Source: **T1**

Title: **CR's to TS 34.121 v3.5.0 for approval**

Agenda item: **5.1.3**

Document for: **Approval**

This document contains 13 CRs to TS 34.121 v3.5.0. These CRs have been agreed by T1 and are put forward to TSG T for approval.

CR related to Test Tolerance:

Spec	CR	Rev	Release	Subject	Cat	Version Current	Version -New	Doc-2nd-Level
34.121	098		R99	Annex F Measurement uncertainty	F	3.5.0	3.6.0	T1-010342

CR related to Total Test Time optimisation:

Spec	CR	Rev	Release	Subject	Cat	Version Current	Version -New	Doc-2nd-Level
34.121	099		R99	RX Spurious emissions	C	3.5.0	3.6.0	T1-010364

CRs related to RRM:

Spec	CR	Rev	Release	Subject	Cat	Version Current	Version -New	Doc-2nd-Level
34.121	100		R99	Structure of RRM test cases	F	3.5.0	3.6.0	T1-010356
34.121	101		R99	Clause 8.2, Idle mode cell reselection delay tests	F	3.5.0	3.6.0	T1-010361
34.121	102		R99	Proposal for measuring method of Random Access	B	3.5.0	3.6.0	T1-010362

CRs related to maintenance:

Spec	CR	Rev	Release	Subject	Cat	Version Current	Version -New	Doc-2nd-Level
34.121	103		R99	Modification to OCNS code channels to allow for 384 kbps allocation	F	3.5.0	3.6.0	T1-010339
34.121	104		R99	Clarification of AWGN definition	F	3.5.0	3.6.0	T1-010340
34.121	105		R99	Correction to test for inner loop power control in the uplink (FDD)	F	3.5.0	3.6.0	T1-010341
34.121	106		R99	Core specification change for uplink inner loop power control	F	3.5.0	3.6.0	T1-010355
34.121	107		R99	Power Control mode in downlink	F	3.5.0	3.6.0	T1-010357
34.121	108		R99	Correction of frequency range for receiver spurious emission requirements	F	3.5.0	3.6.0	T1-010360
34.121	109		R99	Test numbering of multi-path fading propagation tests	D	3.5.0	3.6.0	T1-010363
34.121	110		R99	Measurement of the ON/OFF power during the PRACH preamble	F	3.5.0	3.6.0	T1-010370

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CHANGE REQUEST

⌘ **34.121** **CR** 103 ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Modification to OCNS code channels to allow for 384 kbps allocation
Source:	⌘	T1\RF
Work item code:	⌘	***Date:*** ⌘ 9/July/2001
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:	⌘	There is insufficient space in the code domain fo the OCNS definition to add the 384 kbps RMC for certain tests
Summary of change:	⌘	Code channel 102 is change to 125
Consequences if not approved:	⌘	Testing with 384 kbps RMC and OCNS will not be possible

Clauses affected:	⌘	E.3.5		
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.

E.3 During connection

The following clauses describe the downlink Physical Channels that are transmitted during a connection i.e., when measurements are done. For these measurements the offset between DPCH and SCH shall be zero chips at base station meaning that SCH is overlapping with the first symbols in DPCH in the beginning of DPCH slot structure.

E.3.1 Measurement of Tx Characteristics

Table E.3.1 is applicable for measurements on the Transmitter Characteristics (clause 5) with the exception of subclauses 5.3 (Frequency Error), 5.4.1 (Open Loop Power Control in the Uplink), 5.4.4 (Out-of-synchronisation handling of output power), and 5.5.2 (Transmit ON/OFF Time mask).

NOTE: Applicability to subclause 5.7 (Power setting in uplink compressed mode) is FFS.

Table E.3.1: Downlink Physical Channels transmitted during a connection

Physical Channel	Power
Îor	–93 dBm / 3.84MHz
CPICH	CPICH_Ec / DPCH_Ec = 7 dB
P-CCPCH	P-CCPCH_Ec / DPCH_Ec = 5 dB
SCH	SCH_Ec / DPCH_Ec = 5 dB
PICH	PICH_Ec / DPCH_Ec = 2 dB
DPCH	–103.3 dBm / 3.84MHz

E.3.2 Measurement of Rx Characteristics

Table E.3.2 is applicable for measurements on the Receiver Characteristics (clause 6) with the exception of subclause 6.3 (Maximum input level), and 6.8 (Spurious Emissions).

Table E.3.2: Downlink Physical Channels transmitted during a connection

Physical Channel	Power
CPICH	CPICH_Ec / DPCH_Ec = 7 dB
P-CCPCH	P-CCPCH_Ec/ DPCH_Ec = 5 dB
SCH	SCH_Ec / DPCH_Ec = 5 dB
PICH	PICH_Ec / DPCH_Ec = 2 dB
DPCH	Test dependent power

E.3.3 Measurement of Performance requirements

Table E.3.3 is applicable for measurements on the Performance requirements (clause 7), including subclause 6.3 (Maximum input level) and 5.4.4 (Out-of-synchronisation handling of output power), excluding subclauses 7.6.1 (Demodulation of DCH in open loop transmit diversity mode) and 7.6.2 (Demodulation of DCH in closed loop transmit diversity mode).

Table E.3.3: Downlink Physical Channels transmitted during a connection[1]

Physical Channel	Power	Note
P-CPICH	P-CPICH_Ec/Ior = –10 dB	Use of P-CPICH or S-CPICH as phase reference is specified for each requirement and is also set by higher layer signalling.
S-CPICH	S-CPICH_Ec/Ior = –10 dB	When S-CPICH is the phase reference in a test condition, the phase of S-CPICH shall be 180 degrees offset from the phase of P-CPICH. When S-CPICH is not the phase reference, it is not transmitted.
P-CCPCH	P-CCPCH_Ec/Ior = –12 dB	
SCH	SCH_Ec/Ior = –12 dB	This power shall be divided equally between Primary and Secondary Synchronous channels
PICH	PICH_Ec/Ior = –15 dB	
DPCH	Test dependent power	When S-CPICH is the phase reference in a test condition, the phase of DPCH shall be 180 degrees offset from the phase of P-CPICH.
OCNS	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	1. OCNS interference consists of 16 dedicated data channels. The channelization codes, level settings and timing offsets for data channels are chosen as specified in Table E.3.6. 2. All dedicated channels user data is uncorrelated to each other and the measurement channel during the BER/BLER measurement period.

Note 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the DPCH channels may be used.

[1] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

E.3.4 Connection with open-loop transmit diversity mode

Table E.3.4 is applicable for measurements for subclause 7.6.1(Demodulation of DCH in open loop transmit diversity mode)

Table E.3.4: Downlink Physical Channels transmitted during a connection[2]

Physical Channel	Power	Note
P-CPICH (antenna 1)	P-CPICH_E_{c1}/I_{or} = –13 dB	1. Total P-CPICH_E_c/I_{or} = –10 dB
P-CPICH (antenna 2)	P-CPICH_E_{c2}/I_{or} = –13 dB	
P-CPICH (antenna 1)	P-CPICH_E_{c1}/I_{or} = –13 dB	1. Total P-CPICH_E_c/I_{or} = –10 dB
P-CPICH (antenna 2)	P-CPICH_E_{c2}/I_{or} = –13 dB	
P-CCPCH (antenna 1)	P-CCPCH_Ec_1/I_{or} = –15 dB	1. STTD applied 2. Total P-CCPCH_Ec/I_{or} = –12 dB
P-CCPCH (antenna 2)	P-CCPCH_Ec_2/I_{or} = –15 dB	
SCH (antenna 1 / 2)	SCH_E_c/I_{or} = –12 dB	1. TSTD applied. 2. This power shall be divided equally between Primary and Secondary Synchronous channels
PICH (antenna 1)	PICH_E_{c1}/I_{or} = –18 dB	1. STTD applied 2. Total PICH_E_c/I_{or} = –15 dB
PICH (antenna 2)	PICH_E_{c2}/I_{or} = –18 dB	
DPCH	Test dependent power	1. STTD applied 2. Total power from both antennas
OCNS	Necessary power so that total transmit power spectral density of Node B (I_{or}) adds to one	1. This power shall be divided equally between antennas 2. OCNS interference consists of 16 dedicated data channels. The channelization codes, level settings and timing offsets for data channels are chosen as specified in Table E.3.6. 3. All dedicated channels user data is uncorrelated to each other and the measurement channel during the BER/BLER measurement period.

