T1 and the SS configures a traffic channel

5) SS shall transmit a MEASUREMENT CONTROL message to cell 1

6) After 20 seconds, the SS shall switch the power settings from T1 to T2

7) UE shall transmit a MEASUREMENT REPORT message triggered by event 2C

8) SS shall transmit a HANDOVER FROM UTRAN COMMAND message with activation time at T3 and indicating the traffic channel of the target GSM cell to the UE through DCCH of the serving UTRAN cell.

9) After 5 seconds, the SS shall switch the power settings from T2 to T3

10) UE shall transmit a burst on the traffic channel of cell 2 implying that it has switched to the GSM cell. The UE sends a HANDOVER ACCESS message. If the UE transmits access bursts on the new DCCH of the target cell less than 40 ms from the beginning of time period T3, then the number of successful tests is increased by one.

[Editor's note: TS 34.108, 7.3.4 shall specify the messages HANDOVER ACCESS, PHYSICAL INFORMATION, SABM, UA and HANDOVER COMPLETE]

11) After 5 seconds, the UE is switched off. Any timing information of cell 2 is deleted in the UE.

12) Repeat step 1-11 [TBD] times

Specific Message Contents

All messages indicated ~~below~~above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message (step 5):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE *Measurement type*	Inter-RAT measurement
-Inter-RAT measurement (10.3.7.27)	
-Inter-RAT measurement objects list (10.3.7.23)	Not Present
-Inter-RAT measurement quantity (10.3.7.29)	
-Measurement quantity for UTRAN quality estimate (10.3.7.38)	
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity	CPICH Ec/N0
-CHOICE system	GSM
-Measurement quantity	GSM Carrier RSSI
-Filter coefficient	0
-BSIC verification required	Required
-Inter-RAT reporting quantity (10.3.7.32)	Not Present
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report cells within active set or within virtual active set or of the other RAT
-Maximum number of reported cells	2
-CHOICE report criteria	Inter-RAT measurement reporting criteria
-Inter-RAT measurement reporting criteria (10.3.7.30)	
-Parameters required for each event	1
-Inter-RAT event identity (10.3.7.24)	Event 3C
-Threshold own system	Not Present
-W	Not Present
-Threshold other system	-80 dBm
-Hysteresis	0 dB
-Time to trigger	0 ms
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report cells within active set or within virtual active set or of the other RAT
-Maximum number of reported cells	2
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

HANDOVER FROM UTRAN COMMAND message (step 8):

Information Element	Value/remark
Message Type	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Activation time	At T3
RB information elements	
-RAB information list	1
-RAB Info	Not present
Other information elements	
-CHOICE System type	GSM
-Frequency Band	GSM/DCS 1800 Band
-GSM message	
-Single GSM message	[TBD]
-GSM message List	GSM HANDOVER COMMAND formatted as BIT STRING(1..512). The contents of the HANDOVER COMMAND see next table.

HANDOVER COMMAND

Same as the HANDOVER COMMAND for M = 2 in clause 26.6.5.1 of TS 51.010, except that the CHANNEL MODE IE is included with value = speech full rate or half rate version 3

MEASUREMENT REPORT message for Inter-RAT test cases

This message is common for all inter RAT~~frequency~~ test cases in clause 8.7 and is described in Annex I.

8.3.4.5 Test requirements

For the test to pass, the total number of successful tests shall be more than 90% with a confidence level of [FFS]% of the cases.

Note: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

TSG-T WG1 meeting #14 **T1-020146**
Sophia Antipolis, France 21th – 22th Feb 2002

CR-Form-v4

CHANGE REQUEST

⌘ **34.121** **CR** **140** ⌘ ev **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Introduction of Annex F.6.2: Statistical testing of RRM delay performance
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-13
Category:	⌘	**F** ***Release:*** ⌘ 99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	25.133 requires from 34.121 to test delay parameters statistically according to the following rule: The limit shall be fulfilled in 90% of the cases. The confidence level of the test is to be developed. However 34.121 contains no instructions to perform the tests statistically.
Summary of change:	⌘	Introduction of Annex F.6.2: Statistical testing of RRM delay performance Delay tests shall be repeated [50] times
Consequences if ⌘not app		Statistical testing of RRM delay requirements is not possible

Clauses affected:	⌘	Annex F.6.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

F.6.2 Statistical testing of RRM delay performance

Delay tests in subclause 8.2 shall be repeated [50] times in order to determine the required success ratio

Note: A statistical approach needs to be developed. The number of repetitions required for the test will target towards a good compromise between test time and wrong decision risk.

3GPP TSG-T1 meeting #14 **T1R-020145**
Sophia Antipolis, France, 21 – 22 February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **34.121** **CR** **139** ⌘ ev **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Connection Diagrams for RRM tests cell re-selection in idle mode
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 15. 02. 02
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Connection Diagrams for RRM tests cell re-selection in idle mode are missing
Summary of change:	⌘	Connection Diagrams for RRM tests cell re-selection in idle mode are included
Consequences if not approved:	⌘	Annex A is not complete.

Clauses affected:	⌘	Annex A
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Isolated Impact Analysis: Does not affect implementation of the UE.

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Annex A (informative): Connection Diagrams

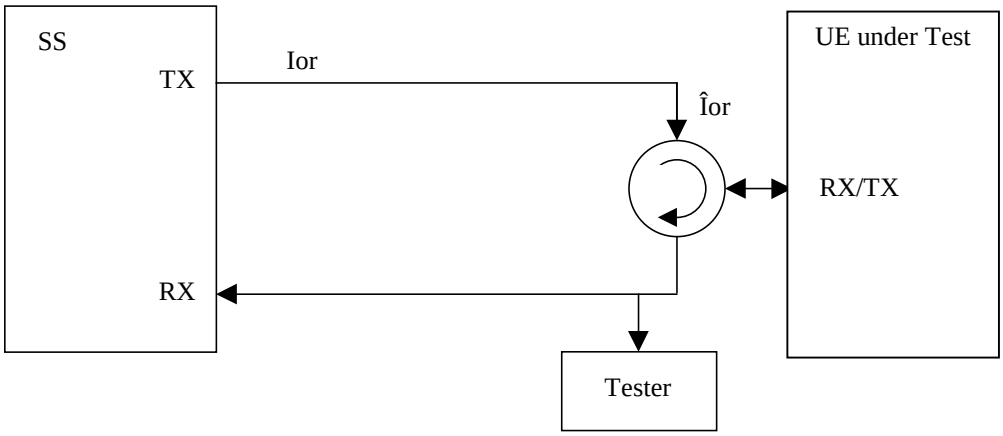

Figure A.1: Connection for Basic TX Test

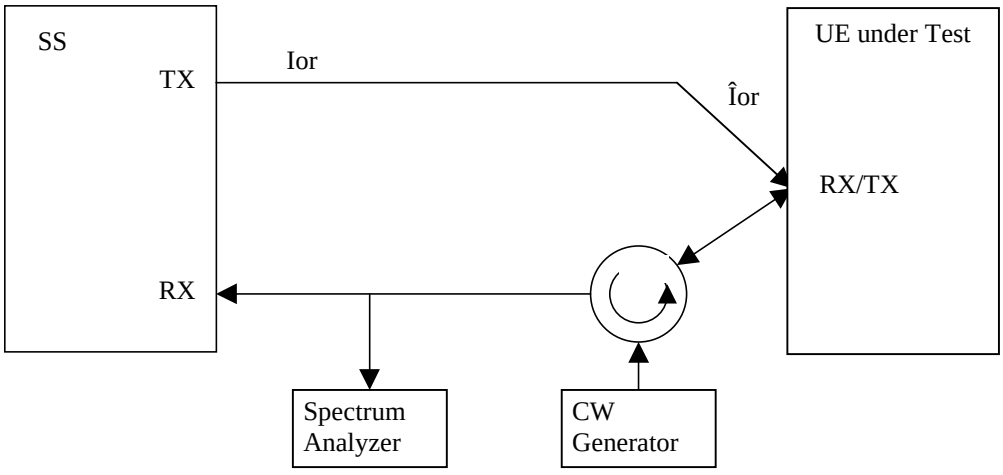

Figure A.2: Connection for TX Intermodulation Test

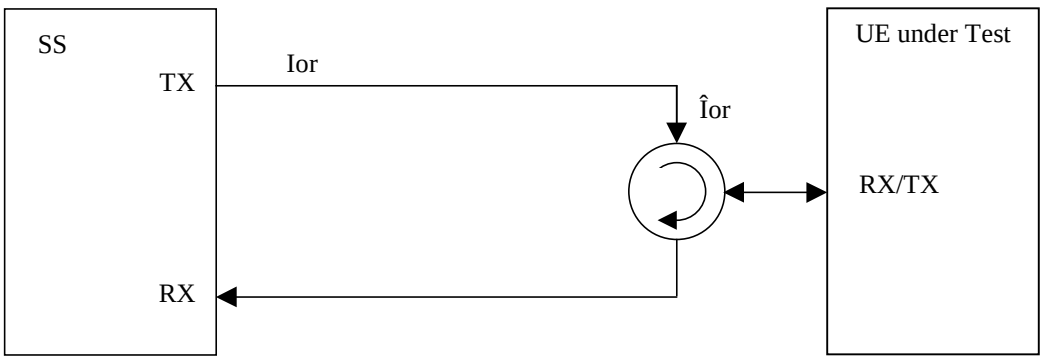

Figure A.3: Connection for Basic RX Test

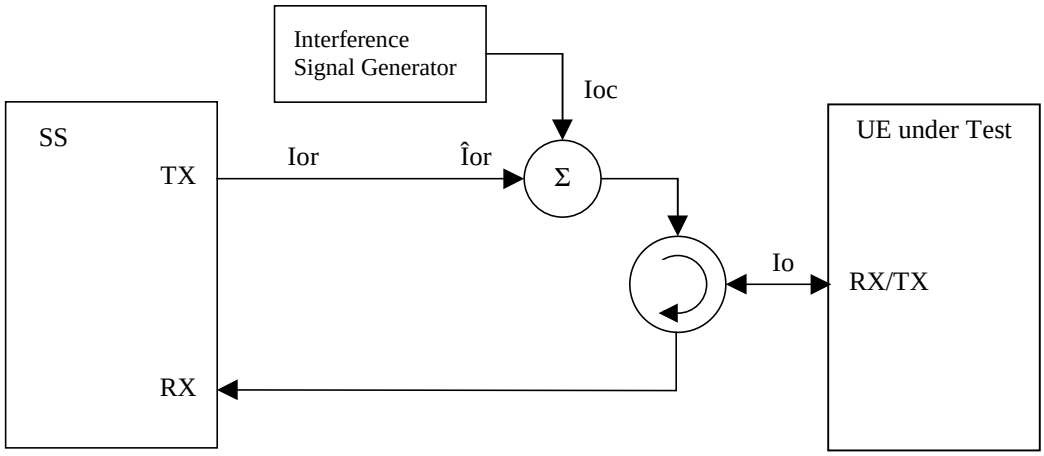

Figure A.4: Connection for RX Test with Interference

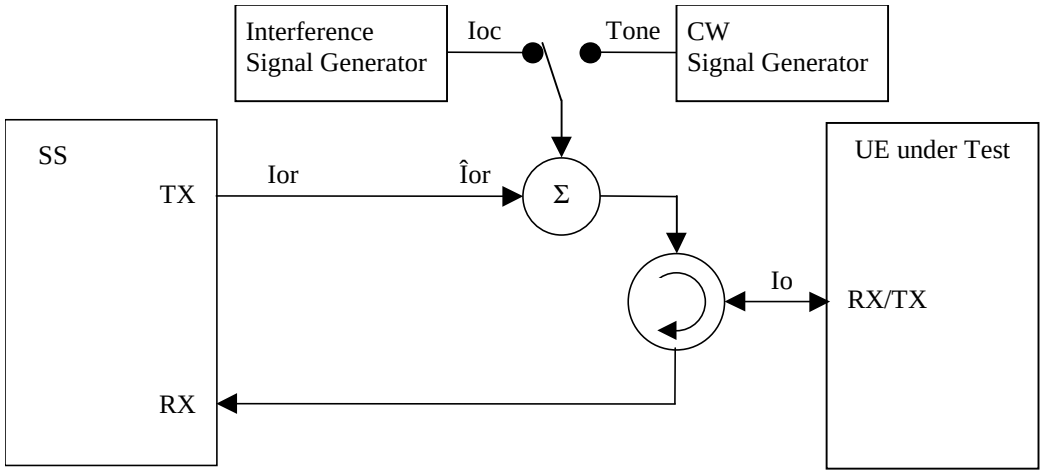

Figure A.5: Connection for RX Test with Interference or additional CW

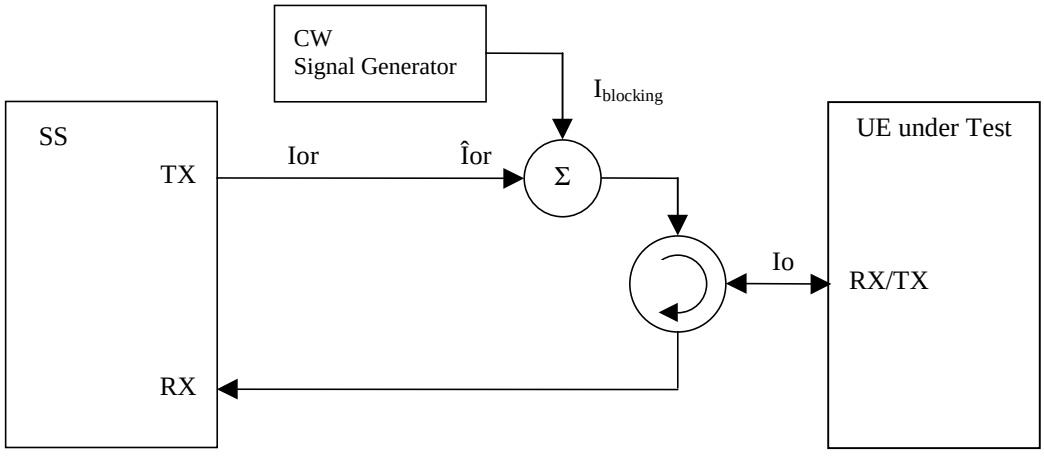

Figure A.6: Connection for RX Test with additional CW

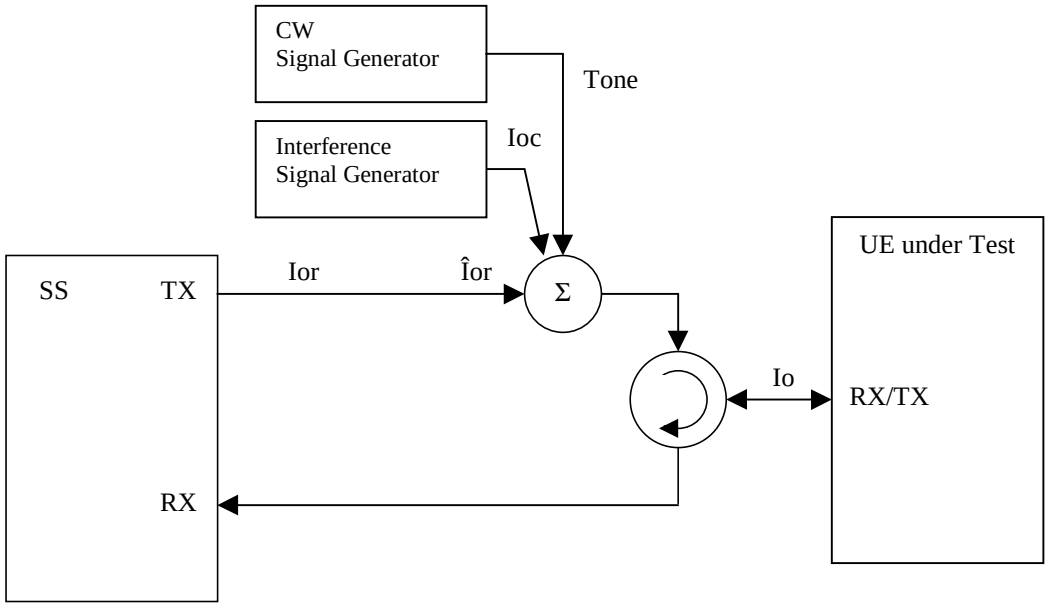

Figure A.7: Connection for RX Test with both Interference and additional CW

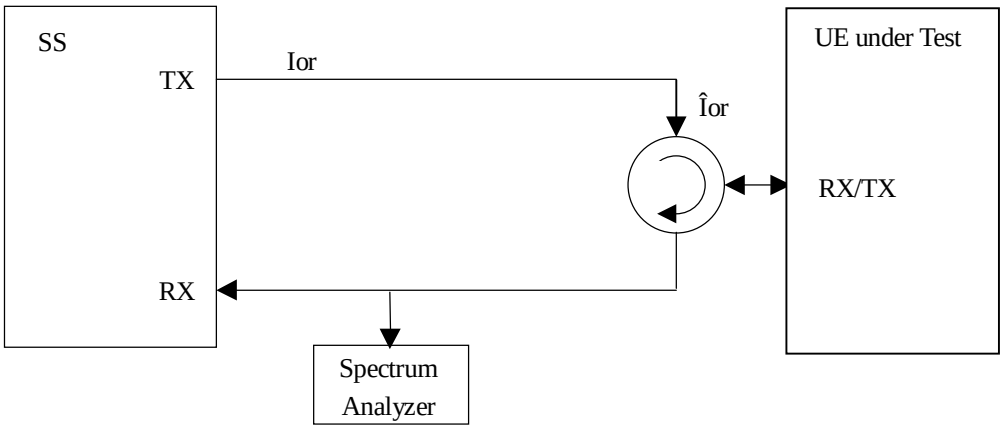

Figure A.8: Connection for Spurious Emission Test

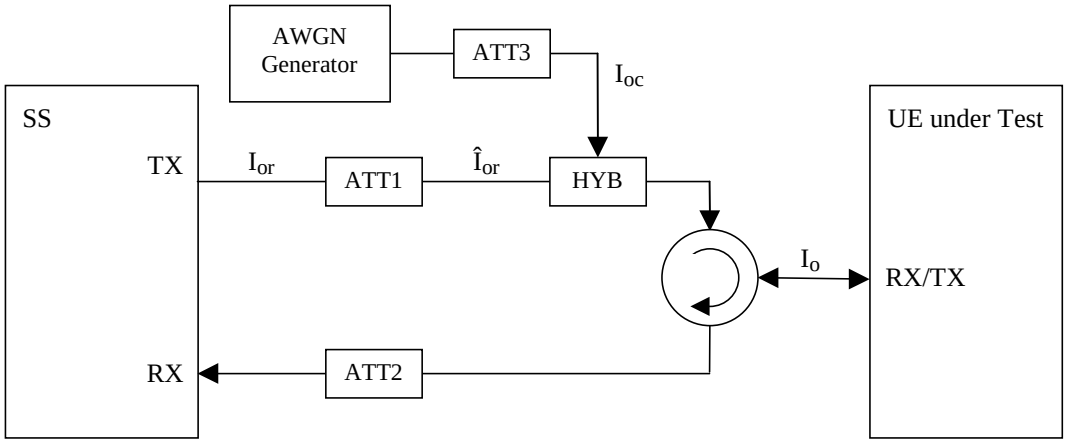

Figure A.9: Connection for Static Propagation Test

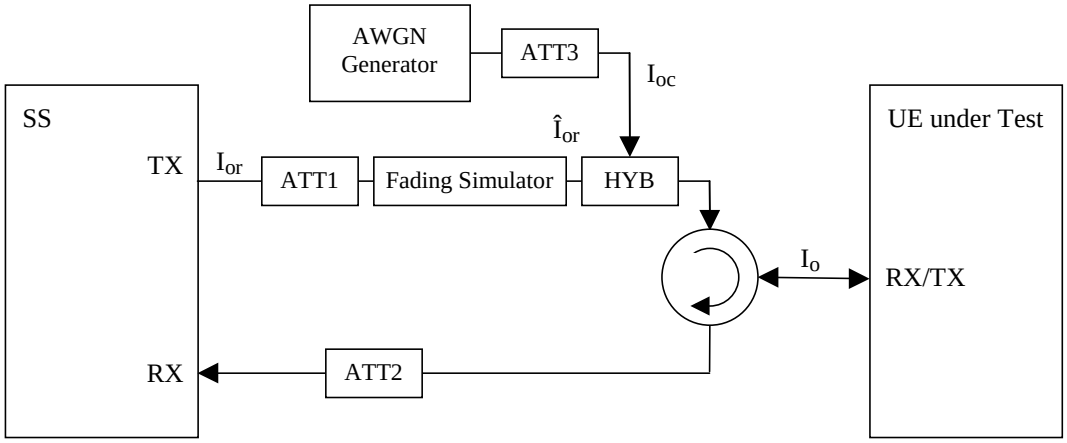

Figure A.10: Connection for Multi-path Fading Propagation Test

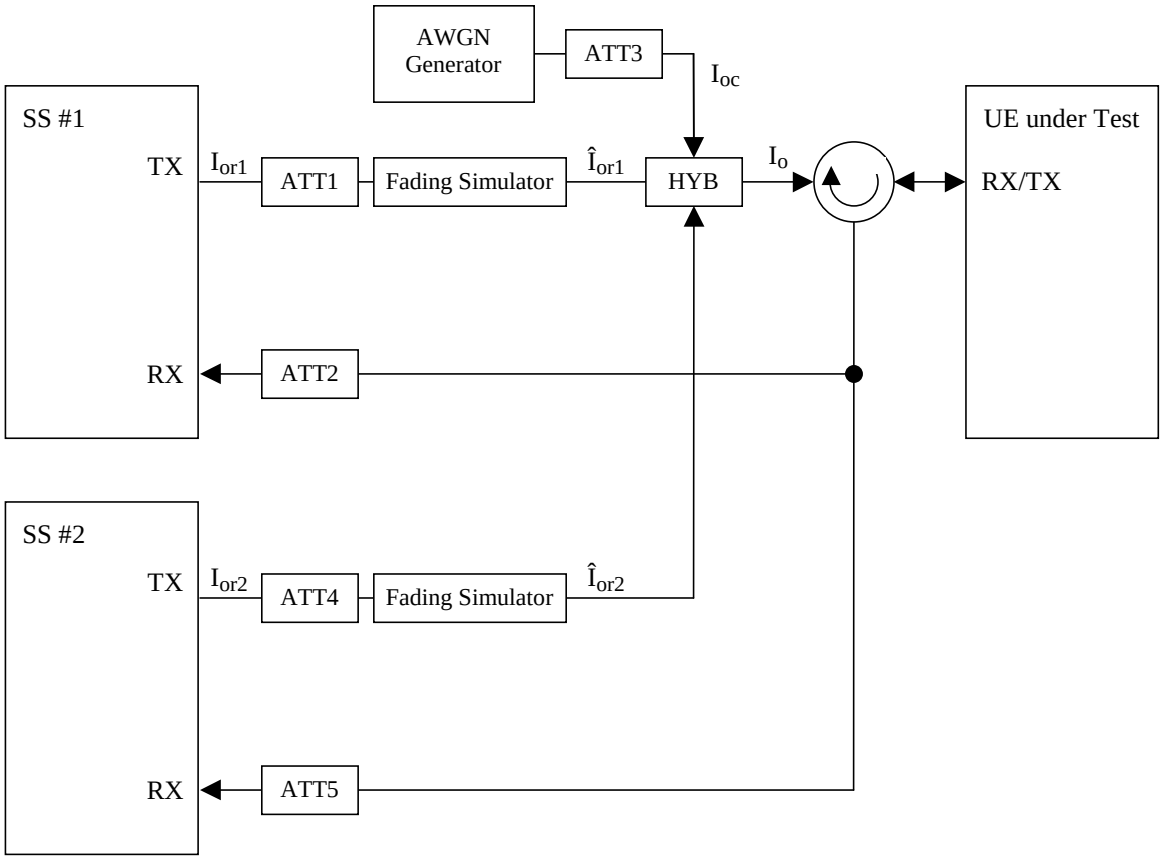

Figure A.11: Connection for Inter-Cell Soft Handover Test

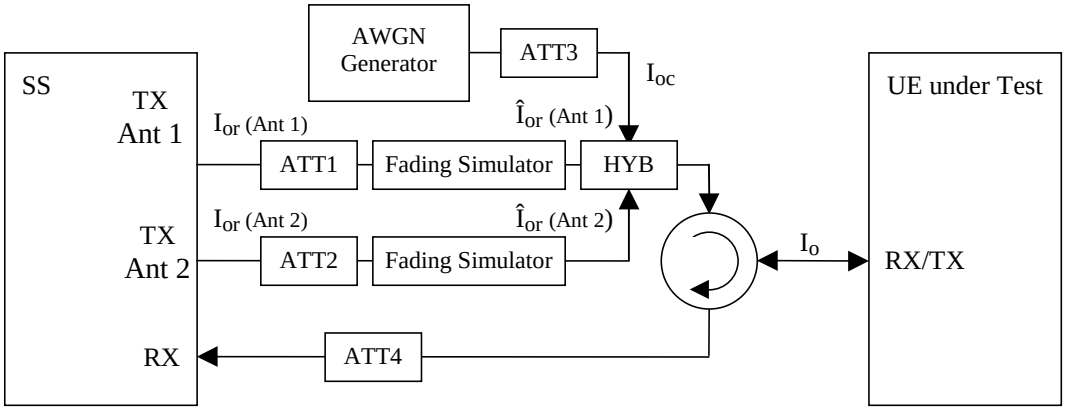

Figure A.12: Connection for Demodulation of DCH in open and closed loop transmit diversity modes

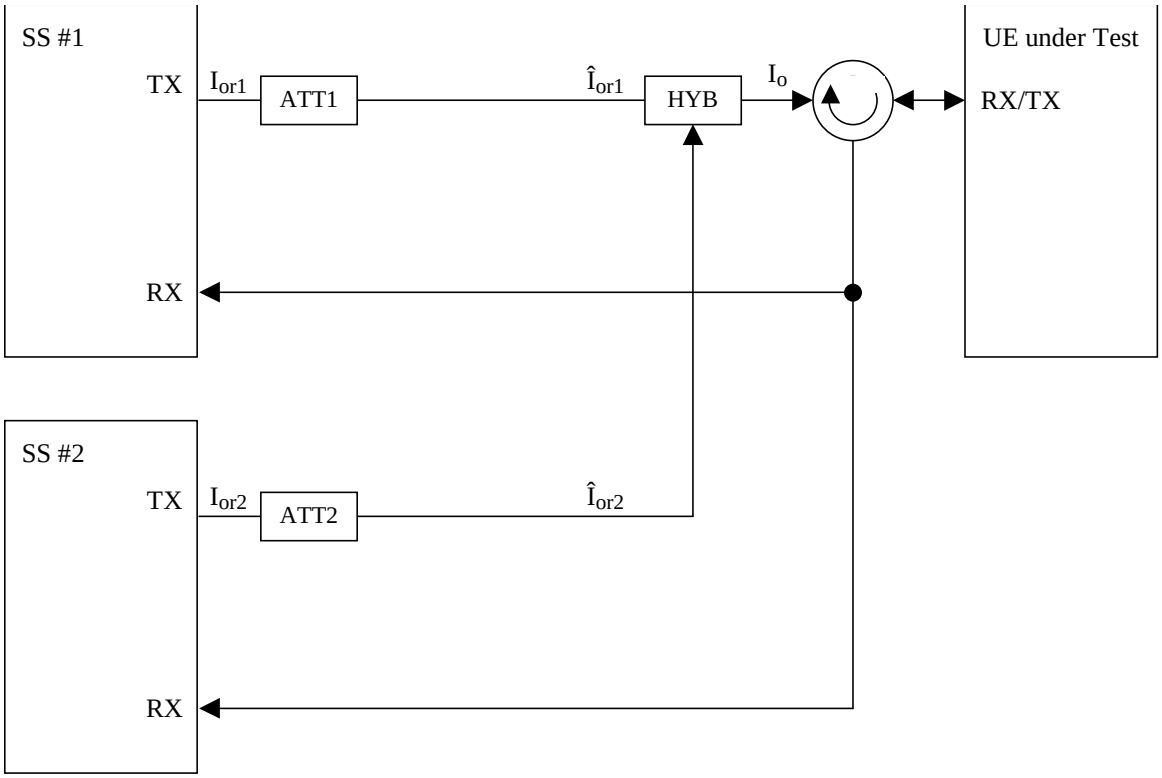

Figure A.13: Connection for Combining of TPC commands in Soft Handover Test 1

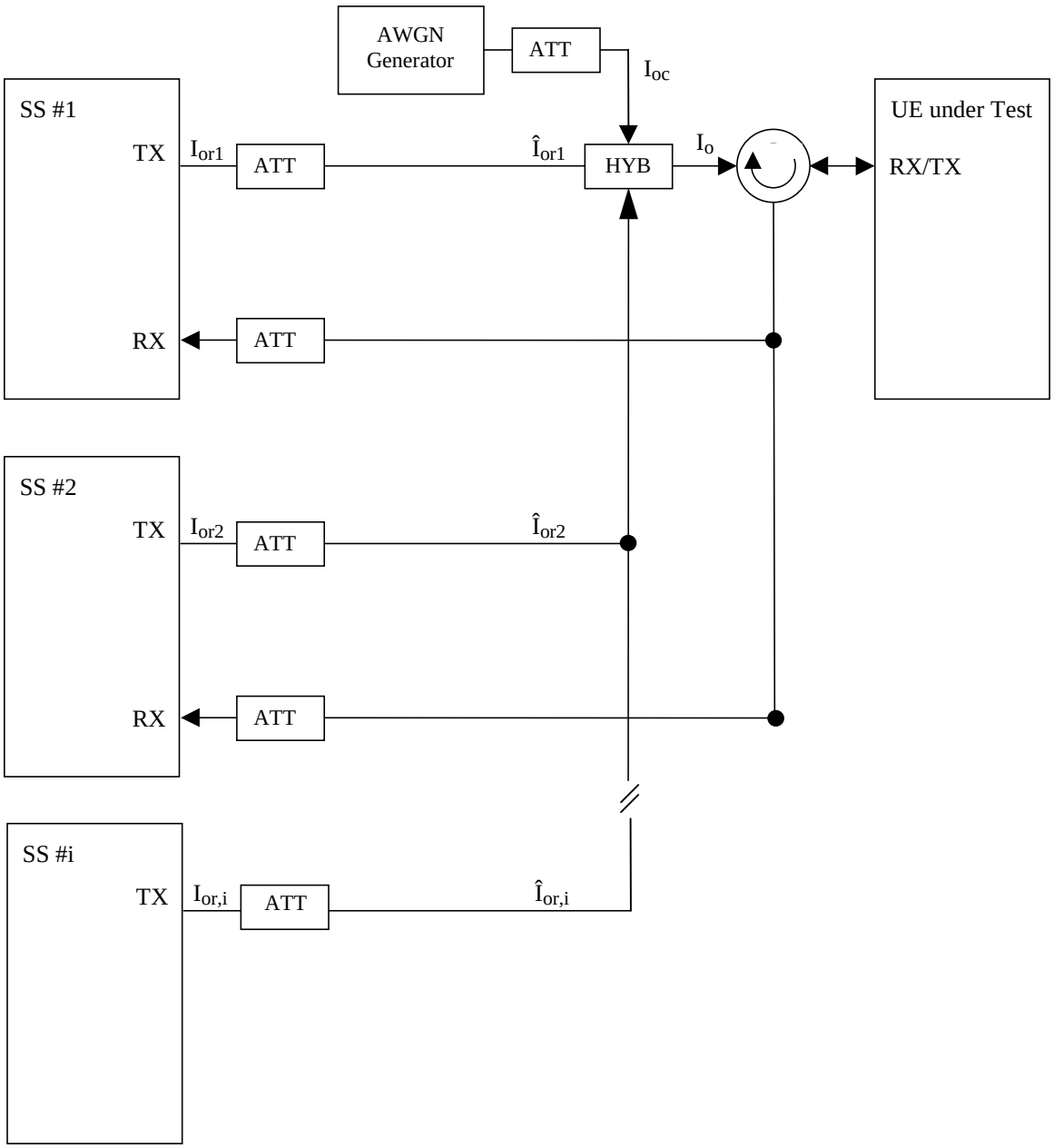

Figure A.14: Connection for cell reselection single carrier multi cell

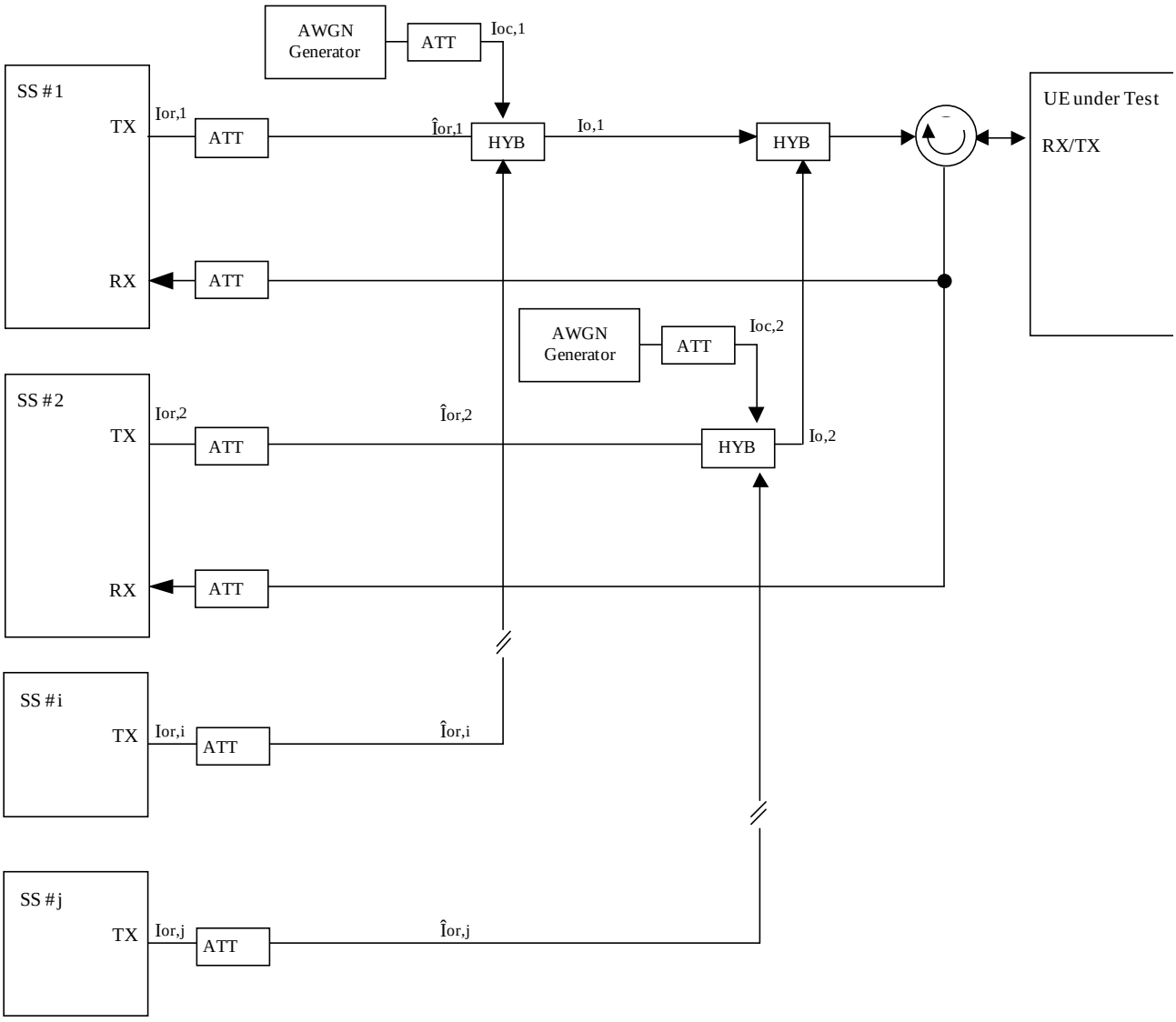

Figure A.15: Connection for cell reselection multi carrier multi cell

3GPP TSG-T1 meeting #14 **T1- 020144**
Sophia Antipolis, France, 21 – 22 February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **34.121** **CR** **138** ⌘ ev **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Measurement Uncertainties and Test Tolerances for RRM Tests
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 15. 02. 02
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	No measurement uncertainties and test tolerances have been defined for the RRM Tests in chapter 8 of 34.121
Summary of change:	⌘	Measurement uncertainties and test tolerances for RRM tests are included
Consequences if not approved:	⌘	Test requirements cannot be derived without the definition of the test tolerances

Clauses affected:	⌘	F1.5, F2.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Isolated Impact Analysis: Does not affect implementation of the UE.

