Source: **T1**

Title: **CR's to TS 34.122 v3.6.0 and v4.2.0 for approval**

Agenda item: **5.1.3**

Document for: **Approval**

This document contains 8 CRs to TS 34.122 v3.6.0 and 8 CRs to TS 34.122 v4.2.0. These CRs have been agreed by T1 and are put forward to TSG T for approval.

CRs related to maintenance of R99:

Spec	CR	Rev	Release	Subject	Cat	Version Current	Version -New	Doc-2nd-Level	Work item
34.122	070		R99	Corrections to various reference to tables in the document.	F	3.6.0	3.7.0	T1-020150	
34.122	071		R99	Maintenance of Annex B	F	3.6.0	3.7.0	T1-020151	
34.122	072		R99	Power Control in the Downlink	F	3.6.0	3.7.0	T1-020152	
34.122	073		R99	Uplink Power Control Performance Test	F	3.6.0	3.7.0	T1-020153	
34.122	074		R99	Replacement of Block STTD by Space Code Transmit Diversity (SCTD)	F	3.6.0	3.7.0	T1-020154	
34.122	075		R99	New RRM Section Headings	F	3.6.0	3.7.0	T1-020155	
34.122	076		R99	Cell Re-selection in idle mode test cases	F	3.6.0	3.7.0	T1-020156	
34.122	077		R99	Statistical testing of RRM delay performance	F	3.6.0	3.7.0	T1-020157	

CRs related to maintenance of Rel-4:

Spec	CR	Rev	Release	Subject	Cat	Version Current	Version -New	Doc-2nd-Level	Work item
34.122	078		Rel-4	Corrections to various reference to tables in the document.	A	4.2.0	4.3.0	T1-020158	TEI
34.122	079		Rel-4	Maintenance of Annex B	A	4.2.0	4.3.0	T1-020159	TEI
34.122	080		Rel-4	Replacement of Block STTD by Space Code Transmit Diversity (SCTD)	A	4.2.0	4.3.0	T1-020160	TEI
34.122	081		Rel-4	New RRM Section Headings (Cat.A)	A	4.2.0	4.3.0	T1-020161	TEI
34.122	082		Rel-4	Cell Re-selection in idle mode test cases	A	4.2.0	4.3.0	T1-020162	TEI
34.122	083		Rel-4	Power Control in the Downlink	A	4.2.0	4.3.0	T1-020163	TEI
34.122	084		Rel-4	Uplink Power Control Performance Test	A	4.2.0	4.3.0	T1-020164	TEI
34.122	085		Rel-4	Statistical testing of RRM delay performance	A	4.2.0	4.3.0	T1-020165	TEI

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020150

CR-Form-v5

CHANGE REQUEST

⌘ **34.122** **CR** **070** ⌘ **rev** **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Corrections to various reference to tables in the document.
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18 Feb, 2002
Category:	⌘ **F**	***Release:*** ⌘ R99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	There are a number of incorrect table references in the document.
Summary of change:	⌘	The references were changed to reference the correct tables.
Consequences if not approved:	⌘	Could result in confusion when the table reference either can't be found or is referencing the wrong table.

Clauses affected:	⌘	5.7 and 6.5.
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

----------Start of Changes----------

5.7 Transmit Modulation

5.7.1 Error Vector Magnitude

5.7.1.1 Definition and applicability

The Error Vector Magnitude (EVM) is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one timeslot.
The requirement of this clause shall apply to all types of UTRA-UE.

5.7.1.2 Minimum Requirements

The Error Vector Magnitude shall not exceed 17,5 % for the parameters specified in table 5.7.1.2~~2.1~~.

Table 5.7.1.2: Test parameters for Error Vector Magnitude/Peak Code Domain Error

Parameter	Level	Unit
UE Output Power	≥-20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.102 [1] clause 6.8.2.

5.7.1.3 Test purpose

The transmitter shall generate a sufficient precise waveform, to enable the receiver to achieve the specified receiver performances.

5.7.1.4 Method of test

----------End of Changes----------
----------Start of Change----------

6.5 Blocking Characteristics

6.5.1 Definition and applicability

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

6.5.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.5.2a and table 6.5.2b. For table 6.5.2b up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size for the interference signal.
The normative reference for this requirement is TS 25.102 clause 7.6.1.

Table 6.5.2a: In-band blocking

Parameter	Offset 1	Offset 2	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	**0**	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/3,84 MHz
$I_{blocking}$ (modulated)	-56	-44	dBm/3,84 MHz
F_{uw} offset	+10 or -10	+15 or -15	MHz

Table 6.5.2b: Out of band blocking

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/3,84 MHz
$I_{blocking}$ (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as definded in clause 4.2(a)	1840 <f <1885 1935 <f <1995 2040 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as definded in clause 4.2(b)	1790 < f < 1835 2005 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as definded in clause 4.2(c)	1850 < f < 1895 1945 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz

NOTE 1: For operation referenced in 4.2(a), from 1885 <f< 1900 MHz, 1920 <f< 1935 MHz, 1995 <f< 2010 MHz and 2025<f< 2040 MHz , the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 shall be applied.

NOTE 2: For operation referenced in 4.2(b), from 1835 < f < 1850 MHz and 1990< f < 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 shall be applied.

NOTE 3: For operation referenced in 4.2(c), from 1895 < f < 1910 MHz and 1930< f < 1945 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 shall be applied.

6.5.3 Test purpose

"The test stresses the ability of the UE receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity."

6.5.4 Method of test

6.5.4.1 Initial conditions

For in-band case:
Test environment: normal; see clauses G.2.1 and G.2.2.

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

For out-of-band case:
Test environment: normal; see clauses G.2.1 and G.2.2.

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

1) Connect the SS and the interfering Signal generator to the antenna connector as shown in figure A.5.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

6.5.4.2 Procedure

1) The wanted signal frequency channel is set into the middle of the band.
2) The interfering Signal Generator is stepped through the frequency range indicated in table 6.5.2.a. with a step size of 1 MHz.
3) The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mchip/s and rolloff 0,22.
4) Measure the BER of the wanted signal received from the UE at the SS for each step of the interferer.
5) Repeat the inband blocking for wanted frequency channels low–band and high-band.
6) The wanted signal frequency channel is set into the middle of the band.
7) The interfering Signal Generator is stepped through the frequency range indicated in table 6.54.2.b with a step size of 1 MHz.
8) The interference signal is a CW signal.
9) Measure the BER of the wanted signal received from the UE at the SS for each step of the interferer.

NOTE: Due to the large amount of time-consuming BER tests it is recommended to speed up a single BER test by reducing the 0.001-BER confidence level [10 000 bits under test or 10 errors] for screening the critical frequencies. Critical frequencies must be identified using standard BER confidence level. [30 000 bits or 30 errors].

----------End of Change----------

TSG-T WG1 meeting #14 **T1-020165**
Sophia Antipolis, France 21 – 22 Feb 2002

CR-Form-v4

CHANGE REQUEST

⌘ **34.122** **CR** **085** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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

Title:	⌘	Introduction of Annex F.6.2: Statistical testing of RRM delay performance
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-13
Category:	⌘ **A**	***Release:*** ⌘ R 4

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

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

Reason for change:	⌘	25.123 requires from 34.122 to test delay parameters statistically according to the following rule: The limit shall be fulfilled in 90% of the cases. The confidence level of the test is to be developed. However 34.122 contains no instructions to perform the tests statistically.
Summary of change:	⌘	Introduction of Annex F.6.2: Statistical testing of RRM delay performance Delay tests shall be repeated [50] times
Consequences if ⌘not app		Statistical testing of RRM delay requirements is not possible

Clauses affected:	⌘	Annex F.6.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

F.6.2 Statistical testing of RRM delay performance

Delay tests in subclause 8.2 shall be repeated [50] times in order to determine the required success ratio

Note: A statistical approach needs to be developed. The number of repetitions required for the test will target towards a good compromise between test time and wrong decision risk.

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020164

CR-Form-v5

CHANGE REQUEST

⌘ **34.122** **CR** **084** ⌘ **rev** **-** ⌘ Current version: **4.2.0** ⌘

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

Title:	⌘	Uplink Power Control Performance Test
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
Category:	⌘	**A** ***Release:*** ⌘ REL-4

Use one of the following categories:
F *(correction)*
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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:	⌘	Conformance test for uplink power control performance is missing.
Summary of change:	⌘	Added test case for uplink power control performance. Defined new test tolerances for new test case based on the tolerances defined for the uplink power control stepsize accuracy tests.
Consequences if not approved:	⌘	Requirements for uplink power control performance TS25.102 would not be tested.

Clauses affected:	⌘	new clause 7.6 added. Additions to F.1.4, F.2.3, F.4
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.

7.6 Uplink Power Control

7.6.1 Definition and applicability

Power control in the uplink is the ability of the UE to converge to the required link quality set by the network while using minimum uplink power. The requirements of this test shall apply to all types of the UTRA-TDD UE.

7.6.2 Minimum requirements

During period T1, the PCCPCH and a second Beacon Channel are transmitted in the DL in designated slots within each frame and at the same power level.

The UE transmits, using the channel of TS25.105, Annex A.2.1 UL reference measurement channel (12.2 kbps) in one UL slot. For different parts of the test, different UL slots will be designated.

The values of table 7.6.1, period T1 shall be selected. Then, with the received PCCPCH and Beacon power set at –60 dBm, the value of DPCH constant value shall be adjusted so that the mean UE output power is 5 dBm. These conditions are held steady during period T1.

Periods T1 and T2 are each 5 seconds long.

Table 7.6.1: UL Power Control Test Conditions

		Period T1	Period T2
I_{BTS} all slots	dBm	-60	
PCCPCH Power -Broadcast	dBm	18	
PCCPCH Power - Received	dBm	-60	-70
Mean UE transmit power	dBm	5	According to tables 7.6.2 and 7.6.3
SIR_{TARGET}	dB	6	
I_{oc} in PCCPCH and Beacon Slots	dBm	-60	
IE (information element) Alpha	As defined in 25.331	1.0	
PCCPCH slot position	Integer 0 -14	0	
Beacon slot position	Integer 0 -14	8	

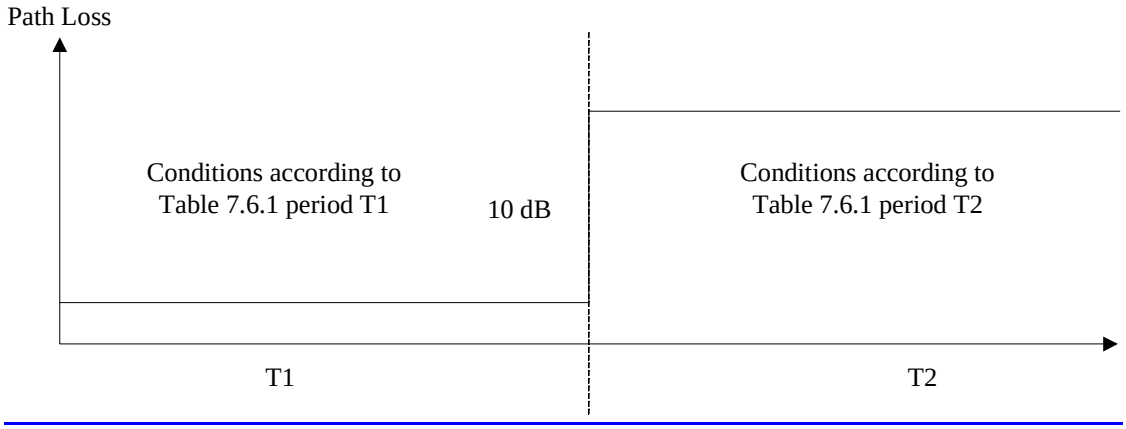

Figure 7.6.1

At the end of period T1, the PCCPCH and Beacon Received power shall be simultaneously decreased by 10 dB. These conditions are summarized in table 7.6.1, period T2.

For the first frame including the change in received power the UE output power shall satisfy the values in table 7.6.2.

For the 20th frame after the change in received power the UE output power shall satisfy the values in table 7.6.3.

Table 7.6.2: Required UE Output Power, Frame Containing Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±4.0	5 ±0.5

Table 7.6.3: Required UE Output Power, 20 Frames after Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±4.0	15 ±4.0

7.6.3 Test purpose

To verify the ability of the UE to converge to the required link quality set by the network while using minimum uplink power.

7.6.4 Method of test

7.6.5 Initial conditions

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

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

1) Connect SS and an AWGN source to the UE antenna connector as shown in figure A.9.

2) Set up a call according to the Generic call setup procedure using SS levels and signalling values as specified in table 7.6.1 for Period P1 and table 7.6.4 . The UE shall be signalled to transmit in timeslot position 1.

Table 7.6.4: Test parameters for Uplink Power Control Test

Parameter	Value/description
UL Reference measurement channel	12,2kbps, according to annex C.2.1
DPCH constant value	0
Data content	real life (sufficient irregular)

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

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

7.6.6 Procedure

1) The SS adjusts the DPCH constant value until the UE transmit power is 5 dBm.

2) After the UE output power has has been held constant at 5 dBm for at least 5 seconds, the received PCCPCH power shall be decreased by 10 dB to -70 dBm as shown in figure 7.6.1.

3) Measure the transmit power according to annex B for the first frame including the pathloss change and the 20th frame after the pathloss change.

4) Set the received PCCPCH power to -60 dBm.

5) SS signals UE to transmit in timeslot 7. Repeat step 1 - 4.

6) SS signals UE to transmit in timeslot 9. Repeat step 1 - 4.

7) SS signals UE to transmit in timeslot 14. Repeat step 1 - 4.

7.6.7 Test requirements

The measured transmit power shall not exceed the prescribed tolerance in tables 7.6.5 and 7.6.6.

Table 7.6.5: Required UE Output Power, Frame Containing Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±5.5	5 ±0.5

Table 7.6.6: Required UE Output Power, 20 Frames after Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±5.5	15 ±5.5

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

<next changed section>

F.1.4 Performance requirement

Table F.1.4 Maximum Test System Uncertainty for Performance Requirements

Clause	Maximum Test System Uncertainty
~~TBD~~7.6 Uplink Power Control	0.3 dB (relative tolerance for 10 dB stepsize)~~TBD~~

<next changed section>

F.2.3 Performance requirements

Table F.2.3 Test Tolerances for Performance Requirements.

Clause	Test Tolerance
7.2, Demodulation in Static Propagation Condition	
7.3, Demodulation of DCH in Multiplath Fading conditions	
7.4, Base Station Transmit diversity modes	
7.6 Uplink Power Control	0.5 dB (relative tolerance for 10 dB stepsize)

<next changed section>

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

The Test Requirements in the present document have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in clause F.2. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in table F.4.