[2] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

Note 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the DPCH channels may be used.

E.3.5 Connection with closed loop transmit diversity mode

Table E.3.5 is applicable for measurements for subclause 7.6.2 (Demodulation of DCH in closed loop transmit diversity mode)

Table E.3.5: Downlink Physical Channels transmitted during a connection[3]

Physical Channel	Power	Note
P-CPICH (antenna 1)	P-CPICH_Ec1/Ior = –13 dB	1. Total P-CPICH_Ec/Ior = –10 dB
P-CPICH (antenna 2)	P-CPICH_Ec2/Ior = –13 dB	
P-CCPCH (antenna 1)	P-CCPCH_Ec1/Ior = –15 dB	1. STTD applied
P-CCPCH (antenna 2)	P-CCPCH_Ec2/Ior = –15 dB	1. STTD applied, total P-CCPCH_Ec/Ior = –12 dB
SCH (antenna 1 / 2)	SCH_Ec/Ior = –12 dB	1. TSTD applied
PICH (antenna 1)	PICH_Ec1/Ior = –18 dB	1. STTD applied
PICH (antenna 2)	PICH_Ec2/Ior = –18 dB	2. STTD applied, total PICH_Ec/Ior = –15 dB
DPCH	Test dependent power	1. Total power from both antennas
OCNS	Necessary power so that total transmit power spectral density of Node B (Ior) adds to one	1. This power shall be divided equally between antennas 2. OCNS interference consists of 16 dedicated data channels. The channelization codes, level settings and timing offsets for data channels are chosen as specified in Table E.3.6. 3. All dedicated channels user data is uncorrelated to each other and the measurement channel during the BER/BLER measurement period.

Note 1: For dynamic power correction required to compensate for the presence of transient channels, e.g. control channels, a subset of the DPCH channels may be used.

[3] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

Table E.3.6: DPCH Spreading Code, Timing offsets and relative level settings for OCNS signal.

Channelization Code	Timing offset ($x256T_{chip}$)	Level setting (dB)
2	86	-1
11	134	-3
17	52	-3
23	45	-5
31	143	-2
38	112	-4
47	59	-8
55	23	-7
62	1	-4
69	88	-6
78	30	-5
85	18	-9
94	30	-10
~~102~~	~~61~~	~~-8~~
113	128	-6
119	143	0
125	61	-8

Note: The DPCH Spreading Codes, Timing offsets and relative level settings are choosen for simulating a signal with realistic PAR.

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CHANGE REQUEST

⌘ **34.121** **CR** 104 ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Clarification of AWGN definition
Source:	⌘	T1\RF
Work item code:	⌘	***Date:*** ⌘ 9/July/2001
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 AWGN definition is incomplete
Summary of change:	⌘	The peak to average ratio of the signal at 0.001% probability and flatness are defined.
Consequences if not approved:	⌘	An AWGN signal with insufficient randomness may be used which will artificially improve test results.

Clauses affected:	⌘	7.1 (7.1.2)
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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 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 [4] TS 34.109.

Table 7.1.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	UL DPCH bit rate
12.2 kbps reference measurement channel	12.2 kbps	30 ksps	60 kbps
64/144/384 kbps reference measurement channel	64 kbps	120 ksps	240 kbps
	144 kbps	240 ksps	480 kbps
	384 kbps	480 ksps	960 kbps

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

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

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CHANGE REQUEST

⌘ **TS34.121** **CR** **105** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Correction to test for inner loop power control in the uplink (FDD)
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2001-07-03
Category:	⌘	**F** ***Release:*** ⌘ R99

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F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
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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:	⌘	To avoid implying an additional requirement which is not in the Core Specification.
Summary of change:	⌘	The maximum output power at which the inner loop power control shall function normally is determined during the inner loop power control test itself, not during a separate test carried out at a different time under potentially different conditions.
Consequences if not approved:	⌘	UEs which are functioning entirely in accordance with the Core Requirements could fail the test.

Clauses affected:	⌘	5.4.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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, 2 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 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 power of the original (reference) timeslot and the average 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 $\alpha = 0.22$ and a bandwidth equal to the chip rate.

Table 5.4.2.1: Transmitter power control 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 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

NOTE 1: 3dB inner loop power control steps are only used in compressed mode.

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

The requirements for the derivation of TPC_cmd are detailed in TS 25.214 subclauses 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 subclause 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 (subclause 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 ~~measured~~ in subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see subclause 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 [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.4.2.4.2 Procedure

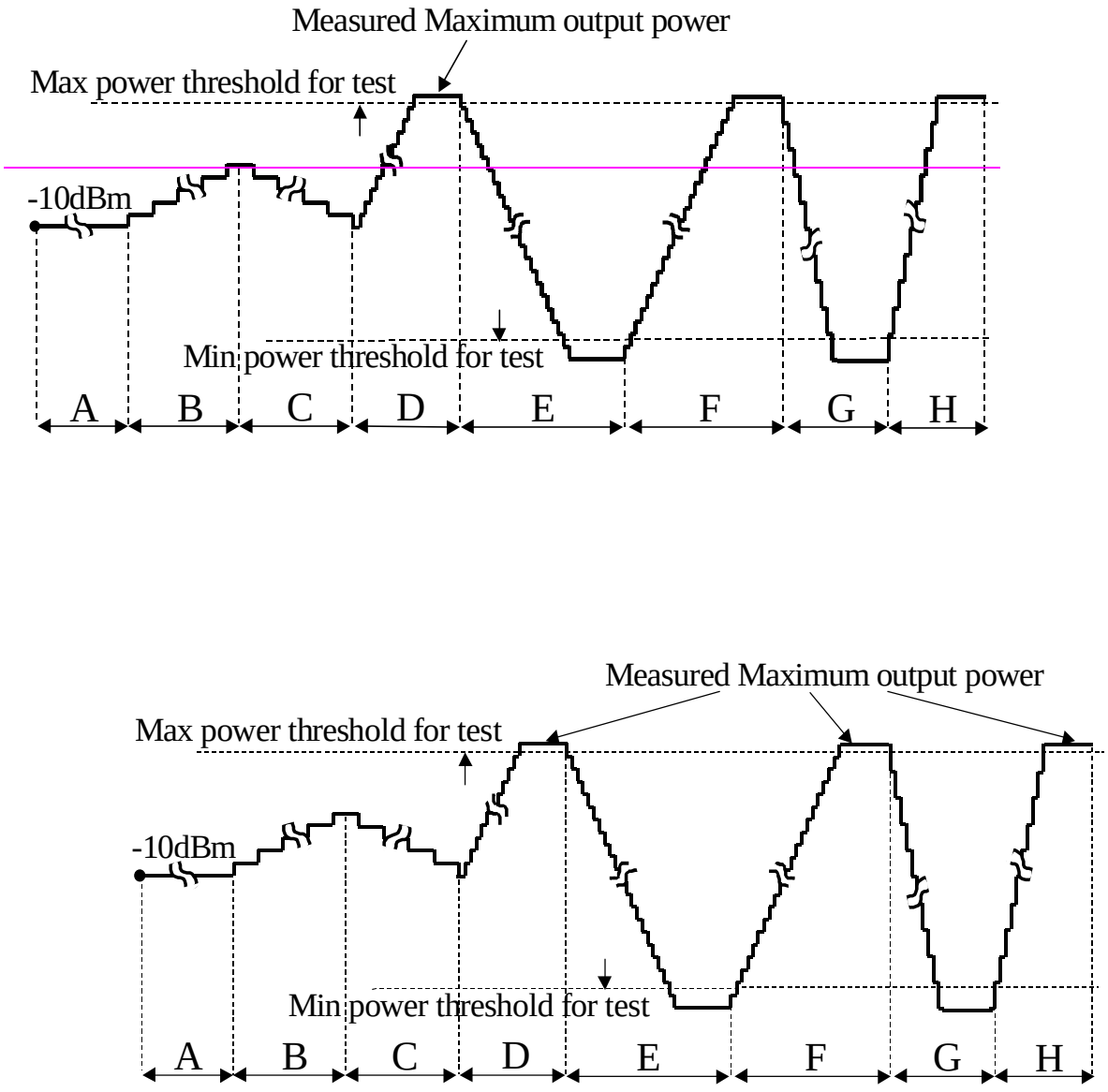

Figure 5.4.2.4 Inner Loop Power Control Test Steps

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±9dBm. 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:

   10000010101010111110100000101010101111101000001010101011111 0

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[1] TPC commands with the value 0.