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Annex F (normative): General test conditions and declarations

The requirements of this clause apply to all applicable tests in the present document.

Many of the tests in the present document measure a parameter relative to a value that is not fully specified in the UE specifications. For these tests, the Minimum Requirement is determined relative to a nominal value specified by the manufacturer.

When specified in a test, the manufacturer shall declare the nominal value of a parameter, or whether an option is supported.

In all the relevant clauses in this clause all Bit Error Ratio (BER), Block Error Ratio (BLER), False transmit format Detection Ratio **(**FDR) measurements shall be carried out according to the general rules for statistical testing in clause F.6.

F.1 Acceptable uncertainty of Test System

The maximum acceptable uncertainty of the Test System is specified below for each test, where appropriate. The Test System shall enable the stimulus signals in the test case to be adjusted to within the specified range, and the equipment under test to be measured with an uncertainty not exceeding the specified values. All ranges and uncertainties are absolute values, and are valid for a confidence level of 95 %, unless otherwise stated.

A confidence level of 95 % is the measurement uncertainty tolerance interval for a specific measurement that contains 95 % of the performance of a population of test equipment.

For RF tests it should be noted that the uncertainties in clause F.1 apply to the Test System operating into a nominal 50 ohm load and do not include system effects due to mismatch between the DUT and the Test System.

F.1.1 Measurement of test environments

The measurement accuracy of the UE test environments defined in annex G, Test environments shall be.

- Pressure ±5 kPa.
- Temperature ±2 degrees.
- Relative Humidity ±5 %.
- DC Voltage ±1,0 %.
- AC Voltage ±1,5 %.
- Vibration 10 %.
- Vibration frequency 0,1 Hz.

The above values shall apply unless the test environment is otherwise controlled and the specification for the control of the test environment specifies the uncertainty for the parameter.

F.1.2 Measurement of transmitter

Table F.1.2: Maximum Test System Uncertainty for transmitter tests

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
5.2 Maximum Output Power	±0,7 dB	
5.3 Frequency Error	±10 Hz	
5.4.1 Open loop power control in uplink	±1,0 dB	The uncertainty of this test is a combination of the downlink level setting error and the uplink power measurement that are uncorrelated. Formula = SQRT(source_level_error^2 + power_meas_error^2)
5.4.2 Inner loop power control in the uplink - One step	±0,1 dB relative over a 1,5 dB range (1 dB and 0 dB step) ±0,15 dB relative over a 3,0 dB range (2 dB step) ±0,2 dB relative over a 4.5 dB range (3 dB step)	This accuracy is based on the linearity of the absolute power measurement of the test equipment.
5.4.2 Inner loop power control in the uplink – seven and ten steps	±[0,3] dB relative over a 26 dB range	
5.4.3 Minimum Output Power	±1,0 dB	Measured on a static signal
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH_E_c}{I_{or}}$	±0,4 dB	0.1 dB uncertainty in DPCCH ratio 0.3 dB uncertainty in Ior/Ioc based on power meter measurement after the combiner Overall error is the sum of the Ioc/Ior ratio error and the DPCCH_Ec/Ior ratio. The absolute error of the AWGN Ioc is not important but is specified as 1.0 dB
5.5.1 Transmit OFF Power: (static case)	±1,0 dB	Measured on a static signal
5.5.2 Transmit ON/OFF time mask (dynamic case)	On power +0,7 dB – 1,0 dB Off power (dynamic case) TBD	Assume asymmetric meas error -1.0 dB / 0.7 dB comprising RSS of: -0.7 dB downlink error plus -0.7 dB meas error, and +0.7 dB for upper limit (assume UE won't go above 24 nominal). For the off power, the accuracy of a two-pass measurement needs to be analysed.
5.6 Change of TFC: power control step size (7 dB step)	±0,3 dB relative over a 9 dB range	
5.7 Power setting in uplink compressed mode:-UE output power	Will be a subset of 5.4.2.	
5.8 Occupied Bandwidth	±100 kHz	Accuracy = ±3*RBW. Assume 30 kHz bandwidth.
5.9 Spectrum emission mask	±1,5 dB	
5.10 ACLR	5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
5.11 Spurious emissions	± 2,0 dB for UE and coexistence bands for results > -60 dBm ± 3,0 dB for results < -60 dBm Outside above: f≤2.2GHz: ± 1.5 dB 2.2 GHz < f ≤ 4 GHz: ± 2.0 dB f > 4 GHz: ±4.0 dB	
5.12 Transmit Intermodulation	± 2.2 dB	CW Interferer error is 0.7 dB for the UE power RSS with 0.7 dB for CW setting = 1.0 dB Measurement error of intermod product is 0.7 dB for UE power RSS with 0.7 dB for relative = 1.0 dB Interferer has an effect of 2 times on the intermod product so overall test uncertainty is 2*1.0 RSS with 1.0 = 2.2 dB. Apply half any excess test system uncertainty to increase the interferer level
5.13.1 Transmit modulation: EVM	±2.5 % (for single code)	
5.13.2 Transmit modulation: peak code domain error	±1.0dB	

F.1.3 Measurement of receiver

Table F.1.3: Maximum Test System Uncertainty for receiver tests

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.2 Reference sensitivity level	± 0.7 dB	
6.3 maximum input level:	± 0.7 dB	The critical parameter is the overall signal level and not the –19 dB DPCH_Ec/Ior ratio. 0.7 dB absolute error due to signal measurement DPCH_Ec/Ior ratio error is <0.1 dB but is not important so is ignored
6.4 Adjacent channel selectivity	± 1.1 dB	Overall system uncertainty comprises three quantities: 1. Wanted signal level error 2. Interferer signal level error 3. Additional impact of interferer ACLR Items 1 and 2 are assumed to be uncorrelated so can be root sum squared to provide the ratio error of the two signals. Assume for simplicity this ratio error is linearly added to the interferer ACLR. Test System uncertainty = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect. The ACLR effect is calculated by:(Formula to follow) (E.g. ACLR at 5 MHz of 51 dB gives additional error of .0765 dB. ACLR of 48 gives error of –0.15 dB.)
6.5 Blocking characteristics	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and $f_b \leq$ 2.2 GHz: ± [1.0] dB 2.2 GHz < f ≤ 4 GHz: ±[1.7] dB f > 4 GHz: ±[3.1] dB	Using ± 0.7 dB for signal and interferer as currently defined and 68 dB ACLR @ 10 MHz.
6.6 Spurious Response	f ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.7 Intermodulation Characteristics	±1.3 dB	Similar issues to 7.4 ACS test. ETR028 says impact f the closer signal is twice that of the far signal. If both signals drop 1 dB, intermod product drops 2 dB. Formula = $\sqrt{(2 \cdot CW_level_error)^2 + (\mathrm{mod}_level_error)^2}$ (Using CW interferer ±0.5 dB, modulated interferer ±0.5 dB, wanted signal ±0.7 dB) 1.3 dB! Broadband noise/ACLR not considered but may have impact.
6.8 Spurious emissions	± 3.0 dB for UE receive band (-78 dBm) Outside above: f≤2.2GHz: ± 2.0 dB (-57 dBm) 2.2 GHz < f ≤ 4 GHz: ± 2.0 dB (-47 dBm) f > 4 GHz: ±4.0 dB (-47 dBm)	

F.1.4 Performance requirement

Table F.1.4: Maximum Test System Uncertainty for Performance Requirements

Clause	Maximum Test System Uncertainty		Derivation of Test System Uncertainty
7.2 Demodulation in Static Propagation Condition	$\hat{I}_{or}/I_{oc}$	±0.3 dB	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in Ior/Ioc based on power meter measurement after the combiner Overall error is the sum of the Ioc/Ior ratio error and the DPCH_Ec/Ior ratio but is not RSS for simplicity. The absolute error of the AWGN Ioc is not important for any tests in clause 7 but is specified as 1.0 dB.
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_C}{I_{or}}$	±0.1 dB	
7.3 Demodulation of DCH in multipath Fading Propagation conditions	$\hat{I}_{or}/I_{oc}$	±0.56 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB In addition the same ±0.3 dB Ior/Ioc ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in Iior/Ioc is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_C}{I_{or}}$	±0.1 dB	
7.4 Demodulation of DCH in Moving Propagation conditions	$\hat{I}_{or}/I_{oc}$	±0.6 dB	Same as 7.3
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_C}{I_{or}}$	±0.1 dB	
7.5 Demodulation of DCH in Birth-Death Propagation conditions	$\hat{I}_{or}/I_{oc}$	±0.6 dB	Same as 7.3
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_C}{I_{or}}$	±0.1 dB	
7.6.1 Demodulation of DCH in open loop Transmit diversity mode	$\hat{I}_{or}/I_{oc}$	±0.8 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB Ior/Ioc ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in Iior/Ioc is $(0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 0.768 dB. Round up to 0.8 dB
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_C}{I_{or}}$	±0.1 dB	
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode	$\hat{I}_{or}/I_{oc}$	±0.8 dB	Same as 7.6.1
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_C}{I_{or}}$	±0.1 dB	

Clause	Maximum Test System Uncertainty		Derivation of Test System Uncertainty
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.8 dB ±1.0 dB ±0.1 dB	Same as 7.6.1
7.7.1 Demodulation in inter-cell soft Handover	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.8 dB ±1.0 dB ±0.1 dB	Same as 7.6.1
7.7.2 Combining of TPC commands Test 1	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.3 dB ±1.0 dB ±0.1 dB	Have two Ior1 and Ior2, and no AWGN. So error is only 0.3 dB Test is looking for changes in power – need to allow for relaxation in criteria for power step of probably 0.1 dB to 0.4 dB
7.7.2 Combining of TPC commands Test 2	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.8 dB ±1.0 dB ±0.1 dB	Same as 7.6.1
7.8.1 Power control in downlink constant BLER target	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.6 dB ±1.0 dB ±0.1 dB	Same as 7.3
7.8.2, Power control in downlink initial convergence	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.6 dB ±1.0 dB ±0.1 dB	Same as 7.3
7.8.3, Power control in downlink: wind up effects	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.6 dB ±1.0 dB ±0.1 dB	Same as 7.3
7.9 Downlink compressed mode	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.6 dB ±1.0 dB ±0.1 dB	Same as 7.3
7.10 Blind transport format detection Tests 1, 2, 3	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.3 dB ±1.0 dB ±0.1 dB	Same as 7.2
7.10 Blind transport format detection Tests 4, 5, 6	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH_E_c}{I_{or}}$	±0.6 dB ±1.0 dB ±0.1 dB	Same as 7.3

F.1.5 Requirements for support of RRM

~~TBD~~

Table F.1.5: Maximum Test System Uncertainty for Radio Resource Management Tests

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.2 Idle Mode Tasks		
8.2.2 Cell Re-Selection		
8.2.2.1 Scenario 1: Single carrier case	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB.
8.2.2.2 Scenario 2: Multi carrier case	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.3 dB uncertainty in Ioc1/Ioc2 based on power meter measurement after the combiner Overall error for the CPICH_Ec/Io is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the CPICH_Ec/Ior ratio. The absolute error of the AWGN is specified as 1.0 dB.
8.2.3 UTRAN to GSM Cell Re-Selection		
8.2.3.1 Scenario 1: Both UTRA and GSM level changed	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.3 dB I_{oc} ±1.0 dB RXLEV ±1.0 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in CPICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.3 dB uncertainty in Ioc/RXLEV based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB. The absolute error of the RXLEV is specified as 1.0 dB.

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.2.3.2 Scenario 2: Only UTRA level changed	$\hat{I}_{or}/I_{oc}$ ±0.3 dB $I_{oc}/RXLEV$ ±0.3 dB I_{oc} ±1.0 dB RXLEV ±1.0 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.3.1
8.2.4 FDD/TDD cell re-selection	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.2.2
8.3 UTRAN Connected Mode Mobility		
8.3.1 FDD/FDD Soft Handover		No test case
8.3.2 FDD/FDD Hard Handover	TBD	
8.3.3 FDD/TDD Handover	TBD	
8.3.4 Inter-system Handover form UTRAN FDD to GSM	TBD	
8.3.5 Cell Re-selection in CELL_FACH		
8.3.5.1 One frequency present in the neighbour list	TBD	
8.3.5.2 Two frequencies present in the neighbour list	TBD	
8.3.6 Cell Re-selection in CELL_PCH		
8.3.6.1 One frequency present in the neighbour list	TBD	
8.3.6.2 Two frequencies present in the neighbour list	TBD	
8.3.7 Cell Re-selection in URA_PCH		
8.3.7.1 One frequency present in the neighbour list	TBD	
8.3.7.2 Two frequencies present in the neighbour list	TBD	
8.4 RRC Connection Control	TBD	
8.4.1 RRC Re-establishment delay		
8.4.2 Random Access	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{AICH_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in AICH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ratio error and the AICH Ec/Ior ratio. The absolute error of the AWGN is specified as 1.0 dB
8.5 Timing and Signalling Characteristics		

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.5.1 UE Transmit Timing	I_{or} ±1.0 dB I_{or1}/I_{or2} ±0.3 dB $\frac{DPCH_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in Ior1/Ior2 based on power meter measurement after the combiner The absolute error of the Ior is specified as 1.0 dB.
8.6 UE Measurements Procedures		
8.6.1 FDD intra frequency measurements		
8.6.1.1 Event triggered reporting in AWGN propagation conditions	TBD	
8.6.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition	TBD	
8.6.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition	TBD	
8.6.1.4 Correct reporting of neighbours in fading propagation condition	TBD	
8.6.2 FDD inter frequency measurements		
8.6.2.1 Correct reporting of neighbours in AWGN propagation condition	TBD	
8.6.2.2 Correct reporting of neighbours in Fading propagation condition	TBD	
8.6.3 TDD measurements	TBD	
8.6.3.1Correct reporting of TDD neighbours in AWGN propagation condition	TBD	
8.7 Measurements Performance Requirements		
8.7.1 CPICH RSCP		
8.7.1.1 Intra frequency measurements accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.2.1
8.7.1.2 Inter frequency measurement accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.2.2
8.7.2 CPICH Ec/Io		
8.7.1.1 Intra frequency measurements accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.2.1

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
8.7.1.2 Inter frequency measurement accuracy	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB $\frac{CPICH_E_c}{I_{or}}$ ±0.1 dB	Same as 8.2.2.2
8.7.3 UTRA Carrier RSSI	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB I_{oc1}/I_{oc2} ±0.3 dB	0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ based on power meter measurement after the combiner 0.3 dB uncertainty in Ioc1/Ioc2 based on power meter measurement after the combiner The absolute error of the AWGN is specified as 1.0 dB
8.7.4 SFN-CFN observed time difference	TBD	
8.7.5 SFN-SFN observed time difference	TBD	
8.7.6 UE Rx-Tx time difference		
8.7.7 Observed time difference to GSM cell	TBD	
8.7.8 P-CCPCH RSCP	TBD	

F.2 Test Tolerances (This clause is informative)

The Test Tolerances defined in this clause have been used to relax the Minimum Requirements in the present document to derive the Test Requirements.

The Test Tolerances are derived from Test System uncertainties, regulatory requirements and criticality to system performance. As a result, the Test Tolerances may sometimes be set to zero.

The test tolerances should not be modified for any reason e.g. to take account of commonly known test system errors (such as mismatch, cable loss, etc.).

F.2.1 Transmitter

Table F.2.1: Test Tolerances for transmitter tests.

Clause	Test Tolerance
5.2 Maximum Output Power	0.7 dB
5.3 Frequency error	10 Hz
5.4.1 Open loop power control in uplink	1.0 dB
5.4.2 Inner loop power control in the uplink - One step	0.1 dB (1 dB and 0 dB step) 0.15 dB (2 dB step) 0.2 dB (3 dB step)
5.4.2 Inner loop power control in the uplink - seven and ten steps	[0.3] dB
5.4.3 Minimum Output Power	1.0 dB
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH_E_c}{I_{or}}$	0.4 dB
5.4.4 Out-of-synchronisation handling of output power: transmit ON/OFF time	0 ms
5.5.1 Transmit OFF power	1.0 dB
5.5.2 Transmit ON/OFF time mask (dynamic case)	On power +0.7 dB / -1.0 dB Off power TT [ ] dB
5.6 Change of TFC: power control step size	0.3 dB
5.7 Power setting in uplink compressed mode:-UE output power	See subset of 5.4.2
5.8 Occupied Bandwidth	0 kHz
5.9 Spectrum emission mask	1.5 dB
5.10 ACLR	0.8 dB
5.11 Spurious emissions	0 dB
5.12 Transmit Intermodulation	0 dB
5.13.1 Transmit modulation: EVM	0%
5.13.2 Transmit modulation: peak code domain error	1.0 dB

F.2.2 Receiver

Table F.2.2: Test Tolerances for receiver tests.

Clause	Test Tolerance
6.2 Reference sensitivity level	0.7 dB
6.3 Maximum input level:	0.7 dB
6.4 Adjacent channel selectivity	0 dB
6.5 Blocking characteristics	0 dB
6.6 Spurious Response	0 dB
6.7 Intermodulation Characteristics	0 dB
6.8 Spurious emissions	0 dB

F.2.3 Performance requirements

Table F.2.3: Test Tolerances for Performance Requirements.

Clause	Test Tolerance
7.2 Demodulation in Static Propagation Condition	0.3 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.3 Demodulation of DCH in multipath Fading Propagation conditions	0.6 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.4 Demodulation of DCH in Moving Propagation conditions	0.6 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.5 Demodulation of DCH in Birth-Death Propagation conditions	0.6 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.6.1 Demodulation of DCH in open loop Transmit diversity mode	0.8 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode	0.8 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode	0.8 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.7.1 Demodulation in inter-cell soft Handover conditions	0.8 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.7.2 Combining of TPC commands Test 1	0.8 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.7.2 Combining of TPC commands Test 8	0.3 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.8.1 Power control in downlink constant BLER target	0.6 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.8.2, Power control in downlink initial convergence	0.6 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.8.3, Power control in downlink: wind up effects	0.6 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.9 Downlink compressed mode	0.6 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.10 Blind transport format detection Tests 1, 2, 3	0.3 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior
7.10 Blind transport format detection Tests 4, 5, 6	0.6 dB for Ioc/Ior 0.1 dB for DPCH_Ec/Ior

F.2.4 Requirements for support of RRM

~~TBD~~

Table F.2.4: Test Tolerances for Radio Resource Management Tests

Clause	Test Tolerance
8.2 Idle Mode Tasks	
8.2.2 Cell Re-Selection	
8.2.2.1 Scenario 1: Single carrier case	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior
8.2.2.2 Scenario 2: Multi carrier case	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior
8.2.3 UTRAN to GSM Cell Re-Selection	
8.2.3.1 Scenario 1: Both UTRA and GSM level changed	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 0.3 dB for Ioc/RXLEV
8.2.3.2 Scenario 2: Only UTRA level changed	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 0.3 dB for Ioc/RXLEV
8.2.4 FDD/TDD cell re-selection	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 0.3 dB for Ioc1/Ioc2
8.3 UTRAN Connected Mode Mobility	
8.3.1 FDD/FDD Soft Handover	
8.3.2 FDD/FDD Hard Handover	TBD
8.3.3 FDD/TDD Handover	TBD
8.3.4 Inter-system Handover form UTRAN FDD to GSM	TBD
8.3.5 Cell Re-selection in CELL_FACH	
8.3.5.1 One frequency present in the neighbour list	TBD
8.3.5.2 Two frequencies present in the neighbour list	TBD
8.3.6 Cell Re-selection in CELL_PCH	
8.3.6.1 One frequency present in the neighbour list	TBD
8.3.6.2 Two frequencies present in the neighbour list	TBD
8.3.7 Cell Re-selection in URA_PCH	
8.3.7.1 One frequency present in the neighbour list	TBD
8.3.7.2 Two frequencies present in the neighbour list	TBD
8.4 RRC Connection Control	
8.4.1 RRC Re-establishment delay	TBD
8.4.2 Random Access	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for AICH_Ec/Ior
8.5 Timing and Signalling Characteristics	
8.5.1 UE Transmit Timing	TBD
8.6 UE Measurements Procedures	
8.6.1 FDD intra frequency measurements	
8.6.1.1 Event triggered reporting in AWGN propagation conditions	TBD
8.6.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition	TBD
8.6.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition	TBD

Clause	Test Tolerance
8.6.1.4 Correct reporting of neighbours in fading propagation condition	TBD
8.6.2 FDD inter frequency measurements	
8.6.2.1 Correct reporting of neighbours in AWGN propagation condition	TBD
8.6.2.2 Correct reporting of neighbours in Fading propagation condition	TBD
8.6.3 TDD measurements	
8.6.3.1Correct reporting of TDD neighbours in AWGN propagation condition	TBD
8.7 Measurements Performance Requirements	TBD
8.7.1 CPICH RSCP	
8.7.1.1 Intra frequency measurements accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 1.0 dB for Ioc
8.7.1.2 Inter frequency measurement accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior 0.3 dB for Ioc1/Ioc2 1.0 dB for Ioc
8.7.2 CPICH Ec/Io	
8.7.1.1 Intra frequency measurements accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior
8.7.1.2 Inter frequency measurement accuracy	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for CPICH_Ec/Ior
8.7.3 UTRA Carrier RSSI	0.3 dB for $\hat{I}_{or}/I_{oc}$ 1.0 dB for Ioc
8.7.4 SFN-CFN observed time difference	
8.7.5 SFN-SFN observed time difference	
8.7.6 UE Rx-Tx time difference	0.3 dB for $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
8.7.7 Observed time difference to GSM cell	TBD
8.7.8 P-CCPCH RSCP	TBD

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CHANGE REQUEST

⌘ **34.121** **CR** **137** ⌘ **rev** **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Implementation of test tolerances to test cases in subclause 7
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 19 Feb, 2002
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The test tolerances defined in Annex F.2.3 are not implemented to test cases in subclause 7. Derivation of test requirements (subclause F.4) is incomplete.
Summary of change:	⌘	1) Subclause 7:The test tolerances defined in Annex F.2.3 are implemented to the test requirements in subclause 7 (except for test case 7.7.2, since test tolerance for $\hat{I}_{or}/I_{oc}$ is defined as 0,3 dB in test 1. Anyhow test tolerance for absolute Ior value should be defined) . 2) Subclause F.2.3: Ioc/Ior is replaced by $\hat{I}_{or}/I_{oc}$ 3) Subclause F.4: Derivation of test tolerances is completed (except for test case 7.7.2) 4) The term "DPCH_Ec/Ior power" changed to "DPCH_Ec/Ior power ratio" consistent with T1R020055 in test requirement subclauses.
Consequences if not approved:	⌘	Test tolerances for test cases in subclause 7 are not implemented.

Clauses affected:	⌘	7, F.1, F.2 and F.4		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

7 Performance requirements

7.1 General

The performance requirements for the UE in this clause are specified for the measurement channels specified in annex C and table 7.1.1, the propagation conditions specified in clause 7.1.2 and the Down link Physical channels specified in annex D. Unless stated otherwise, DL power control is OFF.

The method for Block Error Ratio (BLER) measurement is specified in 3GPP TS 34.109 [4].

Table 7.1.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	DL DPCH bit rate	TTI (ms)
12,2 kbps reference measurement channel	12,2 kbps	30 ksps	60 kbps	20
64/144/384 kbps reference measurement channel	64 kbps	120 ksps	240 kbps	20
144kbps reference measurement channel	144 kbps	240 ksps	480 kbps	20
384 kbps reference measurement channel	384 kbps	480 ksps	960 kbps	10

The common RF test conditions of Performance requirement are defined in clause E.3.3, and each test conditions in this clause (clause 7) should refer clause E.3.3. Individual test conditions are defined in the paragraph of each test.

All Block Error ratio (BLER) measurements in clause 7 shall be performed according to the general rules for statistical testing in Annex F.6

7.1.1 Measurement Configurations

In all measurements UE should transmit with maximum power while receiving signals from Node B. Transmission Power Control is always disable during the measurements. Chip Rate is specified to be 3,84 MHz.

It as assumed that fields inside DPCH have the same energy per PN chip. Also, if the power of S-CCPCH is not specified in the test parameter table, it should be set to zero. The power of OCNS should be adjusted that the power ratios (E_c/I_{or}) of all specified forward channels add up to one.

Measurement configurations for different scenarios are shown in figure A.9, figure A.10 and figure A.11.

7.1.2 Definition of Additive White Gaussian Noise (AWGN) Interferer

The minimum bandwidth of the AWGN interferer shall be 1,5 times chip rate of the radio access mode (e.g. 5,76 MHz for a chip rate of 3,84 Mcps). The flatness across this minimum bandwidth shall be less than ±0,5 dB and the peak to average ratio at a probability of 0,001 % shall exceed 10 dB.

7.2 Demodulation in Static Propagation conditions

7.2.1 Demodulation of Dedicated Channel (DCH)

7.2.1.1 Definition and applicability

The receive characteristic of the Dedicated Channel (DCH) in the static environment is determined by the Block Error Ratio (BLER). BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.2.1.2 Minimum requirements

For the parameters specified in table 7.2.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in table 7.2.1.2. These requirements are applicable for TFCS size 16.

Table 7.2.1.1: DCH parameters in static propagation conditions

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–1				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.2.1.2: DCH requirements in static propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–16,6 dB	10^{-2}
2	–13,1 dB	10^{-1}
	–12,8 dB	10^{-2}
3	–9,9 dB	10^{-1}
	–9,8 dB	10^{-2}
4	–5,6 dB	10^{-1}
	–5,5 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.2.3.1.

7.2.1.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a static propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.2.1.4 Method of test

7.2.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS and an AWGN noise source to the UE antenna connector as shown in figure A.9.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters for test 1-5 as specified in table 7.2.1.~~1~~3.
4. Enter the UE into loopback test mode and start the loopback test.

7.2.1.4.2 Procedures

1. Measure BLER of DCH.

7.2.1.5 Test requirements

~~For the parameters specified in table 7.2.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.2.1.2.~~For the parameters specified in table 7.2.1.3 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.2.1.4. These requirements are applicable for TFCS size 16.

Table 7.2.1.3: DCH parameters in static propagation conditions

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–0,7				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.2.1.4: DCH requirements in static propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–16,5 dB	10^{-2}
2	–13,0 dB	10^{-1}
	–12,7 dB	10^{-2}
3	–9,8 dB	10^{-1}
	–9,7 dB	10^{-2}
4	–5,5 dB	10^{-1}
	–5,4 dB	10^{-2}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.3 Demodulation of DCH in Multi-path Fading Propagation conditions

7.3.1 Single Link Performance

7.3.1.1 Definition and applicability

The receive characteristics of the Dedicated Channel (DCH) in different multi-path fading environments are determined by the Block Error Ratio (BLER) values. BLER is measured for the each of the individual data rate specified for the DPCH. DCH is mapped into in Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.3.1.2 Minimum requirements

For the parameters specified in tables 7.3.1.1, 7.3.1.3, 7.3.1.5, 7.3.1.7 and 7.3.1.9 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in tables 7.3.1.2, 7.3.1.4, 7.3.1.6, 7.3.1.8 and 7.3.1.10. These requirements are applicable for TFCS size 16.

Table 7.3.1.1: DCH parameters in multi-path fading propagation conditions (Case 1)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	9				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.2: DCH requirements in multi-path fading propagation conditions (Case 1)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–15,0 dB	10^{-2}
2	–13,9 dB	10^{-1}
	–10,0 dB	10^{-2}
3	–10,6 dB	10^{-1}
	–6,8 dB	10^{-2}
4	–6,3 dB	10^{-1}
	–2,2 dB	10^{-2}

Table 7.3.1.3: DCH parameters in multi-path fading propagation conditions (Case 2)

Parameter	Test 5	Test 6	Test 7	Test 8	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–3	–3	3	6	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.4: DCH requirements in multi-path fading propagation conditions (Case 2)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
5	–7,7 dB	10^{-2}
6	–6,4 dB	10^{-1}
	–2,7 dB	10^{-2}
7	–8,1 dB	10^{-1}
	–5,1 dB	10^{-2}
8	–5,5 dB	10^{-1}
	–3,2 dB	10^{-2}

Table 7.3.1.5: DCH parameters in multi-path fading propagation conditions (Case 3)

Parameter	Test 9	Test 10	Test 11	Test 12	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–3	–3	3	6	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.6: DCH requirements in multi-path fading propagation conditions (Case 3)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
9	–11,8 dB	10^{-2}
10	–8,1 dB	10^{-1}
	–7,4 dB	10^{-2}
	–6,8 dB	10^{-3}
11	–9,0 dB	10^{-1}
	–8,5 dB	10^{-2}
	–8,0 dB	10^{-3}
12	–5,9 dB	10^{-1}
	–5,1 dB	10^{-2}
	–4,4 dB	10^{-3}

Table 7.3.1.7: DCH parameters in multi-path fading propagation conditions (Case 1) with S-CPICH

Parameter	Test 13	Test 14	Test 15	Test 16	Unit
Phase reference	S-CPICH				
$\hat{I}_{or}/I_{oc}$	9				dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.8: DCH requirements in multi-path fading propagation conditions (Case 1) with S-CPICH

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
13	-15,0 dB	10^{-2}
14	-13,9 dB	10^{-1}
	-10,0 dB	10^{-2}
15	-10,6 dB	10^{-1}
	-6,8 dB	10^{-2}
16	-6,3 dB	10^{-1}
	-2,2 dB	10^{-2}

Table 7.3.1.9: DCH parameters in multi-path fading propagation conditions (Case 6)

Parameter	Test 17	Test 18	Test 19	Test 20	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	-3	-3	3	6	dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.10: DCH requirements in multi-path fading propagation conditions (Case 6)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
17	-8,8 dB	10^{-2}
18	-5,1 dB	10^{-1}
	-4,4 dB	10^{-2}
	-3,8 dB	10^{-3}
19	-6,0 dB	10^{-1}
	-5,5 dB	10^{-2}
	-5,0 dB	10^{-3}
20	-2,9 dB	10^{-1}
	-2,1 dB	10^{-2}
	-1,4 dB	10^{-3}

The reference for this requirement is TS 25.101 [1] clause 8.3.1.1.