Table F.4: Derivation of Test Requirements

Test	Minimum Requirement in TS 25.102	Test Tolerance (TT)	Test Requirement in TS 34.122
5.2 Maximum Output Power	Power single code Power class 2 (24 dBm) Tolerance = +1/-3 dB Power class 3 (21 dBm) Tolerance = +2/-2 dB Power multi code Power class 2 (21 dBm) Tolerance = +1/-3 dB Power class 3 (18 dBm) Tolerance = ±2 dB	0,7 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT For power class 2 (single and multi): Upper Tolerance limit = +1,7 dB Lower Tolerance limit = -3,7 dB For power class 3 (single and milti): Upper Tolerance limit = +2,7 dB Lower Tolerance limit = -2,7 dB
5.3 UE Frequency Stability	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).
5.4.1.1 Uplink Pwer Control, Initial accuracy	± 9dB normal conditions ± 12dB extreme conditions	1.0 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT Nominal expected TX power ± 10dB (normal conditions) ± 13dB (extreme conditions)
5.4.1.2 Uplink Power Control, differential accuracy	SIR Target / Pow Step Tol <1 dB / 0.5 dB <2dB / 1 dB <3 dB / 1.5 dB <10 dB / 2 dB <20dB / 4 dB <30 dB / 6 dB > 30 dB / 9 dB	TT 0.1 dB 0.15 dB 0.2 dB 0.5 dB 0.7 dB 0.7 dB 1.0 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT
5.4.2 Minimum Transmit Power	UE minimum transmit power shall be less than –44 dBm	1.0 dB	Formula: UE minimum transmit power + TT UE minimum transmit power = –43 dBm
5.4.5 Out-of-synchronisation handling of output power:	$\frac{\Sigma DPCH\_E_c}{I_{or}}$ levels before A –4.6 dB AB: -10 dB BD: -16 dB DE: -12 dB EF: -6 dB transmit ON/OFF time 200ms	0,4 dB for $\frac{\Sigma DPCH\_E_c}{I_{or}}$ 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 $\frac{\Sigma DPCH\_E_c}{I_{or}}$ levels: Before A: -4.6 AB: -10 + 0,4 dB BD: -16 – 0,4 dB DE: -12 - 0,4 dB EF: -6 + 0,4 dB 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.transmit ON/OFF time 200ms
5.5.1 Transmit OFF power	Transmit OFF power shall be less than –65 dBm	1.5 dB	Formula: Transmit OFF power + TT Transmit OFF power = –63,5 dBm

<table>
<tr><td>5.5.1 Occupied Bandwidth</td><td colspan="2">The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.</td><td>0 kHz</td><td colspan="2">Formula: occupied channel bandwitdh: + TT

occupied channel bandwidth = 5,0 MHz</td></tr>
<tr><td>5.5.2.1 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>5.5.2.2 Adjacent Channel Leakage Power Ratio (ACLR)</td><td colspan="2">Power Classes 2 and 3:
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 2 and 3:
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">5.5.3 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 5.5.3</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>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>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>
</table>

<table>
<tr><td>5.6 Transmit Intermodulation</td><td colspan="2">Intermodulation Product
5MHz -31 dBc
10MHz -41 dBc</td><td>0 dB</td><td colspan="2">Formula: Intermodulation Product + TT
Intermodulation Product
5MHz -31 dBc
10MHz -41 dBc</td></tr>
<tr><td>5.7.1 Error Vector Magnitude</td><td colspan="2">The Error Vector Magnitude shall not exceed 17.5 %</td><td>0%</td><td colspan="2">Formula: EVM limit + TT
EVM limit = 17,5 %</td></tr>
<tr><td>5.7.2 Peak code domain error</td><td colspan="2">The peak code domain error shall not exceed -21dB</td><td>±1.0 dB</td><td colspan="2">Formula: Peak code domain error + TT
Peak code domain error = -20 dB</td></tr>
<tr><td>6.2 Reference sensitivity level</td><td colspan="2">$\hat{I}_{or}$ = -105 dBm / 3,84 MHz
BER limit = 0.001</td><td>0.7 dB</td><td colspan="2">Formula: $\hat{I}_{or}$+ T
BER limit unchanged

$\hat{I}_{or}$ = -104,3 dBm / 3,84 MHz</td></tr>
<tr><td>6.4 Adjacent Channel Selectivity</td><td colspan="2">$\hat{I}_{or}$ = -91 dBm / 3,84 MHz
Ioac (modulated) = -52 dBm/3,84 MHz
BER limit = 0.001</td><td>0 dB</td><td colspan="2">Formula: $\hat{I}_{or}$ unchanged
Ioac - TT
BER limit unchanged

Ioac = -52 dBm/3,84 MHz</td></tr>
<tr><td>6.5 Blocking Characteristics</td><td colspan="2">See table 6.5.2a and 6.5.2b in TS 34.122
BER limit = 0,001</td><td>0 dB</td><td colspan="2">Formula:
$I_{blocking}$ (modulated) - TT (dBm/3,84MHz)
$I_{blocking}$ (CW) - TT (dBm)
BER limit unchanged</td></tr>
<tr><td>6.6 Spurious Response</td><td colspan="2">Iblocking(CW) –44 dBm
Fuw:
Spurious response frequencies
BER limit = 0.001</td><td>0 dB</td><td colspan="2">Formula: $I_{blocking}$ (CW) - TT (dBm)
Fuw unchanged
BER limit unchanged

Iblocking(CW) -44 dBm</td></tr>
<tr><td>6.7 Intermodulation Characteristics</td><td colspan="2">Iouw1 (CW) -46 dBm
Iouw2 (modulated) –46 dBm / 3,84 MHz
Fuw1 (offset) 10 MHz
Fuw2 (offset) 20 MHz

BER limit = 0.001</td><td>0 dB</td><td colspan="2">Formula: TBD
BER limit unchanged.</td></tr>
<tr><td rowspan="7">6.8 Spurious Emissions</td><td colspan="2"></td><td></td><td colspan="2">Formula: Maximum level+ TT
Add zero to all the values of Maximum Level in table 6.8.1.</td></tr>
<tr><td>Frequency Band</td><td>Maximum level</td><td></td><td>Frequency Band</td><td>Maximum level</td></tr>
<tr><td>9kHz ≤ f < 1GHz</td><td>-57dBm /100kHz</td><td>0 dB</td><td>9kHz ≤ f < 1GHz</td><td>-57dBm /100kHz</td></tr>
<tr><td>1,9-1,92 GHz
2,01-2.025GHz
2,11-2.170GHz</td><td>-60 dBm / 3,84MHz</td><td>0 dB</td><td>1,9-1,92 GHz
2,01-2.025GHz
2,11-2.170GHz</td><td>-60 dBm / 3,84MHz</td></tr>
<tr><td>1 –1,9GHz,
1,92–2,01 GHz
2,025–2,11GHz</td><td>-47 dBm/1MHz</td><td>0 dB</td><td>1 –1,9GHz,
1,92–2,01 GHz
2,025–2,11GHz</td><td>-47 dBm/1MHz</td></tr>
<tr><td rowspan="3">1GHz ≤ f ≤ 12,75GHz</td><td rowspan="3">-47dBm /1MHz</td><td>0 dB</td><td>1GHz ≤ f ≤ 2,2GHz</td><td>-47dBm /1MHz</td></tr>
<tr><td>0 dB</td><td>2,2GHz < f ≤ 4GHz</td><td>-47dBm /1MHz</td></tr>
<tr><td>0 dB</td><td>4GHz < f ≤ 12,75GHz</td><td>-47dBm /1MHz</td></tr>
</table>

7.6 Downlink Power Control		TS #1,9	TS #7,14	0.5 dB for 10 dB change in output power, 0 otherwise.	Formula for 10 dB change in transmit power: Upper Tolerance limit + TT Lower Tolerance limit – TT
	1st frame	15 ±4.0 dBm	5 ±0.5 dBm		
	2nd frame	15 ±4.0 dBm	15 ±4.0 dBm		

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020163

CR-Form-v3

CHANGE REQUEST

⌘ **TS 34.122 CR 083** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

*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 in the Downlink
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
Category:	⌘	**A** ***Release:*** ⌘ REL-4

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:	⌘	Requirement has been updated in TS25.102. Test purpose, method of test, and test requirements are missing.
Summary of change:	⌘	Updated minimum requirement with new text from TS25.102. Added test purpose, test method, and test requirements.
Consequences if not approved:	⌘	Conformance tests would be inconsistent with core specifications and incomplete.

Clauses affected:	⌘	7.5.1, new sections 7.5.2, 7.5.3, and 7.5.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://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.

7.5 Power control in downlink for 3,84 Mcps TDD Option

Power control in the downlink is the ability of the UE receiver to converge to the required link quality set by the network while using minimum downlink power.

7.5.1 Minimum requirements

For the parameters specified in table 7.5.1.a the average downlink $\hat{I}_{or}/I_{oc}$ power shall be below the specified value in Table 7.5.1.a more than 90% of the time. BLER shall be as shown in Table 7.5.1.b more than 90% of the time. Downlink power control is ON during the test.

~~not exceed the values specified in table 7.5.1.b. Downlink power control is ON during the test.~~

Table 7.5.1.a: Test parameters for downlink power control

Parameter	Unit	Test 1	~~Test 2~~
$\frac{DPCH\_E_c}{I_{or}}$	dB	0	~~[ ]~~
I_{OC}	dBm/3,84 MHz	-60	
Information Data Rate	kbps	12,2	
Target quality value on DTCH	BLER	0,01	
Propagation condition		~~Case 4~~Case 1	
DL Power Control step size, Δ_{TPC}	dB	1	
Maximum DL power *	dB	0	
Minimum DL power *	dB	-27	

Note: DL power is relative to P-CCPCH power.

Table 7.5.1.b: Requirements for downlink power control

Parameter	Unit	Test 1	~~Test 2~~
$\hat{I}_{or}/I_{oc}$	dB	8,0~~[ ]~~	~~[ ]~~
Measured quality on DTCH	BLER	0,01±30%	~~0,01±30%~~

The reference for this requirement is TS 25.102 [1] clause 8.5.1.

7.5.2 Test purpose

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

7.5.3 Method of test

7.5.3.1 Initial conditions

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

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

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

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

3) RF parameters are set up according to table 7.5.1.a

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 7.5.1.a. SS will vary the physical channel power in downlink according to the TPC commands from UE, and at the same time measure BLER. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

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

7.5.3.2 Procedure

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

2) The measured quality on DTCH (BLER) and the measured downlink $\hat{I}_{or}/I_{oc}$ power ratio values averaged over one slot are compared to the limits in table 7.5.1.b.

7.5.4 Test Requirements

a) The measured quality on DTCH does not exceed the values in table 7.5.1.b.

b) The downlink $\hat{I}_{or}/I_{oc}$ power ratio values, which are averaged over one slot, shall be below the values in table 7.5.1.b more than 90 % of the time.

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020162

CR-Form-v5

CHANGE REQUEST

⌘ **TS 34.122** **CR** **082** ⌘ **rev** **-** ⌘ Current version: **4.2.0** ⌘

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

Title:	⌘	Cell Re-selection in idle mode test cases
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
Category:	⌘	**A** ***Release:*** ⌘ REL-4

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Test cases for cell re-selection are missing.
Summary of change:	⌘	Added test cases for cell re-selection.
Consequences if not approved:	⌘	Requirements in the core specification would not be tested.

Clauses affected:	⌘	All subslauses in section 8.		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
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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.

8 Requirements for Support of RRM

8.1 General

Void.

8.2 Idle Mode Tasks

~~8.2.1 Introduction~~

~~Void.~~

8.2.~~2~~1 RF Cell Selection Scenario

8.2.~~2~~1.1 Introduction

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in TS 25.304. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

8.2.~~3~~2 ~~RF~~ Cell Re-Selection ~~Scenario~~

8.2.2.1 Scenario 1: TDD/TDD cell re-selection single carrier case

8.2.2.1.1 Definition and applicability

8.2.2.1.1.1 3,84 Mcps TDD Option

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell , and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the TDD UE.

8.2.2.1.1.2 1,28 Mcps TDD Option

Void.

8.2.2.1.2 Minimum requirement

8.2.2.1.2.1 3,84 Mcps TDD Option

The cell re-selection delay shall be less than 8 s when the DRX cycle length is 1,28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD}$ + T_{SI}, where:

$T_{evaluateTDD}$	A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.
T_{SI}	Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.1.

8.2.2.1.2.2 1,28 Mcps TDD Option

Void.

8.2.2.1.3 Test purpose

This test is to verify the requirement for the cell re-selection delay in the single carrier case

8.2.2.1.4 Method of test

8.2.2.1.4.1 3,84 Mcps TDD Option

8.2.2.1.4.1.1 Initial conditions

This scenario implies the presence of 1 carrier and 6 cells as given in Table 8.2.2.1.1 and Table 8.2.2.1.2. 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
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
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.
T_{SI}		s	1.28	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	
T2		s	15	

Table 8.2.2.1.2: Cell re-selection single carrier multi-cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset1$_{s,n}$	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			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, 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			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.2.2.1.4.1.2 Procedure

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for RRC CONNECTION REQUEST messages from the UE.

b) The UE is switched on.

c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.

d) After 15 s, the parameters are changed as described for T2.

e) The SS waits for RRC CONNECTION REQUEST messages from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps d) to g) [TBD] times.

8.2.2.1.4.2 1,28 Mcps TDD Option

Void.

8.2.2.1.5 Test Requirements

8.2.2.1.5.1 3,84 Mcps TDD Option

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.

3) In step g), the UE shall respond on cell 1 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

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

8.2.2.1.5.2 1,28 Mcps TDD Option

Void.

8.2.2.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

8.2.2.2.1 Definition and applicability

8.2.2.2.1.1 3,84 Mcps Option

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell , and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the TDD UE.

8.2.2.2.1.2 1,28 Mcps Option

Void.

8.2.2.2.2 Minimum requirement

8.2.2.2.2.1 3,84 Mcps Option

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD}$ + T_{SI}, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.2.

8.2.2.2.2.2 1,28 Mcps Option

Void.

8.2.2.2.3 Test purpose

This test is to verify the requirement for the cell re-selection delay in the multi carrier case

8.2.2.2.4 Method of test

8.2.2.2.4.1 3,84 Mcps Option

8.2.2.2.4.1.1 Initial conditions

This scenario implies the presence of 2 carriers and 6 cells as given in Table 8.2.2.2.1 and Table 8.2.2.2.2. 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
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
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.
T_{SI}		s	1.28	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	
T2		s	15	

Table 8.2.2.2.2: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	6	0	6	0	0	6	0	6	-3	-3	-3	-3
PCCPCH RSCP	dBm	-67	-73			-73	-67			-76	-76		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-76	-76			-76	-76			-76	-76		
Qoffset1$_{s,n}$	dB	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			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.2.2.2.4.1.2 Procedure

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for RRC CONNECTION REQUEST messages from the UE.

b) The UE is switched on.

c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.

d) After 15 s, the parameters are changed as described for T2.

e) The SS waits for RRC CONNECTION REQUEST messages from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps 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.

8.2.2.2.4.2 1,28 Mcps Option

Void.

8.2.2.2.5 Test Requirements

8.2.2.2.5.1 3,84 Mcps Option

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 1 within 8 s.

3) In step g), the UE shall respond on cell 2 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

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

8.2.2.2.5.2 1,28 Mcps Option

Void.

8.2.~~3~~2.~~1~~3 Scenario 3: TDD/FDD Cell ~~Re~~re-~~S~~selection ~~single carrier multi cell case~~

8.2.~~3~~2.~~1~~3.1 Definition and applicability

8.2.2.3.1.1 3,84 Mcps Option

The cell re-selection delay is defined as the time from when 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 sending 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 a TDD cell and reselects to an FDD cell.

The requirements and this test apply to UEs supporting both TDD and FDD.

8.2.2.3.1.2 1,28 Mcps Option

The cell reselection procedure allows the UE to select a more suitable cell and camp on it, if the UE has evaluated in N_{serv} successive measurements that the serving cell does not fulfill the cell selection criterion S_{rxlex}, defined in TS 25.304.

The cell re-selection delay is defined as the time from which the actual cell quality level in the current serving Cell 1 deteriorates to the moment when the UE camps on a better ranked Cell 2, and starts to send the SYNCH-UL sequence in the UwPTS for sending the RRC CONNECTION REQUEST to perform a Location Registration on cell 2.