7) Step F: Transmit a sequence of 150[1] 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[1] TPC commands with the value 0.

9) Step H: Transmit a sequence of 75[1] 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 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 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 25μs before each slot boundary and 25μs after each slot boundary shall not be included in the power measurements.

[1] 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.

T1-010342

CR-Form-v4

CHANGE REQUEST

⌘ **34.121** **CR** **098** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

*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:	⌘	CR to 34.121 Annex F Measurement uncertainty
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2001-07-10
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:	⌘	Various updates based on work of TEM ad hoc
Summary of change:	⌘	Numerous
Consequences if not approved:	⌘	Incorrect Test Requirements will be set

Clauses affected:	⌘			
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 F (normative): General test conditions and declarations

The requirements of this clause apply to all applicable tests in this specification.

Many of the tests in this specification 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 subclauses 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 annex 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 subclause 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

Subclause	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 ~~which~~ 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 ~~12 dB to~~ 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 ~~ON/~~OFF Power: (static case) ~~UE minimum output power~~	±1.0 dB	~~(Static off power case)~~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~~25~~ 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	

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

Subclause	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	~~Using ± 0.7 dB for signal and interferer as currently defined, and 68 dB ACLR @ 10 MHz.~~ 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	

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

Subclause	Maximum Test System Uncertainty		Derivation of Test System Uncertainty
7.2 Demodulation in Static Propagation Condition	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH\_E_c}{I_{or}}$	±0.3 dB ±1.0 dB ±0.1 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 section 7 but is specified as 1.0 dB.
7.3 Demodulation of DCH in multipath Fading Propagation conditions	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH\_E_c}{I_{or}}$	±0.56 dB ±1.0 dB ±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 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
7.4 Demodulation of DCH in Moving Propagation conditions	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH\_E_c}{I_{or}}$	±0.6 dB ±1.0 dB ±0.1 dB	Same as 7.3
7.5 Demodulation of DCH in Birth-Death Propagation conditions	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH\_E_c}{I_{or}}$	±0.6 dB ±1.0 dB ±0.1 dB	Same as 7.3
7.6.1 Demodulation of DCH in open loop Transmit diversity mode	$\hat{I}_{or}/I_{oc}$ I_{oc} $\frac{DPCH\_E_c}{I_{or}}$	±0.8 dB ±1.0 dB ±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 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
7.6.2 Demodulation of DCH in closed loop Transmit diversity 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

7.6.3, 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

F.2 Test Tolerances (This subclause is informative)

The Test Tolerances defined in this subclause have been used to relax the Minimum Requirements in this specification 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.

Subclause	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 – ~~7~~seven and ~~10~~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~~25~~ 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.

Subclause	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.

Subclause	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

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 Part 1 sub-part 2 section 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 subclause F.1 of this specification.

If the Test System for a test is known to have a measurement uncertainty greater than that specified in subclause 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 subclause 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 subclause 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 subclause F.1 had been used.

F.4 Derivation of Test Requirements (This subclause is informative)

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 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

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 subclause 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~~25~~ dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT Upper limit = -4.7~~5~~ dB Lower limit = -9.3~~25~~ dB
5.7 Power setting in uplink compressed mode	Various	TBD (Subset of 5.4.2)	TBD
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~~bandwidth: + TT occupied channel bandwidth = 5.0 MHz

<table>
<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 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:

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

F.5 Acceptable uncertainty of Test Equipment (This subclause is informative)

This informative subclause specifies the critical parameters of the components of an overall Test System (e.g. Signal generators, Signal Analysers etc.) which are necessary when assembling a Test System that complies with subclause F.1 Acceptable Uncertainty of Test System. These Test Equipment parameters are fundamental to the accuracy of the overall Test System and are unlikely to be improved upon through System Calibration.

F.5.1 Transmitter measurements

Table F.5.1 Equipment accuracy for transmitter measurements

Test	Equipment accuracy	Test conditions
5.2 Maximum Output Power	Not critical	~~21~~19 to 2~~5~~8 dBm
5.3 Frequency error	± 10 Hz	0 to 500 Hz.
5.4.1 Open loop power control in uplink	Not critical	-43.7 dBm to 2~~5~~8 dBm
5.4.2 Inner loop power control in the uplink – single step	±0.1 dB relative over a 1.5 dB range ±0.15 dB relative over a 3.0 range ±0.2 dB relative over a 4.5 dB range	+2~~5~~8 dBm to –50 dBm
5.4.2 Inner loop power control in the uplink – ~~10~~ seven and ten steps	±0.3 dB relative over a 26 dB range	+2~~5~~8 dBm to –50 dBm
5.4.3 Minimum Output Power	Not critical	
5.4.4 Out-of-synchronisation handling of output power: $\frac{DPCCH\_E_c}{I_{or}}$	±0.1 dB uncertainty in DPCCH_Ec/Ior ratio	Ratio from –16.6 dB to –28 dB
5.5.1 Transmit ON/OFF Power: UE transmit OFF power	Not critical	-56 dBm (static power)
5.5.2 Transmit ON/OFF Power: transmit ON/OFF time mask	TBD	-56 dBm (dynamic power over approx. 70 dB range)
5.6 Change of TFC: power control step size	±0.3~~25~~ dB relative over a 9 dB range	+2~~5~~8 dBm to –50 dBm
5.7 Power setting in uplink compressed mode:-UE output power	Subset of 5.4.2	+2~~5~~8 dBm to –50 dBm
5.8 Occupied Bandwidth	±100 kHz	For results between 4 and 6 MHz?
5.9 Spectrum emission mask	Not critical	P_Max Accuracy applies ± 5 dB either side of UE requirements
5.10 ACLR	5 MHz offset ± 0.8 dB 10 MHz offset ± 0.8 dB	~~21~~19 to 2~~5~~8 dBm at 5 MHz offset for results between 40 dB and 50 dB. 2~~5~~8 dBm at 10 MHz offset for results between 45 dB and 55 dB.
5.11 Spurious emissions	Not critical	~~21~~19 to 2~~5~~8 dBm
5.12 Transmit Intermodulation	Not critical	~~21~~19 to 2~~5~~8 dBm
5.13.1 Transmit modulation: EVM	±2.5 % (for single code)	2~~5~~8 dBm to –21 dBm
5.13.2 Transmit modulation: peak code domain error	±1.0dB	For readings between -10 dB to –20 dB.

F.5.2 Receiver measurements

Table F.5.2: Equipment accuracy for receiver measurements

Subclause	Equipment accuracy	Test conditions
6.2 Reference sensitivity level	Not critical	
6.3 Maximum input level:	Not critical	
6.4 Adjacent channel selectivity	Not critical	
6.5 Blocking characteristics	Not critical	
6.6 Spurious Response	Not critical	
6.7 Intermod Characteristics	Not critical	
6.8 Spurious emissions	Not critical	

F.5.3 Performance measurements

Table G.3: Equipment accuracy for performance measurements

Subclause	Equipment accuracy	Test conditions
7.2 to 7.10	$\frac{DPCH\_E_c}{I_{or}}$ ±0.1 dB	-2.2 to –18.9 dB

F.6 General rules for statistical testing

[TBD]

3GPP TSG T WG1 meeting#12 **T1-010355**
Busan, Korea 6th – 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **TS34.121 CR 106** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

*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:	⌘	Core specification change for uplink inner loop power control
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2001-07-06
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:	⌘	To propagate a change from the Core Specification (TS25.101).
Summary of change:	⌘	The range over which the inner loop power control shall be tested is now specified.
Consequences if not approved:	⌘	The test specification TS34.121 would not be consistent with the core specification TS25.101.

Clauses affected:	⌘	5.4.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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, 2 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 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 power of the original (reference) timeslot and the average 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 $\alpha = 0.22$ and a bandwidth equal to the chip rate.

Table 5.4.2.1: Transmitter power control 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 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 subclause 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 subclause 5.2.2.

NOTE 1: 3dB inner loop power control steps are only used in compressed mode.

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

The requirements for the derivation of TPC_cmd are detailed in TS 25.214 subclauses 5.1.2.2.2 and 5.1.2.2.3.