7.3.1.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a multi-path fading propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.3.1.4 Method of test

7.3.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS, multi-path fading simulator and an AWGN noise source to the UE antenna connector as shown in figure A.10.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters for test 1-20 as specified table 7.3.1.11, table 7.3.1.13, table 7.3.1.15, table 7.3.1.17 and table 7.3.1.19.
4. Enter the UE into loopback test mode and start the loopback test.
5. Setup fading simulators as fading condition case 1, case 2, case 3 and case 6, which are described in table D.2.2.1.

7.3.1.4.2 Procedures

1. Measure BLER of DCH.

7.3.1.5 Test requirements

~~For the parameters specified in table 7.3.1.1, table 7.3.1.3, table 7.3.1.5, table 7.3.1.7 and table 7.3.1.9 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.3.1.2, table 7.3.1.4, table 7.3.1.6, table 7.3.1.8 and table 7.3.1.10.~~For the parameters specified in tables 7.3.1.11, 7.3.1.13, 7.3.1.15, 7.3.1.17 and 7.3.1.19 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in tables 7.3.1.12, 7.3.1.14, 7.3.1.16, 7.3.1.18 and 7.3.1.20. These requirements are applicable for TFCS size 16.

Table 7.3.1.11: DCH parameters in multi-path fading propagation conditions (Case 1)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	9,6				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.12: DCH requirements in multi-path fading propagation conditions (Case 1)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–14,9 dB	10^{-2}
2	–13,8 dB	10^{-1}
	–9,9 dB	10^{-2}
3	–10,5 dB	10^{-1}
	–6,7 dB	10^{-2}
4	–6,2 dB	10^{-1}
	–2,1 dB	10^{-2}

Table 7.3.1.13: DCH parameters in multi-path fading propagation conditions (Case 2)

Parameter	Test 5	Test 6	Test 7	Test 8	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–2,4	–2,4	3,6	6,6	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.14: DCH requirements in multi-path fading propagation conditions (Case 2)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
5	–7,6 dB	10^{-2}
6	–6,3 dB	10^{-1}
	–2,6 dB	10^{-2}
7	–8,0 dB	10^{-1}
	–5,0 dB	10^{-2}
8	–5,4 dB	10^{-1}
	–3,1 dB	10^{-2}

Table 7.3.1.15: DCH parameters in multi-path fading propagation conditions (Case 3)

Parameter	Test 9	Test 10	Test 11	Test 12	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–2,4	–2,4	3,6	6,6	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.16: DCH requirements in multi-path fading propagation conditions (Case 3)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
9	–11,7 dB	10^{-2}
10	–8,0 dB	10^{-1}
	–7,3 dB	10^{-2}
	–6,7 dB	10^{-3}
11	–8,9 dB	10^{-1}
	–8,4 dB	10^{-2}
	–7,9 dB	10^{-3}
12	–5,8 dB	10^{-1}
	–5,0 dB	10^{-2}
	–4,3 dB	10^{-3}

Table 7.3.1.17: DCH parameters in multi-path fading propagation conditions (Case 1) with S-CPICH

Parameter	Test 13	Test 14	Test 15	Test 16	Unit
Phase reference	S-CPICH				
$\hat{I}_{or}/I_{oc}$	9,6				dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.18: DCH requirements in multi-path fading propagation conditions (Case 1) with S-CPICH

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
13	-14,9 dB	10^{-2}
14	-13,8 dB	10^{-1}
	-9,9 dB	10^{-2}
15	-10,5 dB	10^{-1}
	-6,7 dB	10^{-2}
16	-6,2 dB	10^{-1}
	-2,1 dB	10^{-2}

Table 7.3.1.19: DCH parameters in multi-path fading propagation conditions (Case 6)

Parameter	Test 17	Test 18	Test 19	Test 20	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	-2,4	-2,4	3,6	6,6	dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.3.1.20: DCH requirements in multi-path fading propagation conditions (Case 6)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
17	-8,7 dB	10^{-2}
18	-5,0 dB	10^{-1}
	-4,3 dB	10^{-2}
	-3,7 dB	10^{-3}
19	-5,9 dB	10^{-1}
	-5,4 dB	10^{-2}
	-4,9 dB	10^{-3}
20	-2,8 dB	10^{-1}
	-2,0 dB	10^{-2}
	-1,3 dB	10^{-3}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.4 Demodulation of DCH in Moving Propagation conditions

7.4.1 Single Link Performance

7.4.1.1 Definition and applicability

The receive single link performance of the Dedicated Channel (DCH) in dynamic moving propagation conditions are determined by the Block Error Ratio (BLER) values. BLER is measured for the each of the individual data rate specified for the DPCH. DCH is mapped into Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.4.1.2 Minimum requirements

For the parameters specified in table 7.4.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in table 7.4.1.2.

Table 7.4.1.1: DCH parameters in moving propagation conditions

Parameter	Test 1	Test 2	Unit
Phase reference	P-CPICH		
$\hat{I}_{or}/I_{oc}$	–1		dB
I_{oc}	–60		dBm / 3,84 MHz
Information Data Rate	12,2	64	kbps

Table 7.4.1.2: DCH requirements in moving propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–14,5 dB	10^{-2}
2	–10,9 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.4.1.1.

7.4.1.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a moving propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.4.1.4 Method of test

7.4.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS and an AWGN noise source to the UE antenna connector as shown in figure A.10.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters as specified in table 7.4.1.~~1~~3.
4. Enter the UE into loopback test mode and start the loopback test.
5. Setup fading simulator as moving propagation condition, which is described in clause D.2.3.

7.4.1.4.2 Procedures

1. Measure BLER of DCH.

7.4.1.5 Test requirements

~~For the parameters specified in table 7.4.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.4.1.2.~~For the parameters specified in table 7.4.1.3 the average downlink $\frac{DPCH_E_c}{}$ power ratio shall be below the specified value for the BLER shown in table 7.4.1.4.

Table 7.4.1.3: DCH parameters in moving propagation conditions

Parameter	Test 1	Test 2	Unit
Phase reference	P-CPICH		
$\hat{I}_{or}/I_{oc}$	–0,4		dB
I_{oc}	–60		dBm / 3,84 MHz
Information Data Rate	12,2	64	kbps

Table 7.4.1.4: DCH requirements in moving propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–14,4 dB	10^{-2}
2	–10,8 dB	10^{-2}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.5 Demodulation of DCH in Birth-Death Propagation conditions

7.5.1 Single Link Performance

7.5.1.1 Definition and applicability

The receive single link performance of the Dedicated Channel (DCH) in dynamic birth-death propagation conditions are determined by the Block Error Ratio (BLER) values. BLER is measured for the each of the individual data rate specified for the DPCH. DCH is mapped into Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.5.1.2 Minimum requirements

For the parameters specified in table 7.5.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in table 7.5.1.2.

Table 7.5.1.1: DCH parameters in birth-death propagation conditions

Parameter	Test 1	Test 2	Unit
Phase reference	P-CPICH		
$\hat{I}_{or}/I_{oc}$	–1		dB
I_{oc}	–60		dBm / 3,84 MHz
Information Data Rate	12,2	64	kbps

Table 7.5.1.2: DCH requirements in birth-death propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–12,6 dB	10^{-2}
2	-8,7 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.5.1.1.

7.5.1.3 Test purpose

To verify the ability of the receiver to receive a predefined test signal, representing a birth-death propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a BLER not exceeding a specified value.

7.5.1.4 Method of test

7.5.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS and an AWGN noise source to the UE antenna connector as shown in figure A.10.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters as specified in table 7.5.1.~~1~~3.
4. Enter the UE into loopback test mode and start the loopback test.
5. Setup fading simulator as birth-death propagation condition, which is described in clause D.2.4.

7.5.1.4.2 Procedures

1. Measure BLER of DCH.

7.5.1.5 Test requirements

~~For the parameters specified in table 7.5.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.5.1.2.~~For the parameters specified in table 7.5.1.3 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.5.1.4.

Table 7.5.1.3: DCH parameters in birth-death propagation conditions

Parameter	Test 1	Test 2	Unit
Phase reference	P-CPICH		
$\hat{I}_{or}/I_{oc}$	–0,4		dB
I_{oc}	–60		dBm / 3,84 MHz
Information Data Rate	12,2	64	kbps

Table 7.5.1.4: DCH requirements in birth-death propagation conditions

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–12,5 dB	10^{-2}
2	-8,6 dB	10^{-2}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.6 Demodulation of DCH in downlink Transmit diversity modes

7.6.1 Demodulation of DCH in open-loop transmit diversity mode

7.6.1.1 Definition and applicability

The receive characteristic of the Dedicated Channel (DCH) in open loop transmit diversity mode is determined by the Block Error Ratio (BLER). DCH is mapped into in Dedicated Physical Channel (DPCH).

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.1.2 Minimum requirements

For the parameters specified in table 7.6.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in table 7.6.1.2.

Table 7.6.1.1: Test parameters for DCH reception in a open-loop transmit diversity scheme (Propagation condition: Case 1)

Parameter	Test 1	Unit
Phase reference	P-CPICH	
$\hat{I}_{or}/I_{oc}$	9	dB
I_{oc}	–60	dBm / 3,84 MHz
Information data rate	12,2	kbps

Table 7.6.1.2: Test requirements for DCH reception in open-loop transmit diversity scheme

Test Number	$\frac{DPCH_E_c}{I_{or}}$ (antenna 1/2)	BLER
1	–16,8 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.6.1.1.

7.6.1.3 Test purpose

To verify that UE reliably demodulates the DPCH of the Node B while open loop transmit diversity is enabled during the connection.

7.6.1.4 Method of test

7.6.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in figure A.12.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.6.1.~~1~~ 3 and table E 3.4.

4) Enter the UE into loopback test mode and start the loopback test.

5) Activate open loop Tx diversity function.

6) Set up fading simulators as fading condition case 1, which is described in table D.2.2.1.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.6.1.4.2 Procedure

1) Measure BLER in points specified in table 7.6.1.~~2~~4.

7.6.1.5 Test Requirements

~~For the parameters specified in table 7.6.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.6.1.2.~~For the parameters specified in table 7.6.1.3 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.6.1.4.

Table 7.6.1.3: Test parameters for DCH reception in a open-loop transmit diversity scheme (Propagation condition: Case 1)

Parameter	Test 1	Unit
Phase reference	P-CPICH	
$\hat{I}_{or}/I_{oc}$	9,8	dB
I_{oc}	–60	dBm / 3,84 MHz
Information data rate	12,2	kbps

Table 7.6.1.4: Test requirements for DCH reception in open-loop transmit diversity scheme

Test Number	$\frac{DPCH_E_c}{I_{or}}$ (antenna 1/2)	BLER
1	–16,7 dB	10^{-2}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.6.2 Demodulation of DCH in closed loop transmit diversity mode

7.6.2.1 Definition and applicability

The receive characteristic of the dedicated channel (DCH) in closed loop transmit diversity mode is determined by the Block Error Ratio (BLER). DCH is mapped into in Dedicated Physical Channel (DPCH).

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.2.2 Minimum requirements

For the parameters specified in table 7.6.2.1 the average downlink ~~$\frac{DPCH_E_c}{}$~~ power shall be below the specified value for the BLER shown in table 7.6.2.2.

Table 7.6.2.1: Test Parameters for DCH Reception in closed loop transmit diversity mode (Propagation condition: Case 1)

Parameter	Test 1 (Mode 1)	Test 2 (Mode 2)	Unit
$\hat{I}_{or}/I_{oc}$	9	9	dB
I_{oc}	–60	–60	dBm / 3,84 MHz
Information data rate	12,2	12,2	kbps
Feedback error ratio	4	4	%

Table 7.6.2.2: Test requirements for DCH reception in feedback transmit diversity mode

Test Number	$\frac{DPCH_E_c}{I_{or}}$ (see note)	BLER
1	–18,0 dB	10^{-2}
2	–18,3 dB	10^{-2}
NOTE: This is the total power from both antennas. Power sharing between antennas are closed loop mode dependent as specified in TS 25.214 [5].		

The reference for this requirement is TS 25.101 [1] clause 8.6.2.1.

7.6.2.3 Test purpose

To verify that UE reliably demodulates the DPCH of the Node B while closed loop transmit diversity is enabled during the connection.

7.6.2.4 Method of test

7.6.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in figure A.12.
2) Set up a call according to the Generic call setup procedure.
3) RF parameters are set up according to table 7.6.2.1 and table E 3.5.
4) Enter the UE into loopback test mode and start the loopback test.
5) Activate closed loop Tx diversity function.
6) Set up fading simulators as fading condition case 1, which is described in table D.2.2.1.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.6.2.4.2 Procedure

1) Measure BLER in points specified in table 7.6.2.2.

7.6.2.5 Test Requirements

~~For the parameters specified in table 7.6.2.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.6.2.2.~~For the parameters specified in table 7.6.2.3 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.6.2.4.

Table 7.6.2.3: Test Parameters for DCH Reception in closed loop transmit diversity mode (Propagation condition: Case 1)

Parameter	Test 1 (Mode 1)	Test 2 (Mode 2)	Unit
$\hat{I}_{or}/I_{oc}$	9,8	9,8	dB
I_{oc}	–60	–60	dBm / 3,84 MHz
Information data rate	12,2	12,2	kbps
Feedback error ratio	4	4	%

Table 7.6.2.4: Test requirements for DCH reception in feedback transmit diversity mode

Test Number	$\frac{DPCH_E_c}{I_{or}}$ (see note)	BLER
1	–17,9 dB	10^{-2}
2	–18,2 dB	10^{-2}
NOTE: This is the total power from both antennas. Power sharing between antennas are closed loop mode dependent as specified in TS 25.214 [5].		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.6.3 Demodulation of DCH in Site Selection Diversity Transmission Power Control mode

7.6.3.1 Definition and applicability

The bit error characteristics of UE receiver is determined in Site Selection Diversity Transmission Power Control (SSDT) mode. Two Node B emulators are required for this performance test. The delay profiles of signals received from different base stations are assumed to be the same but time shifted by 10 chip periods.

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.3.2 Minimum requirements

The downlink physical channels and their relative power to Ior are the same as those specified in clause E.3.3 irrespective of Node Bs and the test cases. DPCH_Ec/Ior value applies whenever DPDCH in the cell is transmitted. In Test 1 and Test 3, the received powers at UE from two Node Bs are the same, while 3dB offset is given to one that comes from one of Node Bs for Test 2 and Test 4 as specified in table 7.6.3.1.

For the parameters specified in table 7.6.3.1 the average downlink ~~$DPCH_E_c$~~ power shall be below the specified value for the BLER shown in table 7.6.3.2.

Table 7.6.3.1: DCH parameters in multi-path propagation conditions during SSDT mode (Propagation condition: Case 1)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or1}/I_{oc}$	0	-3	0	0	dB
$\hat{I}_{or2}/I_{oc}$	0	0	0	-3	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	12,2	12,2	12,2	kbps
Feedback error rate (note)	4	4	4	4	%
Number of FBI bits assigned to "S" Field	1	1	2	2	
Code word Set	Long	Long	Short	Short	
NOTE: Feedback error rate is defined as FBI bit error rate.					

Table 7.6.3.2: DCH requirements in multi-path propagation conditions during SSDT Mode

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–7,5 dB	10^{-2}
2	–6,5 dB	10^{-2}
3	–10,5 dB	10^{-2}
4	–9,2 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.6.3.1.

7.6.3.3 Test purpose

To verify that UE reliably demodulates the DPCH of the selected Node B while site selection diversity is enabled during soft handover.

7.6.3.4 Method of test

7.6.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect two SS's, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in figure A.11.

2) Set up a call according to the Generic call setup procedure, and RF parameters are set up according to table 7.6.3.~~1~~ 3 and table 7.6.3.~~2~~4.

3) Enter the UE into loopback test mode and start the loopback test.

4) Activate SSDT function.

5) Set up fading simulators as fading condition case 1, which is described in table D.2.2.1.

7.6.3.4.2 Procedure

Measure BLER in points specified in table 7.6.3.4~~2~~.

7.6.3.5 Test Requirements

~~BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.6.3.2.~~For the parameters specified in table 7.6.3.3 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.6.3.4.

Table 7.6.3.3: DCH parameters in multi-path propagation conditions during SSDT mode (Propagation condition: Case 1)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or1}/I_{oc}$	0,8	-2,2	0,8	0,8	dB
$\hat{I}_{or2}/I_{oc}$	0,8	0,8	0,8	-2,2	dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2	12,2	12,2	12,2	kbps
Feedback error rate (note)	4	4	4	4	%
Number of FBI bits assigned to "S" Field	1	1	2	2	
Code word Set	Long	Long	Short	Short	
NOTE: Feedback error rate is defined as FBI bit error rate.					

Table 7.6.3.4: DCH requirements in multi-path propagation conditions during SSDT Mode

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–7,4 dB	10^{-2}
2	–6,4 dB	10^{-2}
3	–10,4 dB	10^{-2}
4	–9,1 dB	10^{-2}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.7 Demodulation in Handover conditions

7.7.1 Demodulation of DCH in Inter-Cell Soft Handover

7.7.1.1 Definition and applicability

The bit error ratio characteristics of UE is determined during an inter-cell soft handover. During the soft handover a UE receives signals from different Base Stations. A UE has to be able to demodulate two P-CCPCH channels and to combine the energy of DCH channels. Delay profiles of signals received from different Base Stations are assumed to be the same but time shifted by 10 chips.

The receive characteristics of the different channels during inter-cell handover are determined by the Block Error Ratio (BLER) values.

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.7.1.2 Minimum requirements

For the parameters specified in table 7.7.1.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in table 7.7.1.2.

Table 7.7.1.1: DCH parameters in multi-path propagation conditions during Soft Handoff (Case 3)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	0	0	3	6	dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.7.1.2: DCH requirements in multi-path propagation conditions during Soft Handoff (Case 3)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–15,2 dB	10^{-2}
2	–11,8 dB	10^{-1}
	–11,3 dB	10^{-2}
3	–9,6 dB	10^{-1}
	–9,2 dB	10^{-2}
4	–6,0 dB	10^{-1}
	–5,5 dB	10^{-2}

The reference for this requirement is TS 25.101 [1] clause 8.7.1.1.

7.7.1.3 Test purpose

To verify that the BLER does not exceed the value at the DPCH_Ec/Ior specified in table 7.7.1.2.

7.7.1.4 Method of test

7.7.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

[TBD]

7.7.1.4.2 Procedures

1) Connect the SS, multi-path fading simulator and an AWGN noise source to the UE antenna connector as shown in figure A.11.

2) Set up the call.

3) Set the test parameters for test 1-5 as specified in table 7.7.1.~~1~~3.

4) Count, at the SS, the number of information blocks transmitted and the number of correctly received information blocks at the UE.

5) Measure BLER of DCH channel.

7.7.1.5 Test requirements

~~For the parameters specified in table 7.7.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in table 7.7.1.2.~~ For the parameters specified in table 7.7.1.3 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power ratio shall be below the specified value for the BLER shown in table 7.7.1.4.

Table 7.7.1.3: DCH parameters in multi-path propagation conditions during Soft Handoff (Case 3)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	0,8	0,8	3,8	6,8	dB
I_{oc}	-60				dBm / 3,84 MHz
Information Data Rate	12,2	64	144	384	kbps

Table 7.7.1.4: DCH requirements in multi-path propagation conditions during Soft Handoff (Case 3)

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER
1	–15,1 dB	10^{-2}
2	–11,7 dB	10^{-1}
	–11,2 dB	10^{-2}
3	–9,5 dB	10^{-1}
	–9,1 dB	10^{-2}
4	–5,9 dB	10^{-1}
	–5,4 dB	10^{-2}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.7.2 Combining of TPC commands from radio links of different radio link sets

7.7.2.1 Definition and applicability

When a UE is in soft handover, multiple TPC commands may be received in each slot from different cells in the active set. In general, the TPC commands transmitted in the same slot in the different cells may be different and need to be combined to give TPC_cmd as specified in TS 25.214 [5], in order to determine the required uplink power step.

The requirements and this test apply to all types of UTRA for the FDD UE.

7.7.2.2 Minimum requirements

Test parameters are specified in table 7.7.2.1. The delay profiles of the signals received from the different cells are the same but time-shifted by 10 chips.

For Test 1, the uplink power changes between adjacent slots shall be as shown in table 7.7.2.2 over the 4 consecutive slots. Note that this case is without an additional noise source I_{oc}.

For Test 2, the Cell1 and Cell2 TPC patterns are repeated a number of times. If the transmitted power of a given slot is increased compared to the previous slot, then a variable "Transmitted power UP" is increased by one, otherwise a variable "Transmitted power DOWN" is increased by one. The requirements for "Transmitted power UP" and "Transmitted power DOWN" are shown in table 7.7.2.3.

Table 7.7.2.1: Parameters for TPC command combining

Parameter	Test 1	Test 2	Unit
Phase reference	P-CPICH		-
DPCH_Ec/Ior	–12		dB
$\hat{I}_{or1}$ and $\hat{I}_{or2}$	–60		dBm / 3,84 MHz
I_{oc}	-	-60	dBm / 3,84 MHz
Power-Control-Algorithm	Algorithm 1		-
Cell 1 TPC commands over 4 slots	{0,0,1,1}		-
Cell 2 TPC commands over 4 slots	{0,1,0,1}		-
Information Data Rate	12,2		Kbps
Propagation condition	Static without AWGN source I_{oc}	Multi-path fading case 3	-

Table 7.7.2.2: Requirements for Test 1

Test Number	Required power changes over the 4 consecutive slots
1	Down, Down, Down, Up

Table 7.7.2.3: Requirements for Test 2

Test Number	Ratio (Transmitted power UP) / (Total number of slots)	Ratio (Transmitted power DOWN) / (Total number of slots)
2	≥0,25	≥0,5

The reference for this requirement is TS 25.101 [1] clause 8.7.2.1.

7.7.2.3 Test purpose

To verify that the combining of TPC commands received in soft handover results in TPC_cmd being derived so as to meet the requirements stated in tables 7.7.2.2 and 7.7.2.3.

7.7.2.4 Method of test

7.7.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect two SS's to the UE antenna connector as shown in figure A.13.
2) Set the test parameters as specified in table 7.7.2.1 for Test 1.
3) Set up a call according to the Generic Call Setup procedure.
4) Signal the uplink DPCH power control parameters to use Algorithm 1 and a step size of 1dB.
5) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding the generic call setup procedure and loopback test.

7.7.2.4.2 Procedures

1) Before proceeding with paragraph (2), set the output power of the UE, measured at the UE antenna connector, to be in the range –10 ± 9 dBm. This may be achieved by setting the downlink signal ($\hat{I}_{or}$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SSs.

2) Send the following sequences of TPC commands in the downlink from each SS over a period of 5 timeslots:

	Downlink TPC commands				
	Slot #0	Slot #1	Slot #2	Slot #3	Slot #4
SS1	0	0	0	1	1
SS2	0	0	1	0	1

3) Measure the average output power at the UE antenna connector in timeslots # 0, 1, 2, 3 and 4, not including the 25 μs transient periods at the start and end of each slot.

4) End test 1 and disconnect UE.

5) Connect two SS's and an AWGN source to the UE antenna connector as shown in figure A.11.

6) Initialise variables "Transmitted power UP" and "Transmitted power DOWN" to zero.

7) Set the test parameters as specified in table 7.7.2.1 for Test 2.

8) Set up a call according to the Generic Call Setup procedure.

9) Signal the uplink DPCH power control parameters to use Algorithm 1 and a step size of 1 dB.

10) Enter the UE into loopback test mode and start the loopback test.

11) Perform the following steps a) to d) [15] times:

   a) Before proceeding with step b), set the output power of the UE, measured at the UE antenna connector, to be in the range –10 ± 9 dBm. This may be achieved by generating suitable downlink TPC commands from the SSs.

   b) Send the following sequences of TPC commands in the downlink from each SS over a period of 33 timeslots:

	Downlink TPC commands
SS1	1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1
SS2	1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1

   c) Measure the average output power at the UE antenna connector in each timeslot, not including the 25 μs transient periods at the start and end of each slot.

   d) For each timeslot from the 2nd timeslot to the 33rd timeslot inclusive:

      – if the average power in that timeslot is greater than or equal to the average power in the previous timeslot plus 0,5 dB, increment "Transmitted power UP" by 1;

      – if the average power in that timeslot is less than or equal to the average power in the previous timeslot minus 0,5 dB, increment "Transmitted power DOWN" by 1.

7.7.2.5 Test requirements

1) In Step 2) of clause 7.7.2.4.2, the average power in slot #1 shall be less than or equal to the average power in slot #0 minus 0,5 dB.

2) In Step 2) of clause 7.7.2.4.2, the average power in slot #2 shall be less than or equal to the average power in slot #1 minus 0,5 dB.

3) In Step 2) of clause 7.7.2.4.2, the average power in slot #3 shall be less than or equal to the average power in slot #2 minus 0,5 dB.

4) In Step 2) of clause 7.7.2.4.2, the average power in slot #4 shall be greater than or equal to the average power in slot #3 plus 0,5 dB.

5) At the end of the test, "Transmitted power UP" shall be greater than or equal to [95] and "Transmitted power DOWN" shall be greater than or equal to [210].

NOTE: The test limits in requirements (4) and (5) have been computed to give a confidence level of [99,7] % that a UE which follows the core requirements will pass. The number of timeslots has been chosen to get a good compromise between the test time and the risk of passing a bad UE.

7.8 Power control in downlink

Power control in the downlink is the ability of the UE receiver to converge to required link quality set by the network while using as low power as possible in downlink. If a BLER target has been assigned to a DCCH (See clause C.3), then it has to be such that outer loop is based on DTCH and not on DCCH.

7.8.1 Power control in the downlink, constant BLER target

7.8.1.1 Definition and applicability

Power control in the downlink is the ability of the UE receiver to converge to required link quality set by the network while using as low power as possible in downlink. If a BLER target has been assigned to a DCCH (See clause C.3), then it has to be such that outer loop is based on DTCH and not on DCCH. The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.1.2 Minimum requirements

For the parameters specified in table 7.8.1.1 the downlink $\frac{DPCH_E_c}{I_{or}}$ power measured values, which are averaged over one slot, shall be below the specified value in table 7.8.1.2 more than 90% of the time. BLER shall be as shown in table 7.8.1.2. Power control in downlink is ON during the test.

Table 7.8.1.1: Test parameter for downlink power control, constant BLER target

Parameter	Test 1	Test 2	Unit
$\hat{I}_{or}/I_{oc}$	9	-1	dB
I_{oc}	–60		dBm / 3,84 MHz
Information Data Rate	12,2		kbps
Target quality on DTCH	0,01		BLER
Propagation condition	Case 4		
Maximum_DL_Power (note)	7		dB
Minimum_DL_Power (note)	-18		dB
DL Power Control step size, Δ_{TPC}	1		dB
Limited Power Increase	"Not used"		-
NOTE: Power is compared to P-CPICH as specified in [9].			

Table 7.8.1.2: Requirements in downlink power control, constant BLER target

Parameter	Test 1	Test 2	Unit
$\frac{DPCH_E_c}{I_{or}}$	-16,0	-9,0	dB
Measured quality on DTCH	0,01 ± 30 %	0,01 ± 30 %	BLER

The reference for this requirement is TS 25.101 [1] clause 8.8.1.1.

7.8.1.3 Test purpose

To verify that the UE receiver is capable of converging to required link quality set by network while using as low power as possible.

7.8.1.4 Method of test

7.8.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.8.1.~~1~~3.

4) Enter the UE into loopback test mode and start the loopback test.

5) SS signals to UE target quality value on DTCH as specified in table 7.8.1.~~1~~3. SS will vary the physical channel power in downlink according to the TPC commands from UE. Downlink power control mode (DPC_MODE) 0 shall be used. At the same time BLER is measured. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.8.1.4.2 Procedure

1) After the target quality on DTCH is met, BLER is measured. Simultaneously the downlink $\frac{DPCH_E_c}{I_{or}}$ power averaged over one slot is measured. This is repeated until adequate amount of measurements is done to reach the required confidence level.

2) The measured quality on DTCH (BLER) and the measured downlink $\frac{DPCH_E_c}{I_{or}}$ power values averaged over one slot are compared to limits in table 7.8.1.2.

7.8.1.5 ~~7.8.1.5~~ Test Requirements

The test parameters are specified in table 7.8.1.3.

Table 7.8.1.3: Test parameter for downlink power control, constant BLER target

Parameter	Test 1	Test 2	Unit
$\hat{I}_{or}/I_{oc}$	9,6	-0,4	dB
I_{oc}	–60		dBm / 3,84 MHz
Information Data Rate	12,2		kbps
Target quality on DTCH	0,01		BLER
Propagation condition	Case 4		
Maximum_DL_Power (note)	7		dB
Minimum_DL_Power (note)	-18		dB
DL Power Control step size, Δ_{TPC}	1		dB
Limited Power Increase	"Not used"		-
NOTE: Power is compared to P-CPICH as specified in [9].			

a) The measured quality on DTCH does not exceed the values in table 7.8.1.~~2~~4.

b) The downlink $\frac{DPCH_E_c}{I_{or}}$ power values, which are averaged over one slot, shall be below the values in table 7.8.1.~~2~~ 4 more than 90 % of the time.

Table 7.8.1.~~2~~4: Requirements in downlink power control, constant BLER target

Parameter	Test 1	Test 2	Unit
$\frac{DPCH_E_c}{I_{or}}$	-15,9	-8,9	dB
Measured quality on DTCH	0,01 ± 30 %	0,01 ± 30 %	BLER

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.8.2 Power control in the downlink, initial convergence

7.8.2.1 Definition and applicability

This requirement verifies that DL power control works properly during the first seconds after DPCH connection is established. The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.2.2 Minimum requirements

For the parameters specified in table 7.8.2.1 the downlink DPCH_Ec/Ior power measured values, which are averaged over 50 ms, shall be within the range specified in table 7.8.2.2 more than 90 % of the time. T1 equals to 500 ms and it starts 10 ms after the DPDCH connection is initiated. T2 equals to 500 ms and it starts when T1 has expired. Power control is ON during the test.

Table 7.8.2.1: Test parameters for downlink power control, initial convergence

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Target quality value on DTCH	0,01	0,01	0,1	0,1	BLER
Initial DPCH_Ec/Ior	-5,9	-25,9	-2,1	-22,1	dB
Information Data Rate	12,2	12,2	64	64	kbps
$\hat{I}_{or}/I_{oc}$	-1				dB
I_{oc}	-60				dBm/3,84 MHz
Propagation condition	Static				
Maximum_DL_Power (note)	7				dB
Minimum_DL_Power (note)	-18				dB
DL Power Control step size, Δ_{TPC}	1				dB
Limited Power Increase	"Not used"				
NOTE: Power is compared to P-CPICH as specified in [9].					

Table 7.8.2.2: Requirements in downlink power control, initial convergence

Parameter	Test 1 and Test 2	Test 3 and Test 4	Unit
$\frac{DPCH_E_c}{I_{or}}$ during T1	-18,9 ≤ DPCH_Ec/Ior ≤ -11,9	-15,1 ≤ DPCH_Ec/Ior ≤ -8,1	dB
$\frac{DPCH_E_c}{I_{or}}$ during T2	-18,9 ≤ DPCH_Ec/Ior ≤ -14,9	-15,1 ≤ DPCH_Ec/Ior ≤ -11,1	dB

The reference for this requirement is TS 25.101 [1] clause 8.8.2.1.

7.8.2.3 Test purpose

To verify that DL power control works properly during the first seconds after DPCH connection is established.

7.8.2.4 Method of test

7.8.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

7.8.2.4.2 Procedure

1) Set up call using test parameters according to table 7.8.2.1.

2) SS signals to UE target quality value on DTCH as specified in table 7.8.2.~~1~~3. SS will vary the physical channel power in downlink according to the TPC commands from UE. Downlink power control mode (DPC_MODE) 0 shall be used.

3) Measure $\frac{DPCH_E_c}{I_{or}}$ power averaged over 50 ms during T1. T1 starts 10 ms after DPDCH connection is initiated and T1 equals to 500 ms.

4) Measure $\frac{DPCH_E_c}{I_{or}}$ power averaged over 50 ms during T2. T2 starts, when T1 has expired and T2 equals to 500 ms.

7.8.2.5 ~~7.8.2.5~~ Test Requirements

The test parameters are specified in table 7.8.2.3.

Table 7.8.2.3: Test parameters for downlink power control, initial convergence

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Target quality value on DTCH	0,01	0,01	0,1	0,1	BLER
Initial DPCH_Ec/Ior	-5,9	-25,9	-2,1	-22,1	dB
Information Data Rate	12,2	12,2	64	64	kbps
$\hat{I}_{or}/I_{oc}$	-0,4				dB
I_{oc}	-60				dBm/3,84 MHz
Propagation condition	Static				
Maximum_DL_Power (note)	7				dB
Minimum_DL_Power (note)	-18				dB
DL Power Control step size, Δ_{TPC}	1				dB
Limited Power Increase	"Not used"				
NOTE: Power is compared to P-CPICH as specified in [9].					

a) The downlink $\frac{DPCH_E_c}{I_{or}}$ power values shall be within the range specified in table 7.8.2.~~2~~ 4 during T1 more than 90 % of the time.

b) The downlink $\frac{DPCH_E_c}{I_{or}}$ power values shall be within the range specified in table 7.8.2.~~2~~ 4 during T2 more than 90 % of the time.