If the UE has evaluated in N_{serv} (see table F2.4.1.2) successive measurements that the serving cell does not fulfill the cell selection criterion S_{rxlex}, defined in TS 25.304, the UE shall initiate the measurements of all neighbor cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

The requirements of this test apply to all types of UTRA-UE.

8.2.~~3~~2.~~1~~3.2 Minimum requirements

8.2.~~3~~2.~~1~~3.2.1 3,84 Mcps TDD Option

The cell re-selection delay shall be less than 8 s when the DRX cycle length is 1,28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD}$ + T_{SI}, where:

$T_{evaluateFDD}$ See TS 25.123 [2] Table 4.1 in section 4.2.2.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.3

~~Void.~~

8.2.~~3~~2.~~1~~3.2.2 1,28 Mcps TDD Option

The minimum requirement for the cell re-selection delay is less than 8 s with a DRX cycle length of 1280ms.

This shall be verified in more than [FFS]% of the cases with a confidence level of [FFS].

The normative reference for this requirement is TS 25.123 [2]clauses 4.2.2.7.2 and A4.2.1.2.2.

NOTE: The cell re-selection delay can be expressed as: $T_{evaluateTDD}$ + T_{SI}, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to table F2.4.1.A in Annex F clause F.2.4.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7,68 s, allow 8 s in the test case.

8.2.~~3~~2.~~1~~3.3 Test purpose

The test purpose is to verify the requirement for the cell re-selection.

8.2.~~3~~2.~~1~~3.4 Method of test

8.2.2.3.4.1 3,84 Mcps Option

8.2.2.3.4.1.1 Initial conditions

This scenario implies the presence of 1 TDD and 1 FDD cell as given in Table 8.2.2.3.4.1 and Table 8.2.2.3.4.2. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.3.4.1: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
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.
T_{SI}		s	1.28	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	
T2		s	15	

Table 8.2.2.3.4.2: TDD/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		8		n.a	n.a.
		T1	T2	T 1	T 2	T 1	T 2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	-12
SCH t_{offset}		0	0	0	0	n.a.	n.a.
PICH_Ec/Ior	dB			-3	-3	-15	-15
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2	-2	3
I_{oc}	dBm/3.84 MHz	-70					
CPICH_RSCP	dBm	n.a.		n.a.		-82	-77
PCCPCH_RSCP	dBm	-70	-75			n.a.	n.a.
Cell_selection and reselectionquality _measure		CPICH_RSCP				CPICH_RSCP	
Qrxlevmin	dBm	-102				-115	
$Qoffset1_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
$Qhyst1_{s}$	dB	0				0	
Treselection	s	0				0	
Sintersearch	dB	not sent				not sent	
Propagation Condition		AWGN				AWGN	

8.2.2.3.4.1.2 Procedure

a) The SS activates cell 1 and cell 2 with T1 defined parameters and monitors them for RRC CONNECTION REQUEST messages from the UE.

b) The UE is switched on.

c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.

d) After 30 s, the parameters are changed as described for T2.

e) The SS waits for RRC CONNECTION REQUEST messages from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps d) to g) [TBD] times.

8.2.2.3.4.2 1,28 Mcps Option

8.2.~~3~~2.~~1~~3.4.2.1 Initial Conditions

Initially, the UE is in *Normally Camped* state on a TDD cell, e.g. the UE shall attempt to detect, synchronize and monitor intra-frequency cells indicated in the measurement control system information of the serving cell.

The UE shall measure PCCPCH RSCP at least every $T_{measureNTDD}$ (see table F2.4.1A) for intra-frequency cells that are detected and measured according to the measurement rules. $T_{measureNTDD}$ is defined in table F2.4.1A. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better than the serving cell within $T_{evaluateNTDD}$ (see table F2.4.1A), from the moment the intra-frequency cell became at least [2] dB better ranked than the current serving cell, provided that Treselection timer is set to zero and PCCPCH RSCP is used as measurement quantity for cell reselection.

If the Treselection timer has a non zero value and the intra frequency cell is better ranked than the serving cell, the UE shall evaluate this intra frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The Initial conditions for the test case are described in table 8.2.2.3.4.1~~8.2.3.1.2.2~~a. The scenario implies the presence of 1 carrier and 6 cells. Cell 1 and Cell 2 shall belong to different Location Areas. The UE is requested to monitor neighbouring cells on a single carrier which is the current carrier of the serving cell.

Table 8.2.2.3.4.1~~8.2.32.1.2.2~~a: General test parameters for Cell Re-selection single carrier multi-cell case (1,28 Mcps TDD Option)

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
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.
T_{SI}		s	1,28	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	
T2		s	15	

Table 8.2.2.3.4.2~~8.2.3.1.2.2~~b: Cell re-selection single carrier multi-cell case (1,28 Mcps TDD Option)

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]	[7]	[9]	[7]	[9]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-64]	[-66]			[-66]	[-64]			[-74]	[-74]		
$Qoffset1_{s,n}$	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			
$Qhyst1_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-74]	[-74]			[-74]	[-74]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, 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			
$Qhyst1_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/1, 28 MHz	-70											
Propagation Condition		AWGN											

8.2.3~~2~~.1~~3~~.4.2.2 Procedure

~~8.2.3.1.4.2.1 3,84 Mcps TDD Option~~

~~Void.~~

~~8.2.3.1.4.2.2 1,28 Mcps TDD Option~~

a) The test scenario of 6 cells with the parameter setting given in tables 8.2.3~~2~~.1~~3~~.2.2a and 8.2.3~~2~~.1~~3~~.2.2b is to be realized by the SS.

b) UE is switched on.

c) UE is in *Normally Camped* state on a TDD cell.

d) SS waits to the end of for the time interval T_1 (15s) as described in Table 8.2.3~~2~~.1~~3~~.2.2a.

e) At the end of time interval T_1, time interval T_2 begins, SS changes parameters yielding cell 2 better ranked than serving cell 1.

f) SS waits for the SYNCH-UL sequence in the UwPTS from the UE.

g) Cell reselection delay is measured.

h) At the end of time interval T_2, conditions of time interval T_1 are repeated by SS yielding cell 1 better ranked than serving cell 2.

i) SS waits for the SYNCH-UL sequence in the UwPTS from the UE.

j) Cell reselection delay is measured.

k) Repeat step e) to h) until confidence level of [FFS] is reached.

8.2.~~3~~2.~~1~~3.5 Test requirements

8.2.~~3~~2.~~1~~3.5.1 3,84 Mcps TDD Option

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.

3) In step g), the UE shall respond on cell 1 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

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

~~Void.~~

8.2.~~3~~2.~~1~~3.5.2 1,28 Mcps TDD Option

The requirement for the cell re-selection delay is 8 s in the single carrier case reported in clause 8.2.~~3~~2.~~1~~3.1.

This shall be verified in more than [FFS]% of the cases with a confidence level of [FFS].

NOTE: The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to table F2.4.1.A in annex F clause F2.4.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

Test parameters are to be set according to table 8.2.2.3.5.1~~8.2.3.1.5.2~~ where the test tolerances shall not exceed the limits prescribed in annex F clause F.2.4.1.2.

Table 8.2.2.3.5.1~~8.2.3.1.5.2~~: Cell re-selection single carrier multi-cell case (1,28 Mcps TDD Option)

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9+TT1]	[7-TT1]	[9+TT1]	[7-TT1]	[7-TT1]	[9+TT1]	[7-TT1]	[9+TT1]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]
PCCPCH RSCP	dBm	[-64+TT1]	[-66-TT1]			[-66-TT1]	[-64+TT1]			[-74-TT2]	[-74-TT2]		
Qoffset1$_{s,n}$	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			
Qhyst1$_s$ Treselection Sintrasearch	dB s dB	0 0 not sent				0 0 not sent				0 0 not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]
PCCPCH RSCP	dBm	[-74-TT2]	[-74-TT2]			[-74-TT2]	[-74-TT2]			[-74-TT2]	[-74-TT2]		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, 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			
Qhyst1$_s$ Treselection Sintrasearch	dB s dB	0 0 not sent				0 0 not sent				0 0 not sent			
I_{oc}	dBm/ 1,28 MHz	-70											
Propagation Condition		AWGN											

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

8.2.2.4 Scenario 4: inter RAT cell re-selection

8.2.2.4.1 Definition and applicability

8.2.2.4.1.1 3,84 Mcps Option

The cell re-selection delay is defined as the time from when the cell quality levels change to the moment when this change makes the UE reselect a better ranked cell, and starts to send LOCATION UPDATING REQUEST message to perform a Location update to the new cell.

This test is for the case where the UE camps on a TDD cell and reselects to a GSM cell.

The requirements and this test apply to UEs supporting both TDD and GSM.

8.2.2.4.1.2 1,28 Mcps Option

Void.

8.2.2.4.2 Minimum requirement

8.2.2.4.2.1 3,84 Mcps Option

The cell re-selection delay shall be less than 8 s when the DRX cycle length is 1,28 s. The cell selection parameters in the BCCH of the GSM cell in system info 3 and 4 are transmitted at least every second.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The normative reference for this requirement is TS 25.123 [2] clauses 4.3.2.1 and A.4.2.4

8.2.2.4.2.2 1,28 Mcps Option

Void.

8.2.2.4.3 Test purpose

This test verifies the UE meets the minimum requirement for the case where the UE camps on a TDD cell and reselects to a GSM cell.

8.2.2.4.4 Method of Test

8.2.2.4.4.1 3,84 Mcps Option

8.2.2.4.4.1.1 Initial conditions

This scenario implies the presence of 1 TDD and 1 GSM cell as given in Table 8.2.2.4.1, 8.2.2.4.2, and 8.2.2.4.3. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.4.1: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD Cell
	Neighbour cell		Cell2	GSM Cell
Final condition	Active cell		Cell2	
DRX cycle length		s	1,28	UTRAN cell
BCCH repetition period (GSM cell)		s	1,87	In GSM the system information is scheduled according to an 8 x (51 x 8) cycle (i.e. a system information message is transmitted every 235 ms). The cell selection parameters in system info 3 and 4 are transmitted at least every second. (GSM 05.02)
T1		s	15	
T2		s	15	

Table 8.2.2.4.2: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
Timeslot Number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH t_{offset}		0	0	0	0
PICH_Ec/Ior	dB			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2
I_{oc}	dBm/3,84 MHz	–70		–70	
PCCPCH RSCP	dBm	-70	-75		
Propagation Condition		AWGN		AWGN	
Treselection	s	0			
$Ssearch_{RAT}$	dB	not sent			

Table 8.2.2.4.3: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-70
RXLEV_ACCESS_MIN	dBm	-100	
MS_TXPWR_MAX_CCH	dBm	30	

8.2.2.4.4.1.2 Procedure

a) The SS activates cell 1 and 2 with T1 defined parameters and monitors cell 1 and 2 for RRC CONNECTION REQUEST and LOCATION UPDATING REQUEST messages from the UE.

b) The UE is switched on.

c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.

d) After 15 s, the parameters are changed as described for T2.

e) The SS waits for LOCATION UPDATING REQUEST messages from the UE.

f) After 15 s, the parameters are changed as described for T1.

g) The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps d) to g) [TBD] times.

8.2.2.4.4.2 1,28 Mcps Option

Void.

8.2.2.4.5 Test Requirements

8.2.2.4.5.1 3,84 Mcps Option

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.

3) In step g), the UE shall respond on cell 1.

For the test to pass, the total number of fulfilled test requirements in step 2) shall be at least 90% of the cases.

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

8.2.2.4.5.2 1,28 Mcps Option

Void.

8.3 UTRAN Connected Mode Mobility

8.3.1 TDD/TDD Handover

Void.

8.3.2 TDD/FDD Handover

Void.

8.3.3 TDD/GSM Handover

Void.

8.3.4 Cell Re-selection in CELL_FACH

8.3.4.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.4.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.3.5 Cell Re-selection in CELL_PCH

8.3.5.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.6.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.3.6 Cell Re-selection in URA_PCH

8.3.6.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.6.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.4 RRC Connection Control

8.4.1 RRC connection re-establishment delay

Void.

8.4.2 Transport Format Combination selection in UE

Void.

8.5 Timing Characteristics

8.5.1 UE Timing Advance

Void.

8.5.2 UE Transmit Timing

Void.

8.6 UE Measurements Procedures

8.6.1 TDD intra frequency measurements

8.6.1.1 Event triggered reporting in AWGN propagation conditions

Void.

8.6.1.2 Event 1H and 1I triggered reporting in AWGN propagation condition

Void.

8.6.2 TDD inter frequency measurements

8.6.2.1 Correct reporting of neighbours in AWGN propagation condition

Void.

8.6.3 FDD measurements

8.6.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

Void.

8.7 Measurements Performance Requirements

Void.

~~8.2.4 PLMN Selection and Re-Selection Scenario~~

~~Void.~~

~~8.2.5 Location Registration Scenario~~

~~Void.~~

~~8.3 RRC Connection mobility~~

~~8.3.1 Handover~~

~~8.3.1.1 Introduction~~

~~Void.~~

~~8.3.1.2 Handover 3G to 3G~~

~~8.3.1.2.1 TDD/TDD Handover~~

~~Void.~~

~~8.3.1.2.2 TDD/FDD Handover~~

~~Void.~~

~~8.3.1.3 Handover 3G to 2G~~

~~8.3.1.3.1 Handover to GSM~~

~~Void.~~

~~8.3.2 Radio Link Management~~

~~8.3.2.1 Link adaptation~~

~~Void.~~

~~8.3.3 Cell Update~~

~~Void.~~

~~8.3.4 URA Update~~

~~Void.~~

~~8.4 RRC Connection Control~~

~~8.4.1 Radio Access Bearer Control~~

~~Void.~~

~~8.5 Dynamic Channel Allocation~~

~~Void.~~

~~8.6 Timing characteristics~~

~~8.6.1 Timing Advance (TA) Requirements~~

~~Void.~~

~~8.7 Measurements Performance Requirements~~

~~8.7.1 Measurements Performance for UE~~

~~Void.~~

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020161

CR-Form-v5

CHANGE REQUEST

⌘ **TS 34.122** **CR** **081** ⌘ **rev** **-** ⌘ Current version: **4.2.0** ⌘

*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:	⌘	New RRM Section Headings
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
Category:	⌘	**A** ***Release:*** ⌘ REL-4

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:	⌘	Core specification has been reorganized since the existing section headings were created.
Summary of change:	⌘	Created new section headings based on TS 25.123.
Consequences if not approved:	⌘	Conformance tests would be inconsistent with core specifications and new test cases would be difficult to add.

Clauses affected:	⌘	All subslauses in section 8.
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8 Requirements for Support of RRM

8.1 General

Void.

8.2 Idle Mode Tasks

~~8.2.1 Introduction~~

~~Void.~~

8.2.~~2~~1 RF Cell Selection Scenario

8.2.~~2~~1.1 Introduction

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in TS 25.304. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

8.2.~~3~~2 RF Cell Re-Selection Scenario

8.2.2.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.2.2.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.2.~~3~~2.~~1~~3 Scenario 3: TDD/FDD Cell ~~Re~~re-~~S~~selection ~~single carrier multi cell case~~

8.2.~~3~~2.~~1~~3.1 Definition and applicability

The cell reselection procedure allows the UE to select a more suitable cell and camp on it, if the UE has evaluated in N_{serv} successive measurements that the serving cell does not fulfill the cell selection criterion S_{rxlex}, defined in TS 25.304.

The cell re-selection delay is defined as the time from which the actual cell quality level in the current serving Cell 1 deteriorates to the moment when the UE camps on a better ranked Cell 2, and starts to send the SYNCH-UL sequence in the UwPTS for sending the RRC CONNECTION REQUEST to perform a Location Registration on cell 2.

