TSG-RAN Meeting #7 *TSGRP#6(00)0021*
Madrid, Spain, 13 – 15 March 2000

Title: **Agreed CRs to TS 25.133**

Source: **TSG-RAN WG4**

Agenda item: **6.2.3**

Spec	CR	Rev	Phas	Subject	Cat	Current	New	WG4 doc
25.133	001		R99	Modification of RL Failure Requirement	F	3.0.0	3.1.0	R4-000142
25.133	002		R99	Idle Mode Tasks	C	3.0.0	3.1.0	R4-000303
25.133	003		R99	Revised UE handover requirements	F	3.0.0	3.1.0	R4-000317
25.133	004		R99	Editorial corrections	D	3.0.0	3.1.0	R4-000304
25.133	005		R99	UE measurement requirement update	F	3.0.0	3.1.0	R4-000305
25.133	006		R99	TDD Measurements Performance Requirements for TS25.133 (FDD)	B	3.0.0	3.1.0	R4-000313
25.133	007		R99	UTRAN measurement requirement update	F	3.0.0	3.1.0	R4-000308
25.133	008		R99	Requirements on parallel measurements	F	3.0.0	3.1.0	R4-000309
25.133	009		R99	Inclusion on transport channel BER.	F	3.0.0	3.1.0	R4-000314

CHANGE REQUEST

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25.133	CR	001	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG RAN #7	for approval	X	strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 00.02.29

Subject: Modification of RL Failure Requirement

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:

With a new definition of the CPHY-Out-Of-Synch primitive, there is a need to modify the requirements for RL Failure. This as it will take 200 ms to detect out of synch.

The criteria for turning off UE Tx power (bad DPCCH quality) is proposed to be defined and tested in TS25.101. Thus this requirement should make sure that the other part of the out-of-synch functionality is tested. Therefore, faulty CRCs are used as a triggering mechanism.

Clauses affected: 6.1

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	25.101 CR ? (Tdoc R4-(00)0141) 25.214 CR 066 25.423 CR ? (Tdoc R3-(00)0479) 25.433 CR ? (Tdoc R3-(00)0478)
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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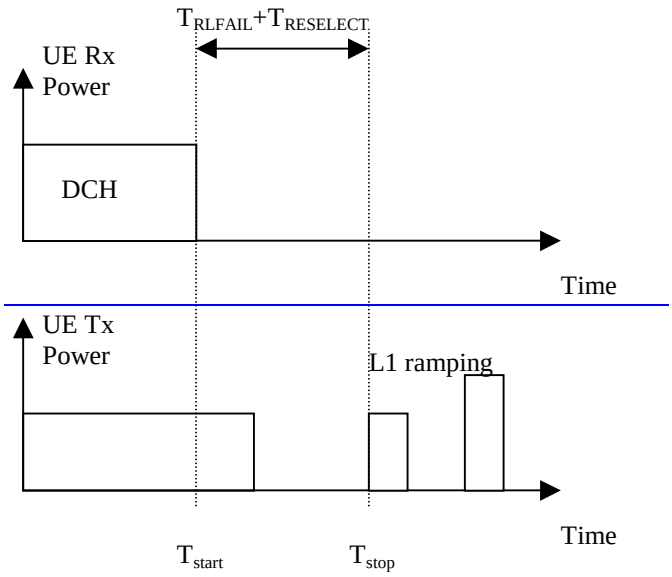
6 RRC Connection Control

6.1 Requirements for RRC Re-establishment

6.6.1 RRC Re-establishment delay

When the UE is in Cell_DCH state, the UE shall be capable of sending a RRC CONNECTION RE-ESTABLISHMENT CONNECT message~~, in the test case defined in the following section,~~ within $T_{RE\text{-}ESTABLISH}$ ~~T_{RLFAIL} + $T_{RESELECT}$~~ seconds from when the CPHY-Out-Of-Synch primitive indicates lost synchronisation. ~~the radio connection was lost.~~ The RRC Re-establishment delay requirement ($T_{RE\text{-}ESTABLISH\text{-}REQ}$) is defined as the time between the moment when errourness CRCs are applied, to ~~radio connection is lost to~~ when the UE starts to send preambles on the PRACH. This is ~~exemplified~~ illustrated in Figure 6-1, where the RRC Re-establishment delay ($T_{RE\text{-}ESTABLISH\text{-}REQ}$) is the time between T_{start} and T_{stop}. T_{PRIM} is the time it takes for the CPHY-Out-Of-Synch primitive to detect lost synchronisation and $T_{RE\text{-}ESTABLISH}$ is the time to perform higher layer functionality.



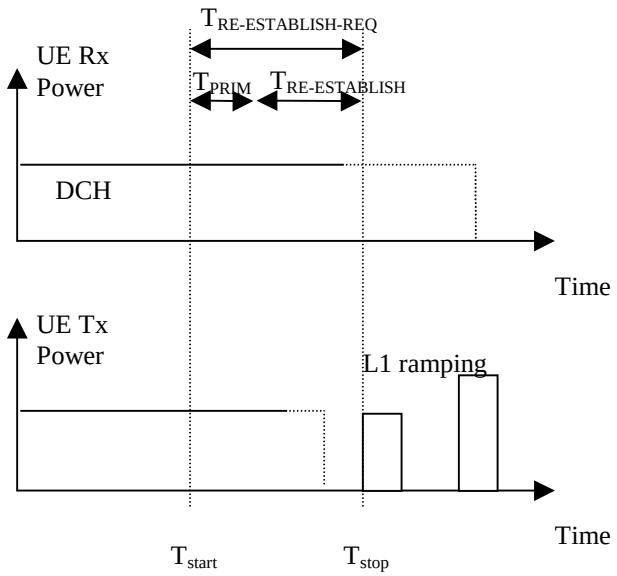


Figure 6-1: RRC Connection Re-establishment Requirement

6.6.2 Test Parameters

This test shall include 6 cells, one serving, one target and four steady interferes. The UE shall be in connected mode with a DL reference measurement channel 12.2 kbps dedicated traffic channel ongoing to one cell (serving cell). Measurement control information shall be signalled from the test device at least 5 seconds before T_{start}. At T_{start} faulty CRCs are applied on all transport blocks on all transport channels. ~~the traffic channel is switched off.~~ T_{stop} is defined as the time when the UE starts to send preambles on PRACH to the target cell.