Table 7.8.2.4: Requirements in downlink power control, initial convergence

Parameter	Test 1 and Test 2	Test 3 and Test 4	Unit
$\frac{DPCH_E_c}{I_{or}}$ during T1	-18,8 ≤ DPCH_Ec/Ior ≤ -11,8	-15,0 ≤ DPCH_Ec/Ior ≤ -8,0	dB
$\frac{DPCH_E_c}{I_{or}}$ during T2	-18,8 ≤ DPCH_Ec/Ior ≤ -14,8	-15,0 ≤ DPCH_Ec/Ior ≤ -11,0	dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.8.3 Power control in the downlink, wind up effects

7.8.3.1 Definition and applicability

This requirement verifies that, after the downlink maximum power is limited in the UTRAN and it has been released again, the downlink power control in the UE does not have a wind up effect, i.e. the required DL power has increased during time period the DL power was limited. The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.3.2 Minimum requirements

This test is run in three stages where stage 1 is for convergence of the power control loop, in stage two the maximum downlink power for the dedicated channel is limited not to be higher than the parameter specified in table 7.8.3.1. All parameters used in the three stages are specified in table 7.8.3.1. The downlink $\frac{DPCH_E_c}{I_{or}}$ power measured values, which are averaged over one slot, during stage 3 shall be lower than the value specified in table 7.8.3.2 more than 90 % of the time. Power control of the UE is ON during the test.

Table 7.8.3.1: Test parameter for downlink power control, wind-up effects

Parameter	Test 1			Unit
	Stage 1	Stage 2	Stage 3	
Time in each stage	>15	5	0,5	s
$\hat{I}_{or}/I_{oc}$	5			dB
I_{oc}	-60			dBm/3,84 MHz
Information Data Rate	12,2			kbps
Quality target on DTCH	0,01			BLER
Propagation condition	Case 4			
Maximum_DL_Power (note)	7	-6,2	7	dB
Minimum_DL_Power (note)	-18			dB
DL Power Control step size, Δ_{TPC}	1			dB
Limited Power Increase	"Not used"			-
NOTE: Power is compared to P-CPICH as specified in [9].				

Table 7.8.3.2: Requirements in downlink power control, wind-up effects

Parameter	Test 1, stage 3	Unit
$\frac{DPCH_E_c}{I_{or}}$	-13,3	dB

The reference for this requirement is TS 25.101 [1] clause 8.8.3.1.

7.8.3.3 Test purpose

To verify that the UE downlink power control does not require too high downlink power during a period after the downlink power is limited by the UTRAN.

7.8.3.4 Method of test

7.8.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

4) RF parameters are set up according to table 7.8.3.~~1~~3. Stage 1 is used for the power control to converge and during Stage 2 the maximum downlink power is limited by UTRAN.

5) SS signals to UE target quality value on DTCH as specified in table 7.8.3.1. SS will vary the physical channel power in downlink according to the TPC commands from UE. Downlink power control mode (DPC_MODE) 0 shall be used.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.8.3.4.2 Procedure

1) Measure $\frac{DPCH_E_c}{I_{or}}$ power during stage 3 according to table 7.8.3.~~1~~3.

7.8.3.5 ~~7.8.3.5~~ Test Requirements

The test parameters are specified in table 7.8.3.3.

Table 7.8.3.3: Test parameter for downlink power control, wind-up effects

Parameter	Test 1			Unit
	Stage 1	Stage 2	Stage 3	
Time in each stage	>15	5	0,5	s
$\hat{I}_{or}/I_{oc}$	5,6			dB
I_{oc}	-60			dBm/3,84 MHz
Information Data Rate	12,2			kbps
Quality target on DTCH	0,01			BLER
Propagation condition	Case 4			
Maximum_DL_Power (note)	7	-6,2	7	dB
Minimum_DL_Power (note)	-18			dB
DL Power Control step size, Δ_{TPC}	1			dB
Limited Power Increase	"Not used"			-
NOTE: Power is compared to P-CPICH as specified in [9].				

The downlink $\frac{DPCH_E_c}{I_{or}}$ power values, which are averaged over one slot, shall be lower than the level specified in table 7.8.3.~~2~~4 during stage 3 more than 90 % of the time.

Table 7.8.3.4: Requirements in downlink power control, wind-up effects

Parameter	Test 1, stage 3	Unit
$\frac{DPCH_E_c}{I_{or}}$	-13,2	dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.9 Downlink compressed mode

Downlink compressed mode is used to create gaps in the downlink transmission, to allow the UE to make measurements on other frequencies.

7.9.1 Single link performance

7.9.1.1 Definition and applicability

The receiver single link performance of the Dedicated Traffic Channel (DCH) in compressed mode is determined by the Block Error Ratio (BLER) and transmitted DPCH_Ec/Ior power in the downlink.

The compressed mode parameters are given in clause C.5. Tests 1 and 2 are using Set 1 compressed mode pattern parameters from table C.5.1 in clause C.5 while tests 3 and 4 are using Set 2 compressed mode patterns from the same table.

The requirements and this test apply to all types of UTRA for the FDD UE.

7.9.1.2 Minimum requirements

For the parameters specified in table 7.9.1 the downlink $\frac{DPCH_E_c}{I_{or}}$ power measured values, which are averaged over one slot, shall be below the specified value in table 7.9.2 more than 90% of the time. The measured quality on DTCH shall be as required in table 7.9.2.

Downlink power control is ON during the test. Uplink TPC commands shall be error free. System simulator shall increase the transmitted power during compressed frames by the same amount that UE is expected to increase its SIR target during those frames.

Table 7.9.1: Test parameter for downlink compressed mode

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Delta SIR1	0	3	0	3	dB
Delta SIR after1	0	3	0	3	dB
Delta SIR2	0	0	0	0	dB
Delta SIR after2	0	0	0	0	dB
$\hat{I}_{or}/I_{oc}$	9				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2				kbps
Propagation condition	Case 2				
Target quality value on DTCH	0,01				BLER
Maximum DL Power (note)	7				dB
Minimum DL Power (note)	-18				dB
DL Power Control step size, Δ_{TPC}	1				dB
Limited Power Increase	"Not used"				-
NOTE: Power is compared to P-CPICH as specified in [9].					

Table 7.9.2: Requirements in downlink compressed mode

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
$\frac{DPCH_E_c}{I_{or}}$	-15,4	No requirements	-15,4	No requirements	dB
Measured quality of compressed and recovery frames	No requirements	< 0,001	No requirements	< 0,001	BLER
Measured quality on DTCH	0,01 ± 30 %				BLER

The reference for this requirement is TS 25.101 [1] clause 8.9.1.1.

7.9.1.3 Test purpose

The purpose of this test is to verify the reception of DPCH in a UE while downlink is in a compressed mode. The UE needs to preserve the BLER using sufficient low DL power. It is also verified that UE applies the Delta SIR values, which are signaled from network, in its outer loop power control algorithm.

7.9.1.4 Method of test

7.9.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to table 7.9.1. SS shall increase the transmitted power during compressed mode frames by the same amount that UE is expected to increase its SIR target during those frames.

4) Set compressed mode parameters according to table C.5.1. Tests 1 and 2 are using Set 1 compressed mode pattern parameters and while tests 3 and 4 are using Set 2 compressed mode pattern parameters.

5) Enter the UE into loopback test mode and start the loopback test.

6) SS signals to UE target quality value on DTCH as specified in table 7.9.1. Uplink TPC commands shall be error free. SS will vary the physical channel power in downlink according to the TPC commands from UE. SS response time for UE TPC commands shall be one slot. At the same time BLER is measured. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.9.1.4.2 Procedure

1) Test 1: Measure quality on DTCH and $\frac{DPCH_E_c}{I_{or}}$ power values averaged over one slot.

2) Test 2: Measure quality on DTCH and quality of compressed and recovery frames.

3) Test 3: Measure quality on DTCH and $\frac{DPCH_E_c}{I_{or}}$ power values averaged over one slot.

4) Test 4: Measure quality on DTCH and quality of compressed and recovery frames.

7.9.1.5 ~~7.9.1.5~~ Test requirements

The test parameters are specified in table 7.9.3.

Table 7.9.3: Test parameter for downlink compressed mode

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Delta SIR1	0	3	0	3	dB
Delta SIR after1	0	3	0	3	dB
Delta SIR2	0	0	0	0	dB
Delta SIR after2	0	0	0	0	dB
$\hat{I}_{or}/I_{oc}$	9,6				dB
I_{oc}	–60				dBm / 3,84 MHz
Information Data Rate	12,2				kbps
Propagation condition	Case 2				
Target quality value on DTCH	0,01				BLER
Maximum DL Power (note)	7				dB
Minimum DL Power (note)	-18				dB
DL Power Control step size, Δ_{TPC}	1				dB
Limited Power Increase	"Not used"				-
NOTE: Power is compared to P-CPICH as specified in [9].					

a) Test 1: The downlink $\frac{DPCH_E_c}{I_{or}}$ power values averaged over one slot shall be below the values in table 7.9.~~2~~4 more than 90 % of the time. The measured quality on DTCH shall be as required in table 7.9.~~2~~4.

b) Test 2: Measured quality on DTCH and measured quality of compressed and recovery frames do not exceed the values in table 7.9.~~2~~4.

c) Test3: The downlink $\frac{DPCH_E_c}{I_{or}}$ power values averaged over one slot shall be below the values in table 7.9.~~2~~4 more than 90 % of the time. The measured quality on DTCH shall be as required in table 7.9.~~2~~4.

d) Test 4: Measured quality on DTCH and measured quality of compressed and recovery frames do not exceed the values in table 7.9.~~2~~4.

Table 7.9.4: Requirements in downlink compressed mode

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
$\frac{DPCH_E_c}{I_{or}}$	-15,3	No requirements	-15,3	No requirements	dB
Measured quality of compressed and recovery frames	No requirements	< 0,001	No requirements	< 0,001	BLER
Measured quality on DTCH	0,01 ± 30 %				BLER

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

7.10 Blind transport format detection

7.10.1 Definition and applicability

Performance of Blind transport format detection is determined by the Block Error Ratio (BLER) values and by the measured average transmitted DPCH_Ec/Ior value.

7.10.2 Minimum requirements

For the parameters specified in table 7.10.1 the average downlink $\frac{DPCH_E_c}{I_{or}}$ power shall be below the specified value for the BLER and FDR shown in table 7.10.2.

Table 7.10.1: Test parameters for Blind transport format detection

Parameter	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Unit
$\hat{I}_{or}/I_{oc}$	–1			–3			dB
I_{oc}	–60						dBm / 3.84 MHz
Information Data Rate	12,2 (rate 1)	7,95 (rate 2)	1,95 (rate 3)	12,2 (rate 1)	7,95 (rate 2)	1,95 (rate 3)	kbps
propagation condition	static			multi-path fading case 3			-
TFCI	off						-

Table 7.10.2: The Requirements for DCH reception in Blind transport format detection

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER	FDR
1	–17,7dB	10^{-2}	10^{-4}
2	–17,8dB	10^{-2}	10^{-4}
3	–18,4dB	10^{-2}	10^{-4}
4	–13,0dB	10^{-2}	10^{-4}
5	–13,2dB	10^{-2}	10^{-4}
6	–13,8dB	10^{-2}	10^{-4}
NOTE: The value of DPCH_Ec/Ior, Ioc, and Ior/Ioc are defined in case of DPCH is transmitted.			

NOTE: In the test, 9 deferent Transport Format Combinations (table 7.10.3) are sent during the call set up procedure, so that UE has to detect correct transport format in this 9 candidates.

Table.7.10.3: Transport format combinations informed during the call set up procedure in the test

	1	2	3	4	5	6	7	8	9
DTCH	12,2 k	10,2 k	7,95 k	7,4 k	6,7 k	5,9 k	5,15 k	4,75 k	1,95 k
DCCH					2,4 k				

7.10.3 Test purpose

To verify the ability of the blind transport format detection to receive a predefined test signal, representing a static propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) and false transport format detection ratio (FDR) not exceeding a specified value.

To verify the ability of the blind transport format detection to receive a predefined test signal, representing a malti-path propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) and false transport format detection ratio (FDR) not exceeding a specified value.

7.10.4 Method of test

7.10.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1. Connect the SS and AWGN noise source to the UE antenna connector as shown in figure A.9 in the case for test 1-3. Connect the SS, multipath fading simulator and an AWGN noise source to the UE antenna connector as shown in figure A.10 in the case of test 4-6.
2. Set up a call according to the Generic call setup procedure.
3. Set the test parameters for test 1-6 as specified table 7.10.~~1~~ 4 and table 7.10.~~2~~5.
4. Enter the UE into loopback test mode and start the loopback test.
5. In the case of test 4-6, Setup fading simulator as fading condition case 3 which are described in table D.2.2.1.

7.10.4.2 Procedure

Measure BLER and FDR of DCH.

7.10.5 Test requirements

The test parameters are specified in table 7.10.4.

Table 7.10.4: Test parameters for Blind transport format detection

Parameter	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Unit
$\hat{I}_{or}/I_{oc}$	–0,7			–2,4			dB
I_{oc}	–60						dBm / 3.84 MHz
Information Data Rate	12,2 (rate 1)	7,95 (rate 2)	1,95 (rate 3)	12,2 (rate 1)	7,95 (rate 2)	1,95 (rate 3)	kbps
propagation condition	Static			multi-path fading case 3			-
TFCI	off						-

BLER and FDR shall not exceed the values at the DPCH_Ec/Ior specified in table 7.10.~~2~~5.

Table 7.10.5: The Requirements for DCH reception in Blind transport format detection

Test Number	$\frac{DPCH_E_c}{I_{or}}$	BLER	FDR
1	–17,6dB	10^{-2}	10^{-4}
2	–17,7dB	10^{-2}	10^{-4}
3	–18,3dB	10^{-2}	10^{-4}
4	–12,9dB	10^{-2}	10^{-4}
5	–13,1dB	10^{-2}	10^{-4}
6	–13,7dB	10^{-2}	10^{-4}
NOTE: The value of DPCH_Ec/Ior, Ioc, and Ior/Ioc are defined in case of DPCH is transmitted.			

NOTE: In the test, 9 deferent Transport Format Combinations (table 7.10.3) are sent during the call set up procedure, so that UE has to detect correct transport format in this 9 candidates.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

Annex F (normative): General test conditions and declarations

The requirements of this clause apply to all applicable tests in the present document.

Many of the tests in the present document measure a parameter relative to a value that is not fully specified in the UE specifications. For these tests, the Minimum Requirement is determined relative to a nominal value specified by the manufacturer.

When specified in a test, the manufacturer shall declare the nominal value of a parameter, or whether an option is supported.

In all the relevant clauses in this clause all Bit Error Ratio (BER), Block Error Ratio (BLER), False transmit format Detection Ratio **(**FDR) measurements shall be carried out according to the general rules for statistical testing in clause F.6.

F.1 Acceptable uncertainty of Test System

The maximum acceptable uncertainty of the Test System is specified below for each test, where appropriate. The Test System shall enable the stimulus signals in the test case to be adjusted to within the specified range, and the equipment under test to be measured with an uncertainty not exceeding the specified values. All ranges and uncertainties are absolute values, and are valid for a confidence level of 95 %, unless otherwise stated.

A confidence level of 95 % is the measurement uncertainty tolerance interval for a specific measurement that contains 95 % of the performance of a population of test equipment.

For RF tests it should be noted that the uncertainties in clause F.1 apply to the Test System operating into a nominal 50 ohm load and do not include system effects due to mismatch between the DUT and the Test System.

F.1.1 Measurement of test environments

The measurement accuracy of the UE test environments defined in annex G, Test environments shall be.

- Pressure ±5 kPa.
- Temperature ±2 degrees.
- Relative Humidity ±5 %.
- DC Voltage ±1,0 %.
- AC Voltage ±1,5 %.
- Vibration 10 %.
- Vibration frequency 0,1 Hz.

The above values shall apply unless the test environment is otherwise controlled and the specification for the control of the test environment specifies the uncertainty for the parameter.

F.1.2 Measurement of transmitter

Table F.1.2: Maximum Test System Uncertainty for transmitter tests

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
5.2 Maximum Output Power	±0,7 dB	
5.3 Frequency Error	±10 Hz	
5.4.1 Open loop power control in uplink	±1,0 dB	The uncertainty of this test is a combination of the downlink level setting error and the uplink power measurement that are uncorrelated. Formula = SQRT(source_level_error^2 + power_meas_error^2)
5.4.2 Inner loop power control in the uplink - One step	±0,1 dB relative over a 1,5 dB range (1 dB and 0 dB step) ±0,15 dB relative over a 3,0 dB range (2 dB step) ±0,2 dB relative over a 4.5 dB range (3 dB step)	This accuracy is based on the linearity of the absolute power measurement of the test equipment.
5.4.2 Inner loop power control in the uplink – seven and ten steps	±[0,3] dB relative over a 26 dB range	
5.4.3 Minimum Output Power	±1,0 dB	Measured on a static signal
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH_E_c}{I_{or}}$	±0,4 dB	0.1 dB uncertainty in DPCCH ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ based on power meter measurement after the combiner Overall error is the sum of the $\hat{I}_{or}/I_{oc}$ ~~Ioc/Ior~~ ratio error and the DPCCH_Ec/Ior ratio. The absolute error of the AWGN Ioc is not important but is specified as 1.0 dB
5.5.1 Transmit OFF Power: (static case)	±1,0 dB	Measured on a static signal
5.5.2 Transmit ON/OFF time mask (dynamic case)	On power +0,7 dB – 1,0 dB Off power (dynamic case) TBD	Assume asymmetric meas error -1.0 dB / 0.7 dB comprising RSS of: -0.7 dB downlink error plus -0.7 dB meas error, and +0.7 dB for upper limit (assume UE won't go above 24 nominal). For the off power, the accuracy of a two-pass measurement needs to be analysed.
5.6 Change of TFC: power control step size (7 dB step)	±0,3 dB relative over a 9 dB range	
5.7 Power setting in uplink compressed mode:-UE output power	Will be a subset of 5.4.2.	
5.8 Occupied Bandwidth	±100 kHz	Accuracy = ±3*RBW. Assume 30 kHz bandwidth.
5.9 Spectrum emission mask	±1,5 dB	
5.10 ACLR	5 MHz offset: ± 0,8 dB 10 MHz offset: ± 0,8 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
5.11 Spurious emissions	± 2,0 dB for UE and coexistence bands for results > -60 dBm ± 3,0 dB for results < -60 dBm Outside above: f≤2.2GHz: ± 1.5 dB 2.2 GHz < f ≤ 4 GHz: ± 2.0 dB f > 4 GHz: ±4.0 dB	
5.12 Transmit Intermodulation	± 2.2 dB	CW Interferer error is 0.7 dB for the UE power RSS with 0.7 dB for CW setting = 1.0 dB Measurement error of intermod product is 0.7 dB for UE power RSS with 0.7 dB for relative = 1.0 dB Interferer has an effect of 2 times on the intermod product so overall test uncertainty is 2*1.0 RSS with 1.0 = 2.2 dB. Apply half any excess test system uncertainty to increase the interferer level
5.13.1 Transmit modulation: EVM	±2.5 % (for single code)	
5.13.2 Transmit modulation: peak code domain error	±1.0dB	

F.1.3 Measurement of receiver

Table F.1.3: Maximum Test System Uncertainty for receiver tests

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.2 Reference sensitivity level	± 0.7 dB	
6.3 maximum input level:	± 0.7 dB	The critical parameter is the overall signal level and not the –19 dB DPCH_Ec/Ior ratio. 0.7 dB absolute error due to signal measurement DPCH_Ec/Ior ratio error is <0.1 dB but is not important so is ignored
6.4 Adjacent channel selectivity	± 1.1 dB	Overall system uncertainty comprises three quantities: 1. Wanted signal level error 2. Interferer signal level error 3. Additional impact of interferer ACLR Items 1 and 2 are assumed to be uncorrelated so can be root sum squared to provide the ratio error of the two signals. Assume for simplicity this ratio error is linearly added to the interferer ACLR. Test System uncertainty = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect. The ACLR effect is calculated by:(Formula to follow) (E.g. ACLR at 5 MHz of 51 dB gives additional error of .0765 dB. ACLR of 48 gives error of –0.15 dB.)
6.5 Blocking characteristics	System error with f <15 MHz offset: ± 1.4 dB f >= 15 MHz offset and $f_b \leq$ 2.2 GHz: ± [1.0] dB 2.2 GHz < f ≤ 4 GHz: ±[1.7] dB f > 4 GHz: ±[3.1] dB	Using ± 0.7 dB for signal and interferer as currently defined and 68 dB ACLR @ 10 MHz.
6.6 Spurious Response	f ≤ 2.2 GHz: ± 1.0 dB 2.2 GHz < f ≤ 4 GHz: ±1.7 dB f > 4 GHz: ±3.1 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.7 Intermodulation Characteristics	±1.3 dB	Similar issues to 7.4 ACS test. ETR028 says impact f the closer signal is twice that of the far signal. If both signals drop 1 dB, intermod product drops 2 dB. Formula = $\sqrt{(2 \cdot CW_level_error)^2 + (\mathrm{mod}_level_error)^2}$ (Using CW interferer ±0.5 dB, modulated interferer ±0.5 dB, wanted signal ±0.7 dB) 1.3 dB! Broadband noise/ACLR not considered but may have impact.
6.8 Spurious emissions	± 3.0 dB for UE receive band (-78 dBm) Outside above: f≤2.2GHz: ± 2.0 dB (-57 dBm) 2.2 GHz < f ≤ 4 GHz: ± 2.0 dB (-47 dBm) f > 4 GHz: ±4.0 dB (-47 dBm)	

F.1.4 Performance requirement

Table F.1.4: Maximum Test System Uncertainty for Performance Requirements

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
7.2 Demodulation in Static Propagation Condition	$\hat{I}_{or}/I_{oc}$ ±0.3 dB I_{oc} ±1.0 dB $\frac{DPCH_E_c}{I_{or}}$ ±0.1 dB	0.1 dB uncertainty in DPCH_Ec ratio 0.3 dB uncertainty in $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ based on power meter measurement after the combiner Overall error is the sum of the ~~Ioc/Io~~ $\hat{I}_{or}/I_{oc}$ r ratio error and the DPCH_Ec/Ior ratio but is not RSS for simplicity. The absolute error of the AWGN Ioc is not important for any tests in clause 7 but is specified as 1.0 dB.
7.3 Demodulation of DCH in multipath Fading Propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.56 dB I_{oc} ±1.0 dB $\frac{DPCH_E_c}{I_{or}}$ ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ is $(0.5^2 + 0.3^2)^{0.5}$ = 0.6 dB
7.4 Demodulation of DCH in Moving Propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.5 Demodulation of DCH in Birth-Death Propagation conditions	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH_E_c}{I_{or}}$ ±0.1 dB	Same as 7.3
7.6.1 Demodulation of DCH in open loop Transmit diversity mode	$\hat{I}_{or}/I_{oc}$ ±0.8 dB I_{oc} ±1.0 dB $\frac{DPCH_E_c}{I_{or}}$ ±0.1 dB	Worst case gain uncertainty due to the fader from the calibrated static profile is ±0.5 dB per output In addition the same ±0.3 dB $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ ratio error as 7.2. These are uncorrelated so can be RSS. Overall error in $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ is $(0.5^2 + 0.5^2 + 0.3^2)^{0.5}$ = 0.768 dB. Round up to 0.8 dB

Clause	Maximum Test System Uncertainty		Derivation of Test System Uncertainty
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode	$\hat{I}_{or}/I_{oc}$	±0.8 dB	Same as 7.6.1
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode	$\hat{I}_{or}/I_{oc}$	±0.8 dB	Same as 7.6.1
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.7.1 Demodulation in inter-cell soft Handover	$\hat{I}_{or}/I_{oc}$	±0.8 dB	Same as 7.6.1
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.7.2 Combining of TPC commands Test 1	$\hat{I}_{or}/I_{oc}$	±0.3 dB	Have two Ior1 and Ior2, and no AWGN. So error is only 0.3 dB Test is looking for changes in power – need to allow for relaxation in criteria for power step of probably 0.1 dB to 0.4 dB
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.7.2 Combining of TPC commands Test 2	$\hat{I}_{or}/I_{oc}$	±0.8 dB	Same as 7.6.1
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.8.1 Power control in downlink constant BLER target	$\hat{I}_{or}/I_{oc}$	±0.6 dB	Same as 7.3
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.8.2, Power control in downlink initial convergence	$\hat{I}_{or}/I_{oc}$	±0.6 dB	Same as 7.3
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.8.3, Power control in downlink: wind up effects	$\hat{I}_{or}/I_{oc}$	±0.6 dB	Same as 7.3
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.9 Downlink compressed mode	$\hat{I}_{or}/I_{oc}$	±0.6 dB	Same as 7.3
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	
7.10 Blind transport format detection Tests 1, 2, 3	$\hat{I}_{or}/I_{oc}$	±0.3 dB	Same as 7.2
	I_{oc}	±1.0 dB	
	$\frac{DPCH_E_c}{I_{or}}$	±0.1 dB	

Clause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
7.10 Blind transport format detection Tests 4, 5, 6	$\hat{I}_{or}/I_{oc}$ ±0.6 dB I_{oc} ±1.0 dB $\frac{DPCH_E_C}{I_{or}}$ ±0.1 dB	Same as 7.3

F.1.5 Requirements for support of RRM

TBD

F.2 Test Tolerances (This clause is informative)

The Test Tolerances defined in this clause have been used to relax the Minimum Requirements in the present document to derive the Test Requirements.

The Test Tolerances are derived from Test System uncertainties, regulatory requirements and criticality to system performance. As a result, the Test Tolerances may sometimes be set to zero.

The test tolerances should not be modified for any reason e.g. to take account of commonly known test system errors (such as mismatch, cable loss, etc.).

F.2.1 Transmitter

Table F.2.1: Test Tolerances for transmitter tests.

Clause	Test Tolerance
5.2 Maximum Output Power	0.7 dB
5.3 Frequency error	10 Hz
5.4.1 Open loop power control in uplink	1.0 dB
5.4.2 Inner loop power control in the uplink - One step	0.1 dB (1 dB and 0 dB step) 0.15 dB (2 dB step) 0.2 dB (3 dB step)
5.4.2 Inner loop power control in the uplink - seven and ten steps	[0.3] dB
5.4.3 Minimum Output Power	1.0 dB
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH_E_c}{I_{or}}$	0.4 dB
5.4.4 Out-of-synchronisation handling of output power: transmit ON/OFF time	0 ms
5.5.1 Transmit OFF power	1.0 dB
5.5.2 Transmit ON/OFF time mask (dynamic case)	On power +0.7 dB / -1.0 dB Off power TT [ ] dB
5.6 Change of TFC: power control step size	0.3 dB
5.7 Power setting in uplink compressed mode:-UE output power	See subset of 5.4.2
5.8 Occupied Bandwidth	0 kHz
5.9 Spectrum emission mask	1.5 dB
5.10 ACLR	0.8 dB
5.11 Spurious emissions	0 dB
5.12 Transmit Intermodulation	0 dB
5.13.1 Transmit modulation: EVM	0%
5.13.2 Transmit modulation: peak code domain error	1.0 dB

F.2.2 Receiver

Table F.2.2: Test Tolerances for receiver tests.

Clause	Test Tolerance
6.2 Reference sensitivity level	0.7 dB
6.3 Maximum input level:	0.7 dB
6.4 Adjacent channel selectivity	0 dB
6.5 Blocking characteristics	0 dB
6.6 Spurious Response	0 dB
6.7 Intermodulation Characteristics	0 dB
6.8 Spurious emissions	0 dB

F.2.3 Performance requirements

Table F.2.3: Test Tolerances for Performance Requirements.

Clause	Test Tolerance
7.2 Demodulation in Static Propagation Condition	0.3 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.3 Demodulation of DCH in multipath Fading Propagation conditions	0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.4 Demodulation of DCH in Moving Propagation conditions	0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.5 Demodulation of DCH in Birth-Death Propagation conditions	0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.6.1 Demodulation of DCH in open loop Transmit diversity mode	0.8 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode	0.8 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode	0.8 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.7.1 Demodulation in inter-cell soft Handover conditions	0.8 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.7.2 Combining of TPC commands Test 1	0.8 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.7.2 Combining of TPC commands Test 8	0.3 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.8.1 Power control in downlink constant BLER target	0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.8.2, Power control in downlink initial convergence	0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.8.3, Power control in downlink: wind up effects	0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.9 Downlink compressed mode	0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.10 Blind transport format detection Tests 1, 2, 3	0.3 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior
7.10 Blind transport format detection Tests 4, 5, 6	0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$ 0.1 dB for DPCH_Ec/Ior

F.2.4 Requirements for support of RRM

TBD

F.3 Interpretation of measurement results

The measurement results returned by the Test System are compared – without any modification – against the Test Requirements as defined by the shared risk principle.

The Shared Risk principle is defined in ETR 273-1-2 clause 6.5.

The actual measurement uncertainty of the Test System for the measurement of each parameter shall be included in the test report.

The recorded value for the Test System uncertainty shall be, for each measurement, equal to or lower than the appropriate figure in clause F.1 of the present document.

If the Test System for a test is known to have a measurement uncertainty greater than that specified in clause F.1, it is still permitted to use this apparatus provided that an adjustment is made value as follows.

Any additional uncertainty in the Test System over and above that specified in clause F.1 shall be used to tighten the Test Requirement – making the test harder to pass. (For some tests e.g. receiver tests, this may require modification of stimulus signals). This procedure will ensure that a Test System not compliant with clause F.1does not increase the chance of passing a device under test where that device would otherwise have failed the test if a Test System compliant with clause F.1 had been used.

F.4 Derivation of Test Requirements (This clause is informative)

The Test Requirements in the present document have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in clause F.2. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in table F.4.