If the UE has evaluated in N_{serv} (see table F2.4.1.2) successive measurements that the serving cell does not fulfill the cell selection criterion S_{rxlex}, defined in TS 25.304, the UE shall initiate the measurements of all neighbor cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

The requirements of this test apply to all types of UTRA-UE.

8.2.~~3~~2.~~1~~3.2 Minimum requirements

8.2.~~3~~2.~~1~~3.2.1 3,84 Mcps TDD Option

Void.

8.2.~~3~~2.~~1~~3.2.2 1,28 Mcps TDD Option

The minimum requirement for the cell re-selection delay is less than 8 s with a DRX cycle length of 1280ms.

This shall be verified in more than [FFS]% of the cases with a confidence level of [FFS].

The normative reference for this requirement is TS 25.123 [2]clauses 4.2.2.7.2 and A4.2.1.2.2.

NOTE: The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to table F2.4.1.A in Annex F clause F.2.4.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7,68 s, allow 8 s in the test case.

8.2.~~3~~2.~~1~~3.3 Test purpose

The test purpose is to verify the requirement for the cell re-selection.

8.2.~~3~~2.~~1~~3.4 Method of test

8.2.~~3~~2.~~1~~3.4.1 Initial Conditions

Initially, the UE is in *Normally Camped* state on a TDD cell, e.g. the UE shall attempt to detect, synchronize and monitor intra-frequency cells indicated in the measurement control system information of the serving cell.

The UE shall measure PCCPCH RSCP at least every $T_{measureNTDD}$ (see table F2.4.1A) for intra-frequency cells that are detected and measured according to the measurement rules. $T_{measureNTDD}$ is defined in table F2.4.1A. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better than the serving cell within $T_{evaluateNTDD}$ (see table F2.4.1A), from the moment the intra-frequency cell became at least [2] dB better ranked than the current serving cell, provided that Treselection timer is set to zero and PCCPCH RSCP is used as measurement quantity for cell reselection.

If the Treselection timer has a non zero value and the intra frequency cell is better ranked than the serving cell, the UE shall evaluate this intra frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The Initial conditions for the test case are described in table 8.2.~~3~~2.~~1~~3.2.2a. The scenario implies the presence of 1 carrier and 6 cells. Cell 1 and Cell 2 shall belong to different Location Areas. The UE is requested to monitor neighbouring cells on a single carrier which is the current carrier of the serving cell.

Table 8.2.~~3~~2.~~1~~3.2.2a: General test parameters for Cell Re-selection single carrier multi-cell case (1,28 Mcps TDD Option)

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
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.
T_{SI}		s	1,28	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	
T2		s	15	

Table 8.2.~~3~~2.~~1~~3.2.2b: Cell re-selection single carrier multi-cell case (1,28 Mcps TDD Option)

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]	[7]	[9]	[7]	[9]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-64]	[-66]			[-66]	[-64]			[-74]	[-74]		
Qoffset1$_{s,n}$	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			
Qhyst1$_s$ Treselection Sintrasearch	dB s dB	0 0 not sent				0 0 not sent				0 0 not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-74]	[-74]			[-74]	[-74]			[-74]	[-74]		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, 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			
Qhyst1$_s$ Treselection Sintrasearch	dB s dB	0 0 not sent				0 0 not sent				0 0 not sent			
I_{oc}	dBm/1, 28 MHz	-70											
Propagation Condition		AWGN											

8.2.~~3~~2.~~1~~3.4.2 Procedure

8.2.~~3~~2.~~1~~3.4.2.1 3,84 Mcps TDD Option

Void.

8.2.~~3~~2.~~1~~3.4.2.2 1,28 Mcps TDD Option

a) The test scenario of 6 cells with the parameter setting given in tables 8.2.~~3~~2.~~1~~3.2.2a and 8.2.~~3~~2.~~1~~3.2.2b is to be realized by the SS.

b) UE is switched on.

c) UE is in *Normally Camped* state on a TDD cell.

d) SS waits to the end of for the time interval T_1 (15s) as described in Table 8.2.~~3~~2.~~1~~3.2.2a.

e) At the end of time interval T_1, time interval T_2 begins, SS changes parameters yielding cell 2 better ranked than serving cell 1.

f) SS waits for the SYNCH-UL sequence in the UwPTS from the UE.

g) Cell reselection delay is measured.

h) At the end of time interval T_2, conditions of time interval T_1 are repeated by SS yielding cell 1 better ranked than serving cell 2.

i) SS waits for the SYNCH-UL sequence in the UwPTS from the UE.

j) Cell reselection delay is measured.

k) Repeat step e) to h) until confidence level of [FFS] is reached.

8.2.~~3~~2.~~1~~3.5 Test requirements

8.2.~~3~~2.~~1~~3.5.1 3,84 Mcps TDD Option

Void.

8.2.~~3~~2.~~1~~3.5.2 1,28 Mcps TDD Option

The requirement for the cell re-selection delay is 8 s in the single carrier case reported in clause 8.2.~~3~~2.~~1~~3.1.

This shall be verified in more than [FFS]% of the cases with a confidence level of [FFS].

NOTE: The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to table F2.4.1.A in annex F clause F2.4.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

Test parameters are to be set according to table 8.2.3.1.5.2 where the test tolerances shall not exceed the limits prescribed in annex F clause F.2.4.1.2.

Table 8.2.3.1.5.2: Cell re-selection single carrier multi-cell case (1,28 Mcps TDD Option)

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9+TT1]	[7-TT1]	[9+TT1]	[7-TT1]	[7-TT1]	[9+TT1]	[7-TT1]	[9+TT1]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]
PCCPCH RSCP	dBm	[-64+TT1]	[-66-TT1]			[-66-TT1]	[-64+TT1]			[-74-TT2]	[-74-TT2]		
Qoffset1$_{s,n}$	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			
Qhyst1$_s$ Treselection Sintrasearch	dB s dB	0 0 not sent				0 0 not sent				0 0 not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]	[-1-TT2]
PCCPCH RSCP	dBm	[-74-TT2]	[-74-TT2]			[-74-TT2]	[-74-TT2]			[-74-TT2]	[-74-TT2]		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, 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			
Qhyst1$_s$ Treselection Sintrasearch	dB s dB	0 0 not sent				0 0 not sent				0 0 not sent			
I_{oc}	dBm/ 1,28 MHz	-70											
Propagation Condition		AWGN											

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

8.2.2.4 Scenario 4: inter RAT cell re-selection

Void.

8.3 UTRAN Connected Mode Mobility

8.3.1 TDD/TDD Handover

Void.

8.3.2 TDD/FDD Handover

Void.

8.3.3 TDD/GSM Handover

Void.

8.3.4 Cell Re-selection in CELL_FACH

8.3.4.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.4.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.3.5 Cell Re-selection in CELL_PCH

8.3.5.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.6.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.3.6 Cell Re-selection in URA_PCH

8.3.6.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.6.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.4 RRC Connection Control

8.4.1 RRC connection re-establishment delay

Void.

8.4.2 Transport Format Combination selection in UE

Void.

8.5 Timing Characteristics

8.5.1 UE Timing Advance

Void.

8.5.2 UE Transmit Timing

Void.

8.6 UE Measurements Procedures

8.6.1 TDD intra frequency measurements

8.6.1.1 Event triggered reporting in AWGN propagation conditions

Void.

8.6.1.2 Event 1H and 1I triggered reporting in AWGN propagation condition

Void.

8.6.2 TDD inter frequency measurements

8.6.2.1 Correct reporting of neighbours in AWGN propagation condition

Void.

8.6.3 FDD measurements

8.6.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

Void.

8.7 Measurements Performance Requirements

Void.

~~8.2.4 PLMN Selection and Re-Selection Scenario~~

~~Void.~~

~~8.2.5 Location Registration Scenario~~

~~Void.~~

~~8.3 RRC Connection mobility~~

~~8.3.1 Handover~~

~~8.3.1.1 Introduction~~

~~Void.~~

~~8.3.1.2 Handover 3G to 3G~~

~~8.3.1.2.1 TDD/TDD Handover~~

~~Void.~~

~~8.3.1.2.2 TDD/FDD Handover~~

~~Void.~~

~~8.3.1.3 Handover 3G to 2G~~

~~8.3.1.3.1 Handover to GSM~~

~~Void.~~

~~8.3.2 Radio Link Management~~

~~8.3.2.1 Link adaptation~~

~~Void.~~

~~8.3.3 Cell Update~~

~~Void.~~

~~8.3.4 URA Update~~

~~Void.~~

~~8.4 RRC Connection Control~~

~~8.4.1 Radio Access Bearer Control~~

~~Void.~~

~~8.5 Dynamic Channel Allocation~~

~~Void.~~

~~8.6 Timing characteristics~~

~~8.6.1 Timing Advance (TA) Requirements~~

~~Void.~~

~~8.7 Measurements Performance Requirements~~

~~8.7.1 Measurements Performance for UE~~

~~Void.~~

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020160

CR-Form-v3

CHANGE REQUEST

⌘ **TS 34.122 CR 080** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

*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:	⌘	Replacement of Block STTD by Space Code Transmit Diversity (SCTD)
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
Category:	⌘	**A** ***Release:*** ⌘ REL-4

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:	⌘	Block STTD has been replaced by SCTD in TS25.102. This was approved in TSG-RAN WG4 Mtg #21 in tdoc R4-020374.
Summary of change:	⌘	Block STTD has been deleted and replaced with SCTD.
Consequences if not approved:	⌘	Conformance tests would be inconsistent with core specifications.

Clauses affected:	⌘	7.4.1
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.

7.4 Base station transmit diversity mode for 3,84 Mcps TDD Option

7.4.1 Demodulation of BCH in ~~Block STTD~~ SCTD mode

This is not tested.

TSG-T1 meeting #14 **T1-020159**
Sophia Antipolis, France 21 – 22 Feb 2002

CR-Form-v4

CHANGE REQUEST

⌘ **34.122** **CR** **079** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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

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

Title:	⌘	Maintenance of annex B: Global In-Channel TX-Test.
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-13
Category:	⌘	**A** ***Release:*** ⌘ R4

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

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

Reason for change:	⌘	Progress of 34.122 concerning different power and modulation measurements stipulates maintenance of the Global In-Channel TX-Test.
Summary of change:	⌘	1) Algorithmic support for the overall test implementation added 2) Algorithmic definition of decision point power added 3) Algorithmic definition of code domain power added 4) Error corrections
Consequences if not approved:	⌘	Implementation of all in-channel TX test parameters may be ambiguous leading to inconsistent measurements and system performance

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

Annex B (normative): Global In-Channel TX-Test

B.1 General

The global in-channel Tx test enables the measurement of all relevant parameters that describe the in-channel quality of the output signal of the Tx under test in a single measurement process.

The parameters describing the in-channel quality of a transmitter, however, are not necessarily independent. The algorithm chosen for description inside this annex places particular emphasis on the exclusion of all interdependencies among the parameters. Any other algorithm (e.g. having better computational efficiency) may be applied, as long as the results are the same within the accuracy limits.
All notes referred in the various clauses of B.2 are put together in B.3.

B.2 Definition of the process

B.2.1 Basic principle

The process is based on the comparison of the actual **output signal of the TX under test**, received by an ideal receiver, with a **reference signal**, that is generated by the measuring equipment and represents an ideal error free received signal. The reference signal shall be composed of the same number of codes at the correct spreading factors as contained in the test signal. Note, for simplification, the notation below assumes only codes of one spreading factor although the algorithm is valid for signals containing multiple spreading factors.
All signals are represented as equivalent (generally complex) baseband signals.

B.2.2 Output signal of the TX under test

The output signal of the TX under test is acquired by the measuring equipment, filtered by a matched filter (RRC 0.22, correct in shape and in position on the frequency axis) and stored for further processing~~at one sample per chip at the Inter-Symbol-Interference free instants~~.

The following form represents the physical signal in the entire measurement interval:
one vector **Z**, containing N = ns x sf + ma complex samples;

with
ns: number of symbols in the measurement interval;
sf: number of chips per symbol. (sf: spreading factor) (see Note: Symbol length)
ma: number of midamble chips ~~(only in TDD)~~

B.2.3 Reference signal

The reference signal is constructed by the measuring equipment according to the relevant TX specifications. It is filtered by the same matched filter, mentioned in B.2.2., and stored at the Inter-Symbol-Interference free instants. The following form represents the reference signal in the entire measurement interval:
one vector **R**, containing N = ns x sf + ma complex samples;

ns, sf, ma: see B.2.2

B.2.4 void

B.2.5 Classification of measurement results

The measurement results achieved by the global in-channel TX test can be classified into two types:
Results of type “deviation”, where the error-free parameter has a non-zero magnitude. (These are the parameters that quantify the integral physical characteristic of the signal).These parameters are:

- RF Frequency
- Power (in case of single code)
- Code Domain Power (in case of multi code)
- Timing ~~(only for UE)~~

(Additional parameters: see Note: Deviation)

Results of type “residual”, where the error-free parameter has value zero. (These are the parameters that quantify the error values of the measured signal, whose ideal magnitude is zero). These parameters are:

- Error Vector Magnitude (EVM);
- Peak Code Domain Error (PCDE).

- (Additional parameters: see Note residual).

B.2.6 Process definition to achieve results of type “deviation”

The reference signal (**R**; see clause B.2.3) and the signal under Test (Z; see subclause B.2.2) are ~~is~~ varied with respect to the parameters mentioned in clause B.2.5 under "results of type deviation" in order to achieve best fit ~~with the recorded signal under test (**Z**; see clause B.2.2)~~. Best fit is achieved when the RMS difference value between the varied signal under test and the varied reference signal is an absolute minimum.

Overview:

$$FCT\ \left[\ Z(\tilde{f},\tilde{t},\tilde{\varphi},g_1,g_2,\ldots,g_{synch})-R(f,t,\varphi,\tilde{g}_1,\tilde{g}_2,\ldots,\tilde{g}_{synch})\ \right]=Minimum\quad !$$

Z : Signal under test.
R: Reference signal,
with frequency f, the timing t, the phase φ, gain of code1 (g_1), gain of code2 (g_2) etc, and the gain of the synch channel g_{synch}
The parameters marked with a tilde in Z and R are varied in order to achieve a best fit.

Detailed formula: see Note: Formula for the minimum process

The varied reference signal, after the best fit process, will be called **R'.**
The varied signal under test, after the best fit process, will be called **Z’.**

The varying parameters, leading to **R' and Z’** represent directly the wanted results of type “deviation”. These measurement parameters are expressed as deviation from the reference value with units same as the reference value.
In case of multi code, the type-“deviation”-parameters (frequency, timing and (RF-phase)) are varied commonly for all codes such that the process returns one frequency-deviation, one timing deviation, (one RF-phase – deviation).
(These parameters are not varied on the individual codes signals such that the process would return~~s~~ kr frequency errors... . (kr: number of codes in the reference signal)).
The only type-“deviation”-parameters varied individually are the code domain gain factors (g1, g2, …)
~~The only type “deviation” parameters varied individually are code powers such that the process returns k code power deviations (k: number of codes).~~

E.2.5.1 Decision Point Power

The mean-square value of the signal-under-test, sampled at the best estimate of the of Intersymbol-Interference-free points using the process defined in subclause 2.5, is referred to the *Decision Point Power* (DPP):

E.2.5.2 Code-Domain Power

The samples, Z’, are separated into symbol intervals to create ns time-sequential vectors **z** with sf complex samples comprising one symbol interval. The *Code Domain Power* is calculated according to the following steps:

(1) Take the vectors **z** defined above.