Unless explicitly stated the test parameters should be similar to the test parameters for Cell Reselection, time T1, section 4.3.1.2. System information shall be provided in the same manner as for the test for cell re-selection, section 4.3.1.2.

The following additional parameters are needed:

Table 6-1

Parameter	**Unit**	**Value**
DPCH_Ec/Ior	dB	~~TBD~~ –16.6
N313	Frames	~~TBD~~20
N315	Frames	20
T313	~~m~~seconds	0 and 3

6.6.2.1 Test 1 – Target Cell known by UE

All six cells in the test shall be given in the measurement control information to the UE before the test is started.

6.6.2.2 Test 2 – Target cell not known by UE

All cells except the target cell shall be in the measurement control information to the UE before the test is started.

6.6.2.3 Performance Requirements

~~For both test 1 and test 2, correct RRC Re-establishment shall be greater than 90% with 95% confidence.~~ RRC Re-establishment is correct if within $T_{RE\text{-}ESTABLISH\text{-}REQ}$ ~~T~~ seconds the UE tries to re-establish the RRC connection with the target cell. $T_{RE\text{-}ESTABLISH\text{-}REQ}$ ~~T~~ is defined in Table 6-2.

~~*Editors note: T_{RLFAIL} is depending on the value set for N313. Once decided, this shall be counted for here.*~~

Table 6-2: Requirements for RRC Re-establishment

	~~**Cell known by UE**~~**Test 1**	~~**Cell not known by UE**~~**Test 2**
Intra Frequency, T313=0	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ ~~T~~= ~~T_{RLFAIL} +8~~1000 ms	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ ~~T~~= ~~T_{RLFAIL} +3~~0200 ms
Intra Frequency, T313=3	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 4000 ms	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 6200 ms

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25.133	CR	002	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-03-02

Subject: Idle Mode Tasks

Work item: UTRA

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	X
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Performance Requirements are added for interfrequency measurements. Updates for requirement tables for Cell selection and reselection and SHO. Introduction of performance requirements and related test cases for UTRAN to GSM and GSM to UTRAN cell re-selection in idle mode.

Clauses affected: Section 4.

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications	X	→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: Complete update of section 4.

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4 Idle Mode Tasks

4.1 Introduction

Note: The paging period and the repetition rate of relevant system information blocks needs to be defined.

4.2 RF Cell Selection Scenario

[Note: Some performance requirements in agreed scenarios are added into this section. More scenarios will be added later]

4.2.1 Requirements for Cell Selection Single carrier Single cell case

4.2.1.1 Cell Selection delay

The UE shall be capable of selecting a suitable cell within [5] seconds from switch on in the test case defined in following section in Table 4-1. The cell selection delay is defined as a time the UE needs for sending RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.

4.2.1.2 Test Parameters

The stored information of the last registered PLMN is utilized in this test. The stored information includes UTRA RF CHANNEL NUMBER. The active cell in the test does not contain any neighbour cells in its measurement control information.

Table 4-1:

Parameter	**Unit**	**Cell 1**
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior	dB	~~To be calculated~~ -0.941
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	~~-60~~ -70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Qmin	dB	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]

4.2.1.3 Performance Requirements

C~~orrect c~~ell selection shall be ~~greater~~ correct in more than [X%] of the cases~~with [Y%] confidence~~. Cell selection is correct if within [5] seconds the UE camps on the cell,.

4.2.2 Requirements for Cell Selection multi carrier multi cell case

4.2.2.1 Cell selection delay

The UE shall be capable of selecting a suitable cell within [5+x] seconds from switch on in the test case defined in following section in Table 4-2. The cell selection delay is defined as a time the UE needs for sending RRC Connection Request for Location Registration message to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.

4.2.2.2 Test Parameters

The stored information of the last registered PLMN is utilized in this test. The stored information includes one of the UTRA RF CHANNEL NUMBERs used in the test. All the cells in the test are given in the measurement control information of each cell, which are on the RF carrier stored to the UE.

[Note: Here pilot pollution case with different power levels for cells could be included]

Table 4-2:

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
UTRA RF Channel Number		Channel 1	Channel 1	Channel 1	Channel 2	Channel 2	Channel 2
CPICH_Ec/Ior	dB	-10	-10	-10	-10	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12	-12	-12	-12	-12
SCH_Ec/Ior	dB	-12	-12	-12	--12	-12	-12
PICH_Ec/Ior	dB	-15	-15	-15	-15	-15	-15
OCNS_Ec/Ior	dB	-0.941~~To Be Calculated~~	-0.941~~To Be Calculated~~	-0.941~~To Be Calculated~~	-0.941~~To Be Calculated~~	-0.941~~To Be Calculated~~	-0.941~~To Be Calculated~~
$\hat{I}_{or}/I_{oc}$	dB	5.3~~ 0~~	2.3 ~~-4.8~~	-1.7 ~~-9.5~~	6.3 ~~-4.8~~	14.3 ~~5.9~~	2.3 ~~-9.5~~
I_{oc}	dBm/3.84 MHz	-70~~-60~~			-70~~-60~~		
CPICH_Ec/Io	dB	-13	-16	-20	~~-16~~-19	-11	~~-20~~-23
Propagation Condition		AWGN			AWGN		
Qmin	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

4.2.2.3 Performance Requirements

C~~orrect c~~ell selection shall be ~~greater~~ correct in more than [X%] of the cases ~~with [Y%] confidence~~. Cell selection is correct if within [5+x] seconds the UE camps on the cell, which fulfils the cell selection criteria.