Table F.4.1: Derivation of Test Requirements (Transmitter tests)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.2 Maximum Output Power	Power class 1 (33 dBm) Tolerance = +1/-3 dB Power class 2 (27 dBm) Tolerance = +1/-3 dB Power class 3 (24 dBm) Tolerance = +1/-3 dB Power class 4 (21 dBm) Tolerance = ±2 dB	0.7 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT For power classes 1-3: Upper Tolerance limit = +1.7 dB Lower Tolerance limit = -3.7 dB For power class 4: Upper Tolerance limit = +2.7 dB Lower Tolerance limit = -2.7 dB
5.3 Frequency Error	The UE modulated carrier frequency shall be accurate to within ±0.1 ppm compared to the carrier frequency received from the Node B.	10 Hz	Formula: modulated carrier frequency error + TT modulated carrier frequency error = ±(0.1 ppm + 10 Hz).
5.4.1 Open loop power control in the uplink	Open loop power control tolerance ±9 dB (Normal) Open loop power control tolerance ±12 dB (Normal)	1.0 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT For Normal conditions: Upper Tolerance limit = +10 dB Lower Tolerance limit = -10 dB For Extreme conditions: Upper Tolerance limit = +13 dB Lower Tolerance limit = -13 dB
5.4.2 Inner loop power control in uplink	See table 5.4.2.1 and 5,4,2,2	0.25dB 0.15 dB 0.2 dB [0.3 dB]	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT
5.4.3 Minimum Output Power	UE minimum transmit power shall be less than –50 dBm	1.0 dB	Formula: UE minimum transmit power + TT UE minimum transmit power = –49 dBm

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
5.4.4 Out-of-synchronisation handling of output power:	$\frac{DPCCH_E_c}{I_{or}}$ levels AB: -22 dB BD: -28 dB DE: -24 dB EF: -18 dB transmit ON/OFF time 200ms $\frac{DPDCH_E_c}{I_{or}}$ = -16.6 dB I_{oc} - 60 dBm $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = - 1 dB	0.4 dB for $\frac{DPCCH_E}{I_{or}}$ 0 ms for timing measurement	Formulas: Ratio between A and B + TT Ratio between B and D – TT Ratio between D and E – TT Ratio between E and F + TT transmit ON/OFF time + TT timing $\frac{DPDCH_E_c}{I_{or}}$ = -16.6 dB I_{oc} - 60 dBm $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = - 1 dB $\frac{DPCCH_E_c}{I_{or}}$ levels: AB: -21.6 dB BD: -28.4 dB DE: -24.4 dB EF: -17.6 dB transmit ON/OFF time 200ms timing Uncertainty of OFF power measurement is handled by Transmit OFF power test and uncertainty of ON power measurement is handled by Minimum output power test.
5.5.1 Transmit OFF power (static case)	Transmit OFF power shall be less than -56 dBm	1.0 dB	Formula: Transmit OFF power + TT Transmit OFF power = –55dBm.
5.5.2 Transmit ON/OFF time mask (dynamic case)	Transmit ON power shall be the target value as defined in clause 5.5.2.2 Transmit OFF power shall be less than -56 dBm	On power upper TT = 0.7 dB On power lower TT = 1.0 dB Off power TT [ ] dB	Formula for transmit ON power: Transmit ON power target upper limit + On power upper TT Transmit ON power target lower limit - On power lower TT To calculate Transmit ON power target value range take the nominal TX power range from Table 5.5.2.3 then apply table 5.4.1.1 open limits then apply table 5.7.1 (only if there has been a transmission gap) then cap the upper value using table 5.2.1. Formula for transmit OFF power: Transmit OFF power + Off power TT Transmit OFF power = [ ]dBm
5.6 Change of TFC: power control step size	TFC step size = +5 to +9 dB	0.3 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT Upper limit = -4.7 dB Lower limit = -9.3 dB
5.7 Power setting in uplink compressed mode	Various	TBD (Subset of 5.4.2)	TBD

<table>
<tr><th>Test</th><th colspan="2">Minimum Requirement in TS 25.101</th><th>Test Tolerance (TT)</th><th colspan="2">Test Requirement in TS 34.121</th></tr>
<tr><td>5.8 Occupied Bandwidth</td><td colspan="2">The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3.84 Mcps.</td><td>0 kHz</td><td colspan="2">Formula: occupied channel bandwidth: + TT

occupied channel bandwidth = 5.0 MHz</td></tr>
<tr><td>5.9 Spectrum emission mask</td><td colspan="2">Minimum requirement defined in TS25.101 Table 6.10.
The lower limit shall be –50 dBm / 3.84 MHz or which ever is higher.</td><td>1.5 dB</td><td colspan="2">Formula: Minimum requirement + TT
Lower limit + TT
Add 1.5 to Minimum requirement entries in TS25.101 Table 6.10
The lower limit shall be –48.5 dBm / 3.84 MHz or which ever is higher.</td></tr>
<tr><td>5.10 Adjacent Channel Leakage Power Ratio (ACLR)</td><td colspan="2">Power Classes 3 and 4:
UE channel +5 MHz or -5 MHz, ACLR limit: 33 dB
UE channel +10 MHz or -10 MHz, ACLR limit: 43 dB</td><td>0.8 dB</td><td colspan="2">Formula: ACLR limit - TT
Power Classes 3 and 4:
UE channel +5 MHz or -5 MHz, ACLR limit: 32.2 dB
UE channel +10 MHz or -10 MHz, ACLR limit: 42.2 dB</td></tr>
<tr><td rowspan="12">5.11 Spurious Emissions</td><td colspan="2"></td><td></td><td colspan="2">Formula: Minimum Requirement+ TT
Add zero to all the values of Minimum Requirements in table 5.11.1a and 5.11.1b.</td></tr>
<tr><td>Frequency Band</td><td>Minimum Requirement</td><td></td><td>Frequency Band</td><td>Minimum Requirement</td></tr>
<tr><td>9 kHz ≤ f < 150 kHz</td><td>–36dBm /1kHz</td><td>0 dB</td><td>9kHz ≤ f < 1GHz</td><td>–36dBm /1kHz</td></tr>
<tr><td>150 kHz ≤ f < 30 MHz</td><td>–36dBm /10kHz</td><td>0 dB</td><td>150 kHz ≤ f < 30 MHz</td><td>–36dBm /10kHz</td></tr>
<tr><td>30 MHz ≤ f < 1000 MHz</td><td>–36dBm /100kHz</td><td>0 dB</td><td>30 MHz ≤ f < 1000 MHz</td><td>–36dBm /100kHz</td></tr>
<tr><td rowspan="3">1 GHz ≤ f < 12.75 GHz</td><td rowspan="3">–30dBm /1MHz</td><td>0 dB</td><td>1 GHz ≤ f < 2.2 GHz</td><td>–30dBm /1MHz</td></tr>
<tr><td>0 dB</td><td>2.2 GHz ≤ f < 4 GHz</td><td>–30dBm /1MHz</td></tr>
<tr><td>0 dB</td><td>4 GHz ≤ f < 12.75 GHz</td><td>–30dBm /1MHz</td></tr>
<tr><td>1893.5 MHz < f < 1919.6 MHz</td><td>–41dBm /300kHz</td><td>0 dB</td><td>1893.5 MHz < f < 1919.6 MHz</td><td>–41dBm /300kHz</td></tr>
<tr><td>925 MHz ≤ f ≤ 935 MHz</td><td>–67dBm /100kHz</td><td>0 dB</td><td>925 MHz ≤ f ≤ 935 MHz</td><td>–67dBm /100kHz</td></tr>
<tr><td>935 MHz < f ≤ 960 MHz</td><td>–79dBm /100kHz</td><td>0 dB</td><td>935 MHz < f ≤ 960 MHz</td><td>–79dBm /100kHz</td></tr>
<tr><td>1805 MHz ≤ f ≤ 1880 MHz</td><td>–71dBm /100kHz</td><td>0 dB</td><td>1805 MHz ≤ f ≤ 1880 MHz</td><td>–71dBm /100kHz</td></tr>
<tr><td>5.12 Transmit Intermodulation</td><td colspan="2">Intermodulation Product
5MHz -31 dBc
10MHz -41 dBc
CW Interferer level = -40 dBc</td><td>0 dB</td><td colspan="2">Formula: CW interferer level – TT/2

Intermod Products limits remain unchanged.

CW interferer level = -40 dBc</td></tr>
<tr><td>5.13.1 Transmit modulation: EVM</td><td colspan="2">The measured EVM shall not exceed 17.5%.</td><td>0%</td><td colspan="2">Formula: EVM limit + TT
EVM limit = 17.5 %</td></tr>
<tr><td>5.13.2 Transmit modulation: peak code domain error</td><td colspan="2">The measured Peak code domain error shall not exceed -15 dB.</td><td>1.0 dB</td><td colspan="2">Formula: Peak code domain error + TT
Peak code domain error = -14 dB</td></tr>
</table>

Table F.4.2: Derivation of Test Requirements (Receiver tests)

Test	Minimum Requirement in TS 25.101		Test Tolerance (TT)	Test Requirement in TS 34.121	
6.2 Reference sensitivity level	Îor = -106.7 dBm / 3.84 MHz DPCH_Ec = –117 dBm / 3.84 MHz BER limit = 0.001		0.7 dB	Formula: Îor+ TT DPCH_Ec + TT BER limit unchanged Îor = -106 dBm / 3.84 MHz DPCH_Ec = -116.3 dBm / 3.84 MHz	
6.3 Maximum input level	-25 dBm Ior -19 dBc DPCH_Ec/Ior		0.7 dB	Formula: Ior-TT Ior = -25.7 dBm	
6.4 Adjacent Channel Selectivity	Îor = -92.7 dBm / 3.84 MHz DPCH_Ec = –103 dBm / 3.84 MHz Ioac (modulated) = -52 dBm/3.84 MHz BER limit = 0.001		0 dB	Formula: Îor unchanged DPCH_Ec unchanged Ioac – TT BER limit unchanged Ioac = -52 dBm/3.84 MHz	
6.5 Blocking Characteristics	See Table 6.5.3 and 6.5.4. in TS34.121 BER limit = 0.001		0 dB	Formula: $I_{blocking}$ (modulated) - TT (dBm/3.84MHz) $I_{blocking}$ (CW) - TT (dBm) BER limit unchanged	
6.6 Spurious Response	Iblocking(CW) –44 dBm Fuw: Spurious response frequencies BER limit = 0.001		0 dB	Formula: $I_{blocking}$ (CW) - TT (dBm) Fuw unchanged BER limit unchanged $I_{blocking}$(CW) = -44 dBm	
6.7 Intermodulation Characteristics	Iouw1 (CW) -46 dBm Iouw2 (modulated) –46 dBm / 3.84 MHz Fuw1 (offset) 10 MHz Fuw2 (offset) 20 MHz Ior = -103.7 dBm/3.84 MHz DPCH_Ec = -114 dBm/3.84 BER limit = 0.001		0 dB	Formula: Ior + TT DPCH_Ec + TT Iouw1 level unchanged Iouw2 level unchanged BER limit unchanged. Ior = -114 dBm BER limit. = 0.001	
6.8 Spurious Emissions				Formula: Maximum level + TT Add zero to all the values of Maximum Level in table 6.8.1.	
	Frequency Band	Maximum level		Frequency Band	Maximum level
	9kHz ≤ f < 1GHz	-57dBm /100kHz	0 dB	9kHz ≤ f < 1GHz	-57dBm /100kHz
	1GHz ≤ f ≤ 12.75GHz	-47dBm /1MHz	0 dB	1GHz ≤ f ≤ 2.2GHz	-47dBm /1MHz
			0 dB	2.2GHz < f ≤ 4GHz	-47dBm /1MHz
			0 dB	4GHz < f ≤ 12.75GHz	-47dBm /1MHz
	1920MHz ≤ f ≤ 1980MHz	-60dBm /3.84MHz	0 dB	1920MHz ≤ f ≤ 1980MHz	-60dBm /3.84MHz
	2110MHz ≤ f ≤ 2170MHz	-60dBm /3.84MHz	0 dB	2110MHz ≤ f ≤ 2170MHz	-60dBm /3.84MHz

Table F.4.3: Derivation of Test Requirements (Performance tests)

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.2 Demodulation of DPCH in static conditions	$\frac{DPCH_E_c}{I_{or}}$ -5.5 to -16.6 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = -1 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.3 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = -0.7 dB $\frac{DPCH_E_c}{I_{or}}$ -5.4 to -16.5 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 1-4	$\frac{DPCH_E_c}{I_{or}}$ -2.2 to -15.0 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = 9 dB to -3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = 9.6 to –2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -2.1 to -14.9 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 5-8	$\frac{DPCH_E_c}{I_{or}}$ -3.2 to -7.7 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 6 dB to -3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 6.6 to -2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -3.1 to -7.6 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 9-12	$\frac{DPCH_E_c}{I_{or}}$ -4.4 to -11.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 6 dB to -3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 6.6 to –2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -4.3 to –11.7 dB:

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 13-16	$\frac{DPCH_E_c}{I_{or}}$ -2.2 to -15.0 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 $\frac{DPCH_E_c}{I_{or}}$ -2.1 to -14.9 dB:
7.3 Demodulation of DPCH in multi-path fading propagation conditions Tests 17-20	$\frac{DPCH_E_c}{I_{or}}$ -1.4 to -8.8 dB I_{oc} = -60 dBm $\hat{I}_{or}/I_{oc}$ = 6 to -3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 6.6 to –2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -1.3 to -8.7 dB:
7.4 Demodulation of DPCH in moving propagation conditions	$\frac{DPCH_E_c}{I_{or}}$ -~~2.2~~10.9 to ~~–15.0~~-14.5 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = ~~9 dB to –3~~-1 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc =+~~ ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = -0.4~~9.6 to –2.4~~ dB $\frac{DPCH_E_c}{I_{or}}$ -~~2.1~~10.8 to –14.~~9~~ 4 dB:
7.5 Demodulation of DPCH birth-death propagation conditions	$\frac{DPCH_E_c}{I_{or}}$ -~~2.2~~8.7 to ~~–15.0~~12.6 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = ~~9 dB to –3~~ -1 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc =+~~ ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = -0.4~~9.6 to –2.4~~ dB $\frac{DPCH_E_c}{I_{or}}$ -~~2.1~~8.6 to ~~–14.9~~12.5 dB:

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.6.1 Demodulation of DPCH in transmit diversity propagation conditions	$\frac{DPCH_E_c}{I_{or}}$ -16.8 dB~~2.2 to –15.0~~ I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = 9 dB ~~to –3 dB~~	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.8 dB for ~~Ioc/Ior~~ $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc =+~~ ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ ~~Ior/Ioc~~ = 9.~~6~~ 8 ~~to –2.4~~ dB $\frac{DPCH_E_c}{I_{or}}$ ~~-2.1 to –14.9~~16,7 dB:
7.6.2 Demodulation of DCH in closed loop Transmit diversity mode	$\frac{DPCH_E_c}{I_{or}}$ -18 to -18.3 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.8 dB $\frac{DPCH_E_c}{I_{or}}$ -17.9 to -18.2 dB: ~~To be completed~~
7.6.3, Demodulation of DCH in site selection diversity Transmission power control mode	$\frac{DPCH_E_c}{I_{or}}$ -7.5 to -9.2 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 0 to -3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 0.8 to -2.2 dB $\frac{DPCH_E_c}{I_{or}}$ -7.4 to -9.1 dB: ~~To be completed~~
7.7.1 Demodulation in inter-cell soft Handover	$\frac{DPCH_E_c}{I_{or}}$ -5.5 to –15.2 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = Ior2/Ioc = 6 to 0 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.8 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 6.8 to 0.8 dB $\frac{DPCH_E_c}{I_{or}}$ -5.4 to –15.4 dB: ~~To be completed~~
7.7.2 Combining of TPC commands Test 1			To be completed

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.7.2 Combining of TPC commands Test 2			To be completed
~~7.7.2 Combining of TPC commands Test 2~~			~~To be completed~~
7.8.1 Power control in downlink constant BLER target	$\frac{DPCH_E_c}{I_{or}}$ -9 to -16 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 to -1 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 to -0.4 dB $\frac{DPCH_E_c}{I_{or}}$ -8.9 to –15.9 dB: ~~To be completed~~
7.8.2, Power control in downlink initial convergence	$\frac{DPCH_E_c}{I_{or}}$ -8.1 to –18.9 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = -1 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = -0.4 dB $\frac{DPCH_E_c}{I_{or}}$ -8.0 to -18.8 dB: ~~To be completed~~
7.8.3, Power control in downlink: wind up effects	$\frac{DPCH_E_c}{I_{or}}$ -13.3 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 5 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 5.6 dB $\frac{DPCH_E_c}{I_{or}}$ -13.2 dB: ~~To be completed~~

Test	Minimum Requirement in TS 25.101	Test Tolerance (TT)	Test Requirement in TS 34.121
7.9 Downlink compressed mode	$\frac{DPCH_E_c}{I_{or}}$ -15.4 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = 9 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = 9.6 dB $\frac{DPCH_E_c}{I_{or}}$ -15.3 dB: ~~To be completed~~
7.10 Blind transport format detection Tests 1, 2, 3	$\frac{DPCH_E_c}{I_{or}}$ -17.7 to -18.4 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = -1 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.3 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = -0.7 dB $\frac{DPCH_E_c}{I_{or}}$ -17.6 to –18.3 dB: ~~To be completed~~
7.10 Blind transport format detection Tests 4, 5, 6	$\frac{DPCH_E_c}{I_{or}}$ -13.0 to -13.8 dB I_{oc} = - 60 dBm $\hat{I}_{or}/I_{oc}$ = -3 dB	0.1 dB for $\frac{DPCH_E_c}{I_{or}}$ 0.6 dB for $\hat{I}_{or}/I_{oc}$	Formulas: $\frac{DPCH_E_c}{I_{or}}$ = ratio + TT $\hat{I}_{or}/I_{oc}$ = ratio + TT I_{oc} unchanged $\hat{I}_{or}/I_{oc}$ = -2.4 dB $\frac{DPCH_E_c}{I_{or}}$ -12.9 to -13.7 dB: ~~To be completed~~

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020142

2CR-Form-v3

CHANGE REQUEST

⌘ **TS 34.121 CR 136** ⌘ rev **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Update of RRM Cell reselection delay tests in idle mode
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-07
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Modification of Initial conditions and Procedure/Test requirements
Summary of change:	⌘	1. "Initial conditions" clause: Test environment and frequency range is added 2. "Procedure" and "Test requirements" clause: "Test requirements" are cleaned up so any procedural statements are moved to "Procedure"
Consequences if not approved:	⌘	Initial conditions will be insufficiently specified and the test procedure will be split between "Procedure" and "Test requirements"

Clauses affected:	⌘	Clause 8
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track ch anges") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8 Requirements for support of RRM

8.1 General

8.2 Idle Mode Tasks

8.2.1 Cell Selection

Void.

8.2.2 Cell Re-Selection

8.2.2.1 Scenario 1: Single carrier case

8.2.2.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change makes the UE camp on a new cell, and starts to send preambles on the PRACH for the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the FDD UE.

8.2.2.1.2 Minimum requirement

The cell re-selection delay shall be less than 8 s with a DRX cycle length of 1.28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE: The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$	See Table 4.1 in TS 25.133 [2] clause 4.2.2.
T_{SI}	Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2.2 and A.4.2.1.

8.2.2.1.3 Test purpose

To verify that the UE meets the minimum requirement.

8.2.2.1.4 Method of test

8.2.2.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

This scenario implies the presence of 1 carrier and 6 cells as given in tables 8.2.2.1.1 and 8.2.2.1.2. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1 280 ms. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.1.1: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter	Unit	Value	Comment
Access Service Class (ASC#0) - Persistence value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
DRX cycle length	s	1,28	The value shall be used for all cells in the test.
T1	s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2	s	15	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table 8.2.2.1.2: Test parameters for Cell re-selection single carrier multi cell

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0,941		-0,941		-0,941		-0,941		-0,941		-0,941	
$\hat{I}_{or}/I_{oc}$	dB	7,3	10,27	10,27	7,3	0,27		0,27		0,27		0,27	
I_{oc}	dBm / 3,84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dB	21		21		21		21		21		21	
$Qoffset2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFFSET2	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	

8.2.2.1.4.2 Procedure

1~~a~~) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE.

2~~b~~) The UE is switched on.

3~~c~~) The SS waits for random access requests from the UE on cell 2.

4~~d~~) After 15 s, the parameters are changed as described for T2.

5~~e~~) The SS waits for random access requests from the UE. If the UE responds on cell 1 within 8 s then the number of successful tests is increased by one.

6~~f~~) After another 15 s, the parameters are changed as described for T1.

7~~g~~) The SS waits for random access requests from the UE. If the UE responds on cell 2 within 8 s then the number of successful tests is increased by one.

8~~h~~) Repeat step 4~~d~~) to 7~~g~~) [TBD] times.

8.2.2.1.5 Test requirements

~~1) In step c), after the UE has responded on cell 2, it shall not respond on any other cell (cell selection).~~

~~2) In step e), the UE shall respond on cell 1 within 8 s.~~

~~3) In step g), the UE shall respond on cell 2 within 8 s.~~

For the test to pass, the total number of ~~fulfilled~~ successful attempts~~tests~~ ~~requirements 2) and 3)~~ shall be more than 90% with a confidence level of [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.2.2 Scenario 2: Multi carrier case

8.2.2.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change makes the UE camp on a new cell, and starts to send preambles on the PRACH for the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the FDD UE.

8.2.2.2.2 Minimum requirement

The cell re-selection delay shall be less than 8 s with a DRX cycle length of 1.28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE: The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$	See Table 4.1 in TS 25.133 [2] clause 4.2.2.
T_{SI}	Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2.3 and A.4.2.2.

8.2.2.2.3 Test purpose

To verify that the UE meets the minimum requirement.

8.2.2.2.4 Method of test

8.2.2.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

This scenario implies the presence of 2 carriers and 6 cells as given in tables 8.2.2.2.1 and 8.2.2.2.2. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1 280 ms. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.2.1: General test parameters for Cell Re-selection in multi carrier case

Parameter	Unit	Value	Comment
Access Service Class (ASC#0) - Persistence value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
DRX cycle length	S	1,28	The value shall be used for all cells in the test.
T1	s	30	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2	s	15	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table 8.2.2.2.2: Test parameters for Cell re-selection multi carrier multi cell

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm / 3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dB	21		21		21		21		21		21	
$Qoffset2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
Sintersearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	

8.2.2.2.4.2 Procedures

1~~a~~) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE.

2~~b~~) The UE is switched on.

3~~c~~) The SS waits for random access requests from the UE on cell 2.

4~~d~~) After 30 s, the parameters are changed as described for T2.

5~~e~~) The SS waits for random access request from the UE. If the UE responds on cell 1 within 8 s then the number of successful tests is increased by one.

6~~f~~) After another 15 s, the parameters are changed as described for T1.

7~~g~~) The SS waits for random access requests from the UE. If the UE responds on cell 2 within 8 s then the number of successful tests is increased by one.

8~~h~~) Reduce T1 to 15 s and repeat step 4~~d~~) to 7~~g~~) [TBD] times.

NOTE: T1 is initially 30 s to allow enough time for the UE to search for cells as it has no prior knowledge of these.

8.2.2.2.5 Test requirements

~~1) In step c), after the UE has responded on cell 2, it shall not respond on any other cell (cell selection).~~

~~2) In step e), the UE shall respond on cell 1 within 8 s.~~

~~3) In step g), the UE shall respond on cell 2 within 8 s.~~

For the test to pass, the total number of ~~fulfilled~~ successful tests ~~requirements 2) and 3)~~ shall be more than 90% with a confidence level of [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.3 UTRAN to GSM Cell Re-Selection

8.2.3.1 Scenario 1: Both UTRA and GSM level changed

8.2.3.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change makes the UE camp on a new cell and starts to send the RR Channel Request message for location update to the new cell.

The requirements and this test apply to the combined FDD and GSM UE.

8.2.3.1.2 Minimum requirement

The cell re-selection delay shall be less than 26 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell TS 05.08 [20].

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE: The cell re-selection delay can be expressed as: 4* $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$ See Table 4.1 in TS 25.133 [2] clause 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell TS 05.08 [20]. According to [20], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2 and A.4.3.1.

8.2.3.1.3 Test purpose

To verify that the UE meets the minimum requirement.

8.2.3.1.4 Method of test

8.2.3.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.3.1.1: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	[TBD]	
T2		s	[TBD]	

Table 8.2.3.1.2: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	DB	-10	
PCCPCH_Ec/Ior	DB	-12	
SCH_Ec/Ior	DB	-12	
PICH_Ec/Ior	DB	-15	
OCNS_Ec/Ior	DB	-0.941	
$\hat{I}_{or}/I_{oc}$	DB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	DB	-13	-16.2
CPICH_RSCP	DBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	DB	-20	
Qrxlevmin	DBm	-115	
UE_TXPWR_MAX_RACH	DBm	21	
$Qoffset1_{s,n}$	DB	C1, C2: 0	
Qhyst1	DB	0	
PENALTY_TIME	S	C2: 0	
TEMPORARY_OFFSET1	DB	C2: 0	
Treselection	S	0	
$Ssearch_{RAT}$	DB	not sent	

Table 8.2.3.1.3: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

8.2.3.1.4.2 Procedure

1~~a~~) The SS activates cell 1 and 2 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE.

2~~b~~) The UE is switched on.

3~~c~~) The SS waits for random access requests from the UE on cell 1.

4~~d~~) After T1 s, the parameters are changed as described for T2.

5~~e~~) The SS waits for random access requests from the UE If the UE responds on cell 2 within 28 s then the number of successful tests is increased by one..

6~~f~~) After T2 s, the parameters are changed as described for T1.

7~~g~~) The SS waits for random access requests from the UE on cell 1.

8~~h~~) Repeat step 4~~d~~) to 7~~g~~) [TBD] times.

8.2.3.1.5 Test requirements

~~1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).~~

~~2) In step e), the UE shall respond on cell 2 within 28 s.~~

~~3) In step g), the UE shall respond on cell 1~~

For the test to pass, the total number of ~~fulfilled~~ successful tests ~~requirements in step 2)~~ shall be at least 90% of the cases with a confidence level of [FFS]%.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.3.2 Scenario 2: Only UTRA level changed

8.2.3.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change makes the UE camp on a new cell and starts to send the RR Channel Request message for location update to the new cell.

The requirements and this test apply to the combined FDD and GSM UE.

8.2.3.2.2 Minimum requirement

The cell re-selection delay shall be less than 4 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell TS 05.08 [20].

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE: The cell re-selection delay can be expressed as: 3* $T_{measureFDD}$ + T_{BCCH}, where:

$T_{measureFDD}$ See Table 4.1 in TS 25.133 [2] clause 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell TS 05.08 [20]. According to [20], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 3.84 s + T_{BCCH}, allow 4 s + T_{BCCH} in the test case.

The normative reference for this requirement is TS 25.133 [2] clauses 4.2.2 and A.4.3.2.

8.2.3.2.3 Test purpose

To verify that the UE meets the minimum requirement.

8.2.3.2.4 Method of test

8.2.3.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.3.2.1: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	45	
T2		s	10	

Table 8.2.3.2.2: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	20	-9
I_{oc}	dBm/3.84 MHz	-81	
CPICH_Ec/Io	dB	-10.0	-19.5
CPICH_RSCP	dBm	-70	-100
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table 8.2.3.2.3: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-80
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

8.2.3.2.4.2 Procedure

1~~a~~) The SS activates cell 1 and 2 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE.

2~~b~~) The UE is switched on.

3~~c~~) The SS waits for random access requests from the UE on cell 1.

4~~d~~) After 45 s, the parameters are changed as described for T2.

5~~e~~) The SS waits for random access requests from the UE. If the UE responds on cell 2 within 6 s then the number of successful tests is increased by one.

6~~f~~) After 10 s, the parameters are changed as described for T1.

7~~g~~) The SS waits for random access requests from the UE on cell 1.

8~~h~~) Repeat step 4~~d~~) to 7~~g~~) [TBD] times.

8.2.3.2.5 Test requirements

~~1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).~~

~~2) In step e), the UE shall respond on cell 2 within 6 s.~~

~~3) In step g), the UE shall respond on cell 1~~

For the test to pass, the total number of ~~fulfilled~~ succesful tests ~~requirements in step 2)~~ shall be at least 90% of the cases with a confidence level of [FFS]%.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

3GPP TSG-T WG1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

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CR-Form-v6.1

CHANGE REQUEST

⌘	**34.121**	**CR**	**135**	⌘ **rev**	**-**	⌘	Current version:	**3.7.0**	⌘

Spec Title: Terminal Conformance Specification; Radio transmission and reception (FDD) ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction changes in clause 8.7
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18-Feb-02
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Functional and editorial changes need to be done in clause 8.7.
Summary of change:	⌘	• Remove the square brackets from the [1000] measurements and the [1] sec of the test procedure in the performance measurement test cases (clause 8.7). • Refer to the new created Annex I where appropriate in clause 8.7. • Add TS 34.123-1 and TS 25.215 in the reference section. • Some additional general corrections.
Consequences if not approved:	⌘	Clause 8.7 will be inaccurate, and in some parts there will be used incorrect default messages for the test procedures.

Clauses affected:	⌘	2, 8.7
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

1 Scope

The present document specifies the measurement procedures for the conformance test of the user equipment (UE) that contain transmitting characteristics, receiving characteristics and performance requirements in FDD mode.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TS 25.101 "UE Radio transmission and reception (FDD)".

[2] 3GPP TS 25.133 "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108 "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109 "Terminal logical test interface; Special conformance testing functions".

[5] 3GPP TS 25.214 "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990 "Vocabulary".

[8] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol Specification".

[9] 3GPP TS 25.433 "UTRAN Iub Interface NBAP Signalling".

[10] ITU-R Recommendation SM.329: "Spurious emissions".

[11] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[12] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".

[13] 3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[14] 3GPP TS 25.213: "Spreading and modulation (FDD)".

[15] 3GPP TS 25.223: "Spreading and modulation (TDD)".

[16] ETSI ETR 273-1-2: "Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[17] 3GPP TR 25.926: "UE Radio Access Capabilities".

[18] 3GPP TR 21.904: "UE capability requirements".

[19] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[20] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

[21] 3GPP TS 34.123-1: " User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance Specification".

[22] 3GPP TS 25.215: "Physical Layer – Measurements (FDD)".

3 Definitions, symbols, abbreviations and equations

Definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [5] and TR 25.990 [6].

Terms are listed in alphabetical order in this clause.

3.1 Definitions

For the purpose of the present document, the following additional terms and definitions apply:

Average power: [TBD]

3.2 Symbols

For the purposes of the present document, the following symbols apply:

[…]	Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken

3.3 Abbreviations

For the purpose of the present document, the following additional abbreviations apply:

AFC	Automatic Frequency Control
ASD	Acceleration Spectral Density
ATT	Attenuator
BER	Bit Error Ratio
BLER	Block Error Ratio
BTFD	Blind Transport Format Detection
EVM	Error Vector Magnitude
FDR	False transmit format Detection Ratio
HYB	Hybrid
IM	Intermodulation
ITP	Initial Transmission Power control mode
OBW	Occupied Bandwidth
OCNS	Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink
PAR	Peak to Average Ratio
P-CCPCH	Primary Common Control Physical Channel
P-CPICH	Primary Common Pilot Channel
PCDE	Peak Code Domain Error
RBW	Resolution Bandwidth
RRC	Root-Raised Cosine
S-CCPCH	Secondary Common Control Physical Channel
S-CPICH	Secondary Common Pilot Channel
SCH	Synchronisation Channel consisting of Primary and Secondary synchronisation channels
SS	System Simulator
TGCFN	Transmission Gap Connection Frame Number
TGD	Transmission Gap Distance
TGL	Transmission Gap Length
TGPL	Transmission Gap Pattern Length
TGPRC	Transmission Gap Pattern Repetition Count

TGSN Transmission Gap Starting Slot Number

8.6.2.2 Correct reporting of neighbours in Fading propagation condition

Void

8.6.3 TDD measurements

8.6.3.1 Correct reporting of TDD neighbours in AWGN propagation condition

Void

8.7 Measurements Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in Annex C, sub-clause C.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in Annex E.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

8.7.1 CPICH RSCP

8.7.1.1 Intra frequency measurements accuracy

8.7.1.1.1 Absolute accuracy requirement

8.7.1.1.1.1 Definition and applicability

The absolute accuracy of CPICH RSCP is defined as the CPICH RSCP measured from one cell compared to the actual CPICH RSCP power from same cell.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.1.1.1.2 Minimum Requirements

The accuracy requirements in table 8.7.1.1.1.1 are valid under the following conditions:

- CPICH_RSCP1 ≥ -114 dBm.
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$

Table 8.7.1.1.1.1: CPICH_RSCP Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_RSCP	dBm	±6	±9	-94...-70
	dBm	±8	±11	-70...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.1.1.1 and A.9.1.1.2.

8.7.1.1.1.3 Test purpose

The purpose of this test is to verify that the CPICH RSCP absolute measurement accuracy is within the specified limits in clause 8.7.1.1.1.2. This measurement is for handover evaluation, DL open loop power control, UL open loop control and for the calculation of pathloss.

8.7.1.1.1.4 Method of test

8.7.1.1.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. CPICH RSCP intra frequency absolute accuracy requirements are tested by using test parameters in table 8.7.1.1.1.2.

Table 8.7.1.1.1.2: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-75.54		-59.98		-97.52	
Îor/Ioc	dB	4	0	9	0	0	-6.53
CPICH RSCP, Note 1	dBm	-81.5	-85.5	-60.98	-69.88	-107.5	-114.0
Io, Note 1	dBm	-69		-50		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.1.1.2.

8.7.1.1.1.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT messages.

3) SS shall check CPICH_RSCP value in MEASUREMENT REPORT messages. CPICH RSCP power of Cell 1 reported by UE is compared to actual CPICH RSCP power for each MEASUREMENT REPORT message.

4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated. After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated.

5) After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated ~~below~~above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement (Step 1):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Intra-frequency measurement -Intra-frequency cell info list -Intra-frequency measurement quantity -Filter coefficient -CHOICE mode -Measurement quantity -Intra-frequency reporting quantity -Reporting quantities for active set cells -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting quantities for monitored set cells -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting quantities for detected set cells -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -CHOICE *report criteria* -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present 0 FDD CPICH RSCP No report TRUE TRUE FDD TRUE TRUE TRUE No report FALSE TRUE FDD TRUE TRUE TRUE Not Present Report all active set cells + cells within monitored set on used frequency 2 Not Present Periodical reporting criteria Infinity 250 ms AM RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info	 Not Present

MEASUREMENT REPORT message for Intra frequency test cases

This message is common for all intra frequency test cases in clause 8.7 and is described in Annex I.

8.7.1.1.1.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.1.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.1.1.2 Relative accuracy requirement

8.7.1.1.2.1 Definition and applicability

The relative accuracy of CPICH RSCP is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on the same frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.1.1.2.2 Minimum Requirements

The accuracy requirements in table 8.7.1.1.2.1 are valid under the following conditions:

- CPICH_RSCP1,2 ≥ -114 dBm.
- $\left| CPICH_RSCP1\big|_{in\ dB} - CPICH_RSCP2\big|_{in\ dB} \right| \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$

Table 8.7.1.1.2.1: CPICH_RSCP Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_RSCP	dBm	±3	±3	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.1.1.2 and A.9.1.1.2.

8.7.1.1.2.3 Test purpose

The purpose of this test is to verify that the CPICH RSCP relative measurement accuracy is within the specified limits in clause 8.7.1.1.2.2. This measurement is for handover evaluation, DL open loop power control, UL open loop control and for the calculation of pathloss.

8.7.1.1.2.4 Method of test

8.7.1.1.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. CPICH RSCP intra frequency relative accuracy requirements are tested by using test parameters in table 8.7.1.1.1.2.

1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.1.1.2.

8.7.1.1.2.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT messages.

3) SS shall check CPICH_RSCP value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. CPICH RSCP power value measured from Cell 1 is compared to CPICH RSCP power value measured from Cell 2 for each MEASUREMENT REPORT message.

4) The result of step 3) is compared to actual power level difference of CPICH RSCP of Cell 1 and Cell 2.

5) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated. After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated.

6) After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

7) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement in clause 8.7.1.1.1.4.2 is used.