(2) To achieve meaningful results it is necessary to descramble **z,** leading to **z’**

(3) Take the orthogonal vectors of the channelization code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1), and normalize by the norm of the vectors to produce **C**norm=**C**/sqrt(sf). (see Note: Symbol length)

(4) Calculate the inner product of **z’** with **C**norm**.**. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format k x ns, each value representing a specific symbol and a specific code, which can be exploited in a variety of ways.

k: total number of codes in the code space
ns: number of symbols in the measurement interval

(5) Calculate k mean-square values, each mean-square value unifying ns symbols within one code. (These values can be called "*Absolute CodeDomainPower* (CDP)" [Volt^2].) The sum of the k values of CDP is equal to DPP.

(6) Normalize by the decision point power to obtain

$$Relative\ CodeDomain\ Power = \frac{Absolute\ CodeDomainPower}{DecisionPointPower}$$

B.2.7 Process definition to achieve results of type "residual"

The difference between the varied reference signal (**R'**; see clauseB.2.6.) and the varied TX signal under test (**Z'**; see clauseB.2.6~~2~~) is the error vector **E** versus time:

E = **Z'** – **R'.**

Depending on the parameter to be evaluated, it is appropriate to represent **E** in one of the following two different forms:

Form EVM (representing the physical error signal in the entire measurement interval)
One vector **E**, containing N = ns x sf + ma complex samples;

ns, sf, ma: see B.2.2

Form PCDE (derived from Form EVM by separating the samples into symbol intervals)
ns time-sequential vectors **e** with sf complex samples comprising one symbol interval.

E gives results of type "residual" applying the two algorithms defined in clauses B 2.7.1 and B 2.7.2.

B.2.7.1 Error Vector Magnitude (EVM)

The Error Vector Magnitude EVM is calculated according to the following steps:

1) Take the error vector **E** defined in clause B.2.7 (Form EVM) and calculate the RMS value of **E**; the result will be called RMS(**E**).

2) Take the varied reference vector **R'** defined in clause B.2.6 and calculate the RMS value of **R'**; the result will be called RMS(**R'**).

3) Calculate EVM according to:

$$EVM = \frac{RMS(E)}{RMS(R')} \times 100\%$$ (here, EVM is relative and expressed in %)

(see note TDD)
(see Note: Formula for EVM)

B.2.7.2 Peak Code Domain Error (PCDE)

The Peak Code Domain Error is calculated according to the following steps:

1) Take the error vectors **e** defined in clause B.2.7 (Form PCDE)

2) Take the orthogonal vectors of the channelisation - code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1). (see Note: Symbol length) and normalize by the norm of the vectors to produce **C**norm= **C**/sqrt(sf). (see Note: Symbol length)

3) To achieve meaningful results it is necessary to descramble **e,** leading to **e'** ~~(see Note1: Scrambling code)~~

4) Calculate the inner product of **e'** with **C**norm. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format k x ns, each value representing an error-vector representing a specific symbol and a specific code, which can be exploited in a variety of ways.

k: total number of codes in the code space
ns: number of symbols in the measurement interval

5) Calculate k RMS values, each RMS value unifying ns symbols within one code.
(These values can be called "*Absolute CodeEVMs*" [Volt].)

6) Find the peak value among the k "*Absolute CodeEVMs*".
(This value can be called "*Absolute PeakCodeEVM*" [Volt].)

7) Calculate PCDE according to:

$$10*\lg \frac{(\text{“}Absolute\ PeakCodeEVM\text{”})^2}{(\mathrm{RMS}(\mathbf{R}'))^2}\ \mathrm{dB}$$

(a relative value in dB).

~~(see Note: Denominator)~~
(see Note~~2~~: Scrambling code)
~~(see Note IQ)~~
(see Note TDD)
~~(see Note Synch channel)~~

B.3 Notes

Note: Symbol length)
A general code multiplexed signal is multicode and multirate. In order to avoid unnecessary complexity, the measurement applications use a unique symbol-length, corresponding to a spreading factor, regardless of the really intended spreading factor. Nevertheless the complexity with a multicode / multirate signal can be mastered by introducing appropriate definitions.

Note: Deviation)
It is conceivable to regard more parameters as type „deviation“ e.g. Chip frequency and RF-phase.
As chip-frequency and RF-frequency are linked together by a statement in the core specifications [1] it is sufficient to process RF frequency only.
A parameter RF-phase must be varied within the best fit process (B 2.6.). Although necessary, this parameter-variation doesn't describe any error, as the modulation schemes used in the system don't depend on an absolute RF-phase.

Note: R~~r~~esidual)
It is conceivable to regard more parameters as type „residual“ e.g. IQ origin offset. As it is not the intention of the test to separate for different error sources, but to quantify the quality of the signal, all such parameters are not extracted by the best fit process, instead remain part of EVM and PCDE.

~~**Note: Denominator)**~~
~~If the denominator stems from mutual time shifted signals of different code powers, (e.g. BS, FDD) the measurement result PCDE should be expressed absolutely instead.~~

~~**Note1: Scrambling Code)**~~
~~In general a TX signal under test can use more than one scrambling code. Note that PCDE is processed regarding the unused channelisation - codes as well. In order to know which scrambling code shall be applied on unused channelisation - codes, it is necessary to restrict the test conditions: TX signal under test shall use exactly one scrambling code.~~

Note~~2~~ Scrambling Code)
To interpret the measurement results in practice it should be kept in mind that erroneous code power on unused codes is generally de-scrambled differently under test conditions and under real life conditions, whereas erroneous code power on used codes is generally de-scrambled equally under test conditions and under real life conditions. It might be indicated if a used or unused code hits PCDE.

~~**Note IQ)**~~
~~As in FDD/uplink each code can be used twice, on the I and on the Q channel, the measurement result may indicate on which channel (I or Q) PCDE occurs.~~

Note TDD)
EVM covers the midamble part as well as the data part; however PCDE disregards the midamble part.

~~**Note: Synch Channel)**~~
~~A BS signal contains a physical synch channel, which is non orthogonal, related to the other DPCHs. In this context note: The code channel bearing the result of PCDE is exactly one of the DPCHs (never the synch channel). The origin of PCDE (erroneous code power) can be any DPCH and/or the synch channel.~~

Note: **Fomula for the minimum process**

$$L(\Delta\tilde{f}, \Delta\tilde{t}, \Delta\tilde{\varphi}, \Delta\tilde{g}_c, ..., \Delta\tilde{g}_{mid}) = \sum_{v=0}^{N-1} \left| Z(v) - R(v) \right|^2$$

Legend:

L : the function to be minimised

The parameters to be varied in order to minimize are:

$\Delta\tilde{f}$: the RF frequency offset

$\Delta\tilde{t}$: the timing offset

$\Delta\tilde{\varphi}$: the phase offset

$\Delta\tilde{g}_c \cdots$ code power offsets (one offset for each code)

$\Delta\tilde{g}_{mid}$: the power offset of the midamble

Z(v): Samples of the signal under Test
R(v): Samples of the reference signal

$\sum_{v=0}^{N-1}$: counting index v starting at the beginning of the measurement interval and ending at its end.

N = No of chips during the measurement interval.

Z(v): Samples of the signal under Test. It is modelled as a sequence of complex baseband samples Z(γ) with a time-shift Δt, a frequency offset Δf, a phase offset Δφ, the latter three with respect to the reference signal.

$$Z(v) = Z(v - \Delta\tilde{t}) * e^{-j2\pi\Delta\tilde{f}v} * e^{-j\Delta\tilde{\varphi}}$$

R(v): Samples of the reference signal:

$$R(v) = \sum_{c=1}^{No.of\ codes} (g_c + \Delta\tilde{g}_c) * Chip_c(v) + (g_{mid} + \Delta\tilde{g}_{mid}) * Chip_{mid}(v)$$

g : nominal gain of the code channel or midamble

$\Delta\tilde{g}$: The gain offset to be varied in the minimum process

Chip(v) is the chipsequence of the code channel or midamble
Indices at g, Δg and Chip:
The index indicates the code channel: c = 1,2,... No of code channels

Range for $Chip_c$: +1,-1

Note: **Formula for EVM**

$$EVM = \sqrt{\frac{\sum_{\nu=0}^{N-1} \left| Z'(\gamma) - R'(\gamma) \right|^2}{\sum_{\nu=0}^{N-1} \left| R'(\gamma) \right|^2}} * 100 \ \%$$

Z’(γ), R’(γ) are the varied measured and reference signals.

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020158

CR-Form-v5

CHANGE REQUEST

⌘ **34.122** **CR** **078** ⌘ **rev** **-** ⌘ Current version: **4.2.0** ⌘

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

Title:	⌘	Corrections to various reference to tables in the document.
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18 Feb, 2002
Category:	⌘ **A**	***Release:*** ⌘ REL-4

Use one of the following categories:
F *(correction)*
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B *(addition 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:	⌘	There are a number of incorrect table references in the document.
Summary of change:	⌘	The references were changed to reference the correct tables.
Consequences if not approved:	⌘	Could result in confusion when the table reference either can't be found or is referencing the wrong table.

Clauses affected:	⌘	5.3, 5.5.3, 5.7, 6.5.2.1, and 6.5.4.2.
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.

----------Start of Change----------

5.3 UE frequency stability

5.3.1 Definition and applicability

The frequency stability is the difference of the modulated carrier frequency between the RF transmission from the UE and the RF transmission from the BS. The UE shall use the same frequency source for both RF frequency generation and chip clocking.
The requirements of this test apply to all types of UTRA- UE.

5.3.2 Minimum Requirements

The UE frequency stability, observed over a period of one timeslot, shall be within ±0,1 ppm compared to signals received from the BS.
The normative reference for this requirement is TS 25.102 [1] clause 6.3.

5.3.3 Test purpose

Reliable frequency stability of the UE's transmitter in certain tolerance limits is prerequisite for connectivity.
This test stresses the ability of the UE's receiver to derive correct frequency information from the received signal for the transmitter.

5.3.4 Method of test

5.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.
Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

5.3.4.1.1 3,84 Mcps TDD Option

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 using parameters as specified in table 5.3.4.1.1.

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

Table 5.3.4.1.1: Test parameters for Frequency Stability (3,84 Mcps TDD Option)

Parameter	Value/description
SS level (Ior)	–105 dBm / 3,84 MHz (reference sensitivity)
UL reference measurement channel	12,2 kbps according to annex C.2.1.1.
Data content	real life (sufficient irregular)

----------End of Change----------

----------Start of Change----------

5.5.3 Spurious emissions

5.5.3.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.
The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329 [8].

5.5.3.2 Minimum Requirements

5.5.3.2.1 3,84 Mcps TDD Option

These requirements are only applicable for frequencies which are greater than 12.5 MHz away from the UE center carrier frequency.
The normative reference for this requirement is TS 25.102 [1] clause 6.6.3.1.1.

Table 5.5.3.2.1a: General Spurious emissions requirements (3,84 Mcps TDD Option)

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	-30 dBm

Table 5.5.3.2.1b: Additional Spurious emissions requirements (3,84 Mcps TDD Option)

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm*
935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm*
1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm*

NOTE: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.5.3.2.1a are permitted for each UARFCN used in the measurement.

5.5.3.2.2 1,28Mcps TDD Option

These requirements are only applicable for frequencies which are greater than 4 MHz away from the UE center carrier frequency.
The normative reference for this requirement is TS 25.102 [1] clause 6.6.3.1.2.

Table 5.5.3.2.2a : General Spurious emissions requirements (1,28 Mcps TDD Option)

Frequency Bandwidth	**Resolution Bandwidth**	**Minimum requirement**
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	-30 dBm

Table 5.5.3.2.2b : Additional Spurious emissions requirements (1,28 Mcps TDD Option)

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
925 MHz ≤ f ≤ 935 MHz	100 KHz	-67 dBm*
935 MHz < f ≤ 960 MHz	100 KHz	-79 dBm*
1805 MHz ≤ f ≤ 1880 MHz	100 KHz	-71 dBm*

NOTE: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.5.3.2.2a are permitted for each UARFCN used in the measurement.

5.5.3.3 Test purpose

5.5.3.3.1 3,84 Mcps Option

The test purpose is to verify the ability of the UE to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 12,5 MHz away from of the UE's carrier frequency.

5.5.3.3.2 1,28 Mcps Option

The test purpose is to verify the ability of the UE to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 4 MHz away from of the UE's carrier frequency.

5.5.3.4 Method of test

5.5.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.
Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

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

2) A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.

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

5.5.3.4.2 Procedure

Measure the power of the spurious emissions applying measurement filters with bandwidths as specified in the relevant tables of 5.5.3.2.1 for 3,84 Mcps TDD Option and tables 5.5.3.2.2~~1~~ for 1,28 Mcps TDD Option, respectively. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The center frequency of the filter shall be swept over the frequency bands as given in the tables. The sweep time shall be sufficiently low to capture the active time slots.

5.5.3.5 Test requirements

5.5.3.5.1 3,84 Mcps TDD Option

The spurious emissions measured according to clause 5.5-.3.4.2 shall not exceed the limits specified in the relevant tables of 5.5.3.5.1a and 5.5.3.5.1b.

----------End of Change----------

----------Start of changes----------

5.7 Transmit Modulation

5.7.1 Error Vector Magnitude

5.7.1.1 Definition and applicability

The Error Vector Magnitude (EVM) is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one timeslot.
The requirement of this clause shall apply to all types of UTRA-UE.

5.7.1.2 Minimum Requirements

The Error Vector Magnitude shall not exceed 17,5 % for the parameters specified in table 5.7.1.2~~2.1~~.

Table 5.7.1.2.: Test parameters for Error Vector Magnitude/Peak Code Domain Error

Parameter	Level	Unit
UE Output Power	≥-20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.102 [1] clause 6.8.2.1.

5.7.1.3 Test purpose

----------End of Change----------
----------Start of Change----------

6.5 Blocking Characteristics

6.5.1 Definition and applicability

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

6.5.2 Minimum Requirements

6.5.2.1 3,84 Mcps TDD Option

The BER shall not exceed 0,001 for the parameters specified in table 6.5.2.1a and table 6.5.2.1b. For table 6.5.2.1b up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size for the interference signal.
The normative reference for this requirement is TS 25.102 clause 7.6.1.1.

Table 6.5.2.1a: In-band blocking (3,84 Mcps TDD Option)

Parameter	Offset 1	Offset 2	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/3,84 MHz
$I_{blocking}$ (modulated)	-56	-44	dBm/3,84 MHz
F_{uw} offset	+10 or -10	+15 or -15	MHz

Table 6.5.2.1b: Out of band blocking (3,84 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/3,84 MHz
$I_{blocking}$ (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as definded in clause 4.2(a)	1840 <f <1885 1935 <f <1995 2040 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as definded in clause 4.2(b)	1790 < f < 1835 2005 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as definded in clause 4.2(c)	1850 < f < 1895 1945 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz

NOTE 1: For operation referenced in 4.2(a), from 1885 <f< 1900 MHz, 1920 <f< 1935 MHz, 1995 <f< 2010 MHz and 2025<f< 2040 MHz , the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

NOTE 2: For operation referenced in 4.2(b), from 1835 < f < 1850 MHz and 1990< f < 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

NOTE 3: For operation referenced in 4.2(c), from 1895 < f < 1910 MHz and 1930< f < 1945 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.1 shall be applied.

6.5.2.2 1,28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 6.5.2.2a and table 6.5.2.2b.
The normative reference for this requirement is 3G TS 25.102 [1] clause 7.6.1.2.