4.3 RF Cell Re-Selection Scenario

[Note: One performance requirement in agreed scenario is added into this section. More scenarios will be added later]

4.3.1 Requirements for Cell Re-Selection single carrier multi cell case

4.3.1.1 Cell re-selection delay

When the UE is camped on one of the cells, the UE shall be capable of re-selecting a new cell in the test case defined in the following section in within [5] seconds from it becoming a cell to be re-selected according the cell re-selection criteria. The cells, which are possible to be re-reselected during the test are belonging to different location areas. The cell re-selection delay is then defined as a time from when CPICH_Ec/Io is changed on cell 1 and 2 to the moment in time when the UE starts sending the RRC Connection request for Location Update message to the UTRAN~~The cell re-selection delay is then defined as a time the UE needs for sending RRC Connection Request for Location Update message to UTRAN~~.

4.3.1.2 Test Parameters

One of the 6 cells in Table 4-3 is serving cell and all others are given in the measurement control information of the serving cell. 2 of the cells are possible for cell re-selection and 4 of the cells are steady interfering cells.

Table 4-3:

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3 ~~4.8~~	10.2 ~~7.0~~	10.2 ~~7.0~~	7.3 ~~4.8~~	0.27 ~~9.5~~		0.27 ~~9.5~~		0.27 ~~9.5~~		0.27 ~~9.5~~	
I_{oc}	dBm/3.84 MHz	~~60~~ -70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23 ~~20~~		-23 ~~20~~		-23 ~~20~~		-23 ~~20~~	
Propagation Condition		AWGN											
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst Treselection Qintrasearch	dBm dB	[ ] [ ] [ ]		[ ] [ ] [ ]		[ ] [ ] [ ]		[ ] [ ] [ ]		[ ] [ ] [ ]		[ ] [ ] [ ]	

Time T1 is X seconds and T2 is Y seconds.

Note: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

4.3.1.3 Performance Requirements

C~~orrect c~~ell re-selection shall be ~~greater~~ correct in more than [X%] of the cases~~with [Y%] confidence~~. Cell re-selection is correct if within [5] seconds the UE re-reselects a new cell, which fulfills the cell re-selection criteria.

4.3.1.4 Cell List Size

[The UE shall be capable of recording at least [6] of the strongest cells according to the cell re-selection criteria. The number of the strongest cells recorded inside the UE shall be at least [6].]

4.3.1.5 Maximum number of cells to be monitored

For re-selection purposes, the UE shall be capable of monitoring at least up to 32 neighbouring cells given in the measurement control information. The exact number of cells to be monitored will be determined by the measurement control information broadcast in the serving cell.

4.3.2 Requirements for Cell Re-Selection multi carrier multi cell case

4.3.2.1 Cell re-selection delay

When the UE is camped on one of the cells, the UE shall be capable of re-selecting a new cell in the test case defined in the following section in within [Tres] seconds from it becoming a cell to be re-selected according the cell re-selection criteria. The cells, which are possible to be re-reselected during the test are transmitting on different frequencies and are belonging to different location areas. The cell re-selection delay is then defined as a time from when CPICH Ec/Io is changed on cell 1 and 2 to the moment in time when the UE starts sending the RRC Connection request for Location Update message to the UTRAN

4.3.2.2 Test Parameters

6 cells are given in the measurement control information of the serving cell, 3 on each of the two frequencies. One of the 6 cells in 4.4 is the serving cell, totally 2 of the cells are possible for cell re-selection and 4 of the cells are interfering cells.

Table 4-4:

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Qoffset		[0]		[0]		[0]		[0]		[0]		[0]	
Qhyst Treselection Qintersearch	dB dB	[2] [5] [-8]		[2] [5] [-8]		[2] [5] [-8]		[2] [5] [-8]		[2] [5] [-8]		[2] [5] [-8]	

Time T1 is X seconds and T2 is Y seconds.

4.3.2.3 Performance Requirements

Cell re-selection shall be correct in more than [90%] of the cases. Cell re-selection is correct if within Nt seconds the UE re-reselects a new cell, which fulfills the cell re-selection criteria and stays steady on that cell until the channel conditions are changed again.

4.3.3 Requirements for UTRAN to GSM Cell Re-Selection

Note: These requirements are depending on supported UE capabilities.

Note: Requirements for GSM to UTRAN Cell Re-Selection are defined in the GSM specifications

4.3.3.1 Cell re-selection delay

When the UE is camped on UTRAN cell, the UE shall be capable of re-selecting a GSM cell in the test case defined in the following section in within [TBD] seconds from it becoming a cell to be re-selected according the cell re-selection criteria for UTRAN to GSM. The cells, which are possible to be re-reselected during the test, belong to different location areas. The cell re-selection delay is then defined as a time from when radio conditions are changed to the moment in time when the UE starts sending the RR Channel Request message for location update to GSM.

4.3.3.2 Test Parameters

Tbd.

4.3.3.3 Performance Requirements

Cell re-selection shall be correct in more than [90%] of the cases. Cell re-selection is correct if within [30] seconds the UE re-reselects a new cell, which fulfils the cell re-selection criteria and stays steady on that cell until the channel conditions are changed again.

~~4.4PLMN Selection and Re-Selection Scenario~~

~~4.5 Location Registration Scenario~~

CHANGE REQUEST

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TS 25.133	CR	003	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: *list expected approval meeting # here ↑*		for approval	X	strategic		*(for SMG use only)*
		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: Revised UE handover requirements

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The definition of test parameters has been incomplete. This CR provides missing information to this section.

Clauses affected: Section 5

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications	X	→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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4

5 RRC Connection mobility

5.1 Handover

5.1.1 Introduction

The handover process should be implemented in both the UE and UTRAN. The UE measurements and which radio links the UE shall use is controlled by UTRAN with RRC signalling.

Measurements are specified in TS25.215 and UE behaviour in response to UTRAN RRC messages is described in TS25.331.

5.1.2 Handover 3G to 3G

5.1.2.1 FDD Soft/Softer Handover

The soft handover procedure is initiated from UTRAN with an active set update message.

5.1.2.1.1 Maximum number of cells to be reported

The UE shall be capable of reporting the ~~CPICH~~ requested measurement quantity of at least [6] cells given in a measurement control message(s).

5.1.2.1.2 Measurement reporting delay

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface.