MEASUREMENT REPORT message for Intra frequency test cases

This message is common for all intra frequency test cases in clause 8.7 and is described in Annex I.

8.7.1.1.2.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.1.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.1.2 Inter frequency measurement accuracy

8.7.1.2.1 Relative accuracy requirement

8.7.1.2.1.1 Definition and applicability

The relative accuracy of CPICH RSCP in inter frequency case is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on a different frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.1.2.1.2 Minimum Requirements

The accuracy requirements in table 8.7.1.2.1.1 are valid under the following conditions:

- CPICH_RSCP1,2 ≥ -114 dBm.
- $\left| CPICH_RSCP1\big|_{in\ dB} - CPICH_RSCP2\big|_{in\ dB} \right| \le 20dB$.
- | Channel 1_Io -Channel 2_Io| ≤ 20 dB.
- $\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$.

Table 8.7.1.2.1.1: CPICH_RSCP Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_RSCP	dBm	±6	±6	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.1.2.1 and A.9.1.1.2.

8.7.1.2.1.3 Test purpose

The purpose of this test is to verify that the CPICH RSCP relative measurement accuracy is within the specified limits in clause 8.7.1.2.1.2. This measurement is for handover evaluation, DL open loop power control, UL open loop control and for the calculation of pathloss.

8.7.1.2.1.4 Method of test

8.7.1.2.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, set 1 of table C.5.2 [14 slots is FFS]. CPICH RSCP inter frequency relative accuracy requirements are tested by using test parameters in table 8.7.1.2.1.2.

Table 8.7.1.2.1.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
PICH_Ec/Ior	dB	-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-60.00	-60.00	-84.00	-94.46
Îor/Ioc	dB	9.54	9.54	0	-9.54
CPICH RSCP, Note 1	dBm	-60.46	-60.46	-94.0	-114.0
Io, Note 1	dBm	-50.00	-50.00	-81.0	-94.0
Propagation condition	-	AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.					

1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.2.1.2.

8.7.1.2.1.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.

2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

3) SS shall transmit MEASUREMENT CONTROL message.

4) UE shall transmit periodically MEASUREMENT REPORT messages.

5) SS shall check CPICH_RSCP value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. CPICH RSCP power value measured from Cell 1 is compared to CPICH RSCP power value measured from Cell 2 for each MEASUREMENT REPORT message.

6) The result of step 5) is compared to actual power level difference of CPICH RSCP of Cell 1 and Cell 2.

7) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After ~~{~~1000~~}~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.2.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~{~~1s~~}~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated.

8) After further ~~{~~1000~~}~~ MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

9) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above~~below~~ shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

PHYSICAL CHANNEL RECONFIGURATION message for Inter frequency measurement (step 1):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	240 CFN
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
PhyCH information elements	
-Frequency info	Not Present
Uplink radio resources	
-Maximum allowed UL TX power	Not Present
Downlink radio resources	
-CHOICE mode	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links	
-Downlink DPCH info common for all RL	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info	
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	~~Ina~~Active
-TGCFN	Not Present
-Transmission gap pattern sequence configuration parameters	
-TGMP	FDD measurement
-TGPRC	Not present
-TGSN	4
-TGL1	7
-TGL2	Not Present
-TGD	0
-TGPL1	3
-TGPL2	Not Present
-RPP	Mode 0
-ITP	Mode 0
-CHOICE UL/DL mode	UL and DL
-Downlink compressed mode method	SF/2
-Uplink compressed mode method	SF/2
-Downlink frame type	B
-DeltaSIR1	3.0
-DeltaSIRafter1	3.0
-DeltaSIR2	Not Present
-DeltaSIRafter2	Not Present
-N Identify abort	Not Present
-T Reconfirm abort	Not Present
-TX Diversity Mode	Not Present
-SSDT information	Not Present
-Default DPCH Offset Value	Not Present
-Downlink information per radio link list	
-Downlink information for each radio link	
-Choice mode	FDD
-Primary CPICH info	
-Primary scrambling code	100
-PDSCH with SHO DCH Info	Not Present
-PDSCH code mapping	Not Present

-Downlink DPCH info for each RL	
-CHOICE mode	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	Not Present
-Spreading factor	64
-Code number	63
-Scrambling code change	No code change
-TPC combination index	0
-SSDT Cell Identity	Not Present
-Closed loop timing adjustment mode	Not Present
-SCCPCH Information for FACH	Not Present

MEASUREMENT CONTROL message for Inter frequency measurement (step 3):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Inter-frequency measurement -Inter-frequency cell info list -CHOICE Inter-frequency cell removal -Remove all inter-frequency cells -Remove some inter-frequency cells -Removed inter-frequency cells -Inter-frequency cell id -No inter-frequency cells removed -New inter-frequency cells -Cell for measurement -Inter-frequency measurement quantity -CHOICE reporting criteria -Filter coefficient -CHOICE mode -Measurement quantity for frequency quality estimate -Inter-frequency reporting quantity -UTRA Carrier RSSI -Frequency quality estimate -Non frequency related cell reporting quantities -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -Inter-frequency set update -CHOICE report criteria -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present Not Present Not Present Not Present Not Present Inter-frequency reporting criteria 0 FDD CPICH RSCP TRUE TRUE No report TRUE TRUE FDD TRUE TRUE TRUE Report all active set cells + cells within monitored set on used frequency 2 Not Present Not Present Periodical reporting criteria Infinity 500 ms Acknowledged mode RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info -TGPS reconfiguration CFN -Transmission gap pattern sequence -TGPSI -TGPS Status Flag -TGCFN	 240 1 Active Not present~~240~~

MEASUREMENT REPORT message for Inter frequency test cases

This message is common for all inter frequency test cases in clause 8.7 and is described in Annex I.

8.7.1.2.1.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.2.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.2 CPICH Ec/Io

8.7.2.1 Intra frequency measurements accuracy

8.7.2.1.1 Absolute accuracy requirement

8.7.2.1.1.1 Definition and applicability

The absolute accuracy of CPICH Ec/Io is defined as the CPICH Ec/Io measured from one cell compared to the actual CPICH_Ec/Io power from same cell.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.2.1.1.2 Minimum Requirements

The accuracy requirements in table 8.7.2.1.1.1 are valid under the following conditions:

- CPICH_RSCP1 ≥ -114 dBm.
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \leq 20dB\,.$

Table 8.7.2.1.1.1: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	±1,5 for -14 ≤ CPICH Ec/Io ±2 for -16 ≤ CPICH Ec/Io < -14 ±3 for -20 ≤ CPICH Ec/Io < -16	±3	-94...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.2.1.1.

8.7.2.1.1.3 Test purpose

The purpose of this test is to verify that the CPICH Ec/Io absolute measurement accuracy is within the specified limits in clause 8.7.2.1.1.2. This measurement is for Cell selection/re-selection and for handover evaluation.

8.7.2.1.1.4 Method of test

8.7.2.1.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. CPICH Ec/Io intra frequency absolute accuracy requirements are tested by using the test parameters in table 8.7.2.1.1.2.

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	.2.56	-0.94
Ioc	dBm/ 3.84 MHz	-56.98		-89.07		-94.98	
Îor/Ioc	dB	3.0	3.0	-2.9	-2.9	-9.0	-9.0
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm	-50		-86		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.2.1.1.2.

8.7.2.1.1.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT messages.

3) SS shall check CPICH_Ec/No value in MEASUREMENT REPORT messages. According to Table 8.7.2.1.1.3 the SS calculates CPICH_Ec/Io power of Cell 1, which is compared to the actual CPICH Ec/Io from the same cell for each MEASUREMENT REPORT message.

4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated. After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated.

5) After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Table 8.7.2.1.1.3: CPICH Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/Io < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/Io	dB

Specific Message Contents

All messages indicated above~~below~~ shall use the same content as described in default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement (Step 1):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Intra-frequency measurement -Intra-frequency cell info list -Intra-frequency measurement quantity -Filter coefficient -CHOICE mode -Measurement quantity -Intra-frequency reporting quantity -Reporting quantities for active set cells -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting quantities for monitored set cells -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting quantities for detected set cells -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -CHOICE *report criteria* -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present 0 FDD CPICH RSCP No report TRUE TRUE FDD TRUE TRUE TRUE No report FALSE FALSE FDD FALSE FALSE FALSE Not Present Report all active set cells + cells within monitored set on used frequency 2 Not Present Periodical reporting criteria Infinity 250 ms AM RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info	 Not Present

MEASUREMENT REPORT message for Intra frequency test cases

This message is common for all intra frequency test cases in clause 8.7 and is described in Annex I.

8.7.2.1.1.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in clause 8.7.2.1.1.2. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in subclause 8.7.2.1.1.2 as shown in table 8.7.2.1.1.4.

Table 8.7.2.1.1.4: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	-2.7…1.5 for -14 ≤ CPICH Ec/Io –3.2…2 for -16 ≤ CPICH Ec/Io < -14 –4.2…3 for -20 ≤ CPICH Ec/Io < -16	-4.2…3	-94...-87
		± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-87...-50

The normative reference for this requirement is TS 25.133 [2] clause A.9.1.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.2.1.2 Relative accuracy requirement

8.7.2.1.2.1 Definition and applicability

The relative accuracy of CPICH Ec/Io is defined as the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on the same frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.2.1.2.2 Minimum Requirements

The accuracy requirements in table 8.7.2.1.2.1 are valid under the following conditions:

- CPICH_RSCP1,2 ≥ -114 dBm.
- $\left| CPICH_RSCP1|_{in\ dB} - CPICH_RSCP2|_{in\ dB} \right| \le 20dB$.
- $\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$.

Table 8.7.2.1.2.1: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	±1,5 for -14 ≤ CPICH Ec/Io ±2 for -16 ≤ CPICH Ec/Io < -14 ±3 for -20 ≤ CPICH Ec/Io < -16	±3	-94…-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.2.1.2 and A.9.1.2.2.

8.7.2.1.2.3 Test purpose

The purpose of this test is to verify that the CPICH Ec/Io relative measurement accuracy is within the specified limits in clause 8.7.2.1.2.2. This measurement is for Cell selection/re-selection and for handover evaluation.

8.7.2.1.2.4 Method of test

8.7.2.1.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are in the same frequency. CPICH Ec/Io intra frequency relative accuracy requirements are tested by using test parameters in table 8.7.2.1.1.2.

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.2.1.1.2.

8.7.2.1.2.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT messages.

3) SS shall check CPICH_Ec/No value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. According to Table 8.7.2.1.1.3 the SS calculates CPICH_Ec/Io power of Cell 1 and Cell 2. CPICH_Ec/Io power value measured from Cell 1 is compared to CPICH_Ec/Io power value measured from Cell 2 for each MEASUREMENT REPORT message.

4) The result of step 3) is compared to actual power level difference of CPICH_Ec/Io of Cell 1 and Cell 2.

5) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated. After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated.

6) After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

7) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement in clause 8.7.2.1.1.4.2 is used.

MEASUREMENT REPORT message for Intra frequency test cases

This message is common for all intra frequency test cases in clause 8.7 and is described in Annex I.

8.7.2.1.2.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in clause 8.7.2.1.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.2.2 Inter frequency measurement accuracy

8.7.2.2.1 Absolute accuracy requirement

[TBD]

8.7.2.2.2 Relative accuracy requirement

8.7.2.2.2.1 Definition and applicability

The relative accuracy of CPICH Ec/Io in the inter frequency case is defined as the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on a different frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.2.2.2.2 Minimum Requirements

The accuracy requirements in table 8.7.2.2.2.1 are valid under the following conditions:

- CPICH_RSCP1,2 ≥ -114 dBm.
- $\left| CPICH_RSCP1|_{in\ dB} - CPICH_RSCP2|_{in\ dB} \right| \le 20dB$.
- | Channel 1_Io -Channel 2_Io| ≤ 20 dB.
- $\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$.

Table 8.7.2.2.2.1: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	±1.5 for -14 ≤ CPICH Ec/Io ±2 for -16 ≤ CPICH Ec/Io < -14 ±3 for -20 ≤ CPICH Ec/Io < -16	±3	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.2.2.2 and A.9.1.2.2.

8.7.2.2.2.3 Test purpose

The purpose of this test is to verify that the CPICH Ec/Io relative measurement accuracy is within the specified limits in clause 8.7.2.2.2.2. This measurement is for Cell selection/re-selection and for handover evaluation.

8.7.2.2.2.4 Method of test

8.7.2.2.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, set 1 of table C.5.2 [14 slots is FFS]. CPICH Ec/Io inter frequency relative accuracy requirements are tested by using test parameters in Table 8.7.2.2.2.2.

Table 8.7.2.2.2.2: CPICH Ec/Io Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-87.27	-87.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm	-50	-50	-86	-86	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to Table 8.7.2.2.2.2.

8.7.2.2.2.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.

2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

3) SS shall transmit MEASUREMENT CONTROL message.

4) UE shall transmit periodically MEASUREMENT REPORT messages.

5) SS shall check CPICH_Ec/No value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. According to Table 8.7.2.1.1.3 the SS calculates CPICH_Ec/Io power of Cell 1 and Cell 2. CPICH_Ec/Io power value measured from Cell 1 is compared to CPICH_Ec/Io power value measured from Cell 2 for each MEASUREMENT REPORT message.

6) The result of step 5) is compared to actual power level difference of CPICH_Ec/Io of Cell 1 and Cell 2.

7) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.2.2.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated. After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.2.2.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated.

8) After ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

9) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated ~~below~~above shall use the same content as described in default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

PHYSICAL CHANNEL RECONFIGURATION message for Inter frequency measurement (step 1):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	240 CFN
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
PhyCH information elements	
-Frequency info	Not Present
Uplink radio resources	
-Maximum allowed UL TX power	Not Present
Downlink radio resources	
-CHOICE mode	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links	
-Downlink DPCH info common for all RL	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info	
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	~~Ina~~Active
-TGCFN	Not Present
-Transmission gap pattern sequence configuration parameters	
-TGMP	FDD measurement
-TGPRC	Not present
-TGSN	4
-TGL1	7
-TGL2	Not Present
-TGD	0
-TGPL1	3
-TGPL2	Not Present
-RPP	Mode 0
-ITP	Mode 0
-CHOICE UL/DL mode	UL and DL
-Downlink compressed mode method	SF/2
-Uplink compressed mode method	SF/2
-Downlink frame type	B
-DeltaSIR1	3.0
-DeltaSIRafter1	3.0
-DeltaSIR2	Not Present
-DeltaSIRafter2	Not Present
-N Identify abort	Not Present
-T Reconfirm abort	Not Present
-TX Diversity Mode	Not Present
-SSDT information	Not Present
-Default DPCH Offset Value	Not Present
-Downlink information per radio link list	
-Downlink information for each radio link	
-Choice mode	FDD
-Primary CPICH info	
-Primary scrambling code	100
-PDSCH with SHO DCH Info	Not Present
-PDSCH code mapping	Not Present

-Downlink DPCH info for each RL	
-CHOICE mode	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	Not Present
-Spreading factor	64
-Code number	63
-Scrambling code change	No code change
-TPC combination index	0
-SSDT Cell Identity	Not Present
-Closed loop timing adjustment mode	Not Present
-SCCPCH Information for FACH	Not Present

MEASUREMENT CONTROL message for Inter frequency measurement (step 3):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Inter-frequency measurement -Inter-frequency cell info list -CHOICE Inter-frequency cell removal -Remove all inter-frequency cells -Remove some inter-frequency cells -Removed inter-frequency cells -Inter-frequency cell id -No inter-frequency cells removed -New inter-frequency cells -Cell for measurement -Inter-frequency measurement quantity -CHOICE reporting criteria -Filter coefficient -CHOICE mode -Measurement quantity for frequency quality estimate -Inter-frequency reporting quantity -UTRA Carrier RSSI -Frequency quality estimate -Non frequency related cell reporting quantities -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -Inter-frequency set update -CHOICE report criteria -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present Not Present Not Present Not Present Not Present Inter-frequency reporting criteria 0 FDD CPICH RSCP TRUE TRUE No report TRUE TRUE FDD TRUE TRUE TRUE Report all active set cells + cells within monitored set on used frequency 2 Not Present Not Present Periodical reporting criteria Infinity 500 ms Acknowledged mode RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info -TGPS reconfiguration CFN -Transmission gap pattern sequence -TGPSI -TGPS Status Flag -TGCFN	 240 1 Active Not present~~240~~

MEASUREMENT REPORT message for Intra frequency test cases

This message is common for all inter frequency test cases in clause 8.7 and is described in Annex I.

8.7.2.2.2.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in clause 8.7.2.2.2.2. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in clause 8.7.2.2.2.2 as shown in table 8.7.2.2.2.3.

Table 8.7.2.2.2.3: CPICH_Ec/Io Inter frequency relative

		Accuracy [dB]		Conditions
Parameter	**Unit**	**Normal condition**	**Extreme condition**	**Io [dBm]**
CPICH_Ec/Io	dB	-2.7…1.5 for -14 ≤ CPICH Ec/Io –3.2…2 for -16 ≤ CPICH Ec/Io < -14 –4.2…3 for -20 ≤ CPICH Ec/Io < -16	-4.2…3	-94...-87
		± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-87...-50

The normative reference for this requirement is TS 25.133 [2] clause A.9.1.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.3 UTRA Carrier RSSI

NOTE: This measurement is for Inter-frequency handover evaluation.

8.7.3.1 Absolute measurement accuracy requirement

8.7.3.1.1 Definition and applicability

The absolute accuracy of UTRA Carrier RSSI is defined as the UTRA Carrier RSSI measured from one frequency compared to the actual UTRA Carrier RSSI power of that same frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.3.1.2 Minimum Requirements

Table 8.7.3.1.1: UTRA Carrier RSSI Inter frequency absolute accuracy

Parameter	**Unit**	**Accuracy [dB]**		**Conditions**
		Normal condition	**Extreme condition**	**Io [dBm]**
UTRA Carrier RSSI	dBm	± 4	± 7	-94...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.3.1.

8.7.3.1.3 Test purpose

The purpose of this test is to verify that the UTRA Carrier RSSI measurement is within the specified limits. This measurement is for inter-frequency handover evaluation.

8.7.3.1.4 Method of test

8.7.3.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, Set 1 of table C.5.2 [14 slots is FFS]. UTRA Carrier RSSI absolute accuracy requirements are tested by using test parameters in table 8.7.3.1.2.

Table 8.7.3.1.2: UTRA Carrier RSSI Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-70.27	-70.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm	-50	-50	-69	-69	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.3.1.2.

8.7.3.1.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.

2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

3) SS shall transmit MEASUREMENT CONTROL message.

4) UE shall transmit periodically MEASUREMENT REPORT messages.

5) SS shall check UTRA carrier RSSI value of Channel 2 in MEASUREMENT REPORT messages. UTRA carrier RSSI power of Channel 2 reported by UE is compared to actual UTRA Carrier RSSI value of Channel 2 for each MEASUREMENT REPORT message.

6) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, step 5) above is repeated. After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, step 5) above is repeated.

7) After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

8) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated ~~below~~above shall use the same content as described in default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

PHYSICAL CHANNEL RECONFIGURATION message for Inter frequency measurement (step 1):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	240 CFN
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
PhyCH information elements	
-Frequency info	Not Present
Uplink radio resources	
-Maximum allowed UL TX power	Not Present
Downlink radio resources	
-CHOICE mode	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links	
-Downlink DPCH info common for all RL	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info	
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	~~Ina~~Active
-TGCFN	Not Present
-Transmission gap pattern sequence configuration parameters	
-TGMP	FDD measurement
-TGPRC	Not present
-TGSN	4
-TGL1	7
-TGL2	Not Present
-TGD	0
-TGPL1	3
-TGPL2	Not Present
-RPP	Mode 0
-ITP	Mode 0
-CHOICE UL/DL mode	UL and DL
-Downlink compressed mode method	SF/2
-Uplink compressed mode method	SF/2
-Downlink frame type	B
-DeltaSIR1	3.0
-DeltaSIRafter1	3.0
-DeltaSIR2	Not Present
-DeltaSIRafter2	Not Present
-N Identify abort	Not Present
-T Reconfirm abort	Not Present
-TX Diversity Mode	Not Present
-SSDT information	Not Present
-Default DPCH Offset Value	Not Present
-Downlink information per radio link list	
-Downlink information for each radio link	
-Choice mode	FDD
-Primary CPICH info	
-Primary scrambling code	100
-PDSCH with SHO DCH Info	Not Present
-PDSCH code mapping	Not Present

-Downlink DPCH info for each RL	
-CHOICE mode	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	Not Present
-Spreading factor	64
-Code number	63
-Scrambling code change	No code change
-TPC combination index	0
-SSDT Cell Identity	Not Present
-Closed loop timing adjustment mode	Not Present
-SCCPCH Information for FACH	Not Present

MEASUREMENT CONTROL message for Inter frequency measurement (step 3):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Inter-frequency measurement -Inter-frequency cell info list -CHOICE Inter-frequency cell removal -Remove all inter-frequency cells -Remove some inter-frequency cells -Removed inter-frequency cells -Inter-frequency cell id -No inter-frequency cells removed -New inter-frequency cells -Cell for measurement -Inter-frequency measurement quantity -CHOICE reporting criteria -Filter coefficient -CHOICE mode -Measurement quantity for frequency quality estimate -Inter-frequency reporting quantity -UTRA Carrier RSSI -Frequency quality estimate -Non frequency related cell reporting quantities -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -Inter-frequency set update -CHOICE report criteria -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list	 1 Modify Not Present Not Present Not Present Not Present Not Present Inter-frequency reporting criteria 0 FDD CPICH RSCP TRUE TRUE Type 1 TRUE TRUE FDD TRUE TRUE TRUE Report all active set cells + cells within monitored set on used frequency 2 Not Present Not Present Periodical reporting criteria Infinity 500 ms Acknowledged mode RLC Periodical reporting Not Present
Physical channel information elements -DPCH compressed mode status info -TGPS reconfiguration CFN -Transmission gap pattern sequence -TGPSI -TGPS Status Flag -TGCFN	 240 1 Active Not present~~240~~

MEASUREMENT REPORT message for Inter frequency test cases

This message is common for all inter frequency test cases in clause 8.7 and is described in Annex I.

8.7.3.1.5 Test requirements

The UTRA Carrier RSSI absolute measurement accuracy shall meet the requirements in clause 8.7.3.1.2. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in subclause 8.7.3.1.2 as shown in table 8.7.3.1.3.

Table 8.7.3.1.3: UTRA Carrier RSSI absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.133 [2] clause A.9.1.3.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.3.2 Relative measurement accuracy requirement

8.7.3.2.1 Definition and applicability

The relative accuracy requirement is defined as the UTRA Carrier RSSI measured from one frequency compared to the UTRA Carrier RSSI measured from another frequency.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.3.2.2 Minimum Requirements

The accuracy requirements in table 8.7.3.2.1 are valid under the following condition:

$| \text{Channel 1_Io}|_{\text{dBm}} - \text{Channel 2_Io}|_{\text{dBm}} | < 20$ dB.

Table 8.7.3.2.1: UTRA Carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dBm	± 7	± 11	-94...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.3.2.

8.7.3.2.3 Test purpose

The purpose of this test is to verify that the UTRA Carrier RSSI measurement is within the specified limits. This measurement is for inter-frequency handover evaluation.

8.7.3.2.4 Method of test

8.7.3.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, Set 1 of table C.5.2 [14 slots is FFS]. UTRA Carrier RSSI relative accuracy requirements are tested by using test parameters in table 8.7.3.1.2.

1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.3.1.2.

8.7.3.2.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.

2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

3) SS shall transmit MEASUREMENT CONTROL message.

4) UE shall transmit periodically MEASUREMENT REPORT messages.

5) SS shall check UTRA carrier RSSI value of Channel 1 and Channel 2 in MEASUREMENT REPORT messages. UTRA carrier RSSI power value measured from Channel 1 is compared to UTRA carrier RSSI power value measured from Channel 2 for each MEASUREMENT REPORT message.

6) The result of step 5) is compared to actual power level difference of UTRA Carrier RSSI of Channel 1 and Channel 2.

7) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated. After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional ~~[~~1s~~]~~ and ignore the MEASUREMENT REPORT messages during this period. Then, steps 5) and 6) above are repeated.

8) After further ~~[~~1000~~]~~ MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

9) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

PHYSICAL CHANNEL RECONFIGURATION message and MEASUREMENT CONTROL message for Inter frequency measurement in clause 8.7.3.1.4.2 is used.

MEASUREMENT REPORT message for inter – frequency test cases

This message is common for all inter frequency test cases in clause 8.7 and is described in Annex I.

8.7.3.2.5 Test requirements

The UTRA Carrier RSSI relative measurement accuracy shall meet the requirements in clause 8.7.3.2.2. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in clause 8.7.3.2.2 as shown in table 8.7.3.2.2.

Table 8.7.3.2.2: UTRA Carrier RSSI relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.133 [2] clause A.9.1.3.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

3GPP TSG-T WG1 Meeting #14
Sophia-Antipolis, France, 21-22 February, 2002

Tdoc T1-020140

CR-Form-v5

CHANGE REQUEST

⌘ **34.121** **CR** **134** ⌘ **rev** **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections for TS 34.121 subclause 8.7.6
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-Feb-18
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The changes are for correction of errors in test procedure.
Summary of change:	⌘	1) The test parameters for each tests were specified so that the test conditions should be expressed more specifically. 2) The test procedure were modified accordingly. 3) The contents of MEASUREMENT CONTROL message are corrected.
Consequences if not approved:	⌘	The specification TS 34.121 and core specification TS 25.133 are inconsistent. The test is not performed properly.

Clauses affected:	⌘	8.7.6
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.7.5 SFN-SFN observed time difference

Void

8.7.6 UE Rx-Tx time difference

8.7.6.1 UE Rx-Tx time difference type 1

8.7.6.1.1 Definition and applicability

The UE Rx-Tx time difference is defined as the time difference between the UE uplink DPCCH/DPDCH frame transmission and the first detected path (in time) of the downlink DPCH frame from the measured radio link. The reference point of the UE Rx-Tx time difference shall be the antenna connector of the UE. This measurement is specified in clause 5.1.10 of TS 25.215.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.6.1.2 Minimum requirements

Table 8.7.6.1.1

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84Mz]
UE RX-TX time difference	chip	± 1.5	-94...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.9.1.1 and A.9.1.6.1.2.

8.7.6.1.3 Test purpose

The purpose of this test is to verify that the measurement accuracy of Rx-Tx time difference is within the limit specified in clause 8.7.6.1.2. This measurement is used for call setup purposes to compensate propagation delay of DL and UL.

8.7.6.1.4 Method of test

8.7.6.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect SS to the UE antenna connector as shown in figure A.1

2) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters are set up according to Table 8.7.6.1.2. for Test 1.

Table 8.7.6.1.2: UE Rx-Tx time difference type 1 intra frequency test parameters

~~Parameter~~	~~Unit~~	~~Cell 1~~
~~UTRA RF Channel number~~		~~Channel 1~~
~~CPICH_Ec/Ior~~	~~dB~~	~~-10~~
~~PCCPCH_Ec/Ior~~	~~dB~~	~~-12~~
~~SCH_Ec/Ior~~	~~dB~~	~~-12~~
~~PICH_Ec/Ior~~	~~dB~~	~~-15~~
~~DPCH_Ec/Ior~~	~~dB~~	~~-15~~
~~OCNS~~	~~dB~~	~~-1.11~~
~~Îor/Ioc~~	~~dB~~	~~10.5~~
~~Ioc~~	~~dBm/ 3.84 MHz~~	~~*Io –10.9 dB = Ioc,* Note 1~~
~~Io~~	~~dBm~~	~~-94… -50~~
~~Propagation condition~~	~~-~~	~~AWGN~~
~~NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.~~		

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 1	Cell 1	Cell 1
UTRA RF Channel number		Channel 1	Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12	-12
SCH_Ec/Ior	dB	-12	-12	-12
PICH_Ec/Ior	dB	-15	-15	-15
DPCH_Ec/Ior	dB	-15	-15	-15
OCNS	dB	-1.11	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io –10.9 dB = Ioc,* Note 1	*Io –10.9 dB = Ioc,* Note 1	*Io –10.9 dB = Ioc,* Note 1
Io	dBm/3.84 MHz	-94	-72	-50
Propagation condition	-	AWGN	AWGN	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.				

8.7.6.1.4.2 Procedure

~~1) SS shall transmit MEASUREMENT CONTROL message.~~

~~2) UE shall transmit periodically MEASUREMENT REPORT message.~~

~~3) SS shall check "UE Rx-Tx time difference type 1" value in MEASUREMENT REPORT message. The reported value shall be compared to actual UE Rx-Tx time difference value for each MEASUREMENT REPORT message.~~

~~4) SS shall count the number of MEASUREMENT REPORT messages transmitted by UE.~~

~~5) After [1000] MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.~~

~~6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.~~

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT message.

3) SS shall check "UE Rx-Tx time difference type 1" value in MEASUREMENT REPORT message. The reported value shall be compared to actual UE Rx-Tx time difference value for each MEASUREMENT REPORT message. The comparison should be repeated 1000 times.

4) The RF parameters are set up according table 8.7.6.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period.

5) Step 3) above shall be repeated.

6) The RF parameters are set up according table 8.7.6.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period.

7) Step 3) above shall be repeated.

8) SS shall transmit RRC CONNECTION RELEASE message.

Specific Message Contents

~~All messages indicated below shall use the same content as described in default message content, with the following exceptions:~~

All messages indicated above shall use the same content as described in default message content in clause 9 of 34.108 [3] and Annex A of 34.123-1 [21] with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement (Step 1):

Information Element	Value/Remark
Message Type	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command	Modify
-Intra-frequency measurement	
-Intra-frequency cell info list	Not Present
-Intra-frequency measurement quantity	
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity	CPICH RSCP
-Intra-frequency reporting quantity	
-Reporting quantities for active set cells	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	FALSE
-CPICH RSCP reporting indicator	FALSE
-Pathloss reporting indicator	FALSE
-Reporting quantities for monitored set cells	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	FALSE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	FALSE
-CPICH RSCP reporting indicator	FALSE
-Pathloss reporting indicator	FALSE
-Reporting quantities for detected set cells	Not Present
-Reporting cell status	
-CHOICE reported cell	Report all active set cells
-Maximum number of reported cells	1
-Measurement validity	Not Present
-CHOICE *report criteria*	Periodical reporting criteria
-Amount of reporting	Infinity
-Reporting interval	250 ms
-Measurement Reporting Mode	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Periodical reporting
-Additional measurements list	
-CHOICE *measurement type*	UE internal measurement
-UE internal measurement quantity	
-CHOICE *mode*	FDD
-Measurement quantity	UE Tx-Rx time difference
-Filter coefficient	0
-UE internal measurement reporting quantity	
-UE transmitted power	FALSE
-CHOICE *mode*	FDD
-UE Rx-Tx time difference	TRUE
Physical channel information elements	
-DPCH compressed mode status info	Not Present

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	 0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -CHOICE Measurement type -UE Internal measurement quantity -CHOICE mode -Measurement quantity -Filter coefficient -UE Internal reporting quantity -UE Transmitted power -CHOICE mode -UE Rx-Tx time difference -CHOICE report criteria -Amount of reporting -Reporting interval -Measurement Reporting Mode -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode	 1 Setup UE Internal measurement FDD UE Rx-Tx time difference 0 FALSE FDD TRUE Periodical reporting criteria Infinity 250 AM RLC Periodical reporting
Physical channel information elements -DPCH compressed mode status info	 Not Present

MEASUREMENT REPORT message for Intra frequency test cases

This message is common for all intra frequency test cases in clause 8.7 and is described in Annex I.

8.7.6.1.5 Test requirements

The UE Rx-Tx time difference accuracy shall meet the requirements in clause 8.7.6.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020139

CR-Form-v5

CHANGE REQUEST

⌘ **34.121** **CR** **133** ⌘ **rev** **-** ⌘ Current version: **3.7.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	SFN-SFN observed time difference type 1
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18-Feb-02
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Test case description of SFN-SFN observed time difference type 1 is missing in TS 34.121.
Summary of change:	⌘	The test case description is added for SFN-SFN observed time difference type 1.
Consequences if not approved:	⌘	Test case description of SFN-SFN observed time difference type 1 is missing from TS 34.121 and the spec remains incomplete.

Clauses affected:	⌘	8.7.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.7.5 SFN-SFN observed time difference

~~Void~~

8.7.5.1 SFN-SFN observed time difference type 1

8.7.5.1.1 Definition and applicability

This measurement is specified in clause 5.1.9 of TS 25.215 [22]. The reference point for the SFN-SFN observed time difference type 1 shall be the antenna connector of the UE.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.5.1.2 Minimum requirements

The accuracy requirement in table 8.7.5.1.1 is valid under the following conditions:

- CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.
- $\left| CPICH_RSCP1|_{in\ dBm} - CPICH_RSCP2|_{in\ dBm} \right| \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{P-CCPCH_E_c}{I_{or}} \right)_{in\ dB}$ is low enough to ensure successful SFN decoding.

Table 8.7.5.1.1

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm]
SFN-SFN observed time difference type1	chip	± 1	-94...-50

The normative reference for this requirement is TS 25.133 [2] clause 9.1.8.1.1 and A.9.1.5.1.2.