Table 6.5.2.2a: In-band blocking (1,28Mcps TDD Option)

Parameter	Offset	Offset	Unit
Wanted Signal Level	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/1,28 MHz
Unwanted Signal Level (modulated)	-61	-49	dBm/1,28 MHz
F_{uw} (offset)	+3.2 or –3.2	+4.8 or –4.8	MHz

Table 6.5.2.2b: Out of band blocking (1,28Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
Wanted Signal Level	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/1,28 MHz
Unwanted Signal Level (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as definded in clause 4.2(a)	1840 <f <1895.2 1924.8 <f <2005.2 2029.8 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as definded in clause 4.2(b)	1790 < f < 1845.2 1994.8 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as definded in clause 4.2(c)	1850 < f < 1905.2 1934.8 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz

NOTE 1: For operation referenced in 4.2(a), from 1895.2 <f< 1900 MHz, 1920 <f< 1924.8 MHz, 2005.2 <f< 2010 MHz and 2025<f< 2029.8 MHz , the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2shall be applied.

NOTE 2: For operation referenced in 4.2(b), from 1845.2 < f < 1850 MHz and 1990< f < 1994.8 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2 shall be applied.

NOTE 3: For operation referenced in 4.2(c), from 1905.2 < f < 1910 MHz and 1930< f < 1934.8 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.4.2.2 shall be applied.

6.5.3 Test purpose

"The test stresses the ability of the UE receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity."

6.5.4 Method of test

6.5.4.1 Initial conditions

For in-band case:
Test environment: normal; see clauses G.2.1 and G.2.2.

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

For out-of-band case:
Test environment: normal; see clauses G.2.1 and G.2.2.

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

1) Connect the SS and the interfering Signal generator to the antenna connector as shown in figure A.5.

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

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

6.5.4.2 Procedure

1) The wanted signal frequency channel is set into the middle of the band.

2) The interfering Signal Generator is stepped through the frequency range indicated in table 6.5.2.1a for the 3,84 Mcps TDD Option and table 6.5.2.2a for the 1,28 Mcps TDD Option, respectively with a step size of 1 MHz.

3) The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mchip/s for the 3,84 Mcps TDD Option and 1,28 Mchp/s for the 1,28 Mcps TDD Option, respectively and rolloff 0.22.

4) Measure the BER of the wanted signal received from the UE at the SS for each step of the interferer.

5) Repeat the inband blocking for wanted frequency channels low–band and high-band.

6) The wanted signal frequency channel is set into the middle of the band.

7) The interfering Signal Generator is stepped through the frequency range indicated in table 6.54.2.1b for the 3,84 Mcps TDD Option and table 6.54.2.2b for the 1,28 Mcps TDD Option, respectively with a step size of 1 MHz.

8) The interference signal is a CW signal.

9) Measure the BER of the wanted signal received from the UE at the SS for each step of the interferer.

NOTE: Due to the large amount of time-consuming BER tests it is recommended to speed up a single BER test by reducing the 0.001-BER confidence level [10 000 bits under test or 10 errors] for screening the critical frequencies. Critical frequencies must be identified using standard BER confidence level. [30 000 bits or 30 errors].

----------End of Change----------

TSG-T1 meeting #14 **T1-020157**
Sophia Antipolis, France 21 – 22 Feb 2002

CR-Form-v4

CHANGE REQUEST

⌘ **34.122** **CR** **077** ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

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

Title:	⌘	Introduction of Annex F.6.2: Statistical testing of RRM delay performance
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-13
Category:	⌘ **F**	***Release:*** ⌘ 99

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

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

Reason for change:	⌘	25.123 requires from 34.122 to test delay parameters statistically according to the following rule: The limit shall be fulfilled in 90% of the cases. The confidence level of the test is to be developed. However 34.122 contains no instructions to perform the tests statistically.
Summary of change:	⌘	Introduction of Annex F.6.2: Statistical testing of RRM delay performance Delay tests shall be repeated [50] times
Consequences if ⌘not app		Statistical testing of RRM delay requirements is not possible

Clauses affected:	⌘	Annex F.6.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

F.6.2 Statistical testing of RRM delay performance

Delay tests in subclause 8.2 shall be repeated [50] times in order to determine the required success ratio

Note: A statistical approach needs to be developed. The number of repetitions required for the test will target towards a good compromise between test time and wrong decision risk.

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020156

CR-Form-v5

CHANGE REQUEST

⌘ **TS 34.122 CR 076** ⌘ **rev -** ⌘ Current version: **3.6.0** ⌘

*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:	⌘	Cell Re-selection in idle mode test cases
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
Category:	⌘	**F** ***Release:*** ⌘ R99

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

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

Reason for change:	⌘	Test cases for cell re-selection are missing.
Summary of change:	⌘	Added test cases for cell re-selection.
Consequences if not approved:	⌘	Requirements in the core specification would not be tested.

Clauses affected:	⌘	New subclauses in section 8.
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

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

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

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

8 Requirements for Support of RRM

8.1 General

Void.

8.2 Idle Mode Tasks

8.2.1 Cell Selection

Void.

8.2.2 Cell Re-Selection

8.2.2.1 Scenario 1: TDD/TDD cell re-selection single carrier case

8.2.2.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell , and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the TDD UE.

8.2.2.1.2 Minimum requirement

The cell re-selection delay shall be less than 8 s when the DRX cycle length is 1,28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$	A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.
T_{SI}	Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.1.

8.2.2.1.3 Test purpose

This test is to verify the requirement for the cell re-selection delay in the single carrier case

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 Table 8.2.2.1.2. 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
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
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.
T_{SI}		s	1.28	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	
T2		s	15	

Table 8.2.2.1.2: Cell re-selection single carrier multi-cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset1$_{s,n}$	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			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
$intrasearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, 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			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
$intrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3,84 MHz	-70											
Propagation Condition		AWGN											

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 RRC CONNECTION REQUEST messages from the UE.

b) The UE is switched on.

c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.

d) After 15 s, the parameters are changed as described for T2.

e) The SS waits for RRC CONNECTION REQUEST messages from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps d) to g) [TBD] times.

8.2.2.1.5 Test Requirements

1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).

2) In step e), the UE shall respond on cell 2 within 8 s.

3) In step g), the UE shall respond on cell 1 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

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

8.2.2.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

8.2.2.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell , and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the TDD UE.

8.2.2.2.2 Minimum requirement

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.2.

8.2.2.2.3 Test purpose

This test is to verify the requirement for the cell re-selection delay in the multi carrier case

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 Table 8.2.2.2.2. 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
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
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.
T_{SI}		s	1.28	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	
T2		s	15	

Table 8.2.2.2.2: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	6	0	6	0	0	6	0	6	-3	-3	-3	-3
PCCPCH RSCP	dBm	-67	-73			-73	-67			-76	-76		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
$intrasearch	dB	not sent				not sent				not sent			
$intersearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-76	-76			-76	-76			-76	-76		
Qoffset1$_{s,n}$	dB	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			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
$intrasearch	dB	not sent				not sent				not sent			
$intersearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.2.2.2.4.2 Procedure

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for RRC CONNECTION REQUEST messages from the UE.

b) The UE is switched on.

c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.

d) After 15 s, the parameters are changed as described for T2.

e) The SS waits for RRC CONNECTION REQUEST messages from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps 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 1, it shall not respond on any other cell (cell selection).

2) In step e), the UE shall respond on cell 1 within 8 s.

3) In step g), the UE shall respond on cell 2 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

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

8.2.2.3 Scenario 3: TDD/FDD cell re-selection

8.2.2.3.1 Definition and applicability

The cell re-selection delay is defined as the time from when 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 sending 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 a TDD cell and reselects to an FDD cell.

The requirements and this test apply to UEs supporting both TDD and FDD.

8.2.2.3.2 Minimum requirement

The cell re-selection delay shall be less than 8 s when the DRX cycle length is 1,28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$ See TS 25.123 [2] Table 4.1 in section 4.2.2.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.3

8.2.2.3.3 Test purpose

This test verifies the UE meets the minimum requirement for the case where the UE camps on a TDD cell and reselects to an FDD cell.

8.2.2.3.4 Method of test

8.2.2.3.4.1 Initial conditions

This scenario implies the presence of 1 TDD and 1 FDD cell as given in Table 8.2.2.3.1 and Table 8.2.2.3.2. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.3.1: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
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.
T_{SI}		s	1.28	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	
T2		s	15	

Table 8.2.2.3.2: TDD/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		8		n.a	n.a.
		T1	T2	T 1	T 2	T 1	T 2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	-12
SCH t_{offset}		0	0	0	0	n.a.	n.a.
PICH_Ec/Ior	dB			-3	-3	-15	-15
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2	-2	3
I_{oc}	dBm/3.84 MHz	-70					
CPICH_RSCP	dBm	n.a.		n.a.		-82	-77
PCCPCH_RSCP	dBm	-70	-75			n.a.	n.a.
Cell_selection and reselectionquality _measure		CPICH_RSCP				CPICH_RSCP	
Qrxlevmin	dBm	-102				-115	
$Qoffset1_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
$Qhyst1_{s}$	dB	0				0	
Treselection	s	0				0	
Sintersearch	dB	not sent				not sent	
Propagation Condition		AWGN				AWGN	

8.2.2.3.4.2 Procedure

a) The SS activates cell 1 and cell 2 with T1 defined parameters and monitors them for RRC CONNECTION REQUEST messages from the UE.

b) The UE is switched on.

c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.

d) After 30 s, the parameters are changed as described for T2.

e) The SS waits for RRC CONNECTION REQUEST messages from the UE.

f) After another 15 s, the parameters are changed as described for T1.

g) The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps d) to g) [TBD] times.

8.2.2.3.5 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.

3) In step g), the UE shall respond on cell 1 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

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

8.2.2.4 Scenario 4: inter RAT cell re-selection

8.2.2.4.1 Definition and applicability

The cell re-selection delay is defined as the time from when the cell quality levels change to the moment when this change makes the UE reselect a better ranked cell, and starts to send LOCATION UPDATING REQUEST message to perform a Location update to the new cell.

This test is for the case where the UE camps on a TDD cell and reselects to a GSM cell.

The requirements and this test apply to UEs supporting both TDD and GSM.

8.2.2.4.2 Minimum requirement

The cell re-selection delay shall be less than 8 s when the DRX cycle length is 1,28 s. The cell selection parameters in the BCCH of the GSM cell in system info 3 and 4 are transmitted at least every second.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The normative reference for this requirement is TS 25.123 [2] clauses 4.3.2.1 and A.4.2.4

8.2.2.4.3 Test purpose

This test verifies the UE meets the minimum requirement for the case where the UE camps on a TDD cell and reselects to a GSM cell.

8.2.2.4.4 Method of Test

8.2.2.4.4.1 Initial conditions

This scenario implies the presence of 1 TDD and 1 GSM cell as given in Table 8.2.2.4.1, 8.2.2.4.2, and 8.2.2.4.3. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.4.1: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD Cell
	Neighbour cell		Cell2	GSM Cell
Final condition	Active cell		Cell2	
DRX cycle length		s	1,28	UTRAN cell
BCCH repetition period (GSM cell)		s	1,87	In GSM the system information is scheduled according to an 8 x (51 x 8) cycle (i.e. a system information message is transmitted every 235 ms). The cell selection parameters in system info 3 and 4 are transmitted at least every second. (GSM 05.02)
T1		s	15	
T2		s	15	

Table 8.2.2.4.2: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
Timeslot Number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH t_{offset}		0	0	0	0
PICH_Ec/Ior	dB			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2
I_{oc}	dBm/3,84 MHz	–70		–70	
PCCPCH RSCP	dBm	-70	-75		
Propagation Condition		AWGN		AWGN	
Treselection	s	0			
$Ssearch_{RAT}$	dB	not sent			

Table 8.2.2.4.3: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-70
RXLEV_ACCESS_MIN	dBm	-100	
MS_TXPWR_MAX_CCH	dBm	30	

8.2.2.4.4.2 Procedure

a) The SS activates cell 1 and 2 with T1 defined parameters and monitors cell 1 and 2 for RRC CONNECTION REQUEST and LOCATION UPDATING REQUEST messages from the UE.

b) The UE is switched on.

c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.

d) After 15 s, the parameters are changed as described for T2.

e) The SS waits for LOCATION UPDATING REQUEST messages from the UE.

f) After 15 s, the parameters are changed as described for T1.

g) The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps d) to g) [TBD] times.

8.2.2.4.5 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.

3) In step g), the UE shall respond on cell 1.

For the test to pass, the total number of fulfilled test requirements in step 2) shall be at least 90% of the cases.

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

~~8.2 Idle Mode Tasks~~

~~8.2.1 Introduction~~

~~Void.~~

~~8.2.2 RF Cell Selection Scenario~~

~~8.2.2.1 Requirements for Cell Selection single carrier single cell case~~

~~Void.~~

~~8.2.2.2 Requirements for Cell Selection multicarrier carrier multi cell case~~

~~Void.~~

~~8.2.3 RF Cell Re-Selection Scenario~~

~~8.2.3.1 Requirements for Cell Re-Selection single carrier multi cell case~~

~~Void.~~

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020155

CR-Form-v5

CHANGE REQUEST

⌘ **TS 34.122** **CR** **075** ⌘ **rev** **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	New RRM Section Headings
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
Category:	⌘	**F** ***Release:*** ⌘ R99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Core specification has been reorganized since the existing section headings were created.
Summary of change:	⌘	Created new section headings based on TS 25.123.
Consequences if not approved:	⌘	Conformance tests would be inconsistent with core specifications and new test cases would be difficult to add.
Clauses affected:	⌘	All subslauses in section 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

Void.

8.2 Idle Mode Tasks

8.2.1 Cell Selection

Void.

8.2.2 Cell Re-Selection

8.2.2.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.2.2.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.2.2.3 Scenario 3: TDD/FDD cell re-selection

Void.

8.2.2.4 Scenario 4: inter RAT cell re-selection

Void.

8.3 UTRAN Connected Mode Mobility

8.3.1 TDD/TDD Handover

Void.

8.3.2 TDD/FDD Handover

Void.

8.3.3 TDD/GSM Handover

Void.

8.3.4 Cell Re-selection in CELL_FACH

8.3.4.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.4.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.3.5 Cell Re-selection in CELL_PCH

8.3.5.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.6.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.3.6 Cell Re-selection in URA_PCH

8.3.6.1 Scenario 1: TDD/TDD cell re-selection single carrier case

Void.

8.3.6.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

Void.

8.4 RRC Connection Control

8.4.1 RRC connection re-establishment delay

Void.

8.4.2 Transport Format Combination selection in UE

Void.

8.5 Timing Characteristics

8.5.1 UE Timing Advance

Void.

8.5.2 UE Transmit Timing

Void.

8.6 UE Measurements Procedures

8.6.1 TDD intra frequency measurements

8.6.1.1 Event triggered reporting in AWGN propagation conditions

Void.

8.6.1.2 Event 1H and 1I triggered reporting in AWGN propagation condition

Void.

8.6.2 TDD inter frequency measurements

8.6.2.1 Correct reporting of neighbours in AWGN propagation condition

Void.

8.6.3 FDD measurements

8.6.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

Void.

8.7 Measurements Performance Requirements

Void.