5.1.2.1.3 Test parameters

~~For section *5.1.2.1.3.1, 5.1.2.1.3.2* and *5.1.2.1.3.3*~~ The DL reference measurement channel 12.2 kbps as specified in Annex A, Section A.3.1 of TS25.101 shall be used but with power control turned on [see 25.101].

5.1.2.1.3.1 Correct reporting of neighbours and CPICH_Ec/Io and timing measurement accuracies~~y~~ in AWGN propagation condition

This test will derive that the terminal makes correct reporting of an event and that the measurement accuracy of the CFN-SFN observed timed difference between Cell 1 and Cell 2 is within defined limits. Cell 1 is current active cell~~, as illustrated in Figure 5-1~~. The power level of Cell 1 is kept constant and the power level of Cell 2 is changed using ($\hat{I}_{or}/I_{oc}$), as illustrated in ~~,~~ figure 5-1. Hysteresis, Threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, SFN has to be decoded for neighbour cells. CPICH Ec/I0 and the CFN-SFN observed timed difference has to reported together with Event 1A reporting. ~~CPICH Ec/I0 shall be~~

~~reported for Event 1B reporting.~~ New measurement control information, which defines neighbour cells etc., is always sent during time period Time 1. The number of neighbour cells in the measurement control information is 24.

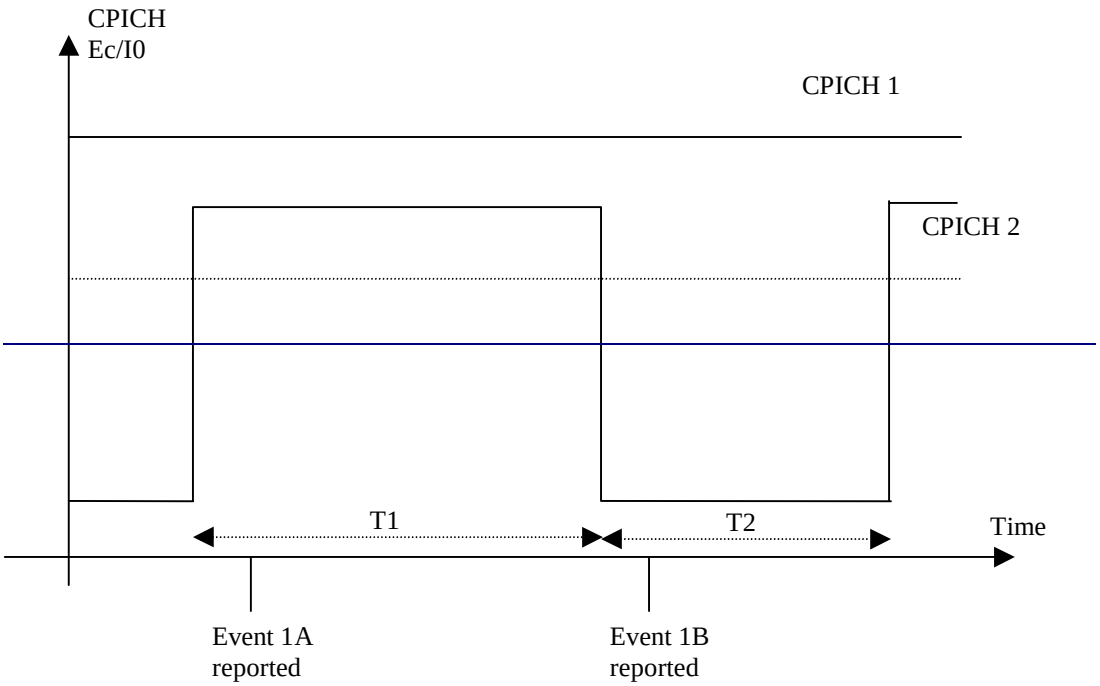
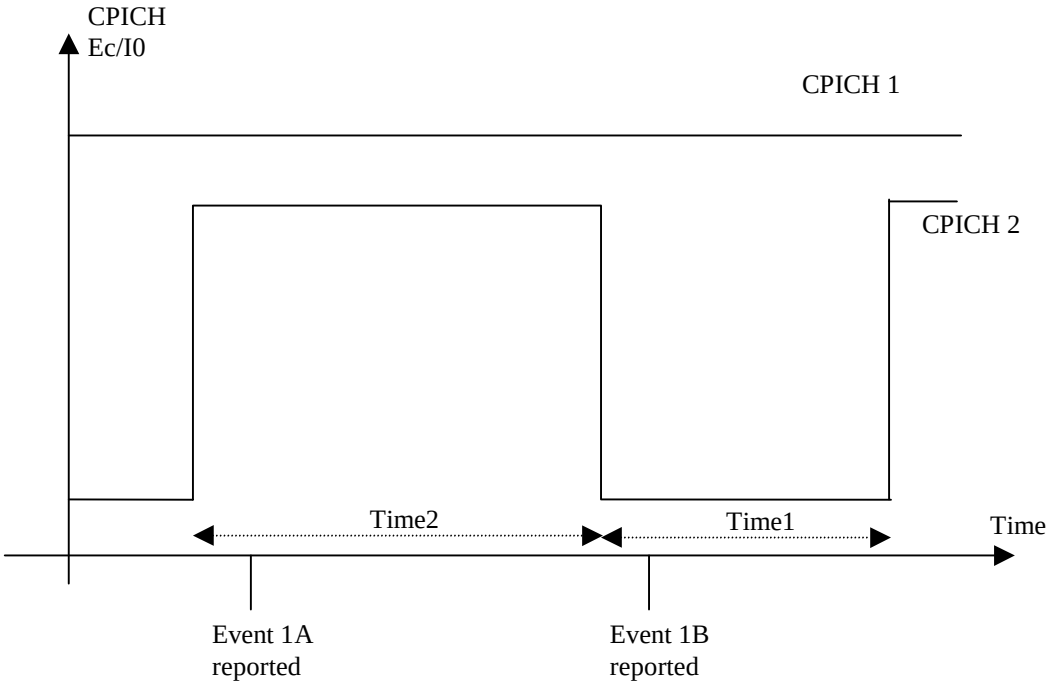


Figure 5-1: Illustration of parameters for soft handover measurement reporting test case