8.7.5.1.3 Test purpose

The purpose of this test is to verify that the measurement accuracy of SFN-SFN observed time difference type 1 is within the limit specified in clause 8.7.5.1.2. This measurement is for identifying time difference between two cells.

8.7.5.1.4 Method of test

8.7.5.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

1) Connect SS to the UE antenna connector as shown in figure A.1

2) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to Table 8.7.5.1.2.

In this case all cells are in the same frequency. Table 8.7.5.1.2 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table 8.7.5.1.2: SFN-SFN observed time difference type 1 Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15		-15		-15	
OCNS_Ec/Ior	dB	-1.11		-1.11		-1.11	
Îor/Ioc	dB	10.5		10.5		10.5	
Ioc	dBm/ 3.84 MHz	*Io –13.7 dB = Ioc*, Note 1		*Io –13.7 dB = Ioc*, Note 1		*Io –13.7 dB = Ioc*, Note 1	
Io	dBm	-50		-72		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

8.7.5.1.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT message.

3) SS shall check “SFN-SFN observed time difference type 1” value in MEASUREMENT REPORT message. The reported value shall be compared to actual SFN-SFN observed time difference type 1 value for each MEASUREMENT REPORT message.

4) SS shall count the number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.5.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.5.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated.

5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message for Intra frequency measurement (Step 1):

Information Element	Value/Remark
Message Type	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command	Modify
-Intra-frequency measurement	
-Intra-frequency cell info list	Not Present
-Intra-frequency measurement quantity	
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity	CPICH RSCP
-Intra-frequency reporting quantity	
-Reporting quantities for active set cells	
-SFN-SFN observed time difference reporting indicator	Type 1
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for monitored set cells	
-SFN-SFN observed time difference reporting indicator	Type 1
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for detected set cells	Not Present
-Reporting cell status	
-CHOICE reported cell	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	2
-Measurement validity	Not Present
-CHOICE *report criteria*	Periodical reporting criteria
-Amount of reporting	Infinity
-Reporting interval	250 ms
-Measurement Reporting Mode	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Periodical reporting
-Additional measurements list	Not Present
Physical channel information elements	
-DPCH compressed mode status info	Not Present

MEASUREMENT REPORT message for Intra frequency test cases

This message is common for all intra frequency test cases in clause 8.7 and is described in Annex I.

8.7.5.1.5 Test requirements

The SFN-SFN observed time difference type 1 accuracy shall meet the requirements in clause 8.7.5.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

3GPP TSG-T WG1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020138

CR-Form-v6.1

CHANGE REQUEST

⌘	34.121	CR	132	⌘ rev	-	⌘	Current version:	3.7.0	⌘

Spec Title: Terminal Conformance Specification; Radio transmission and reception (FDD) ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	SFN-CFN observed time difference test case
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18-Feb-02
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Test case description of SFN-CFN observed time difference is missing in TS 34.121.
Summary of change:	⌘	The test case description is added for SFN-CFN observed time difference.
Consequences if not approved:	⌘	Test case description of SFN-CFN observed time difference is missing from TS 34.121 and the spec remains incomplete.

Clauses affected:	⌘	8.7.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.7.4 SFN-CFN observed time difference

8.7.4.1 Intra frequency measurement requirement

8.7.4.1.1 Definition and applicability

The intra frequency SFN-CFN observed time difference is defined as the SFN-CFN observed time difference from the active cell to a neighbour cell that is in the same frequency. This measurement is specified in clause 5.1.8 of TS 25.215 [22].

The reference point for the SFN-CFN observed time difference shall be the antenna connector of the UE.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.4.1.2 Minimum requirements

The accuracy requirement in Table 8.7.4.1.1 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left|CPICH_RSCP1\right|_{in\ dBm} - CPICH_RSCP2\left|_{in\ dBm}\right| \le 20dB$$

$$\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

$$\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{P-CCPCH_E_c}{I_{or}}\right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 8.7.4.1.1

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm]
SFN-CFN observed time difference	chip	± 1	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.7.1 and A.9.1.4.2.

8.7.4.1.3 Test Purpose

The purpose of this test is to verify that the SFN-CFN observed time difference measurement accuracy is within the specified limits in the clause 8.7.4.1.2. This measurement is for handover timing purposes to identify active cell and neighbour cell time difference.

8.7.4.1.4 Method of test

8.7.4.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

In this case all cells are in the same frequency. Table 8.7.4.1.2 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table 8.7.4.1.2: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15		-15		-15	
OCNS_Ec/Ior	dB	-1.11		-1.11		-1.11	
Îor/Ioc	dB	10.5		10.5		10.5	
Ioc	dBm/ 3.84 MHz	*Io –13.7 dB = Ioc,* Note 1		*Io –13.7 dB = Ioc,* Note 1		*Io –13.7 dB = Ioc,* Note 1	
Io	dBm	-50		-72		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.4.1.2.

8.7.4.1.4.2 Procedure

1) SS shall transmit MEASUREMENT CONTROL message.

2) UE shall transmit periodically MEASUREMENT REPORT message.

3) SS shall check "OFF" and "Tm" values in MEASUREMENT REPORT message and calculate SFN-CFN observed time difference value according to the definition in clause 5.1.8 of TS 25.215 [22]. This value shall be compared to the actual SFN-CFN observed time difference value for each MEASUREMENT REPORT message.

4) SS shall count the number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.4.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.4.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated.

5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message for intra frequency measurement

Information Element	Value/Remark
Message Type	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command	Modify
-Intra-frequency measurement	
-Intra-frequency cell info list	Not Present
-Intra-frequency measurement quantity	
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity	CPICH RSCP
-Intra-frequency reporting quantity	
-Reporting quantities for active set cells	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for monitored set cells	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for detected set cells	Not Present
-Reporting cell status	
-CHOICE reported cell	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	2
-Measurement validity	Not Present
-CHOICE *report criteria*	Periodical reporting criteria
-Amount of reporting	Infinity
-Reporting interval	250 ms
-Measurement Reporting Mode	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Periodical reporting
-Additional measurements list	Not Present
Physical channel information elements	
-DPCH compressed mode status info	Not Present

MEASUREMENT REPORT message for Intra frequency test cases

This message is common for all intra frequency test cases in clause 8.7 and is described in Annex I.

8.7.4.1.5 Test requirements

The SFN-CFN observed time difference measurement accuracy shall meet the requirements in clause 8.7.4.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.4.2 Inter frequency measurement requirement

8.7.4.2.1 Definition and applicability

The inter frequency SFN-CFN observed time difference is defined as the SFN-CFN time difference from the active cell to a neighbour cell that is in a different frequency. This measurement is specified in clause 5.1.8 of TS 25.215 [22].

The reference point for the SFN-CFN observed time difference shall be the antenna connector of the UE.

The requirements and this test apply to all types of UTRA for the FDD UE.

8.7.4.2.2 Minimum requirements

The accuracy requirement in table 8.7.4.2.1 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left|CPICH_RSCP1|_{in\ dBm} - CPICH_RSCP2|_{in\ dBm}\right| \le 20dB$$

| Channel 1_Io$|_{dBm}$ -Channel 2_Io$|_{dBm}$ | ≤ 20 dB.

$$\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

Table 8.7.4.2.1

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm]
SFN-CFN observed time difference	chip	± 1	-94...-50

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.7.2 and A.9.1.4.2.

8.7.4.2.3 Test purpose

The purpose of this test is to verify that the SFN-CFN observed time difference measurement accuracy is within the specified limits in the clause 8.7.4.2.2. This measurement is for handover timing purposes to identify active cell and neighbour cell time difference.

8.7.4.2.4 Method of test

8.7.4.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in clause C.5, set 1 of table C.5.2. Table 8.7.4.2.2 defines the limits of signal strengths and code powers, where the requirement is applicable.

Table 8.7.4.2.2: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15		-15		-15	
OCNS_Ec/Ior	dB	-1.11		-1.11		-1.11	
Îor/Ioc	dB	10.1		10.1		10.1	
Ioc	dBm/ 3.84 MHz	*Io –10.6 dB = Ioc*, Note 1		*Io –10.6 dB = Ioc*, Note 1		*Io –10.6 dB = Ioc*, Note 1	
Io	dBm	-50		-72		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.4.2.2.

8.7.4.2.4.2 Procedure

1) SS shall transmit PHYSICAL CHANNEL RECONFIGURATION message.

2) UE shall transmit PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

3) SS shall transmit MEASUREMENT CONTROL message.

4) UE shall transmit periodically MEASUREMENT REPORT messages.

5) SS shall check "OFF" and "Tm" values in MEASUREMENT REPORT message and calculate SFN-CFN observed time difference value according to the definition in clause 5.1.8 of TS 25.215 [22]. This value shall be compared to the actual SFN-CFN observed time difference value for each MEASUREMENT REPORT message.

6) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.4.2.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.4.2.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 4) and 5) above are repeated.

7) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.

8) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

PHYSICAL CHANNEL RECONFIGURATION message for inter frequency measurement

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	240 CFN
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
PhyCH information elements	
-Frequency info	Not Present
Uplink radio resources	
-Maximum allowed UL TX power	Not Present
Downlink radio resources	
-CHOICE mode	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links	
-Downlink DPCH info common for all RL	Not Present
-CHOICE mode	FDD
-DPCH compressed mode info	
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	Active
-TGCFN	Not Present
-Transmission gap pattern sequence configuration parameters	
-TGMP	FDD measurement
-TGPRC	Not present
-TGSN	4
-TGL1	7
-TGL2	Not Present
-TGD	0
-TGPL1	3
-TGPL2	Not Present
-RPP	Mode 0
-ITP	Mode 0
-CHOICE UL/DL mode	UL and DL
-Downlink compressed mode method	SF/2
-Uplink compressed mode method	SF/2
-Downlink frame type	B
-DeltaSIR1	3.0
-DeltaSIRafter1	3.0
-DeltaSIR2	Not Present
-DeltaSIRafter2	Not Present
-N Identify abort	Not Present
-T Reconfirm abort	Not Present
-TX Diversity Mode	Not Present
-SSDT information	Not Present
-Default DPCH Offset Value	Not Present
-Downlink information per radio link list	
-Downlink information for each radio link	
-Choice mode	FDD
-Primary CPICH info	
-Primary scrambling code	100
-PDSCH with SHO DCH Info	Not Present
-PDSCH code mapping	Not Present
-Downlink DPCH info for each RL	
-CHOICE mode	FDD

-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	Not Present
-Spreading factor	64
-Code number	63
-Scrambling code change	No code change
-TPC combination index	0
-SSDT Cell Identity	Not Present
-Closed loop timing adjustment mode	Not Present
-SCCPCH Information for FACH	Not Present

MEASUREMENT CONTROL message for Inter frequency measurement

Information Element	Value/Remark
Message Type	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command	Modify
-Inter-frequency measurement	
-Inter-frequency cell info list	
-CHOICE Inter-frequency cell removal	
-Remove all inter-frequency cells	Not Present
-Remove some inter-frequency cells	Not Present
-Removed inter-frequency cells	
-Inter-frequency cell id	
-No inter-frequency cells removed	Not Present
-New inter-frequency cells	Not Present
-Cell for measurement	Not Present
-Inter-frequency measurement quantity	
-CHOICE reporting criteria	Inter-frequency reporting criteria
-Filter coefficient	0
-CHOICE mode	FDD
-Measurement quantity for frequency quality estimate	CPICH RSCP
-Inter-frequency reporting quantity	
-UTRA Carrier RSSI	TRUE
-Frequency quality estimate	TRUE
-Non frequency related cell reporting quantities	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE
-Cell Identity reporting indicator	TRUE
-CHOICE mode	FDD
-CPICH Ec/N0 reporting indicator	TRUE
-CPICH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting cell status	
-CHOICE reported cell	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	2
-Measurement validity	Not Present
-Inter-frequency set update	Not Present
-CHOICE report criteria	Periodical reporting criteria
-Amount of reporting	Infinity
-Reporting interval	500 ms
-Measurement Reporting Mode	
-Measurement Report Transfer Mode	Acknowledged mode RLC
-Periodical Reporting / Event Trigger Reporting Mode	Periodical reporting
-Additional measurements list	Not Present
Physical channel information elements	
-DPCH compressed mode status info	
-TGPS reconfiguration CFN	240
-Transmission gap pattern sequence	
-TGPSI	1
-TGPS Status Flag	Active
-TGCFN	Not present

MEASUREMENT REPORT message for Inter frequency test cases

This message is common for all inter frequency test cases in clause 8.7 and is described in Annex I.

8.7.4.2.5 Test requirements

The SFN-CFN observed time difference measurement accuracy shall meet the requirements in clause 8.7.4.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

3GPP TSG-T WG1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020137

CR-Form-v6.1

CHANGE REQUEST

⌘	**34.121**	**CR**	**131**	⌘ **rev**	**-**	⌘	Current version:	**3.7.0**	⌘

Spec Title: Terminal Conformance Specification; Radio transmission and reception (FDD) ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of minimum test times under fading
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18-Feb-02
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Minimum test times for all six fading profiles, minimum number of wavelengths (for multipath) and minimum transitions in birth death propagation are incorrect.
Summary of change:	⌘	Square brackets have been removed from F.6.1.6 and incorrect values have been replaced by more accurate ones.
Consequences if not approved:	⌘	F.6 will remain incorrect.

Clauses affected:	⌘	F.6
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

In the BLER test with fading there is the memory of the multipath fading channel which interferes the statistical independency. Independent error events are assumed but a minimum test time is introduced to average fluctuations of the multipath fading channel.

The formulas, applied to describe the BER BLER test, are primarily based on the following experiment:

(1) After having observed a certain number of errors (**ne**) the number of samples are counted to calculate BER BLER. Provisions are made (note 1) such that the complementary experiment is valid as well:
(2) After a certain number of samples (**ns**) the number of errors, occurred, are counted to calculate BER BLER.
Experiment (1) stipulates to use the following Chi Square Distribution with degree of freedom ne:
2*dchisq(2*NE,2*ne) for all calculations.
(NE: average of the distribution)

F.6.1.5 Definition of good pass fail decision.

This is defined by the probability of wrong decision D. The probability of a correct decision is 1-D.

The probability (risk) to fail a good DUT shall be <= D according to the following definition: A DUT is failed, accepting a probability of <= D that the DUT is still better than the specified error ratio (Test requirement).

The probability to pass a bad DUT shall be <= D according to the following definition: A DUT is passed, accepting a probability of <= D that the DUT is still worse than M times the specified error ratio. (M>=1 is the bad DUT factor).

This definitions lead to an early pass and an early fail limit:

Early fail: ber>= $berlim_{fail}$

$$ber\lim_{fail}(D,ne) = \frac{2*ne}{qchisq(D,2*ne)} \quad (1)$$

For ne>[5]

Early pass: ber <=$berlimbad_{pass}$

$$ber\lim bad_{pass}(D,ne) = \frac{2*ne*M}{qchisq(1-D,2*ne)} \quad (2)$$

For ne >=1

With

ber (normalized BER,BLER): BER,BLER according to F.6.1.1 divided by Test requirement

D: wrong decision probability see table F.6.1.8

ne: Number of error events

M: bad DUT factor see table F.6.1.8

qchisq: inverse cumulative chi squared distribution

F.6.1.6 Good balance between testtime and statistical significance

Three independent test parameters are introduced into the test and shown in Table F.6.1.6.1. These are the obvious basis of test time and statistical significance. From the first two of them three dependent test parameters are derived. The third independent test parameter is justified separately.

Table F.6.1.6.1 independent and dependent test parameters

Independent test parameters			Dependent test parameters		
Test Parameter	Value	Reference	Test parameter	Value	Reference
Target number of error events	[200]	Table F.6.1.8	Early pass/fail condition	curves	Subclause F.6.1.5 Figure 6.1.9
Probability of wrong pass/fail decision D	[0.2%] [0.02%]	Subclause F.6.1.5	Bad DUT factor M	[1.5]	Table 6.1.8
			Test limit factor TL	[1.24]	Table 6.1.8
Minimum test time		Table F.6.1.6.2			

The minimum test time is derived from the following justification:

1) For no propagation conditions and static propagation condition

   No early fail calculated from fractional number of errors <1 (see note 1)

2) For multipath fading condition

   No stop of the test until 990~~[10]~~ wavelengths are crossed with the speed given in the fading profile.

3) For birth death propagation conditions

   No stop of the test until 200~~[10]~~ birth death transitions occur

4) For moving propagation conditions: 628 sec~~[157 s]~~

   This is necessary in order to pass all potential critical points in the moving propagation profile:

   Maximum rake window

   Maximum adjustment speed

   Intersection of moving taps

Table F.6.1.6.2 : minimum Test time

Fading profile	Minimum test time
Multipath propagation 3 km/h	164 sec~~[1.8 s]~~
Multipath propagation 50 km/h	9.8 sec~~[0.1 s]~~
Multipath propagation 120 km/h	4.1 sec~~[45 ms]~~
Multipath propagation 250 km/h	2 sec~~[22ms]~~
Birth Death propagation	38.2 sec~~[1.91s]~~
Moving propagation	628 sec~~[157s]~~

In table F.6.1.8 the minimum test time is converted in minimum number of samples.

F.6.1.7 Pass fail decision rules

No decision is allowed before the minimum test time is elapsed.

1) If minimum Test time < time for target number of error events then the following applies: The required confidence level (= correct decision probability 1-D) shall be achieved. This is fulfilled at an early pass or early fail event. The pass/fail decision is done accordingly.

2) If the minimum test time >= time for target error events, then the test runs for the minimum test time and the decision is done by comparing the result with the test limit.

TSG-T1 meeting #14 **T1-020136**
Sophia Antipolis, France 21 – 22 Feb 2002

CR-Form-v4

CHANGE REQUEST

⌘ **34.121** **CR** **130** ⌘ ev **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Maintenance of annex B: Global In-Channel TX-Test.
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-13
Category:	⌘	**F** ***Release:*** ⌘ 99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Progress of 34.121 concerning different power and modulation measurements stipulates maintenance of the Global In-Channel TX-Test.
Summary of change:	⌘	1) Algorithmic support for the overall test implementation added 2) Algorithmic definition of decision point power added 3) Algorithmic definition of code domain power added 4) Error corrections
Consequences if not approved:	⌘	Implementation of all in-channel TX test parameters may be ambiguous leading to inconsistent measurements and system performance

Clauses affected:	⌘	Annex B
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

Annex B (normative):
Global In-Channel TX-Test

B.1 General

The global in-channel Tx test enables the measurement of all relevant parameters that describe the in-channel quality of the output signal of the Tx under test in a single measurement process.
The parameters describing the in-channel quality of a transmitter, however, are not necessarily independent. The algorithm chosen for description inside this annex places particular emphasis on the exclusion of all interdependencies among the parameters. Any other algorithm (e.g. having better computational efficiency) may be applied, as long as the results are the same within the acceptable uncertainty of the test system as defined in annex F
~~The objective of this Annex is to list the results that shall be available from the Global In-Channel TX-Test. To aid understanding, an example algorithmic description of the measurement process is provided. It is not intended that this particular method is required. It is however required that any algorithm that is used for In-Channel TX tests should deliver the required results with the required accuracy.~~
All notes referred in the various clauses of B.2 are put together in B.3.

B.2 Definition of the process

B.2.1 Basic principle

The process is based on the comparison of the actual **output signal of the TX under test**, received by an ideal receiver, with a **reference signal**, that is generated by the measuring equipment and represents an ideal error free received signal. The reference signal shall be composed of the same number of codes at the correct spreading factors as contained in the test signal. Note, for simplification, the notation below assumes only codes of one spreading factor although the algorithm is valid for signals containing multiple spreading factors. All signals are represented as equivalent (generally complex) baseband signals.

B.2.2 Output signal of the TX under test

The output signal of the TX under test is acquired by the measuring equipment, filtered by a matched filter (RRC 0.22, correct in shape and in position on the frequency axis) and stored for further processing~~at one sample per chip at the Inter-Symbol-Interference free instants.~~
The following form represents the physical signal in the entire measurement interval:

one vector **Z**, containing N = ns x sf ~~+ ma~~ complex samples;

with

ns: number of symbols in the measurement interval;

sf: number of chips per symbol. (sf: spreading factor) (see Note: Symbol length)

~~ma: number of midamble chips (only in TDD)~~

B.2.3 Reference signal

The reference signal is constructed by the measuring equipment according to the relevant TX specifications.
It is filtered by the same matched filter, mentioned in clause B.2.2., and stored at the Inter-Symbol-Interference free instants. The following form represents the reference signal in the entire measurement interval:

- one vector **R**, containing N = ns x sf ~~+ ma~~ complex samples;

- ns, sf~~, ma~~: see clause B.2.2.

B.2.4 void

B.2.5 Classification of measurement results

The measurement results achieved by the global in-channel TX test can be classified into two types:

- Results of type "deviation", where the error-free parameter has a non-zero magnitude. (These are the parameters that quantify the integral physical characteristic of the signal).These parameters are:

  RF Frequency;

  Power (in case of single code);

  Code Domain Power (in case of multi code);

  Timing ~~(only for UE);~~

  (Additional parameters: see Note: Deviation).

- Results of type "residual", where the error-free parameter has value zero. (These are the parameters that quantify the error values of the measured signal, whose ideal magnitude is zero). These parameters are:

  Error Vector Magnitude (EVM);

  Peak Code Domain Error (PCDE).

  (Additional parameters: see Note Rresidual)

B.2.6 Process definition to achieve results of type "deviation"

The reference signal (**R**; see clause B.2.3) and the signal under Test (Z; see subclause B.2.2) are ~~is~~ varied with respect to the parameters mentioned in clause B.2.5 under "results of type deviation" in order to achieve best fit ~~with the recorded signal under test (**Z**; see clause B.2.2)~~. Best fit is achieved when the RMS difference value between the varied signal under test and the varied reference signal is an absolute minimum.

Overview:

$$FCT\ \left[\ Z\left(\tilde{f}, \tilde{t}, \tilde{\varphi}, g_1, g_2, \ldots, g_{synch}\right) - R\left(f, t, \varphi, \tilde{g}_1, \tilde{g}_2, \ldots, \tilde{g}_{synch}\right)\ \right] = Minimum \quad !$$

Z : Signal under test.
R: Reference signal,
with frequency f, the timing t, the phase φ, gain of code1 (g_1), gain of code2 (g_2) etc, and the gain of the synch channel g_{synch} See Note: Power Step
The parameters marked with a tilde in Z and R are varied in order to achieve a best fit.

Detailed formula: see Note: Formula for the minimum process

The varied reference signal, after the best fit process, will be called **R'.**
The varied signal under test, after the best fit process, will be called **Z'.**
The varying parameters, leading to **R'** **and Z'** represent directly the wanted results of type "deviation". These measurement parameters are expressed as deviation from the reference value with units same as the reference value.
In case of multi code, the type-"deviation"-parameters (frequency, timing and (RF-phase)) are varied commonly for all codes such that the process returns one frequency-deviation, one timing deviation, (one RF-phase – deviation).
(These parameters are not varied on the individual codes signals such that the process would return~~s~~ kr frequency errors... . (kr: number of codes in the reference signal)).
The only type-"deviation"-parameters varied individually are the code domain gain factors (g1, g2, …)
~~code powers such that the process returns k code power deviations (k: number of codes).~~

B.2.6.1 Decision Point Power

The mean-square value of the signal-under-test, sampled at the best estimate of the of Intersymbol-Interference-free points using the process defined in subclause 2.5, is referred to the *Decision Point Power* (DPP):

$$DPP = mean\left(\left|Z'\right|^2\right)$$

B.2.6.2 Code-Domain Power

The samples, Z', are separated into symbol intervals to create ns time-sequential vectors **z** with sf complex samples comprising one symbol interval. The *Code Domain Power* is calculated according to the following steps:

(1) Take the vectors **z** defined above.

(2) To achieve meaningful results it is necessary to descramble **z,** leading to **z'** (see Note1: Scrambling code)

(3) Take the orthogonal vectors of the channelization code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1), and normalize by the norm of the vectors to produce **C**norm=**C**/sqrt(sf). (see Note: Symbol length)

(4) Calculate the inner product of **z'** with **C**norm**.**. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format k x ns, each value representing a specific symbol and a specific code, which can be exploited in a variety of ways.

k: total number of codes in the code space
ns: number of symbols in the measurement interval

(5) Calculate k mean-square values, each mean-square value unifying ns symbols within one code. (These values can be called "*Absolute CodeDomainPower* (CDP)" [Volt^2].) The sum of the k values of CDP is equal to DPP.

(6) Normalize by the decision point power to obtain

$$Relative\ CodeDomain\ Power = \frac{Absolute\ CodeDomainPower}{DecisionPointPower}$$

B.2.7 Process definition to achieve results of type "residual"

The difference between the varied reference signal (**R'**; see clause B.2.6.) and the varied TX signal under test (**Z'**; see clause B.2.6~~2~~) is the error vector **E** versus time:

- **E** = **Z** – **R'.**

Depending on the parameter to be evaluated, it is appropriate to represent **E** in one of the following two different forms:

Form EVM (representing the physical error signal in the entire measurement interval)
One vector **E**, containing N = ns x sf ~~+ ma~~ complex samples;

ns, sf~~, ma~~: see B.2.2

Form PCDE (derived from Form EVM by separating the samples into symbol intervals)
ns time-sequential vectors **e** with sf complex samples comprising one symbol interval.

E gives results of type "residual" applying the two algorithms defined in clauses B 2.7.1 and B 2.7.2.

B.2.7.1 Error Vector Magnitude (EVM)

The Error Vector Magnitude EVM is calculated according to the following steps:

1) Take the error vector **E** defined in clause B.2.7 (Form EVM) and calculate the RMS value of **E**; the result will be called RMS(**E**).

2) Take the varied reference vector **R'** defined in clause B.2.6 and calculate the RMS value of **R'**; the result will be called RMS(**R'**).

3) Calculate EVM according to:

$$EVM = \frac{RMS(\mathbf{E})}{RMS(\mathbf{R}')} \times 100\%$$ (here, EVM is relative and expressed in %)

~~(see note TDD)~~(see Note: Formula for EVM)

B.2.7.2 Peak Code Domain Error (PCDE)

The Peak Code Domain Error is calculated according to the following steps:

1) Take the error vectors **e** defined in clause B.2.7 (Form PCDE)

2) To achieve meaningful results it is necessary to descramble **e,** leading to **e'** (see Note1: Scrambling code)

3~~2~~) Take the orthogonal vectors of the channelisation code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1). (see Note: Symbol length) and normalize by the norm of the vectors to produce **C**norm= **C**/sqrt(sf). (see Note: Symbol length)

~~3) To achieve meaningful results it is necessary to descramble **e,** leading to **e'** (see Note1: Scrambling code)~~

4) Calculate the inner product of **e'** with **Cnorm**. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format k x ns, each value representing an error-vector representing a specific symbol and a specific code, which can be exploited in a variety of ways.

k: total number of codes in the code space

ns: number of symbols in the measurement interval

5) Calculate k RMS values, each RMS value unifying ns symbols within one code.
(These values can be called "*Absolute CodeEVMs*" [Volt].)

6) Find the peak value among the k "*Absolute CodeEVMs*".
(This value can be called "*Absolute PeakCodeEVM*" [Volt].)

7) Calculate PCDE according to:

$$10*\lg \frac{(\text{"}Absolute\ PeakCodeEVM\text{"})^2}{(RMS(\mathbf{R}'))^2}\ dB$$ (a relative value in dB).

~~(see Note: Denominator)~~
(see Note2: Scrambling code)
(see Note IQ)
~~(see Note TDD)~~
~~(see Note Synch channel)~~

B.3 Notes

Note: Symbol length)

A general code multiplexed signal is multicode and multirate. In order to avoid unnecessary complexity, the measurement applications use a unique symbol-length, corresponding to a spreading factor, regardless of the really intended spreading factor. Nevertheless the complexity with a multicode / multirate signal can be mastered by introducing appropriate definitions.

Note: Deviation)

It is conceivable to regard more parameters as type „deviation" e.g. Chip frequency and RF-phase.

As chip-frequency and RF-frequency are linked together by a statement in the core specifications [1] it is sufficient to process RF frequency only.

A parameter RF-phase must be varied within the best fit process (B 2.6.). Although necessary, this parameter-variation doesn't describe any error, as the modulation schemes used in the system don't depend on an absolute RF-phase.

Note: Rresidual)

It is conceivable to regard more parameters as type „residual" e.g. IQ origin offset. As it is not the intention of the test to separate for different error sources, but to quantify the quality of the signal, all such parameters are not extracted by the best fit process, instead remain part of EVM and PCDE.

~~**Note: Denominator)**~~

~~If the denominator stems from mutual time shifted signals of different code powers, (e.g. Node B, FDD) the measurement result PCDE should be expressed absolutely instead.~~

Note 1: Scrambling Code)

In general a TX signal under test can use more than one scrambling code. Note that PCDE is processed regarding the unused channelisation - codes as well. In order to know which scrambling code shall be applied on unused channelisation -codes, it is necessary to restrict the test conditions: TX signal under test shall use exactly one scrambling code.

Note 2: Scrambling Code)

To interpret the measurement results in practice it should be kept in mind that erroneous code power on unused codes is generally de-scrambled differently under test conditions and under real life conditions, whereas erroneous code power on used codes is generally de-scrambled equally under test conditions and under real life conditions. It might be indicated if a used or unused code hits PCDE.

Note IQ)

As in FDD/uplink each code can be used twice, on the I and on the Q channel, the measurement result may indicate separate values of CDP or PCDE for I and Q on which channel (I or Q) they occur.~~on which channel (I or Q) PCDE occurs.~~

~~**Note TDD)**~~

~~EVM covers the midamble part as well as the data part; however PCDE disregards the midamble part.~~

~~**Note: Synch Channel)**~~

~~A Node B signal contains a physical synch channel, which is non orthogonal, related to the other DPCHs. In this context note: The code channel bearing the result of PCDE is exactly one of the DPCHs (never the synch channel). The origin of PCDE (erroneous code power) can be any DPCH and/or the synch channel.~~

Note: **Fomula for the minimum process**

$$L\left(\Delta\tilde{f}\,,\Delta\tilde{t}\,,\Delta\tilde{\varphi}\,,\Delta\tilde{g}_{c}\,,\ldots\right) = \sum_{\nu=0}^{N-1}\left|Z(\nu) - R(\nu)\right|^{2}$$

Legend:

L : the function to be minimised

The parameters to be varied in order to minimize are:

$\Delta\tilde{f}$: the RF frequency offset

$\Delta\tilde{t}$: the timing offset

$\Delta\tilde{\varphi}$: the phase offset

$\Delta\tilde{g}_{c}\ldots$ code power offsets (one offset for each code)

Z(ν): Samples of the signal under Test
R(ν): Samples of the reference signal

$\sum_{\nu=0}^{N-1}$: counting index ν starting at the beginning of the measurement interval and ending at its end.

N = No of chips during the measurement interval.

Z(ν): Samples of the signal under Test. It is modelled as a sequence of complex baseband samples Z(γ) with a time-shift Δt, a frequency offset Δf, a phase offset Δφ, the latter three with respect to the reference signal.

$$Z(\nu) = Z(\nu - \Delta\tilde{t}) * e^{-j2\pi\Delta\tilde{f}\nu} * e^{-j\Delta\tilde{\varphi}}$$

R(ν): Samples of the reference signal:

$$R(\nu) = \sum_{c=1}^{No.of\ codes} (g_c + \Delta\tilde{g}_c) * Chip_c(\nu)$$

g_c : nominal gain of the code channel

$\Delta\tilde{g}$: The gain offset to be varied in the minimum process

Chip(ν) is the chipsequence of the code channel

Indices at g, Δg and Chip:

The index indicates the code channel: c = 1,2,... No of code channels

Range for $Chip_c$: +1,-1

Note: **Formula for EVM**

$$EVM = \sqrt{\frac{\sum_{\nu=0}^{N-1} |Z'(\gamma) - R'(\gamma)|^2}{\sum_{\nu=0}^{N-1} |R'(\gamma)|^2}} * 100\ \%$$

Z'(γ), R'(γ) are the varied measured and reference signals.

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020135

CR-Form-v5

CHANGE REQUEST

⌘ **34.121** **CR** **129** ⌘ **rev** **-** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Transmit ON/OFF time mask, Change of TFC and Power setting in uplink compressed mode
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18 Feb, 2002
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	RAN WG4 #21 has approved 25101 CR154 (R4-020385)
Summary of change:	⌘	Editorial corrections to tables 5.5.2.1, 5.6.1 and 5.6.2. Table 5.7.1 is changed to specify the tolerances for transmitter power differences in compliance with RACH and TFC requirements. The table 5.7.1 is consistent with TS25.101 table 6.7.
Consequences if not approved:	⌘	TS 34.121 and TS 25.101 are inconsistent

Clauses affected:	⌘	5.5, 5.6 and 5.7
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.5.2 Transmit ON/OFF Time mask

5.5.2.1 Definition and applicability

The time mask for transmit ON/OFF defines the ramping time allowed for the UE between transmit OFF power and transmit ON power. Possible ON/OFF scenarios are PRACH, CPCH or uplink compressed mode.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.5.2.2 Minimum requirements

The transmit power levels versus time shall meet the mask specified in figure 5.5.1 for PRACH preambles, and the mask in figure 5.5.2 for all other cases. The signal is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate.