5.4.2.3 Test purpose

3GPP TSG-T WG1 Meeting #12 ***Tdoc T1-010356***

Busan, Korea, 6 -7 September, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **TS 34.121 CR 100** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Structure of RRM test cases
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2001-07-10
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:	⌘	This CR is a minor correction of the previous CR (T1R010152), which proposed the change so that the structure of RRM test cases in TS 34.121 should be based on the structure in Annex A instead of the structure of chapter 4 to 9 of TS 25.133.
Summary of change:	⌘	Align the structure of clause 8 to the structure of TS 25.133 V3.6.0 Annex A.
Consequences if not approved:	⌘	Inconsistency between RRM test scenarios as outlined in Annex A of TS 25.133 and the test cases in TS 34.121.

Clauses affected:	⌘	Clause 8
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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

8.2.2.2 Scenario 2: Multi carrier case

8.2.3 UTRAN to GSM Cell Re-Selection

8.2.3.1 Scenario 1

8.2.4 FDD/TDD cell re-selection

~~8.2.2.1 Measurement and evaluation of cell selection criteria S of serving cell~~

~~8.2.2.2 Measurements of intra-frequency cells~~

~~8.2.2.3 Measurements of inter-frequency FDD cells~~

~~8.2.2.4 Measurements of inter-frequency TDD cells~~

~~8.2.2.5 Measurements of inter-RAT GSM cells~~

~~8.2.2.6 Evaluation of cell re-selection criteria~~

~~8.2.2.7 Maximum interruption in paging reception~~

~~8.2.2.8 Number of cells in cell lists~~

8.3 UTRAN Connected ~~m~~Mode ~~m~~Mobility

8.3.1 FDD/FDD Soft Handover

~~8.3.1.1 Active set dimension~~

~~8.3.1.2 Active set update delay~~

~~8.3.1.3 Interruption Time~~

8.3.2 FDD/FDD Hard Handover

~~8.3.2.1 Hard handover delay~~

~~8.3.2.2 Interruption time~~

8.3.3 FDD/TDD Hard Handover

~~8.3.3.1 Hard handover delay~~

~~8.3.3.2 Interruption time~~

8.3.4 Inter-system Handover from UTRAN FDD to GSM~~FDD/GSM Handover~~

~~8.3.4.1 Handover delay~~

~~8.3.4.2 Interruption time~~

8.3.5 Cell Re-selection in CELL_FACH

8.3.5.1 One frequency present in neighbour list

8.3.5.2 Two frequencies present in the neighbour list

~~8.3.5.1 Intra frequency cell reselection~~

~~8.3.5.2 Inter frequency cell reselection~~

~~8.3.5.3 FDD-TDD cell reselection~~

~~8.3.5.4 UTRAN-GSM Cell Reselection~~

8.3.6 Cell Re-selection in CELL_PCH

8.3.6.1 One frequency present in the neighbour list

8.3.6.2 Two frequencies present in the neighbour list

8.3.7 Cell Re-selection in URA_PCH

8.3.7.1 One frequency present in the neighbour list

8.3.7.2 Two frequencies present in the neighbour list

8.4 RRC Connection Control

8.4.1 RRC Re-establishment delay

8.4.2 Random Access

~~8.4.2 Void~~

~~8.4.3 Random Access~~

~~8.4.3.1 Correct behaviour when receiving an ACK~~

~~8.4.3.2 Correct behaviour when receiving an NACK~~

~~8.4.3.3 Correct behaviour at Time-out~~

~~8.4.3.4 Correct behaviour when reaching maximum transmit power~~

~~8.4.4 Transport format combination selection in UE~~

~~8.5 Timing and Signalling characteristics~~8.5 Timing and Signalling Characteristics

8.5.1 UE Transmit Timing

8.6 UE Measurements Procedures

8.6.1 FDD intra frequency measurements

8.6.1.1 Event triggered reporting in AWGN propagation conditions

8.6.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition

8.6.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition

8.6.1.4 Correct reporting of neighbours in fading propagation condition

8.6.2 FDD inter frequency measurements

8.6.2.1 Correct reporting of neighbours in AWGN propagation condition

8.6.2.2 Correct reporting of neighbours in Fading propagation condition

~~8.6.1 General Measurements Requirements in CELL_DCH State~~

~~8.6.1.1 UE Measurement Capability~~

~~8.6.1.2 FDD intra frequency measurements~~

~~8.6.1.2.1 Identification of a new cell~~

~~8.6.1.2.2 UE CPICH measurement capability~~

~~8.6.1.2.3 Periodic Reporting~~

~~8.6.1.2.4 Event Triggered Periodic Reporting~~

~~8.6.1.2.5 Event Triggered Reporting~~

~~8.6.1.3 FDD inter frequency measurements~~

~~8.6.1.3.1 Identification of a new cell~~

~~8.6.1.3.2 Measurement period~~

~~8.6.1.3.3 Periodic Reporting~~

~~8.6.1.3.4 Event Triggered Reporting~~

8.6.3~~6.1.4~~ TDD measurements

8.6.3.1~~6.1.4.1~~ ~~Identification of a new cell~~ Correct reporting of TDD neighbours in AWGN propagation condition

~~8.6.1.4.2 Measurement period~~

~~8.6.1.4.3 Periodic Reporting~~

~~8.6.1.4.4 Event Triggered Reporting~~

~~8.6.1.5 GSM measurements~~

~~8.6.1.5.1 GSM carrier RSSI~~

~~8.6.1.5.2 BSIC verification~~

~~8.6.1.5.2.1 Initial BSIC identification~~

~~8.6.1.5.2.2 BSIC re-confirmation~~

~~8.6.2 Measurements in CELL_DCH State with special requirements~~

~~8.6.3 Capabilities for Support of Event Triggering and Reporting Criteria~~

~~8.6.4 Measurements in CELL_FACH State~~

~~8.6.4.1 UE Measurement Capability~~

~~8.6.4.2 FDD intra frequency measurements~~

~~8.6.4.2.1 Identification of a new cell~~

~~8.6.4.2.2 UE CPICH measurement capability~~

~~8.6.4.2.3 Periodic Reporting~~

~~8.6.4.2.4 Event Triggered Reporting~~

~~8.6.4.3 FDD inter frequency measurements~~

~~8.6.4.3.1 Identification of a new cell~~

~~8.6.4.3.2 Measurement period~~

~~8.6.4.3.3 Periodic Reporting~~

~~8.6.4.3.4 Event Triggered Reporting~~

~~8.6.4.4 TDD measurements~~

~~8.6.4.4.1 Identification of a new cell~~

~~8.6.4.4.2 Measurement period~~

~~8.6.4.5 GSM measurements~~

~~8.6.4.5.1 GSM carrier RSSI~~

~~8.6.4.5.2 BSIC verification~~

8.7 Measurements Performance Requirements

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 CPICH_Ec 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.
- $$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

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	-94...-50

The normative reference for this requirement is [2] TS 25.133 subclause 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 subclause 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 subclauses G.2.1 and G.2.2.

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

Table 8.7.1.1.1.2 defines the limits of signal strengths and code powers, when the requirements are applicable. When verifying the CPICH RSCP intra frequency absolute accuracy requirement only cell 1 in Table 8.7.1.1.1.2 shall be present.

Table 8.7.1.1.1.2: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
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	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc*, Note 1	*Io -13.7 dB = Ioc*, Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -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*.

1) UE is in idle mode and camped on cell 1. SS sends System Information Block type 11 message including intra-frequency measurement reporting criteria IE.
2) SS prompts the operator to make an outgoing call.
3) UE shall transmit a RRC CONNECTION REQUEST message on CCCH.
4) SS shall transmit a RRC CONNECTION SETUP message and allocates DPCH physical channels to UE.
5) UE shall transmit a RRC CONNECTION SETUP COMPLETE message and move to CELL_DCH state.
6) UE shall transmit a MEASUREMENT REPORT message.

8.7.1.1.1.4.2 Procedure

CPICH RSCP measured from Cell 1 is compared to CPICH_Ec power.

8.7.1.1.1.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in subclause 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex 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.

- $\left| CPICH\_RSCP1 \right|_{in\ dB} - CPICH\_RSCP2 \left|_{in\ dB} \right| \leq 20dB$

- $\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$

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 [2] TS 25.133 subclause 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 subclause 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 subclauses G.2.1 and G.2.2.

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

In this case all cells are on the same frequency. Table 8.7.1.1.1.2 defines the limits of signal strengths and code powers, when the requirements are applicable. When verifying the CPICH RSCP intra frequency relative accuracy requirement both cell 1 and 2 in Table 8.7.1.1.1.2 shall be present.