~~**Figure 4-1: Illustration of parameters for soft handover measurement reporting test case**~~

Table 45-1 Test parameters for handover measurement reporting delay

Parameter	Unit	Cell 1		Cell 2	
		Time 1	Time 2	Time 1	Time 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
PICH_Ec/Ior	dB	-15		-15	
DPCH_Ec/Ior	dB	-17~~TBD~~		-17~~TBD~~	
OCNS		-1.049~~[To Be Calculated]~~		-1.049~~[To Be Calculated]~~	
$\hat{I}_{or}/I_{oc}$	dB	0	6.97~~0~~	-Infinity	5.97 ~~1.8~~
I_{oc}	dBm/3.84 MHz	-70~~60~~			
CPICH_Ec/Io	dB	-13	-13	-Infinity	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	msec	0			
Propagation Condition	AWGN				

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

5.1.2.1.3.1.1 Minimum Requirements

The measurement reporting delay shall be less then 0.8 seconds in [90]% of the cases ~~with 95% confidence~~.

Reported CPICH Ec/Io of Cell 2 in Event 1A shall have an accuracy of ± [1.5] dB in [90]% of the 1A reports.

Reported CFN-SFN observed time difference shall have an accuracy of ±[Y] chips in [90]% of the reports.

~~All the reported entities shall be within the requirements, as defined in section 10.~~

5.1.2.1.3.2 Event triggered reporting of multiple neighbours in AWGN propagation condition

This test will derive that the terminal makes correct reporting of an event and that the measurement accuracy of the reported values is within the specified limits. In Figure NEW-1 an illustration of the test case is shown. In the test 4 cells are present. Cell 1 and 2 are within the active set, as illustrated in figure NEW-1. The $\hat{I}_{or}/I_{oc}$ level of Cell 1 and 2 is kept at a constant level according to table NEW-2 and the power level of cell 3 and 4 is changed over time by changing ($\hat{I}_{or}/I_{oc}$) according to table NEW-3. Hysteresis, Threshold and Time to Trigger values are given in the tables below and they are signalled from the test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1C and 1B shall be used. CPICH Ec/Io and CFN-SFN observed time difference shall be reported together with Event 1C. New measurement control information, which defines neighbour cells etc., is continuously sent. The number of neighbour cells in the measurement control information is 32.

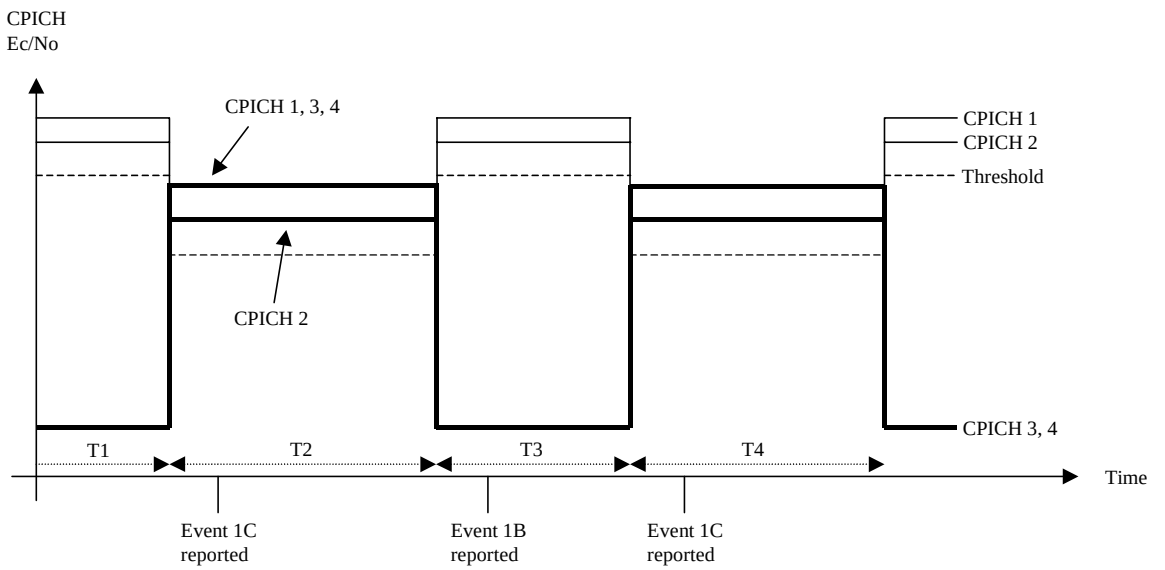


Figure NEW-1: Illustration of the test case

In table NEW-1 the test case is described in detail for each time interval T1 to T4 and Minimum Requirements are given for each time interval.

Table NEW-1

Time	Value	Cell 1 to 2	Cell 3 to 4
T1	> 20 s	Included in	Not visible, e.g. the UE has never had synchronisation to them before.

T2	10 s	the active set, keeping a constant Îor/Ioc level over the test.	Will test the time for initial synchronisation when neighbour 3 and 4 suddenly becomes strong. Cell 3 and 4 becomes stronger than one of the cell in the active set (cell 2) and therefore event 1C shall be triggered. Together with the event a report containing measured CPICH Ec/Io for all cells shall be sent together with the CFN-SFN observed time difference for cell 3 and 4. Minimum Requirements Event 1C shall be reported within [800] ms in [90]% of the cases. Reported CPICH Ec/Io of Cell 1 shall have an accuracy of ± [TBD] dB in [90]%. Reported CFN-SFN observed time difference for Cell 1 shall have an accuracy of ±[Y] chips in [90]% of the reports. Reported CPICH Ec/Io of Cell 2 shall have an accuracy of ± [TBD] dB in [90]%. Reported CFN-SFN observed time difference for Cell 2 shall have an accuracy of ±[Y] chips in [90]% of the reports. Reported CPICH Ec/Io of Cell 3 shall have an accuracy of ± [TBD] dB in [90]%. Reported CFN-SFN observed time difference for Cell 3 shall have an accuracy of ±[TBD] chips in [90]% of the reports. Reported CPICH Ec/Io of Cell 4 shall have an accuracy of ± [TBD] dB in [90]%. Reported CFN-SFN observed time difference for Cell 4 shall have an accuracy of ±[Y] chips in [90]% of the reports.
T3	15 s		Neighbour 3 and 4 suddenly disappears. Event 1B shall be trigerred. Together with the event a report containing measured CPICH Ec/Io for all remaing cells shall be sent. Minimum Requirements Event 1B shall be reported within [150] ms in [90] % of the cases. Reported CPICH Ec/Io of Cell 1 shall have an accuracy of ± [TBD] dB in [90]%. Reported CPICH Ec/Io of Cell 2 shall have an accuracy of ± [TBD] dB in [90]%.