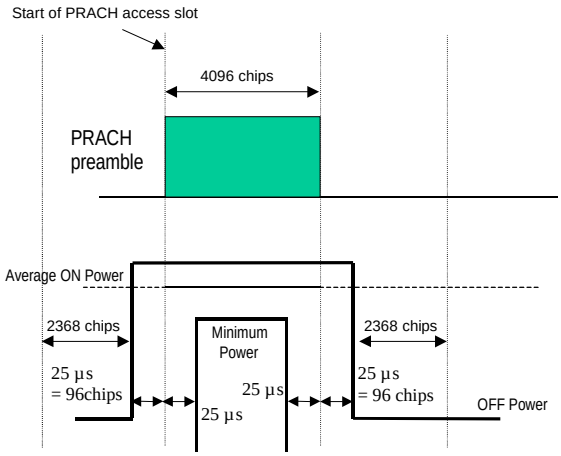

Figure 5.5.1: Transmit ON/OFF template for PRACH preambles

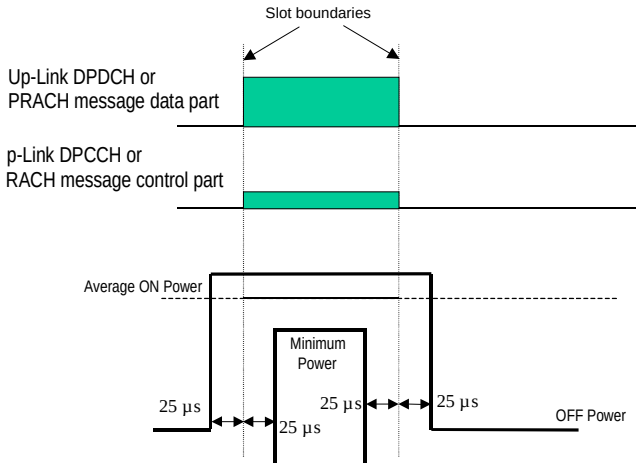

Figure 5.5.2: Transmit ON/OFF template for all other On/Off cases

OFF Power is defined in figure 5.5.1.

ON power is defined as either case as follows. The specification depends on each possible case.

- First preamble of PRACH: Open loop accuracy (table 5.4.1.1).
- During preamble ramping of the RACH and between final RACH preamble and RACH message part: Accuracy depending on size of the required power difference (table 5.5.2.1).

- After transmission gaps in compressed mode: Accuracy as in table 5.7.1.
- Power step to Maximum Power: Maximum power accuracy (table 5.2.1).

Table 5.5.2.1: Transmitter power difference tolerance for RACH preamble ramping, and between final RACH preamble and RACH message part

Power difference size ΔP [dB]	Transmitter power difference tolerance [dB]
0	±1 ~~dB~~
1	±1 ~~dB~~
2	±1,5 ~~dB~~
3	±2 ~~dB~~
4 ≤ ΔP ≤ 10	±2,5 ~~dB~~
11 ≤ ΔP ≤ 15	±3,5 ~~dB~~
16 ≤ ΔP ≤ 20	±4,5 ~~dB~~
21 ≤ ΔP	±6,5 ~~dB~~

The reference for this requirement is TS 25.101 [1] clause 6.5.2.1.

This is tested using PRACH operation.

The minimum requirement for ON power is defined in clause 5.4.1.2.

The minimum requirement for OFF power is defined in clause 5.5.1.2.

NOTE: The main objective for this test case is to check the ramp-up/down power shape.

5.5.2.3 Test purpose

To verify that the UE transmit ON/OFF power levels versus time meets the described mask shown in figure 5.5.1 and figure 5.5.2.

An excess error of transmit ON/OFF response increases the interference to other channels, or increases transmission errors in the up link own channel.

5.5.2.4 Method of test

5.5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure, and $\hat{I}_{or}$ is are set up according to table 5.5.2.2. The relative power level of downlink physical channels to I_{or} are set up according to clause E.2.1.

The RACH procedure within the call setup is used for the test. The number of the available subchannels should be limited to one. This ensures that the preamble sequence is known to the SS. The preamble retransmission shall be at least 3. The power ramping step size shall be 1 dB. Note that the maximum number of preamble retransmissions is limited to 5 due to the fact that the commanded uplink power exceeds the allowed uplink power of more than 6 dB. The SS shall not send either an ACK or a NACK.

See TS 34.108 [3] for details regarding generic call setup procedure.

Table 5.5.2.2: Test parameters for Transmit ON/OFF Time mask (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See table 5.5.2.3	dBm / 3,84 MHz

Table 5.5.2.3: Test parameters for Transmit ON/OFF Time mask (SS)

Parameter	Power Class 1	Power Class 2	Power Class 3	Power Class 4	Unit
$\hat{I}_{or}$ (note 1)	–106,7	–106,7	–106,7	–106,7	dBm / 3,84 MHz
CPICH_RSCP (notes 1 and 2)	–110	–110	–110	–110	dBm
Primary CPICH DL TX power	+19	+19	+19	+19	dBm
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	+129	+129	+129	+129	dB
UL interference	–86	–92	–95	–98	dBm
Constant Value	–10	–10	–10	–10	dB
Expected nominal UE TX power (note 3)	+33	+27	+24	+21	dBm

NOTE 1: The power level of S-CCPCH should be defined because S-CCPCH is transmitted during Preamble RACH transmission period. The power level of S-CCPCH is temporarily set to –10,3 dB relative to I_{or}. However, it is necessary to check whether the above S-CCPCH level is enough to establish a connection with the reference measurement channels.
NOTE 2: The purpose of this parameter is to calculate the Expected nominal UE TX power.
NOTE 3: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.9 Open Loop Power Control of TS 25.331 [8].

5.5.2.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector and select the test parameters of table 5.5.2.3 according to the power class. $\hat{I}_{or}$ shall be according to table 5.5.2.3 (–106,7 dBm / 3,84 MHz).

2) Measure the output power (ON power) of the UE on the first RACH preamble or two consecutive RACH preambles. The measurements shall not include the transient periods. From the occurrence of the first RACH preamble the SS shall predict the following RACH preamble timing.

3) Record the OFF power in a 2 368 chip time interval before a transient period of 25 µs (96 chips) prior to a RACH preamble (ON power) averaging (see note) through a matched filter (RRC 0.22, BW equal to the chiprate). Record the OFF power in a 2368 chip time interval after a transient period of 25 µs (96 chips) after a RACH preamble (ON power) averaging through a matched filter (RRC 0.22, BW equal to the chiprate).

NOTE: OFF power measurement with averaging requires an enough sampling speed to cover the signal bandwidth (e.g. 3,84 MHz times 1,22 = 4,6848 MHz BW).

5.5.2.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (table 5.5.2.3), derived in step 2), shall not exceed the prescribed upper tolerance in table 5.2.2 (clause 5.2.5) and lower tolerance in table 5.4.1.1. (clause 5.4.1.2) for the first preamble, or shall meet the tolerance in table 5.5.2.1 for two consecutive preambles.

The measured leakage power, derived in step 3), shall be below –55 dBm. (clause 5.5.1.5).

5.6 Change of TFC

5.6.1 Definition and applicability

A change of TFC (Transport Format Combination) in uplink means that the power in the uplink varies according to the change in data rate. DTX, where the DPCH is turned off, is a special case of variable data, which is used to minimise the interference between UE(s) by reducing the UE transmit power when voice, user or control information is not present.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.6.2 Minimum requirements

A change of output power is required when the TFC, and thereby the data rate, is changed. The ratio of the amplitude between the DPDCH codes and the DPCCH code will vary. The power step due to a change in TFC shall be calculated in the UE so that the power transmitted on the DPCCH shall follow the inner loop power control. The step in total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude. The accuracy of the power step, given the step size is specified in table 5.6.1. The power change due to a change in TFC is defined as the relative power difference between the average power of the original (reference) timeslot and the average power of the target timeslot, not including the transient duration. The transient duration is from 25 µs before the slot boundary to 25 µs after the slot boundary. The power is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off α = 0,22 and a bandwidth equal to the chip rate.

Table 5.6.1: Transmitter power step tolerance

Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
0	±0,5 ~~dB~~
1	±0,5 ~~dB~~
2	±1,0 ~~dB~~
3	±1,5 ~~dB~~
4 ≤ ΔP ≤ 10	±2,0 ~~dB~~
11 ≤ ΔP ≤ 15	±3,0 ~~dB~~
16 ≤ ΔP ≤ 20	±4,0 ~~dB~~
21 ≤ ΔP	±6,0 ~~dB~~

Clause C.2.1 defines the UL reference measurement channels (12,2 kbps) for TX test and the power ratio between DPCCH and DPDCH as −5,46 dB. Therefore, only one power control step size is selected as minimum requirement from table 5.6.1. The accuracy of the power step, given the step size is specified in table 5.6.2.

Table 5.6.2: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance [dB]
β_c = 0,5333, β_d = 1,0	7	±2 ~~dB~~

The transmit power levels versus time shall meet the mask specified in figure 5.6.1.

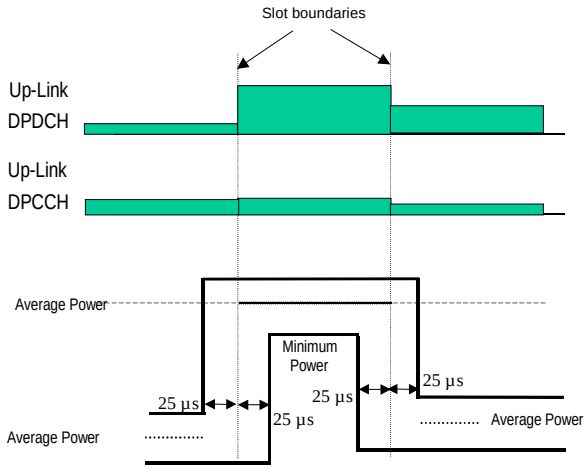

Figure 5.6.1: Transmit template during TFC change

The UL reference measurement channel (12,2 kbps) is a fixed rate channel. Therefore, DTX, where the DPDCH is turned off, is tested, as shown in figure 5.6.2.

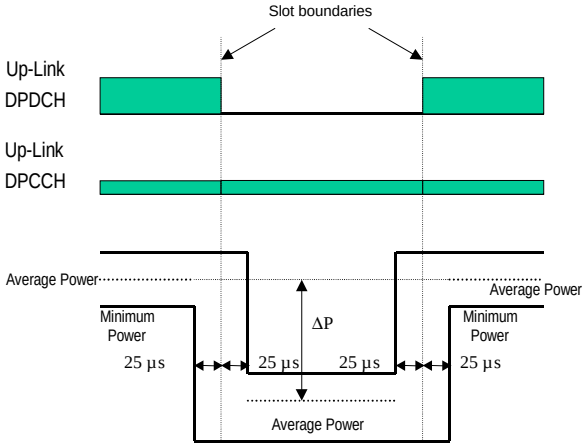

Figure 5.6.2: Transmit template during DTX

The reference for this requirement is TS 25.101 [1] clause 6.5.3.1.

5.6.3 Test purpose

To verify that the tolerance of power control step size does not exceed the described value shown in table 5.6.2.

To verify that the DTX ON/OFF power levels versus time meets the described mask shown in figure 5.6.2.

5.6.4 Method of test

5.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.
2) A call is set up according to the Generic call setup procedure. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.
3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.6.4.2 Procedure

1) Set the attenuation in the downlink signal ($\hat{I}_{or}$) to yield an open loop output power, measured at the UE antenna connector, of 0 dBm.
2) Send alternating "0" and "1" TPC commands in the downlink so as to satisfy the condition of obtaining TPC_cmd = 0.
3) Using the Tester, measure the average output power at the antenna connector of the UE in two cases, both DPDCH and DPCCH are ON and only DPCCH is ON. The measurements shall not include the transient periods.

5.6.5 Test requirements

The difference in mean output power between DPDCH ON and OFF, derived in step 3), shall not exceed the prescribed range in table 5.6.2.

5.7 Power setting in uplink compressed mode

5.7.1 Definition and applicability

Compressed mode in uplink means that the power in uplink is changed.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.7.2 Minimum requirements

A change of output power is required during uplink compressed frames since the transmission of data is performed in a shorter interval. The ratio of the amplitude between the DPDCH codes and the DPCCH code will also vary. The power step due to compressed mode shall be calculated in the UE so that the energy transmitted on the pilot bits during each transmitted slot shall follow the inner loop power control.

Thereby, the power during compressed mode, and immediately afterwards, shall be such that the power on the DPCCH follows the steps due to inner loop power control combined with additional steps of $10Log_{10}(N_{pilot.prev} / N_{pilot.curr})$ dB where $N_{pilot.prev}$ is the number of pilot bits in the previously transmitted slot, and $N_{pilot.curr}$ is the current number of pilot bits per slot.

The resulting step in total transmitted power (DPCCH +DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the power step, given the step size, is specified in table 5.6.1 in clause 5.6.2. The power step is defined as the relative power difference between the average power of the original (reference) timeslot and the average power of the target timeslot, when neither the original timeslot nor the reference timeslot are in a transmission gap. The transient duration is not included, and is from 25 μs before the slot boundary to 2 5μs after the slot boundary. The relative power is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate.

In addition to any power change due to the ratio $N_{pilot.prev} / N_{pilot.curr,}$ the average power of the DPCCH in the first slot after a compressed mode transmission gap shall differ from the average power in the last slot before the transmission gap by an amount Δ_{RESUME}, where Δ_{RESUME} is calculated as described in clause 5.1.2.3 of TS 25.214 [5].

The resulting difference in the total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power difference exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the resulting difference in the total transmitted power (DPCCH + DPDCH) after a transmission gap of up to 14 slots shall be as specified in table 5.7.1.

Table 5.7.1: Transmitter power difference tolerance after a transmission gap of up to 14 slots

~~Tolerance on required difference in total transmitter power after a transmission gap~~	
~~±3 dB~~	
Power difference (Up or down) ΔP [dB]	**Transmitter power step tolerance after a transmission gap [dB]**
ΔP ≤ 2	+/- 3
3	+/- 3
4 ≤ ΔP ≤ 10	+/- 3.5
11 ≤ ΔP ≤ 15	+/- 4
16 ≤ ΔP ≤ 20	+/- 4.5
21 ≤ ΔP	+/- 6.5

The power difference is defined as the relative power difference between the average power of the original (reference) timeslot before the transmission gap and the average power of the target timeslot after the transmission gap, not including the transient durations. The transient durations at the start and end of the transmission gaps are each from 25 μs before the slot boundary to 25 μs after the slot boundary. The relative power is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate.

The transmit power levels versus time shall meet the mask specified in figure 5.7.1.

The reference for this requirement is TS 25.101 [1] clause 6.5.4.1.

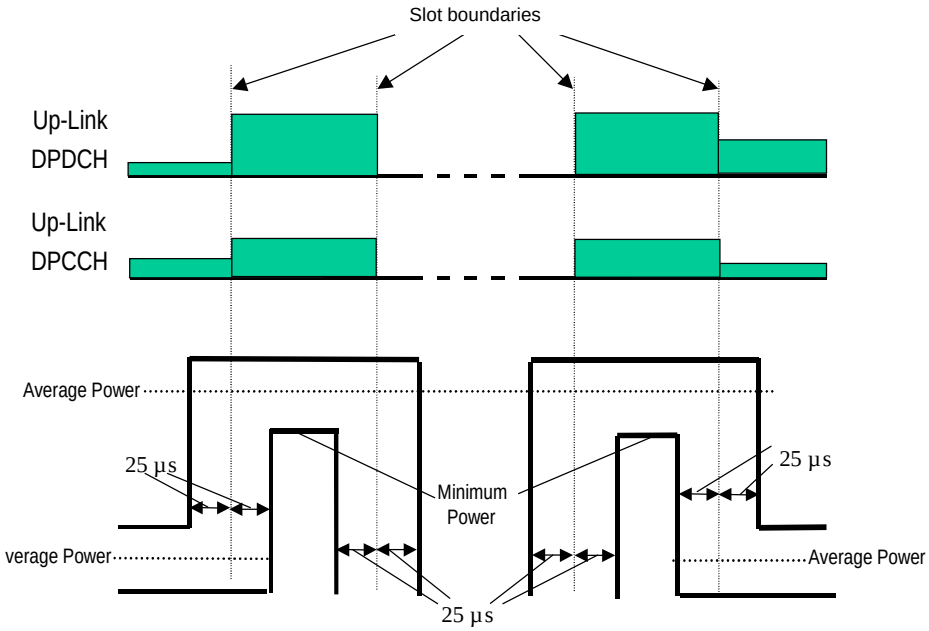

Figure 5.7.1: Transmit template during Compressed mode

For RPL (Recovery Period Length) slots after the transmission gap, where RPL is the minimum out of the transmission gap length and 7 slots, the UE shall use the power control algorithm and step size specified by the signalled Recovery Period Power Control Mode (RPP), as detailed in TS 25.214 [5] clause 5.1.2.3.

When nominal 3 dB power control steps are used in the recovery period, the transmitter output power steps due to inner loop power control shall be within the range shown in table 5.7.2, and the transmitter average output power step due to inner loop power control shall be within the range shown in table 5.7.3, excluding any other power changes due, for example, to changes in spreading factor or number of pilot bits.

Table 5.7.2: Transmitter power control range for 3dB step size

TPC_cmd	Transmitter power control range for 3dB step size	
	Lower	Upper
+1	+1,5 dB	+4,5 dB
0	–0,5 dB	+0,5 dB
–1	–1,5 dB	–4,5 dB

Table 5.7.3: Transmitter average power control range for 3dB step size

TPC_cmd group	Transmitter power control range after 7 equal TPC_cmd groups	
	Lower	Upper
+1	+16 dB	+26 dB
0	–1 dB	+1 dB
–1	–16 dB	–26 dB

The reference for this requirement is TS 25.101 [1] clause 6.4.2.1.1.

5.7.3 Test purpose

To verify that the changes in uplink transmit power in compressed mode are within the prescribed tolerances.

Excess error in transmit power setting in compressed mode increases the interference to other channels, or increases transmission errors in the uplink.

5.7.4 Method of test

5.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

1) Connect the SS to the UE antenna connector as shown in figure A.1.

2) A call is set up according to the Generic call setup procedure. The 12,2 kbps UL reference measurement channel is used, with gain factors β_c = 0,5333 and β_d = 1,0 in non-compressed frames. Slot formats 0, 0A and 0B are used on the uplink DPCCH.

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

5.7.4.2 Procedure

NOTE: CFNs are given in this procedure for reference as examples only. A fixed offset may be applied to the CFNs.

1) Before proceeding with paragraph (4) below, set the output power of the UE, measured at the UE antenna connector, to be in the range –34 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

2) Signal the uplink power control parameters to use Algorithm 1 and a step size of 2 dB.

3) Signal the set of compressed mode parameters shown in table 5.7.5. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of 3 dB output power steps and the implementation of a power change when resuming transmission after a compressed mode gap.

Table 5.7.5: Parameters for pattern A for compressed mode test

Parameter	Meaning	Value
TGPRC	Number of transmission gap patterns within the Transmission Gap Pattern Sequence	1
TGCFN	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence	0
TGSN	Slot number of the first transmission gap slot within the TGCFN	10
TGL1	Length of first transmission gap within the transmission gap pattern	10 slots
TGL2	Length of second transmission gap within the transmission gap pattern	5 slots
TGD	Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern	20 slots
TGPL1	Duration of transmission gap pattern 1	3 frames
TGPL2	Duration of transmission gap pattern 2	Omit
RPP	Recovery Period Power Control Mode	Mode 1
ITP	Initial Transmit Power Mode	Mode 1
UL/DL Mode	Defines whether only DL, only UL, or combined UL/DL compressed mode is used	UL/DL
Downlink Compressed Mode Method	Method for generating downlink compressed mode gap	SF/2
Uplink Compressed Mode Method	Method for generating uplink compressed mode gap	SF/2
Scrambling code change	Indicates whether the alternative scrambling code is used	No code change
Downlink frame type	Downlink compressed frame structure	A
DeltaSIR	Delta in DL SIR target value to be set in the UE during compressed frames	0
DeltaSIRafter	Delta in DL SIR target value to be set in the UE one frame after the compressed frames	0

The resulting compressed mode pattern is shown in figure 5.7.2.

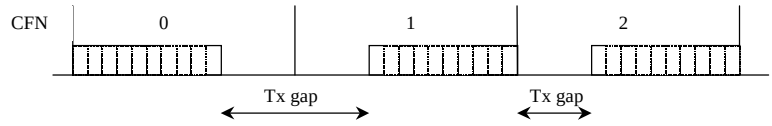

Figure 5.7.2: Pattern A for compressed mode test

4) Transmit TPC commands on the downlink as shown in table 5.7.6.

Table 5.7.6: TPC commands transmitted in downlink

CFN	TPC commands in downlink
0	1 1 1 1 1 1 1 1 1 1 - - - - -
1	- - - - - 1 1 1 1 1 1 1 1 0 0
2	- - - - - 0 1 0 1 0 1 0 1 0 1

5) Measure the mean output power in the following slots, not including the 25 μs transient periods at the start and end of each slot:

CFN 1: Slots # 5,6,7,8,9,10,11,12,14
CFN 2: Slot # 5

6) Re-start the test. Before proceeding with step (8) below, set the output power of the UE, measured at the UE antenna connector, to be in the range 3 ± 9 dBm. This may be achieved by, setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

7) Repeat steps (2) and (3) above, with the exception that TGCFN = 3.

8) Transmit TPC commands on the downlink as shown in table 5.7.7.

Table 5.7.7: TPC commands transmitted in downlink

CFN	TPC commands in downlink
3	0 0 0 0 0 0 0 0 0 0 - - - - -
4	- - - - - 0 0 0 0 0 0 0 0 1 1
5	- - - - - 1 0 1 0 1 0 1 0 1 0

9) Measure the mean output power in the following slots, not including the 25 μs transient periods at the start and end of each slot:

CFN 4: Slots # 5,6,7,8,9,10,11,12,14
CFN 5: Slot # 5

10) Re-start the test. Before proceeding with step (13) below, set the output power of the UE, measured at the UE antenna connector, to be in the range –10 ± 9 dBm. This may be achieved by setting the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.

11) Signal the uplink power control parameters to use Algorithm 1 and a step size of 1 dB.

12) Signal the set of compressed mode parameters shown in table 5.7.8. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of power steps at the start and end of compressed frames, and the implementation of a zero power change when resuming transmission after a compressed mode gap.

Table 5.7.8: Parameters for pattern B for compressed mode test

Parameter	Meaning	Value
TGPRC	Number of transmission gap patterns within the Transmission Gap Pattern Sequence	1
TGCFN	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence	7
TGSN	Slot number of the first transmission gap slot within the TGCFN	8
TGL1	Length of first transmission gap within the transmission gap pattern	14 slots
TGL2	Length of second transmission gap within the transmission gap pattern	omit
TGD	Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern	0
TGPL1	Duration of transmission gap pattern 1	4 frames
TGPL2	Duration of transmission gap pattern 2	Omit
RPP	Recovery Period Power Control Mode	Mode 0
ITP	Initial Transmit Power Mode	Mode 0
UL/DL Mode	Defines whether only DL, only UL, or combined UL/DL compressed mode is used	UL/DL
Downlink Compressed Mode Method	Method for generating downlink compressed mode gap	SF/2
Uplink Compressed Mode Method	Method for generating uplink compressed mode gap	SF/2
Scrambling code change	Indicates whether the alternative scrambling code is used	No code change
Downlink frame type	Downlink compressed frame structure	A
DeltaSIR	Delta in DL SIR target value to be set in the UE during compressed frames	0
DeltaSIRafter	Delta in DL SIR target value to be set in the UE one frame after the compressed frames	0

The resulting compressed mode pattern is shown in figure 5.7.3.

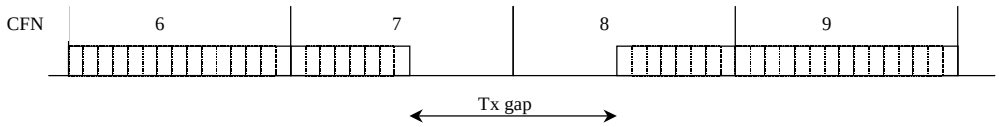

Figure 5.7.3: Pattern B for compressed mode test

13) Transmit TPC commands on the downlink as shown in table 5.7.8.

Table 5.7.8: TPC commands transmitted in downlink

CFN	TPC commands in downlink
6	0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1
7	1 1 1 1 1 1 1 1 - - - - - - -
8	- - - - - - - 0 0 0 0 0 0 0 0
9	0 0 0 1 1 1 1 1 1 1 1 1 1 1 1

14) Measure the mean output power in the following slots, not including the 25 µs transient periods at the start and end of each slot:

CFN 6: Slot # 14
CFN 7: Slots # 0 and 7
CFN 8: Slots # 7 and 14
CFN 9: Slot # 0

5.7.5 Test requirements

For ease of reference, the following uplink output power measurements are defined in figure 5.7.4. In this figure:

- P_g is the mean power in an uplink transmission gap, excluding the 25 μs transient periods.
- P_a is the mean power in the last slot before a compressed frame (or pair of compressed frames), excluding the 25 μs transient periods.
- P_b is the mean power in the first slot of a compressed frame, excluding the 25 μs transient periods.
- P_c is the mean power in the last slot before a transmission gap, excluding the 25 μs transient periods.
- P_d is the mean power in the first slot after a transmission gap, excluding the 25 μs transient periods.
- P_e is the mean power in the last slot of a compressed frame, excluding the 25 μs transient periods.
- P_f is the mean power in the first slot after a compressed frame (or pair of compressed frames), excluding the 25 μs transient periods.

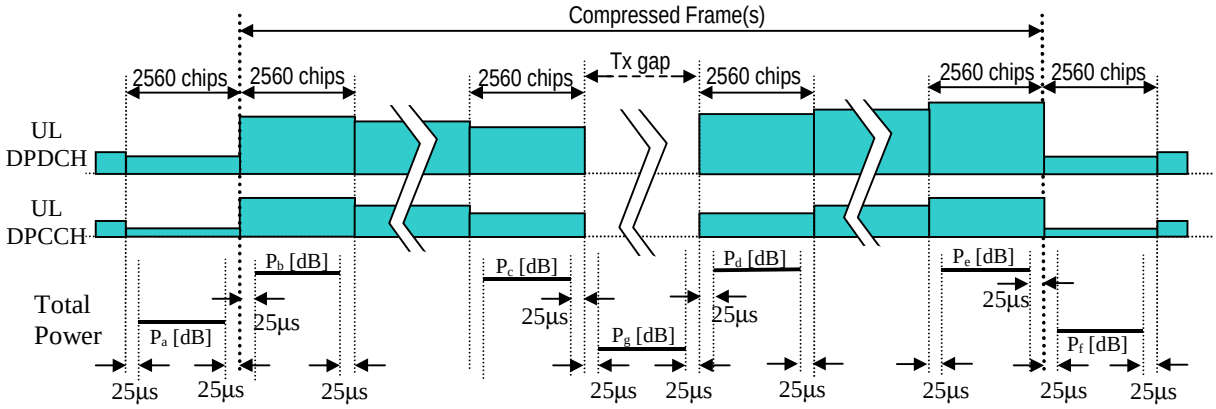

Figure 5.7.4: Uplink transmit power in uplink compressed mode

1. At the boundary between CFN 6 and CFN 7, $P_b - P_a$ shall be within the range +4 ± 2 dB.
2. In slot #5 of CFN 2, the power difference $P_d - P_c$ from the power in slot #14 of CFN 1 shall be within the range -6 ± 3 dB.
3. In slot #5 of CFN 5, the power difference $P_d - P_c$ from the power in slot #14 of CFN 4 shall be within the range +6 ± 3 dB.
4. In slot #7 of CFN 8, the power difference $P_d - P_c$ from the power in slot #7 of CFN 7 shall be within the range 0 ± 3 dB.
5. (void)
6. At the boundary between CFN 8 and CFN 9, $P_f - P_e$ shall be within the range -4 ± 2 dB.
7. In the slots between slot #6 of CFN 1 and slot #12 of CFN 1 inclusive, the change in mean output power from the previous slot shall be within the range given in table 5.7.2 for TPC_cmd = +1.
8. The aggregate change in mean output power from slot #5 of CFN 1 to slot #12 of CFN 1 shall be within the range given in table 5.7.3 for TPC_cmd = +1.
9. In the slots between slot #6 of CFN 4 and slot #12 of CFN 4 inclusive, the change in mean output power from the previous slot shall be within the range given in table 5.7.2 for TPC_cmd = -1.
10. The aggregate change in mean output power from slot #5 of CFN 4 to slot #12 of CFN 4 shall be within the range given in table 5.7.3 for TPC_cmd = -1.

3GPP TSG-T WG1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

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CR-Form-v6.1

CHANGE REQUEST

⌘	34.121	CR	128	⌘ rev	-	⌘	Current version:	3.7.0	⌘

Spec Title: Terminal Conformance Specification; Radio transmission and reception (FDD) ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Creation of common default messages for RRM in Annex I
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18-Feb-02
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Default messages in 34.108 and 34-123-1 need to be modified for RRM test cases purposes. In addition, some of the messages are the same for several test cases. Hence, it make sense to put those common messages in a separate Annex and simplify the editing of the test cases, and at the same time keeping the size of TS 34.121 as small as possible.
Summary of change:	⌘	Default messages have been placed in Annex I. As a first step MEASUREMENT REPORT messages for intra frequency, inter frequency and inter RAT test cases of Clause 8.7 are proposed for inclusion in Annex I.
Consequences if not approved:	⌘	1) MEASUREMENT REPORT messages currently referred in clause 8.7 will be wrong, and procedure will be incorrect. 2) Unnecessary repeatability of the same messages will exist in TS 34.121

Clauses affected:	⌘	Annex I		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Annex I (normative):
~~Void~~Default Message Contents

This Annex contains the default values of common messages, other than those described in TS 34.108 and TS 34.123-1. The messages are primarily concerning the RRM test cases in clause 8 and unless indicated otherwise in specific test cases, shall be transmitted and checked by the system simulator. The necessary messages are listed in alphabetical order.

In this Annex, decimal values are normally used. However, sometimes, a hexadecimal value, indicated by an "H", or a binary value, indicated by a "B" is used.

Contents of MEASUREMENT REPORT message for Intra frequency test cases

Information Element	Value/remark
Message Type	
Integrity check info	The presence of this IE is dependent on IXIT statements in TS 34.123-2. If integrity protection is indicated to be active, this IE shall be present with the values of the sub IEs as stated below. Else, this IE and the sub-IEs shall be absent.
- Message authentication code	This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS.
- RRC Message sequence number	This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value.
Measurement identity	1
Measured Results	
- Intra-frequency measured results list	
- Cell measured results	
- Cell Identity	Not present
- SFN-SFN observed time difference	Checked that this IE is present
- Cell synchronisation information	
- Tm	Checked that this IE is present
- OFF	Checked that this IE is present
- CHOICE mode	FDD
- Primary CPICH info	Checked that this IE is present
- Primary scrambling code	150
- CPICH Ec/N0	Checked that this IE is present
- CPICH RSCP	Checked that this IE is present
- Pathloss	Checked that this IE is present
Measured results on RACH	Checked that this IE is absent
Additional measured results	Checked that this IE is absent
Event results	Checked that this IE is absent

Contents of MEASUREMENT REPORT message for Inter frequency test cases

Information Element	Value/remark
Message Type	
Integrity check info	The presence of this IE is dependent on IXIT statements in TS 34.123-2. If integrity protection is indicated to be active, this IE shall be present with the values of the sub IEs as stated below. Else, this IE and the sub-IEs shall be absent.
- Message authentication code	This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS.
- RRC Message sequence number	This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value.
Measurement identity	1
Measured Results	
- Inter-frequency measured results list	
- UTRA Carrier RSSI	Checked that this IE is present
- Inter-frequency cell measurement results	
- Cell measured results	
- Cell Identity	Not present
- SFN-SFN observed time difference	Checked that this IE is present
- Cell synchronisation information	
-Tm	Checked that this IE is present
- OFF	Checked that this IE is present
- CHOICE mode	FDD
- Primary CPICH info	Checked that this IE is present
- Primary scrambling code	150
- CPICH Ec/N0	Checked that this IE is present
- CPICH RSCP	Checked that this IE is present
- Pathloss	Checked that this IE is present
Measured results on RACH	Checked that this IE is absent
Additional measured results	Checked that this IE is absent
Event results	Checked that this IE is absent

Contents of MEASUREMENT REPORT message for inter – RAT test cases

Information Element	Value/remark
Message Type	
Integrity check info	The presence of this IE is dependent on IXIT statements in TS 34.123-2. If integrity protection is indicated to be active, this IE shall be present with the values of the sub IEs as stated below. Else, this IE and the sub-IEs shall be absent.
- Message authentication code	This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS.
- RRC Message sequence number	This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value.
Measurement identity	1
Measured Results	
- Inter-RAT measured results list	
- CHOICE system	GSM
- Measured GSM cells	Checked that this IE is present
- GSM carrier RSSI	Checked that this IE is present
- Pathloss	Checked that this IE is present
- Observed time difference to GSM cell	Checked that this IE is present
Measured results on RACH	Checked that this IE is absent
Additional measured results	Checked that this IE is absent
Event results	Checked that this IE is absent