1) UE is in idle mode and camped on cell 1. SS sends System Information Block type 11 message including intra-frequency measurement reporting criteria IE.
2) SS prompts the operator to make an outgoing call.
3) UE shall transmit a RRC CONNECTION REQUEST message on CCCH.
4) SS shall transmit a RRC CONNECTION SETUP message and allocates DPCH physical channels to UE.
5) UE shall transmit a RRC CONNECTION SETUP COMPLETE message and move to CELL_DCH state.
6) UE shall transmit a MEASUREMENT REPORT message.

8.7.1.1.2.4.2 Procedure

1) CPICH RSCP measured from cell 1 is compared to the CPICH RSCP measured from cell 2.
2) The result of step 1) is compared to actual level difference of CPICH_Ec of Cell 1 and Cell 2.

8.7.1.1.2.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in subclause 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex 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.
- $\left| CPICH\_RSCP1|_{in\ dB} - CPICH\_RSCP2|_{in\ dB} \right| \le 20dB$
- | 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 8.7.1.2.1.1: 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 [2] TS 25.133 subclause 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 subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see subclause 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 Annex C.5 [14 slots is FFS]. Table 8.7.1.2.1.2 defines the limits of signal strengths and code powers, where the requirement is applicable.

When verifying the CPICH RSCP inter frequency relative accuracy requirement both cell 1 and 2 in Table 8.7.1.2.1.2 shall be present.

Table 8.7.1.2.1.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
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	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io -10.6 dB = Ioc,* Note 1	*Io -10.6 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	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*.			

1) UE is in idle mode and camped on cell 1. SS sends System Information Block type 11 message.
2) SS prompts the operator to make an outgoing call.
3) UE shall transmit a RRC CONNECTION REQUEST message on CCCH.
4) SS shall transmit a RRC CONNECTION SETUP message and allocates DPCH physical channels to UE.
5) UE shall transmit a RRC CONNECTION SETUP COMPLETE message and move to CELL_DCH state.
6) SS shall transmit MEASUREMENT CONTROL message. SS requests UE to start inter frequency measurement for cell 1 and cell 2. DPCH compressed mode status info IE is set to simultaneously activate compressed mode pattern.
7) UE shall transmit a MEASUREMENT REPORT message.

8.7.1.2.1.4.2 Procedure

1) CPICH RSCP measured from cell 1 is compared to the CPICH RSCP measured from cell 2.
2) The result of step 1) is compared to actual level difference of CPICH_Ec power of Cell 1 and Cell 2.

8.7.1.2.1.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in subclause 8.8~~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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex 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 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.

- $$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

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 [2] TS 25.133 subclause 9.1.2.1.1 and A.9.1.2.2

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 subclause 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 subclauses G.2.1 and G.2.2.

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

Table 8.7.2.1.1.2 defines the limits of signal strengths and code powers, where the requirements are applicable.

When verifying the CPICH Ec/Io intra frequency absolute accuracy requirement only cell 1 in Table 8.7.2.1.1.2 shall be present.

Table 8.7.2.1.1.2: CPICH Ec/Io Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
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	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -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*.			

1) UE is in idle mode and camped on cell 1. SS sends System Information Block type 11 message including intra-frequency measurement reporting criteria IE.

2) SS prompts the operator to make an outgoing call.

3) UE shall transmit a RRC CONNECTION REQUEST message on CCCH.

4) SS shall transmit a RRC CONNECTION SETUP message and allocates DPCH physical channels to UE.

5) UE shall transmit a RRC CONNECTION SETUP COMPLETE message and move to CELL_DCH state.

6) UE shall transmit a MEASUREMENT REPORT message.

8.7.2.1.1.4.2 Procedure

CPICH Ec/Io measured from Cell 1 is compared to CPICH_Ec/Io power from same cell.

8.7.2.1.1.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in subclause 8.7.2.1.1.2.

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex 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.

- $\left| CPICH\_RSCP1|_{in\ dB} - CPICH\_RSCP2|_{in\ dB} \right| \le 20dB$

- $\left(\frac{I_o}{\hat{I}_{or}}\right)\Big|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$

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 [2] TS 25.133 subclause 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 subclause 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 subclauses G.2.1 and G.2.2.

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

In this case all cells are in the same frequency. Table 8.7.2.1.1.2 defines the limits of signal strengths and code powers, where the requirements are applicable. When verifying the CPICH Ec/Io intra frequency relative accuracy requirement both cell 1 and 2 in Table 8.7.2.1.1.2 shall be present.

1) UE is in idle mode and camped on cell 1. SS sends System Information Block type 11 message including intra-frequency measurement reporting criteria IE.
2) SS prompts the operator to make an outgoing call.
3) UE shall transmit a RRC CONNECTION REQUEST message on CCCH.
4) SS shall transmit a RRC CONNECTION SETUP message and allocates DPCH physical channels to UE.
5) UE shall transmit a RRC CONNECTION SETUP COMPLETE message and move to CELL_DCH state.
6) UE shall transmit a MEASUREMENT REPORT message.

8.7.2.1.2.4.2 Procedure

1) CPICH Ec/Io measured from cell 1 is compared to the CPICH Ec/Io measured from cell 2.
2) The result of step 1) is compared to actual level difference of CPICH_Ec power of Cell 1 and Cell 2.

8.7.2.1.2.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in subclause 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

8.7.2.2.2 Inter frequency measurement accuracy

8.7.2.2.1 Absolute accuracy requirement

8.7.2.2.1.1 Definition and applicability

[TBD]

8.7.2.2.1.2 Minimum Requirements

The accuracy requirements in Table 8.7.2.2.1.1 are valid under the following conditions:

- CPICH_RSCP1 ≥ -114 dBm.
- $\left.\frac{I_o}{\hat{I}_{or}}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$

Table 8.7.2.2.1.1: CPICH_Ec/Io Inter 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 [2] TS 25.133 subclause 9.1.2.2.1 and A.9.1.2.2.

8.7.2.2.1.3 Test purpose

The purpose of this test is to verify that the CPICH Ec/Io absolute measurement accuracy is within the specified limits in subclause 8.7.2.2.1.2. This measurement is for Cell selection/re-selection and for handover evaluation.

8.7.2.2.1.4 Method of test

8.7.2.2.1.4.1 Initial conditions

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

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

[TBD]

8.7.2.2.1.4.2 Procedure

[TBD]

8.7.2.2.1.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in subclause 8.8~~7~~.7.2.2.1.2.

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

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.

- $\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$

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 [2] TS 25.133 subclause 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 subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see subclause 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 Annex C.5 [14 slots is FFS]. Table 8.8~~7~~.2.2.2.2 defines the limits of signal strengths and code powers, where the requirement is applicable.

When verifying the CPICH Ec/Io inter frequency relative accuracy requirement both cell 1 and 2 in Table 8.8~~7~~.2.2.2.2 shall be present.

Table 8.7.2.2.2.2: CPICH Ec/Io Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
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	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io -10.6 dB = Ioc*, Note 1	*Io -10.6 dB = Ioc*, Note 1
Range 1:Io Range 2: Io	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	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*.			

1) UE is in idle mode and camped on cell 1. SS sends System Information Block type 11 message.

2) SS prompts the operator to make an outgoing call

3) UE shall transmit a RRC CONNECTION REQUEST message on CCCH.

4) SS shall transmit a RRC CONNECTION SETUP message and allocates DPCH physical channels to UE.

5) UE shall transmit a RRC CONNECTION SETUP COMPLETE message and move to CELL_DCH state.

6) SS shall transmit MEASUREMENT CONTROL message. SS requests UE to start inter frequency measurement for cell 1 and cell 2. DPCH compressed mode status info IE is set to simultaneously activate compressed mode pattern.

7) UE shall transmit a MEASUREMENT REPORT message.

8.7.2.2.2.4.2 Procedure

1) CPICH Ec/Io measured from cell 1 is compared to the CPICH Ec/Io measured from cell 2.

2) The result of step 1) is compared to actual level difference of CPICH_Ec power of Cell 1 and Cell 2.