~~8.2 Idle Mode Tasks~~

~~8.2.1 Introduction~~

~~Void.~~

~~8.2.2 RF Cell Selection Scenario~~

~~8.2.2.1 Requirements for Cell Selection single carrier single cell case~~

~~Void.~~

~~8.2.2.2 Requirements for Cell Selection multicarrier carrier multi cell case~~

~~Void.~~

~~8.2.3 RF Cell Re-Selection Scenario~~

~~8.2.3.1 Requirements for Cell Re-Selection single carrier multi cell case~~

~~Void.~~

~~8.2.4 PLMN Selection and Re-Selection Scenario~~

~~Void.~~

~~8.2.5 Location Registration Scenario~~

~~Void.~~

~~8.3 RRC Connection mobility~~

~~8.3.1 Handover~~

~~8.3.1.1 Introduction~~

~~Void.~~

~~8.3.1.2 Handover 3G to 3G~~

~~8.3.1.2.1 TDD/TDD Handover~~

~~Void.~~

~~8.3.1.2.2 TDD/FDD Handover~~

~~Void.~~

~~8.3.1.3 Handover 3G to 2G~~

~~8.3.1.3.1 Handover to GSM~~

~~Void.~~

~~8.3.2 Radio Link Management~~

~~8.3.2.1 Link adaptation~~

~~Void.~~

~~8.3.3 Cell Update~~

~~Void.~~

~~8.3.4 URA Update~~

~~Void.~~

~~8.4 RRC Connection Control~~

~~8.4.1 Radio Access Bearer Control~~

~~Void.~~

~~8.5 Dynamic Channel Allocation~~

~~Void.~~

~~8.6 Timing characteristics~~

~~8.6.1 Timing Advance (TA) Requirements~~

~~Void.~~

~~8.7 Measurements Performance Requirements~~

~~8.7.1 Measurements Performance for UE~~

~~Void.~~

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020154

CR-Form-v3

CHANGE REQUEST

⌘ **TS 34.122 CR 074** ⌘ rev **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Replacement of Block STTD by Space Code Transmit Diversity (SCTD)
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
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.

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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:	⌘	Block STTD has been replaced by SCTD in TS25.102. This was approved in TSG-RAN WG4 Mtg #21 in tdoc R4-020373.
Summary of change:	⌘	Block STTD has been deleted and replaced with SCTD.
Consequences if not approved:	⌘	Conformance tests would be inconsistent with core specifications.

Clauses affected:	⌘	7.4.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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7.4.1 Demodulation of BCH in ~~Block STTD~~ SCTDmode

This is not tested.

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February, 2002

Tdoc T1-020153

CR-Form-v5

CHANGE REQUEST

⌘ **34.122** **CR** **073** ⌘ **rev** **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Uplink Power Control Performance Test
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
Category:	⌘	**F** ***Release:*** ⌘ R99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Conformance test for uplink power control performance is missing.
Summary of change:	⌘	Added test case for uplink power control performance. Defined new test tolerances for new test case based on the tolerances defined for the uplink power control stepsize accuracy tests.
Consequences if not approved:	⌘	Requirements for uplink power control performance TS25.102 would not be tested.

Clauses affected:	⌘	new clause 7.6 added. Additions to F.1.4, F.2.3, F.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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7.6 Uplink Power Control

7.6.1 Definition and applicability

Power control in the uplink is the ability of the UE to converge to the required link quality set by the network while using minimum uplink power. The requirements of this test shall apply to all types of the UTRA-TDD UE.

7.6.2 Minimum requirements

During period T1, the PCCPCH and a second Beacon Channel are transmitted in the DL in designated slots within each frame and at the same power level.

The UE transmits, using the channel of TS25.105, Annex A.2.1 UL reference measurement channel (12.2 kbps) in one UL slot. For different parts of the test, different UL slots will be designated.

The values of table 7.6.1, period T1 shall be selected. Then, with the received PCCPCH and Beacon power set at –60 dBm, the value of DPCH constant value shall be adjusted so that the mean UE output power is 5 dBm. These conditions are held steady during period T1.

Periods T1 and T2 are each 5 seconds long.

Table 7.6.1: UL Power Control Test Conditions

		Period T1	Period T2
I_{BTS} all slots	dBm	-60	
PCCPCH Power -Broadcast	dBm	18	
PCCPCH Power - Received	dBm	-60	-70
Mean UE transmit power	dBm	5	According to tables 7.6.2 and 7.6.3
SIR_{TARGET}	dB	6	
I_{oc} in PCCPCH and Beacon Slots	dBm	-60	
IE (information element) Alpha	As defined in 25.331	1.0	
PCCPCH slot position	Integer 0 -14	0	
Beacon slot position	Integer 0 -14	8	

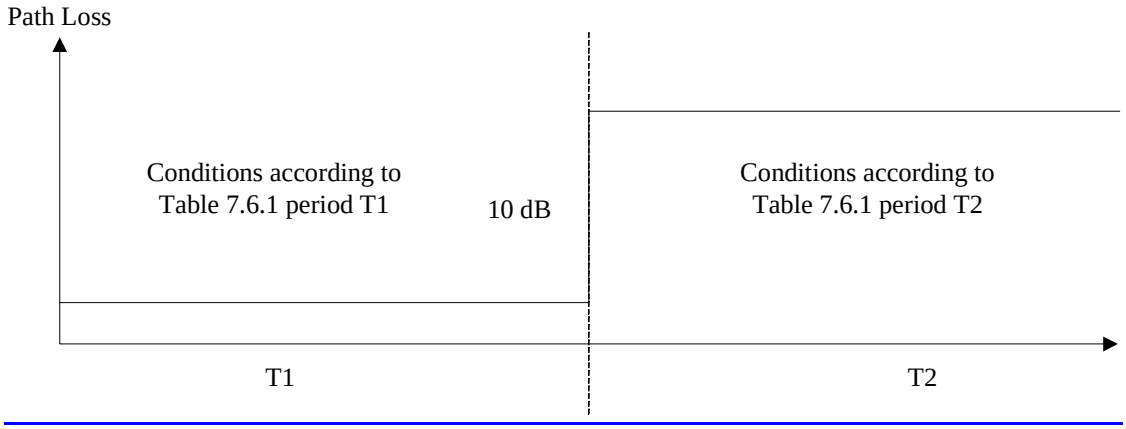

Figure 7.6.1

At the end of period T1, the PCCPCH and Beacon Received power shall be simultaneously decreased by 10 dB. These conditions are summarized in table 7.6.1, period T2.

For the first frame including the change in received power the UE output power shall satisfy the values in table 7.6.2.

For the 20th frame after the change in received power the UE output power shall satisfy the values in table 7.6.3.

Table 7.6.2: Required UE Output Power, Frame Containing Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±4.0	5 ±0.5

Table 7.6.3: Required UE Output Power, 20 Frames after Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±4.0	15 ±4.0

7.6.3 Test purpose

To verify the ability of the UE to converge to the required link quality set by the network while using minimum uplink power.

7.6.4 Method of test

7.6.5 Initial conditions

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

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

1) Connect SS and an AWGN source to the UE antenna connector as shown in figure A.9.

2) Set up a call according to the Generic call setup procedure using SS levels and signalling values as specified in table 7.6.1 for Period P1 and table 7.6.4 . The UE shall be signalled to transmit in timeslot position 1.

Table 7.6.4: Test parameters for Uplink Power Control Test

Parameter	Value/description
UL Reference measurement channel	12,2kbps, according to annex C.2.1
DPCH constant value	0
Data content	real life (sufficient irregular)

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

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

7.6.6 Procedure

1) The SS adjusts the DPCH constant value until the UE transmit power is 5 dBm.

2) After the UE output power has has been held constant at 5 dBm for at least 5 seconds, the received PCCPCH power shall be decreased by 10 dB to -70 dBm as shown in figure 7.6.1.

3) Measure the transmit power according to annex B for the first frame including the pathloss change and the 20th frame after the pathloss change.

4) Set the received PCCPCH power to -60 dBm.

5) SS signals UE to transmit in timeslot 7. Repeat step 1 - 4.

6) SS signals UE to transmit in timeslot 9. Repeat step 1 - 4.

7) SS signals UE to transmit in timeslot 14. Repeat step 1 - 4.

7.6.7 Test requirements

The measured transmit power shall not exceed the prescribed tolerance in tables 7.6.5 and 7.6.6.

Table 7.6.5: Required UE Output Power, Frame Containing Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±5.5	5 ±0.5

Table 7.6.6: Required UE Output Power, 20 Frames after Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±5.5	15 ±5.5

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

<next changed section>

F.1.4 Performance requirement

Table F.1.4 Maximum Test System Uncertainty for Performance Requirements

Clause	Maximum Test System Uncertainty
~~TBD~~7.6 Uplink Power Control	0.3 dB (relative tolerance for 10 dB stepsize)~~TBD~~

<next changed section>

F.2.3 Performance requirements

Table F.2.3 Test Tolerances for Performance Requirements.

Clause	Test Tolerance
7.2, Demodulation in Static Propagation Condition	
7.3, Demodulation of DCH in Multiplath Fading conditions	
7.4, Base Station Transmit diversity modes	
7.6 Uplink Power Control	0.5 dB (relative tolerance for 10 dB stepsize)

<next changed section>

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

The Test Requirements in the present document have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in clause F.2. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in table F.4.

Table F.4: Derivation of Test Requirements

Test	Minimum Requirement in TS 25.102	Test Tolerance (TT)	Test Requirement in TS 34.122
5.2 Maximum Output Power	Power single code Power class 2 (24 dBm) Tolerance = +1/-3 dB Power class 3 (21 dBm) Tolerance = +2/-2 dB Power multi code Power class 2 (21 dBm) Tolerance = +1/-3 dB Power class 3 (18 dBm) Tolerance = ±2 dB	0,7 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT For power class 2 (single and multi): Upper Tolerance limit = +1,7 dB Lower Tolerance limit = -3,7 dB For power class 3 (single and milti): Upper Tolerance limit = +2,7 dB Lower Tolerance limit = -2,7 dB
5.3 UE Frequency Stability	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).
5.4.1.1 Uplink Pwer Control, Initial accuracy	± 9dB normal conditions ± 12dB extreme conditions	1.0 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT Nominal expected TX power ± 10dB (normal conditions) ± 13dB (extreme conditions)
5.4.1.2 Uplink Power Control, differential accuracy	SIR Target / Pow Step Tol <1 dB 0.5 dB <2dB 1 dB <3 dB 1.5 dB <10 dB 2 dB <20dB 4 dB <30 dB 6 dB > 30 dB 9 dB	TT 0.1 dB 0.15 dB 0.2 dB 0.5 dB 0.7 dB 0.7 dB 1.0 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT
5.4.2 Minimum Transmit Power	UE minimum transmit power shall be less than –44 dBm	1.0 dB	Formula: UE minimum transmit power + TT UE minimum transmit power = –43 dBm
5.4.5 Out-of-synchronisation handling of output power:	$\frac{\Sigma DPCH\_E_c}{I_{or}}$ levels before A –4.6 dB AB: -10 dB BD: -16 dB DE: -12 dB EF: -6 dB transmit ON/OFF time 200ms	0,4 dB for $\frac{\Sigma DPCH\_E_c}{I_{or}}$ 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 $\frac{\Sigma DPCH\_E_c}{I_{or}}$ levels: Before A: -4.6 AB: -10 + 0,4 dB BD: -16 – 0,4 dB DE: -12 - 0,4 dB EF: -6 + 0,4 dB 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.transmit ON/OFF time 200ms
5.5.1 Transmit OFF power	Transmit OFF power shall be less than –65 dBm	1.5 dB	Formula: Transmit OFF power + TT Transmit OFF power = –63,5 dBm

<table>
<tr><td>5.5.1 Occupied Bandwidth</td><td colspan="2">The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.</td><td>0 kHz</td><td colspan="2">Formula: occupied channel bandwitdh: + TT

occupied channel bandwidth = 5,0 MHz</td></tr>
<tr><td>5.5.2.1 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>5.5.2.2 Adjacent Channel Leakage Power Ratio (ACLR)</td><td colspan="2">Power Classes 2 and 3:
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 2 and 3:
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">5.5.3 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 5.5.3</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>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>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>
</table>

5.6 Transmit Intermodulation	Intermodulation Product 5MHz -31 dBc 10MHz -41 dBc		0 dB	Formula: Intermodulation Product + TT Intermodulation Product 5MHz -31 dBc 10MHz -41 dBc	
5.7.1 Error Vector Magnitude	The Error Vector Magnitude shall not exceed 17.5 %		0%	Formula: EVM limit + TT EVM limit = 17,5 %	
5.7.2 Peak code domain error	The peak code domain error shall not exceed -21dB		±1.0 dB	Formula: Peak code domain error + TT Peak code domain error = -20 dB	
6.2 Reference sensitivity level	$\hat{I}_{or}$ = -105 dBm / 3,84 MHz BER limit = 0.001		0.7 dB	Formula: $\hat{I}_{or}$+ T BER limit unchanged $\hat{I}_{or}$ = -104,3 dBm / 3,84 MHz	
6.4 Adjacent Channel Selectivity	$\hat{I}_{or}$ = -91 dBm / 3,84 MHz Ioac (modulated) = -52 dBm/3,84 MHz BER limit = 0.001		0 dB	Formula: $\hat{I}_{or}$ unchanged Ioac - TT BER limit unchanged Ioac = -52 dBm/3,84 MHz	
6.5 Blocking Characteristics	See table 6.5.2a and 6.5.2b in TS 34.122 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 Iblocking(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 BER limit = 0.001		0 dB	Formula: TBD BER limit unchanged.	
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
	1,9-1,92 GHz 2,01-2.025GHz 2,11-2.170GHz	-60 dBm / 3,84MHz	0 dB	1,9-1,92 GHz 2,01-2.025GHz 2,11-2.170GHz	-60 dBm / 3,84MHz
	1 –1,9GHz, 1,92–2,01 GHz 2,025–2,11GHz	-47 dBm/1MHz	0 dB	1 –1,9GHz, 1,92–2,01 GHz 2,025–2,11GHz	-47 dBm/1MHz
	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

7.6 Downlink Power Control		TS #1,9	TS #7,14	0.5 dB for 10 dB change in output power, 0 otherwise.	Formula for 10 dB change in transmit power: Upper Tolerance limit + TT Lower Tolerance limit – TT
	1st frame	15 ±4.0 dBm	5 ±0.5 dBm		
	2nd frame	15 ±4.0 dBm	15 ±4.0 dBm		

3GPP TSG-T1 Meeting #14
Sophia Antipolis, France, 21-22 February 2002

Tdoc T1-020152

CR-Form-v3

CHANGE REQUEST

⌘ **TS 34.122 CR 072** ⌘ rev **-** ⌘ Current version: **3.6.0** ⌘

*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 in the Downlink
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 18/02/2002
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:	⌘	Requirement has been updated in TS25.102. Test purpose, method of test, and test requirements are missing.
Summary of change:	⌘	Updated minimum requirement with new text from TS25.102. Added test purpose, test method, and test requirements.
Consequences if not approved:	⌘	Conformance tests would be inconsistent with core specifications and incomplete.

Clauses affected:	⌘	7.5.1, new sections 7.5.2, 7.5.3, and 7.5.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

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

7.5 Power control in downlink

Power control in the downlink is the ability of the UE receiver to converge to the required link quality set by the network while using minimum downlink power.

7.5.1 Minimum requirements

For the parameters specified in table 7.5.1.a the average downlink $\hat{I}_{or}/I_{oc}$ power shall be below the specified value in Table 7.5.1.a more than 90% of the time. BLER shall be as shown in Table 7.5.1.b more than 90% of the time. Downlink power control is ON during the test.

~~not exceed the values specified in table 7.5.1.b. Downlink power control is ON during the test.~~

Table 7.5.1.a: Test parameters for downlink power control

Parameter	Unit	Test 1	~~Test 2~~
$\frac{DPCH\_E_c}{I_{or}}$	dB	0	~~[ ]~~
I_{OC}	dBm/3,84 MHz	-60	
Information Data Rate	kbps	12,2	
Target quality value on DTCH	BLER	0,01	
Propagation condition		~~Case 4~~Case 1	
DL Power Control step size, Δ_{TPC}	dB	1	
Maximum DL power *	dB	0	
Minimum DL power *	dB	-27	

Note: DL power is relative to P-CCPCH power.