T4	10 s		Neighbour 4 to 6 suddenly appears again after being gone for T3 s. Event 1C shall be triggered. Together with the event a report containing measured Ec/Io for all cells shall be sent together with the CFN-SFN observed time difference for cell 3 and 4. Minimum Requirements Event 1C shall be reported within [150] ms in [90]% of the cases. Reported CPICH Ec/Io of Cell 1 shall have an accuracy of ± [TBD] dB in [90]%. Reported CPICH Ec/Io of Cell 2 shall have an accuracy of ± [TBD] dB in [90]%. Reported CPICH Ec/Io of Cell 3 shall have an accuracy of ± [TBD] dB in [90]%. Reported CFN-SFN observed time difference for Cell 3 shall have an accuracy of ±[TBD] chips in [90]% of the reports. Reported CPICH Ec/Io of Cell 4 shall have an accuracy of ± [TBD] dB in [90]%. Reported CFN-SFN observed time difference for Cell 4 shall have an accuracy of ±[Y] chips in [90]% of the reports.

Table NEW-2

Parameter	**Unit**	**Cell 1**				**Cell 2**			
		T1	**T2**	**T3**	**T4**	**T1**	**T2**	**T3**	**T4**
CPICH_Ec/Ior	dB	-10				-10			
PCCPCH_Ec/Ior	dB	-12				-12			
SCH_Ec/Ior	dB	-12				-12			
PICH_Ec/Ior	dB	-15				-15			
DPCH_Ec/Ior	dB	-17				-17			
OCNS_Ec/Ior	dB	-1,049				-1,049			
$\hat{I}_{or}/I_{oc}$	dB	18,5				17			
I_{oc}	dBm/3.84 MHz	-85							
CPICH_Ec/Io	dB	-12,4	-15,5	-12,4	-15,5	-13,9	-17,0	-13,9	-17,0
Threshold	dB	3							
Hysteresis	dB	0							
Time to Trigger	msec	0							
Propagation Condition	AWGN								

Table NEW-3

Parameter	Unit	Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4
CPICH_Ec/Ior	dB	-10				-10			
PCCPCH_Ec/Ior	dB	-12				-12			
SCH_Ec/Ior	dB	-15				-15			
PICH_Ec/Ior	dB	-15				-15			
DPCH_Ec/Ior	dB	N/A				N/A			
OCNS	dB	-0,941				-0,941			
$\hat{I}_{or}/I_{oc}$	dB	-Inf	18,5	-Inf	18,5	-Inf	17,5	-Inf	17,5
I_{oc}	dBm/3.84 MHz	-85							
CPICH_Ec/Io	dB	-Inf	-15,5	-Inf	-15,5	-Inf	-16,5	-Inf	-16,5
Threshold	dB	3							
Hysteresis	dB	0							
Time to Trigger	msec	0							
Propagation Condition	AWGN								

~~5.1.2.1.3.2~~5.1.2.1.3.3 Correct reporting of neighbours in Fading propagation condition

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell. The power level of Cell 1 is kept constant and the power level of Cell 2 is changed using ($\hat{I}_{or}/I_{oc}$). Hysteresis, Threshold and Time to Trigger values are given in the table below and they are signaled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A shall be used. Only the event number is reported in this case. New measurement control information, which defines neighbor cells etc., is sent always during time period Time 1. The number of neighbor cells in the measurement control information is 24.

Table 45-2 Test parameters for correct reporting of neighbours

Parameter	Unit	Cell 1		Cell 2	
		Time 1	Time 2	Time 1	Time 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
PICH_Ec/Ior	dB	-15		-15	
DPCH_Ec/Ior	dB	TBD		TBD	
OCNS		[To Be Calculated]		[To Be Calculated]	
$\hat{I}_{or}/I_{oc}$	DB	0	6.970	-Infinity	5.97 ~~1.8~~
I_{oc}	DBm/3.84 MHz	-7060			
CPICH_Ec/Io	DB	-13	-13	-Infinity	-14
Threshold	DB	3			
Hysteresis	DB	0			
Time to Trigger	Msec	0			
Propagation Condition	2-tap Rayleigh fading, 0 dB, -10 dB, 50km/h~~, 100 km/h~~				

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

5.1.2.1.3.3.1 Minimum Requirement

The measurement reporting delay shall be less then XX seconds in YY% ~~with ZZ % confidence~~.

~~5.1.2.1.3.3~~5.1.2.1.3.4 CPICH_Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition

The test case will derive the terminal's measurement accuracy of CPICH_Ec/Io and false detection resistance. The terminal measurement accuracy of CPICH_Ec/Io is derived using the periodical reporting of active cell's measured CPICH_Ec/Io. The terminal's false detection resistance is derived by recording the amount of erroneous reports. Both Cell 1 and Cell 2 powers ($\hat{I}_{or}/I_{oc}$) are constant during the test case. Cell 2 is near to reporting range. Hysteresis, Threshold, ~~and~~ Time to Trigger values and reporting period for active cell are given in the table below and they are signaled from test device. In the measurement control information it is indicated to the UE that the CPICH_Ec/Io level of the active set cell has to reported periodically (and reporting period) and event-triggered reporting (1A) will also be used. The number of neighbour cells in the measurement control information is 24.