8.7.2.2.2.5 Test requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in subclause 8.78~~7~~.2.2.2.2.

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

8.7.3 UTRA Carrier RSSI

~~8.7.3.1 Absolute accuracy requirement~~

~~8.7.3.2 Relative accuracy requirement~~

~~8.7.3.3 UTRA Carrier RSSI measurement report mapping~~

8.7.4 ~~GSM carrier RSSI~~SFN-CFN observed time difference

8.7.5 ~~Transport channel BLER~~SFN-SFN observed time difference

~~8.7.5.1 BLER measurement requirement~~

~~8.7.5.2 Transport channel BLER measurement report mapping~~

8.7.6 UE ~~transmitted power~~Rx-Tx time difference

~~8.7.6.1 Accuracy requirement~~

~~8.7.6.2 UE transmitted power measurement report mapping~~

8.7.7 ~~SFN-CFN observed time difference~~Observed time difference to GSM cell

~~8.7.7.1 Intra frequency measurement requirement~~

~~8.7.7.2 Inter frequency measurement requirement~~

~~8.7.7.3 SFN-CFN observed time difference measurement report mapping~~

8.7.8 ~~SFN-SFN observed time difference~~P-CCPCH HSCP

~~8.7.8.1 SFN-SFN observed time difference type 1~~

~~8.7.8.1.1 Measurement requirement~~

~~8.7.8.1.2 SFN-SFN observed time difference type 1 measurement report mapping~~

~~8.7.8.2 SFN-SFN observed time difference type 2~~

~~8.7.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active~~

~~8.7.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active~~

~~8.7.8.2.3 Inter frequency measurement requirement accuracy~~

~~8.7.8.2.4 SFN-SFN observed time difference type 2 measurement report mapping~~

8.7.9 UE Rx-Tx time difference

8.7.9.1 UE Rx-Tx time difference type 1

8.7.9.1.1 Measurement requirement

8.7.9.1.2 UE Rx-Tx time difference type 1 measurement report mapping

8.7.9.2 UE Rx-Tx time difference type 2

8.7.9.2.1 Measurement requirement

8.7.9.2.2 UE Rx-Tx time difference type 2 measurement report mapping

8.7.10 Observed time difference to GSM cell

8.7.10.1 Measurement requirement

8.7.10.2 Observed time difference to GSM cell measurement report mapping

8.7.11 P-CCPCH RSCP

8.7.11.1 Absolute accuracy requirements

8.7.11.2 P-CCPCH RSCP measurement report mapping

8.7.12 UE GPS Timing of Cell Frames for LCS

8.7.12.1 UE GPS timing of Cell Frames for LCS measurement report mapping

3GPP TSG-T1 Meeting #12
Busan, Korea, 6-7 September 2001

T1-010357

CR-Form-v4

CHANGE REQUEST

⌘ **34.121 CR 107** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

*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:	⌘	Power Control mode in downlink
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 13.06.01
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 downlink power control mode is not specified.
Summary of change:	⌘	For the power control in downlink measurements power control algorithm one should be used.
Consequences if not approved:	⌘	The measurements can lead to ambiguous results if different power control modes are used.

Clauses affected:	⌘	7.8
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.

7.8 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 Annex 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 Annex 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 *	7		dB
Minimum_DL_Power *	-18		dB
Limited_Power_Raise_Used	"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 [1] TS 25.101 subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see subclause 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. ~~SS response time for UE TPC commands shall be one slot.~~ 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 [3] TS 34.108 and [4] TS 34.109 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 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 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 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 *	7				dB
Minimum_DL_Power *	-18				dB
Limited_Power_Raise_ Used	"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 [1] TS 25.101 subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see subclause 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~~2~~) 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~~3~~) 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 Test Requirements

a) The downlink $\frac{DPCH\_E_c}{I_{or}}$ power 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 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 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 *	7	-6.2	7	dB
Minimum_DL_Power *	-18			dB
Limited_Power_Raise_ Used	"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 [1] TS 25.101 subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see subclause 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 [3] TS 34.108 and [4] TS 34.109 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.

7.8.3.5 Test Requirements

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 during stage 3 more than 90% of the time.

3GPP TSG-T WG1 meeting #12 **T1-010360**
Busan, Korea, 6th – 7th September 2001

CR-Form-v4

CHANGE REQUEST

⌘ **34.121 CR 108** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Correction of frequency range for receiver spurious emission requirements
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2001-09-03
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 current frequency range for receiver spurious emission requirements is inconsistence with is proposed in ITU-R M.[UNWANT-MS].
Summary of change:	⌘	The starting frequency for receiver spurious emission requirements is changed from 9kHz to 30MHz as proposed in ITU-R M.[UNWANT-MS].
Consequences if not approved:	⌘	There will be inconsistency with ITU-R recommendation M.[UNWANT]. It will casue further inconsistency with each regulations those follow the recommendation.

Clauses affected:	⌘	6.8.2,6.8.5		
Other specs Affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.101
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.

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
30MHz~~9kHz~~ ≤ f < 1GHz	100 kHz	-57 dBm	
1GHz ≤ f ≤ 12.75 GHz	1 MHz	-47 dBm	

Table 6.8.2: Additional receiver spurious emission requirements

	Frequency Band	Measurement Bandwidth	Maximum level	Note
For operation in frequency bands as defined in subclause 4.2(a)	1920 MHz ≤ f ≤ 1980 MHz	3.84 MHz	-60 dBm	Mobile transmit band in URA_PCH, Cell_PCH and idle state
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	Mobile receive band

The reference for this requirement is [1] TS 25.101 subclause 7.9.1.

6.8.3 Test purpose

To verify that the UE spurious emission meets the specifications described in subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see subclause 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 camped on a cell
4) UE shall perform Location Registration (LR) before the test procedure in subclause 6.8.4.2, but not during it.
5) Neighbour cell list shall be empty.
6) Paging repetition period and DRX cycle shall be set to minimum (shortest possible time interval).

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
30MHz~~9kHz~~ ≤ f < 1GHz	100 kHz	-57 dBm	
1GHz ≤ f ≤ 12.75 GHz	1 MHz	-47 dBm	

Table 6.8.4: Additional receiver spurious emission requirements

For operation in frequency bands as defined in subclause 4.2(a)	Frequency Band	Measurement Bandwidth	Maximum level	Note
	1920 MHz ≤ f ≤ 1980 MHz	3.84 MHz	-60 dBm	Mobile transmit band in URA_PCH, Cell_PCH and idle state
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	Mobile 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

3GPP TSG-T1 Meeting #12
Busan, Korea, 06- 07 September, 2001

Tdoc T1-010361

CR-Form-v3

CHANGE REQUEST

⌘ **TS 34.121 CR 101** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Reinstatement and update of Idle Mode Cell Reselection Delay tests
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2001-08-28
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:	⌘	Idle Mode Cell Reselection Delay tests were mistakenly removed in TS 34.121, V3.5.0. This CR reinstates the tests and updates them according to TS 25.133, V3.6.0. This CR is built upon T1R010173 which proposed a new structure of RRM test cases in TS 34.121 and was approved at the T1/RF SWG #19 meeting. This CR is a revision of T1R010192. A note below "Test requirements" has been added for each test case.
Summary of change:	⌘	The following tests are reinstated: 1. Clause 8.2.2.1: "Cell Reselection; single carrier case" 2. Clause 8.2.2.2: "Cell Reselection; multi carrier case" The following test is postponed until the requirement in TS 25.133, A.4.3.1 has been completed: Clause 8.2.3: "UTRAN to GSM cell reselection" The following test is new: Clause 8.2.4: "FDD/TDD cell reselection"
Consequences if not approved:	⌘	Inconsistency between RRM test scenarios as outlined in Annex A of TS 25.133 and the test cases in TS 34.121.

Clauses affected:	⌘	Clause 8.2
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.

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 the cell quality levels change to the moment when this change makes the UE reselect a better ranked 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. This shall be verified in more than [FFS]% of the cases with a confidence level of [FFS]%.

The normative reference for this requirement is [2] TS 25.133 subclause 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 Table 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 1280 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.

[Editor's note: The test shall be executed a number of times as indirectly set by the Conformance Requirement. The number is 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex 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 the cell quality levels change to the moment when this change makes the UE reselect a better ranked 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. This shall be verified in more than [FFS]% of the cases with a confidence level of [FFS]%.

The normative reference for this requirement is [2] TS 25.133 subclause 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 Table 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 1280 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.