Table 7.5.1.b: Requirements for downlink power control

Parameter	Unit	Test 1	~~Test 2~~
$\hat{I}_{or}/I_{oc}$	dB	8,0~~[ ]~~	~~[ ]~~
Measured quality on DTCH	BLER	0,01±30%	~~0,01±30%~~

The reference for this requirement is TS 25.102 [1] clause 8.5.1.

7.5.2 Test purpose

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

7.5.3 Method of test

7.5.3.1 Initial conditions

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

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

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

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

3) RF parameters are set up according to table 7.5.1.a

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 7.5.1.a. SS will vary the physical channel power in downlink according to the TPC commands from UE, and at the same time measure BLER. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

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

7.5.3.2 Procedure

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

2) The measured quality on DTCH (BLER) and the measured downlink $\hat{I}_{or}/I_{oc}$ power ratio values averaged over one slot are compared to the limits in table 7.5.1.b.

7.5.4 Test Requirements

a) The measured quality on DTCH does not exceed the values in table 7.5.1.b.

b) The downlink $\hat{I}_{or}/I_{oc}$ power ratio values, which are averaged over one slot, shall be below the values in table 7.5.1.b more than 90 % of the time.

TSG-T1 meeting #14 **T1-020151**
Sophia Antipolis, France 21 – 22 Feb 2002

CR-Form-v4

CHANGE REQUEST

⌘ **34.122** **CR** **071** ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Maintenance of annex B: Global In-Channel TX-Test.
Source:	⌘	T1/RF
Work item code:	⌘	***Date:*** ⌘ 2002-02-13
Category:	⌘	**F** ***Release:*** ⌘ 99

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

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

Reason for change:	⌘	Progress of 34.122 concerning different power and modulation measurements stipulates maintenance of the Global In-Channel TX-Test.
Summary of change:	⌘	1) Algorithmic support for the overall test implementation added 2) Algorithmic definition of decision point power added 3) Algorithmic definition of code domain power added 4) Error corrections
Consequences if not approved:	⌘	Implementation of all in-channel TX test parameters may be ambiguous leading to inconsistent measurements and system performance

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

Annex B (normative): Global In-Channel TX-Test

B.1 General

The global in-channel Tx test enables the measurement of all relevant parameters that describe the in-channel quality of the output signal of the Tx under test in a single measurement process.

The parameters describing the in-channel quality of a transmitter, however, are not necessarily independent. The algorithm chosen for description inside this annex places particular emphasis on the exclusion of all interdependencies among the parameters. Any other algorithm (e.g. having better computational efficiency) may be applied, as long as the results are the same within the accuracy limits.
All notes referred in the various clauses of B.2 are put together in B.3.

B.2 Definition of the process

B.2.1 Basic principle

The process is based on the comparison of the actual **output signal of the TX under test**, received by an ideal receiver, with a **reference signal**, that is generated by the measuring equipment and represents an ideal error free received signal. The reference signal shall be composed of the same number of codes at the correct spreading factors as contained in the test signal. Note, for simplification, the notation below assumes only codes of one spreading factor although the algorithm is valid for signals containing multiple spreading factors.
All signals are represented as equivalent (generally complex) baseband signals.

B.2.2 Output signal of the TX under test

The output signal of the TX under test is acquired by the measuring equipment, filtered by a matched filter (RRC 0.22, correct in shape and in position on the frequency axis) and stored for further processing~~at one sample per chip at the Inter-Symbol-Interference free instants~~.

The following form represents the physical signal in the entire measurement interval:
one vector **Z**, containing N = ns x sf + ma complex samples;

with
ns: number of symbols in the measurement interval;
sf: number of chips per symbol. (sf: spreading factor) (see Note: Symbol length)
ma: number of midamble chips ~~(only in TDD)~~

B.2.3 Reference signal

The reference signal is constructed by the measuring equipment according to the relevant TX specifications. It is filtered by the same matched filter, mentioned in B.2.2., and stored at the Inter-Symbol-Interference free instants. The following form represents the reference signal in the entire measurement interval:
one vector **R**, containing N = ns x sf + ma complex samples;

ns, sf, ma: see B.2.2

B.2.4 void

B.2.5 Classification of measurement results

The measurement results achieved by the global in-channel TX test can be classified into two types:
Results of type “deviation”, where the error-free parameter has a non-zero magnitude. (These are the parameters that quantify the integral physical characteristic of the signal).These parameters are:

- RF Frequency
- Power (in case of single code)
- Code Domain Power (in case of multi code)
- Timing ~~(only for UE)~~

(Additional parameters: see Note: Deviation)

Results of type “residual”, where the error-free parameter has value zero. (These are the parameters that quantify the error values of the measured signal, whose ideal magnitude is zero). These parameters are:

- Error Vector Magnitude (EVM);
- Peak Code Domain Error (PCDE).

- (Additional parameters: see Note residual).

B.2.6 Process definition to achieve results of type “deviation”

The reference signal (**R**; see clause B.2.3) and the signal under Test (Z; see subclause B.2.2) are ~~is~~ varied with respect to the parameters mentioned in clause B.2.5 under "results of type deviation" in order to achieve best fit ~~with the recorded signal under test (**Z**; see clause B.2.2)~~. Best fit is achieved when the RMS difference value between the varied signal under test and the varied reference signal is an absolute minimum.

Overview:

$$FCT\ \left[\ Z(\tilde{f},\tilde{t},\tilde{\varphi},g_1,g_2,...,\ g_{synch}\ ) - R(f,t,\varphi,\tilde{g}_1,\tilde{g}_2,...,\ \tilde{g}_{synch}\ )\ \right] = Minimum\quad !$$

Z : Signal under test.
R: Reference signal,
with frequency f, the timing t, the phase φ, gain of code1 (g_1), gain of code2 (g_2) etc, and the gain of the synch channel g_{synch}
The parameters marked with a tilde in Z and R are varied in order to achieve a best fit.

Detailed formula: see Note: Formula for the minimum process

The varied reference signal, after the best fit process, will be called **R'.**
The varied signal under test, after the best fit process, will be called **Z’.**

The varying parameters, leading to **R' and Z’** represent directly the wanted results of type “deviation”. These measurement parameters are expressed as deviation from the reference value with units same as the reference value.
In case of multi code, the type-“deviation”-parameters (frequency, timing and (RF-phase)) are varied commonly for all codes such that the process returns one frequency-deviation, one timing deviation, (one RF-phase – deviation).
(These parameters are not varied on the individual codes signals such that the process would return~~s~~ kr frequency errors... . (kr: number of codes in the reference signal)).
The only type-“deviation”-parameters varied individually are the code domain gain factors (g1, g2, …)
~~The only type “deviation” parameters varied individually are code powers such that the process returns k code power deviations (k: number of codes).~~

E.2.5.1 Decision Point Power

The mean-square value of the signal-under-test, sampled at the best estimate of the of Intersymbol-Interference-free points using the process defined in subclause 2.5, is referred to the *Decision Point Power* (DPP):

E.2.5.2 Code-Domain Power

The samples, Z’, are separated into symbol intervals to create ns time-sequential vectors **z** with sf complex samples comprising one symbol interval. The *Code Domain Power* is calculated according to the following steps:

(1) Take the vectors **z** defined above.

(2) To achieve meaningful results it is necessary to descramble **z,** leading to **z’**

(3) Take the orthogonal vectors of the channelization code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1), and normalize by the norm of the vectors to produce **C**norm=**C**/sqrt(sf). (see Note: Symbol length)

(4) Calculate the inner product of **z’** with **C**norm**.**. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format k x ns, each value representing a specific symbol and a specific code, which can be exploited in a variety of ways.

k: total number of codes in the code space
ns: number of symbols in the measurement interval

(5) Calculate k mean-square values, each mean-square value unifying ns symbols within one code. (These values can be called "*Absolute CodeDomainPower* (CDP)" [Volt^2].) The sum of the k values of CDP is equal to DPP.

(6) Normalize by the decision point power to obtain

$$Relative\ CodeDomain\ Power = \frac{Absolute\ CodeDomainPower}{DecisionPointPower}$$

B.2.7 Process definition to achieve results of type "residual"

The difference between the varied reference signal (**R'**; see clauseB.2.6.) and the varied TX signal under test (**Z'**; see clauseB.2.6~~2~~) is the error vector **E** versus time:

E = **Z'** – **R'.**

Depending on the parameter to be evaluated, it is appropriate to represent **E** in one of the following two different forms:

Form EVM (representing the physical error signal in the entire measurement interval)
One vector **E**, containing N = ns x sf + ma complex samples;

ns, sf, ma: see B.2.2

Form PCDE (derived from Form EVM by separating the samples into symbol intervals)
ns time-sequential vectors **e** with sf complex samples comprising one symbol interval.

E gives results of type "residual" applying the two algorithms defined in clauses B 2.7.1 and B 2.7.2.

B.2.7.1 Error Vector Magnitude (EVM)

The Error Vector Magnitude EVM is calculated according to the following steps:

1) Take the error vector **E** defined in clause B.2.7 (Form EVM) and calculate the RMS value of **E**; the result will be called RMS(**E**).

2) Take the varied reference vector **R'** defined in clause B.2.6 and calculate the RMS value of **R'**; the result will be called RMS(**R'**).

3) Calculate EVM according to:

$$EVM = \frac{RMS(E)}{RMS(R')} \times 100\%$$ (here, EVM is relative and expressed in %)

(see note TDD)
(see Note: Formula for EVM)

B.2.7.2 Peak Code Domain Error (PCDE)

The Peak Code Domain Error is calculated according to the following steps:

1) Take the error vectors **e** defined in clause B.2.7 (Form PCDE)

2) Take the orthogonal vectors of the channelisation - code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1). (see Note: Symbol length) and normalize by the norm of the vectors to produce **C**norm= **C**/sqrt(sf). (see Note: Symbol length)

3) To achieve meaningful results it is necessary to descramble **e,** leading to **e'** ~~(see Note1: Scrambling code)~~

4) Calculate the inner product of **e'** with **C**norm. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format k x ns, each value representing an error-vector representing a specific symbol and a specific code, which can be exploited in a variety of ways.

k: total number of codes in the code space
ns: number of symbols in the measurement interval

5) Calculate k RMS values, each RMS value unifying ns symbols within one code.
(These values can be called "*Absolute CodeEVMs*" [Volt].)

6) Find the peak value among the k "*Absolute CodeEVMs*".
(This value can be called "*Absolute PeakCodeEVM*" [Volt].)

7) Calculate PCDE according to:

$$10*\lg \frac{(\text{“}Absolute\ PeakCodeEVM\text{”})^2}{(\mathrm{RMS}(\mathbf{R}'))^2}\ \mathrm{dB}$$

(a relative value in dB).

~~(see Note: Denominator)~~
(see Note~~2~~: Scrambling code)
~~(see Note IQ)~~
(see Note TDD)
~~(see Note Synch channel)~~

B.3 Notes

Note: Symbol length)
A general code multiplexed signal is multicode and multirate. In order to avoid unnecessary complexity, the measurement applications use a unique symbol-length, corresponding to a spreading factor, regardless of the really intended spreading factor. Nevertheless the complexity with a multicode / multirate signal can be mastered by introducing appropriate definitions.

Note: Deviation)
It is conceivable to regard more parameters as type „deviation“ e.g. Chip frequency and RF-phase.
As chip-frequency and RF-frequency are linked together by a statement in the core specifications [1] it is sufficient to process RF frequency only.
A parameter RF-phase must be varied within the best fit process (B 2.6.). Although necessary, this parameter-variation doesn't describe any error, as the modulation schemes used in the system don't depend on an absolute RF-phase.

Note: R~~r~~esidual)
It is conceivable to regard more parameters as type „residual“ e.g. IQ origin offset. As it is not the intention of the test to separate for different error sources, but to quantify the quality of the signal, all such parameters are not extracted by the best fit process, instead remain part of EVM and PCDE.

~~**Note: Denominator)**~~
~~If the denominator stems from mutual time shifted signals of different code powers, (e.g. BS, FDD) the measurement result PCDE should be expressed absolutely instead.~~

~~**Note1: Scrambling Code)**~~
~~In general a TX signal under test can use more than one scrambling code. Note that PCDE is processed regarding the unused channelisation - codes as well. In order to know which scrambling code shall be applied on unused channelisation - codes, it is necessary to restrict the test conditions: TX signal under test shall use exactly one scrambling code.~~

Note~~2~~ Scrambling Code)
To interpret the measurement results in practice it should be kept in mind that erroneous code power on unused codes is generally de-scrambled differently under test conditions and under real life conditions, whereas erroneous code power on used codes is generally de-scrambled equally under test conditions and under real life conditions. It might be indicated if a used or unused code hits PCDE.

~~**Note IQ)**~~
~~As in FDD/uplink each code can be used twice, on the I and on the Q channel, the measurement result may indicate on which channel (I or Q) PCDE occurs.~~

Note TDD)
EVM covers the midamble part as well as the data part; however PCDE disregards the midamble part.

~~**Note: Synch Channel)**~~
~~A BS signal contains a physical synch channel, which is non orthogonal, related to the other DPCHs. In this context note: The code channel bearing the result of PCDE is exactly one of the DPCHs (never the synch channel). The origin of PCDE (erroneous code power) can be any DPCH and/or the synch channel.~~

Note: **Fomula for the minimum process**

$$L(\Delta\tilde{f}, \Delta\tilde{t}, \Delta\tilde{\varphi}, \Delta\tilde{g}_c, ..., \Delta\tilde{g}_{mid}) = \sum_{v=0}^{N-1} \left| Z(v) - R(v) \right|^2$$

Legend:

L : the function to be minimised

The parameters to be varied in order to minimize are:

$\Delta\tilde{f}$: the RF frequency offset

$\Delta\tilde{t}$: the timing offset

$\Delta\tilde{\varphi}$: the phase offset

$\Delta\tilde{g}_c \cdots$ code power offsets (one offset for each code)

$\Delta\tilde{g}_{mid}$: the power offset of the midamble

Z(v): Samples of the signal under Test
R(v): Samples of the reference signal

$\sum_{v=0}^{N-1}$: counting index v starting at the beginning of the measurement interval and ending at its end.

N = No of chips during the measurement interval.

Z(v): Samples of the signal under Test. It is modelled as a sequence of complex baseband samples Z(γ) with a time-shift Δt, a frequency offset Δf, a phase offset Δφ, the latter three with respect to the reference signal.

$$Z(v) = Z(v - \Delta\tilde{t}) * e^{-j2\pi\Delta\tilde{f}v} * e^{-j\Delta\tilde{\varphi}}$$

R(v): Samples of the reference signal:

$$R(v) = \sum_{c=1}^{No.of\ codes} (g_c + \Delta\tilde{g}_c) * Chip_c(v) + (g_{mid} + \Delta\tilde{g}_{mid}) * Chip_{mid}(v)$$

g : nominal gain of the code channel or midamble

$\Delta\tilde{g}$: The gain offset to be varied in the minimum process

Chip(v) is the chipsequence of the code channel or midamble
Indices at g, Δg and Chip:
The index indicates the code channel: c = 1,2,... No of code channels

Range for $Chip_c$: +1,-1

Note: **Formula for EVM**

$$EVM = \sqrt{\frac{\sum_{\nu=0}^{N-1} \left| Z'(\gamma) - R'(\gamma) \right|^2}{\sum_{\nu=0}^{N-1} \left| R'(\gamma) \right|^2}} * 100 \ \%$$

Z’(γ), R’(γ) are the varied measured and reference signals.