[Editor's note: The test shall be executed a number of times as indirectly set by the Conformance Requirement. The number is 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

8.2.3 UTRAN to GSM Cell Re-Selection

8.2.3.1 Scenario 1

[Editor's note: The specification of this requirement in TS 25.133, A.4.3.1 has not yet been completed.

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 [2] TS 25.133 subclause 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 Table 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

[Editor's note: The test shall be executed a number of times as indirectly set by the Conformance Requirement. The number is 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

3GPP TSG-T WG1 Meeting #12
Busan, Korea, 6th- 7th September, 2001

Tdoc T1-010362

CR-Form-v4

CHANGE REQUEST

⌘ **TS 34.121 CR 102** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

*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:	⌘	Proposal for measuring method of Random Access in TS34.121
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2001-09-04
Category:	⌘	**B** ***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:	⌘	Description for test case is missing in TS34.121
Summary of change:	⌘	Test case description is proposed for Random Access.
Consequences if not approved:	⌘	The description of the Random access test case is missing in TS 34.121

Clauses affected:	⌘	8.4.3
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 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.

8.3.5.2 Inter frequency cell reselection

8.3.5.3 FDD-TDD cell reselection

8.3.5.4 UTRAN-GSM Cell Reselection

8.3.6 Cell Re-selection in CELL_PCH

8.3.7 Cell Re-selection in URA_PCH

8.4 RRC Connection Control

8.4.1 RRC Re-establishment

8.4.2 Void

8.4.3 Random Access

8.4.3.1 Correct behaviour when receiving an ACK

8.4.3.1.1 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 section 6 of TS 25.214 and the control of the RACH transmission is specified in section 11.2 of TS 25.321. A random access transmit sequence is described in section 6.7.2 of TS 25.303.

8.4.3.1.2 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 section 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 section 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 8.4.3.1.2, the test requirement of the power difference for all preamble ramping is 3dB(Power offset P0). The accuracy is ±2dB as specified in section 6.5.2.1 of 25.101 [1]. The test requirement of the power difference between 10th preamble PRACH and message part is [3dB][1)]. The accuracy is [±2dB] as specified in section 6.5.2.1 of 25.101 [1].

Note 1: In order to calculate the power difference between 10th preamble PRACH and message part by using Power offset P_{p-m} in the Table 8.4.3.1.2, 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 [2] TS 25.133 subclause 6.3.2 and A.6.2.2.1.

8.4.3.1.3 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.

8.4.3.1.4 Method of test

8.4.3.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see subclauses G.2.1 and G.2.2.
Frequencies to be tested: mid range; see subclause 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 8.4.3.1.1, Table 8.4.3.1.2 and Table 8.4.3.1.3. 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 [3] TS 34.108 for details regarding generic call setup procedure.

Table 8.4.3.1.1: 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 section 6.1 of TS34.108, shall be used in all random access ~~tests~~[1] tests[2]. Crucial parameters for the test requirements are repeated in Table 8.4.3.1.2 and A.8.4.3.1.3 and these overrule the parameters defined in SIB type 5.

~~Note1~~Note2: A parameter of AC-to-ASC mapping(AC0-9) in SIB5 of section 6.1 of TS34.108 shall be set to 0 in the case of all random access tests. The EFACC of Type A, which is specified in subclass 8.3.2.15 of TS34.108, shall be selected.

Table 8.4.3.1.2: 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 8.4.3.1.3: 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

8.4.3.1.4.2 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 8.4.3.1.1.

2) Measure the first PRACH preamble output power, the each power difference for preamble ramping and the power difference between 10th 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.

8.4.3.1.5 Test requirements

~~The absolute power applied to the first preamble shall be -30 dBm with an accuracy as specified in section 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 8.4.3.1.2, the test requirement of the power difference for all preamble ramping is 3dB(Power offset P0). The accuracy is ±2dB as specified in section~~

~~6.5.2.1 of 25.101 [1]. The test requirement of the power difference between 10th preamble PRACH and message part is [3dB][2]. The accuracy is [±2dB] as specified in section 6.5.2.1 of 25.101 [1].~~

~~Note 2: In order to calculate the power difference between 10th preamble PRACH and message part by using Power offset P_{p-m} in the Table 8.4.3.1.2, 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 absolute power and the relative power shall meet the requirements in the minimum requirements in subclause 8.4.3.1.2.

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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

8.4.3.2 Correct behaviour when receiving an NACK

8.4.3.2.1 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 section 6 of TS 25.214 and the control of the RACH transmission is specified in section 11.2 of TS 25.321. A random access transmit sequence is described in section 6.7.2 of TS 25.303.

8.4.3.2.2 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 [2] TS 25.133 subclause 6.3.2 and A.6.2.2.2.

8.4.3.2.3 Test purpose

The purpose of this test is to verify that the behaviour of the random access procedure is according to the requirements.

8.4.3.2.4 Method of test

8.4.3.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see subclauses G.2.1 and G.2.2.
Frequencies to be tested: mid range; see subclause 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 8.4.3.1.1, Table 8.4.3.1.2 and Table 8.4.3.1.3. 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 [3] TS 34.108 for details regarding generic call setup procedure.

8.4.3.2.4.2 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 8.4.3.1.1.

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.

8.4.3.2.5 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

8.4.3.3 Correct behaviour at Time-out

8.4.3.3.1 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 section 6 of TS 25.214 and the control of the RACH transmission is specified in section 11.2 of TS 25.321. A random access transmit sequence is described in section 6.7.2 of TS 25.303.

8.4.3.3.2 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 [2] TS 25.133 subclause 6.3.2 and A.6.2.2.3.

8.4.3.3.3 Test purpose

The purpose of this test is to verify that the behaviour of the random access procedure is according to the requirements.

8.4.3.3.4 Method of test

8.4.3.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see subclauses G.2.1 and G.2.2.
Frequencies to be tested: mid range; see subclause 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 8.4.3.1.1, Table 8.4.3.1.2 and Table 8.4.3.1.3. The PRACH procedure within the call setup is used for the test. It is necessary that SS shall transmit no AICH.

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

8.4.3.3.4.2 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 8.4.3.1.1.

2) Measure the number of the preamble part by using a spectrum analyzer.

8.4.3.3.5 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

8.4.3.4 Correct behaviour when reaching maximum transmit power

8.4.3.4.1 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 section 6 of TS 25.214 and the control of the RACH transmission is specified in section 11.2 of TS 25.321. A random access transmit sequence is described in section 6.7.2 of TS 25.303.

8.4.3.4.2 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 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 preamble shall not exceed the maximum allowed UL TX power +/- [] dB (or +/- [] dB in extreme conditions).~~
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 [2] TS 25.133 subclause 6.3.2 and A.6.2.2.4.

8.4.3.4.2.3 Test purpose

The purpose of this test is to verify that the PRACH power settings are within specified limits.

8.4.3.4.4 Method of test

8.4.3.4.4.1 Initial condition

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see subclauses G.2.1 and G.2.2.
Frequencies to be tested: mid range; see subclause 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 8.4.3.1.1, Table 8.4.3.1.2 and Table 8.4.3.1.3. The PRACH procedure within the call setup is used for the test. It is necessary that SS shall transmit no AICH.

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

8.4.3.4.4.2 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 8.4.3.1.1.

2) Measure the all PRACH preamble output power of the UE according to Annex B.

8.4.3.4.5 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

3GPP TSG-T WG1 Meeting #12
Busan, Korea, 6th- 7th September, 2001

Tdoc T1-010363

CR-Form-v3

CHANGE REQUEST

⌘ **34.121** **CR** **109** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Test numbering of multi-path fading propagation tests
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2001-9-3
Category:	⌘	**D** ***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:	⌘	Different tests with multipath-path fading propagation conditions (subclause 7.3) have the same numbers.
Summary of change:	⌘	Tests 9, 10, 11 and 12 of Table 7.3.1.9 and Table 7.3.1.10 have been corrected to be Tests 17, 18, 19 and 20.
Consequences if not approved:	⌘	Test numbers for different tests are overlapping within one subclause. This may cause confusion, when the tests are performed.

Clauses affected:	⌘	7.3
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://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.

7.2.1.4 Method of test

7.2.1.4.1 Initial conditions

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

Frequencies to be tested: mid range; see subclause 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 Table 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 Table 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 ~~9~~17	Test ~~10~~18	Test ~~11~~19	Test ~~12~~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
~~9~~17	-8.8 dB	10^{-2}
~~10~~18	-5.1 dB	10^{-1}
	-4.4 dB	10^{-2}
	-3.8 dB	10^{-3}
~~11~~19	-6.0 dB	10^{-1}
	-5.5 dB	10^{-2}
	-5.0 dB	10^{-3}
~~12~~20	-2.9 dB	10^{-1}
	-2.1 dB	10^{-2}
	-1.4 dB	10^{-3}

The reference for this requirement is [1] TS 25.101 subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see subclause 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-~~15~~ 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.

3GPP TSG-T WG1 Meeting #12
Busan, Korea, 6th- 7th September, 2001

Tdoc T1-010364

CR-Form-v4

CHANGE REQUEST

⌘ **34.121 CR 099** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Usage of CELL_FACH during Rx spurious emission test
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 03.09.01
Category:	⌘	**C** ***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)*
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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 "number of DRX is zero" is not supported in idle mode. The Rx spurious emission test therefore requires a long test time. In Cell FACH state the UE shall continuously receive the S-CCPCH. CELL_FACH state is mandatory for the UE.
Summary of change:	⌘	It is proposed to measure the Rx spurious emission in Cell_FACH state.
Consequences if not approved:	⌘	Unnecessary long test time for Rx spurious emission test.

Clauses affected:	⌘	6.8
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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.

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
9kHz ≤ f < 1GHz	100 kHz	-57 dBm	
1GHz ≤ f ≤ 12.75 GHz	1 MHz	-47 dBm	

Table 6.8.2: Additional receiver spurious emission requirements

	Frequency Band	Measurement Bandwidth	Maximum level	Note
For operation in frequency bands as defined in subclause 4.2(a)	1920 MHz ≤ f ≤ 1980 MHz	3.84 MHz	-60 dBm	Mobile transmit band in URA_PCH, Cell_PCH and idle state
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	Mobile receive band

The reference for this requirement is [1] TS 25.101 subclause 7.9.1.

6.8.3 Test purpose

To verify that the UE spurious emission meets the specifications described in subclause 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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see subclause 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 ~~camped on a cell~~ in CELL_FACH state.

~~4) UE shall perform Location Registration (LR) before the test procedure in subclause 6.8.4.2, but not during it.~~

~~5~~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. ~~Paging repetition period and DRX cycle shall be set to minimum (shortest possible time interval).~~

7) Set UE_TXPWR_MAX_RACH such that Pcompensation =0

8) Set $S_{intersearch}$, $S_{intrasearch}$ and $Ssearch_{RAT\ m}$ to zero

Note 1: 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 25.304~~v3.7.0~~, subcl. 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
9kHz ≤ f < 1GHz	100 kHz	-57 dBm	
1GHz ≤ f ≤ 12.75 GHz	1 MHz	-47 dBm	

Table 6.8.4: Additional receiver spurious emission requirements

For operation in frequency bands as defined in subclause 4.2(a)	Frequency Band	Measurement Bandwidth	Maximum level	Note
	1920 MHz ≤ f ≤ 1980 MHz	3.84 MHz	-60 dBm	Mobile transmit band in URA_PCH, Cell_PCH and idle state
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	Mobile 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 Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

3GPP TSG-T WG1 Meeting #12 ***Tdoc T1-010370***
Busan, Korea 6th-7th, September, 2001

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CHANGE REQUEST

⌘ **34.121 CR 110** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Measurement of the On/Off power during PRACH preamble
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 5-September-2001
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 desired accuray of the On/Off power measurement can only be achieved in a two pass measurement.
Summary of change:	⌘	The number of subchannels is limited to one to have defined acces slots for the On/Off power measurement. A two pass measurement can than be applied to measure On and Off power of different preambles in a ramping cycles.
Consequences if not approved:	⌘	A single pass measurement can not give the desired accuracy for the needed dynamic range (60 dB and more)

Clauses affected:	⌘	5.5.2
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.

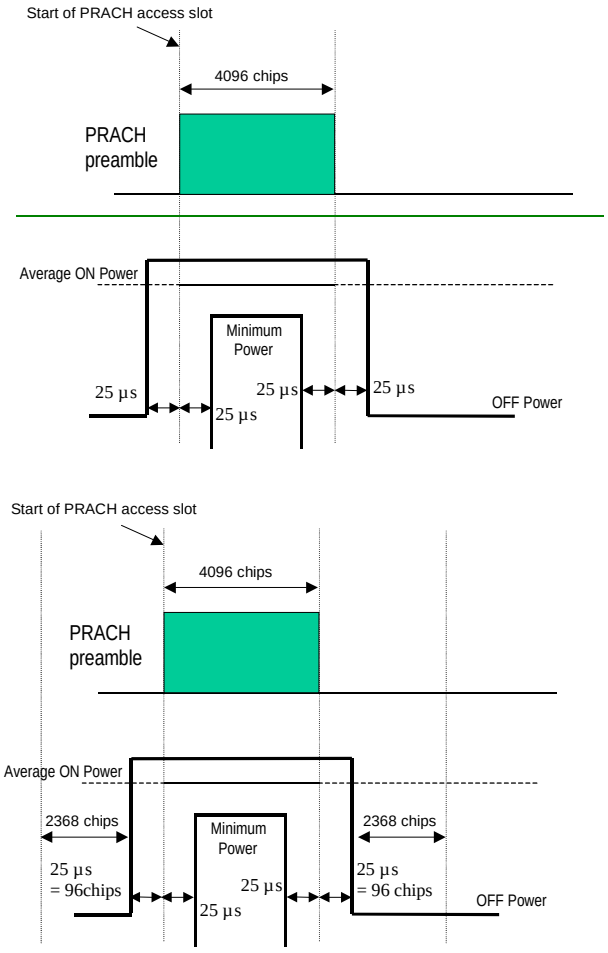

Figure 5.5.1: Transmit ON/OFF template for PRACH preambles

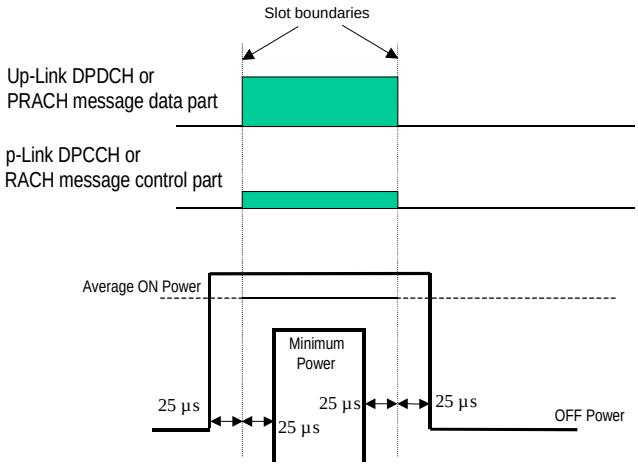

Figure 5.5.2: Transmit ON/OFF template for all other On/Off cases

OFF Power is defined in 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 [1] TS 25.101 subclause 6.5.2.1.
This is tested using PRACH operation.
The minimum requirement for ON power is defined in subclause 5.4.1.2.
The minimum requirement for OFF power is defined in subclause 5.5.1.2.

Note: The main objective for this test case is to check the ramp-up/down power shape. ~~A test case using the first preamble of PRACH is enough to cover the objective.~~

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 subclauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see subclause 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 Annex 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 [3] TS 34.108 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
$\hat{I}_{or}$ 1)	–106.7	–106.7	–106.7	–106.7	dBm / 3.84 MHz
CPICH_RSCP 1),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 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 –10.3dB 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 [8] TS25.331.

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

~~3) Measure the OFF power immediately before and after the first RACH preamble (ON power) . The measurements shall not include the transient periods.~~

3) Record the OFF power in a 2368 chip time interval before a transient period of 25 µs (96 chips) prior to a RACH preamble (ON power) ~~with at least 2 samples /chip through~~ averaging[1] 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) ~~with at least 2 samples /chip~~ averaging through a matched filter (RRC 0.22, BW equal to the chiprate). ~~Calculate the power samples by averaging of the recorded samples of 4 chips duration.~~

[1] Note: OFF power measurement with averaging requires an enough sampling speed to cover the signal bandwidth (e.g. 3.84MHz times 1.22 = 4.6848MHz 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 5.2.1 (Subclause 5.2.2) and lower tolerance in Table 5.4.1.1. (Subclause 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 −56 dBm ~~for each sample~~. (Subclause 5.5.1.2).