Table 45-3 Test parameters for CPICH_Ec/Io measurement accuracy and incorrect reporting of neighbours

Parameter	Unit	Cell 1	Cell 2
CPICH_Ec/Ior	DB	-10	-10
PCCPCH_Ec/Ior	DB	-12	-12
SCH_Ec/Ior	DB	-12	-12
PICH_Ec/Ior	DB	-15	-15
DPCH_Ec/Ior	DB	TBD	TBD
OCNS		[To Be Calculated]	[To Be Calculated]
$\hat{I}_{or}/I_{oc}$	DB	1.680	-3.32 -7.25
I_{oc}	DBm/3.84 MHz	-7060	
CPICH_Ec/Io	DB	-13	-18
Threshold	DB	3	
Hysteresis	DB	0	
Time to Trigger	Msec	0	
Reporting period	Msec	TBD	
Propagation Condition	AWGN		

~~In the periodical reporting the accuracy of the reported CPICH_Ec/Io for cell 1 shall be within given accuracy limits in X% of the reports with Y% confidence.~~

5.1.2.1.3.4.1 Minimum Requirements

Event triggered report rate shall not exceed X reports in Y seconds.

In the periodical reporting the reported CPICH_Ec/Io for Cell 1 shall have an accuracy of ± [TBD] dB in [90]% of the reports.

5.1.2.1.4 Active set dimension

The active set is defined as set of radio links simultaneously involved in a specific communication service between an User Equipment and a UTRAN access point. The UE shall be capable of supporting at least [6] radio links in the active set.

5.1.2.1.5 Active set update delay

The active set update delay start is defined as the time from when the UE receives the active set update message from UTRAN, or at the time stated through the activation time when to perform the active set update. The activation time stop is defined as the time when the UE successfully only uses the set of radio links stated in that message for power control. The active set update delay is defined as the time between the active set update start and the active set stop.

The active set update delay for different number of added cells is stated in the table below. There is different requirement on the active set update delay depending on if the cell has been within the monitored set of cells for the last [FFS] [s] or not.

[Editor's Note: the requirement of an active set update of at least [1] second after the reception of the UTRAN acknowledgement as proposed in R4-99712, shall be considered as a starting point for the setting of this requirement]

Table 45-4

Number of new cells present in the active set update message	Maximum active set update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1		
2		
3		
4		
5		
6		
…		

If an active set update includes a combination of cells included and not included in the monitored set the maximum active set update delay is the sum of respective maximum delays.

5.1.2.1.6 BS Functionality in Site Selection Diversity Transmission (SSDT) Mode

Site Selection Diversity Transmission (SSDT) is an optional feature of BS. This requirement for SSDT mode ensures that BS correctly reacts to Layer 1 feedback signaling messages from UE.

5.1.2.1.6.1.1 Minimum Requirements

For the conditions specified in Table 5-5, the BS shall transmit or not transmit the downlink DPDCH channel.

Table 45-5: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set in BS	DB	-5			
Uplink: $\frac{DPCH\_E_c}{I_o}$	DB	Q_{th} + 10	Q_{th} + 10	Q_{th} - 3	Q_{th} – 3

Cell ID transmitted by UE	-	A	B	A	B
Transmission Of downlink DPCCH	-	Yes	Yes	yes	Yes
Transmission Of downlink DPDCH	-	Yes	No	yes	Yes

The above test should be for repeated for each of the three code sets “long”, “medium” and “short” Cell ID code sets. The UE emulator can check the power ratio of downlink DPDCH/DPCCH in order to confirm whether BS transmitted the DPDCH.

5.1.2.2 FDD Hard Handover

The hard handover procedure is initiated from UTRAN with an handover command message. The hard handover procedure may cause the UE to change its frequency. Compressed mode according to the UE Capability may be used to be able to make any measurements on other frequencies.

5.1.2.2.1 Requirements

5.1.2.2.1.1 Maximum number of cells/frequencies to be monitored on other frequencies

The UE shall be capable of measuring the ~~CPICH~~ requested measurement quantity of at least [FFS] cells on a maximum of [FFS] frequencies, different from the frequency currently used by the UE.

The cells and frequencies are given to the UE in a measurement control message(s), and the measurement slots available with compressed mode is given through physical channel reconfiguration parameters.

~~5.1.2.2.1.2 Measurement reporting delay~~

~~The measurement reporting delay start is defined as the time from when a report is triggered at the physical layer, and in the end of an available [FFS] ms measurement slot, according to the event or periodic mechanism set to trigger the measurement report. The measurement reporting delay end is defined as the time when the UE tries to transmit the measurement report over the Uu interface.~~

~~The measurement reporting delay is defined as the time between the measurement reporting delay start and the measurement reporting delay stop.~~

~~*[Editors Note: The details for this requirement and the relation to compressed mode are FFS.]*~~

~~For all possible events defined in the measurement control messages as inter-frequency measurement reporting criteria, the measurement reporting delay shall not exceed the time stated in the table below.~~

~~**Table 5-6**~~

~~TTI for DCCH carrying measurement report [ms]~~	~~Maximum measurement reporting delay [ms]~~
~~10~~	
~~20~~	
~~40~~	
~~80~~	

~~5.1.2.2.1.2.1 System Level Requirement on Measurement Reporting Delay~~

~~*[This Section specifies a system level requirement on measurement reporting delay for the network scenario described; when the values in Table 5-6 in Section 5.1.2.2.1.2 will be specified, also the requirement described in this section will be taken into account; in this way a merge between the two sections will be possible]*~~

5.1.2.2.1.2 Measurement reporting delay

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface.

5.1.2.2.1.2.1 Test Parameters for DL compressed mode

The DL reference measurement channel 12.2 kbps shall be used, with power control turned on [see 25.101]. Test parameters for DL compressed mode are given in Annex?? of TS25.101.

5.1.2.2.1.2.2 CPICH_Ec/Io measurement accuracy and correct reporting of neighbours in AWGN propagation condition

This test will derive that the terminal makes correct reporting of an event . Cell 1 is current active cell, Cell 2 is a neighbour cell on the used frequency and Cell 3 is a neighbour cell on the un-used frequency. The power level of Cell 1 and Cell 3 are kept constant and the power level of Cell 2 is changed using ($\hat{I}_{or}/I_{oc}$),as illustrated in Figure5-2.

Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A, 1B and 2C shall be used. The CPICH Ec/I0 of the best cell on the un-used frequency has to reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is 24. The X number of neighbours are on the un-used frequency. The BLER of the current active link is also measured.

Figure 5-2: Illustration of parameters for handover measurement reporting test case

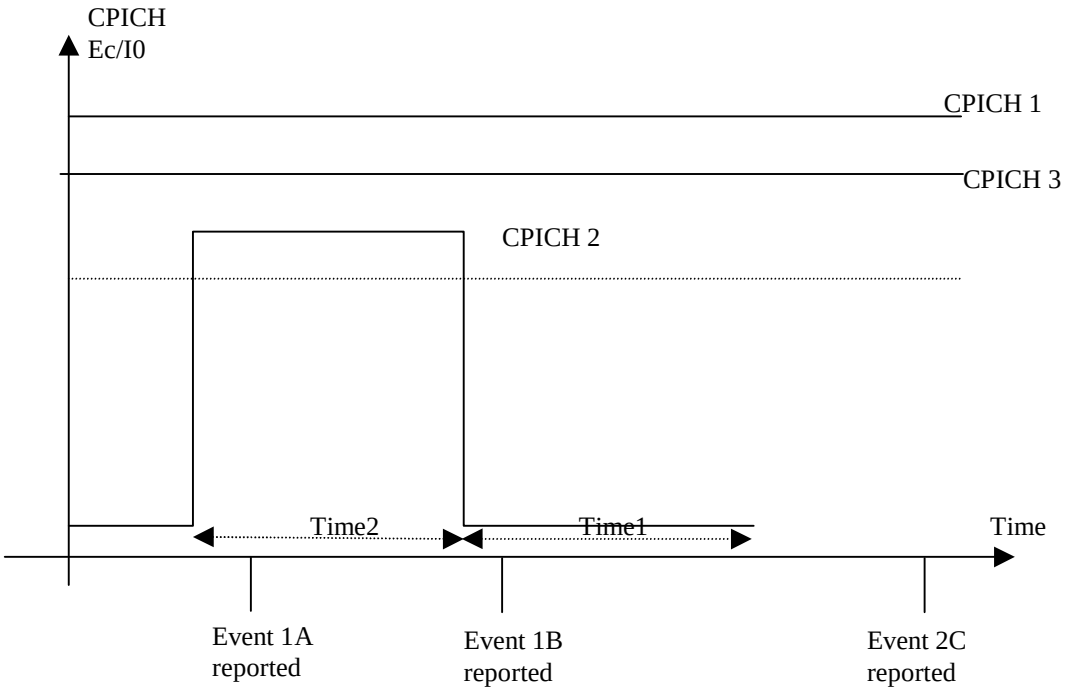


Table-5-7 Test parameters for CPICH_Ec/Io measurement accuracy and correct reporting of neighbours

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	TBD		TBD		TBD	
OCNS		[To Be Calculated]		[To Be Calculated]		[To Be Calculated]	
$\hat{I}_{or}/I_{oc}$	dB	0	4.39	-Infinity	2.39	-1.8	-1.8
I_{oc}	dBm/3.84 MHz	-70				-70	
CPICH_Ec/Io	dB	-13	-13	-Infinity	-15	-14	-14
Absolute Threshold (Ec/No)	dB	-18					
Hysteresis	dB	0					
Time to Trigger	msec	0					
Propagation Condition	AWGN						

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

5.1.2.2.1.2.2.1 Minimum Requirements

The measurement reporting delay shall be less than [5] seconds in [90]% of the cases.

Reported CPICH Ec/Io of Cell 3 in Event 2C shall have an accuracy of to ±[TBD] dB of the 2C reports.

The BLER of the DCH shall not exceed [TBD] value.

5.1.2.3.2.2 Correct reporting of neighbours in Fading propagation condition

This test will derive that the terminal makes correct reporting of an event . Cell 1 is current active cell and Cell 2 is a neighbour cell on the un-used frequency. The power level of Cell 1 and Cell 2 are kept constant and the power level of. Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting 2C shall be used. Only events, which occur, are reported in this case. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is 24. The X number of neighbours are on the un-used frequency. The BLER of the current active link is also measured.

Table 5-8 Test parameters for Correct reporting of neighbours

Parameter	Unit	Cell 1		Cell 2	
UTRA RF Channel Number		Channel 1		Channel 2	
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
PICH_Ec/Ior	dB	-15		-15	
DPCH_Ec/Ior	dB	TBD		TBD	
OCNS		[To Be Calculated]		[To Be Calculated]	
$\hat{I}_{or}/I_{oc}$	dB	0	0	-1.8	-1.8
I_{oc}	dBm/3.84 MHz	-70		-70	
CPICH_Ec/Io	dB	-13	-13	-14	-14
Absolute Threshold (Ec/No)	dB	-18			
Hysteresis	dB	0			
Time to Trigger	msec	0			
Propagation Condition	2-tap Rayleigh fading, 0 dB, -10 dB, 50km/h				

5.1.2.3.2.2.1 Minimum Requirements

The measurement reporting delay shall be less then Y seconds in [90] % of the cases.

The BLER of the DCH shall not exceed [TBD] value.

~~For hard handover purposes, the measurement reporting delay shall not exceed [5] seconds under the following network conditions: Initial serving cell at $\hat{I}_{or}$ = -70 dBm/3.84MHz, with 6 neighbours at $\hat{I}_{or}$ = -75 dBm/3.84MHz. Then the new cell is switched on at $\hat{I}_{or}$ = -60 dBm/3.84MHz, all steady signals.~~

5.1.2.1.4 Active set dimension

The active set is defined as set of radio links simultaneously involved in a specific communication service between an User Equipment and a UTRAN access point. The UE shall be capable of supporting at least [6] radio links in the active set.

5.1.2.1.7 Active set update delay

The active set update delay start is defined as the time from when the UE receives the active set update message from UTRAN, or at the time stated through the activation time when to perform the active set update. The activation time stop is defined as the time when the UE successfully only uses the set of radio links stated in that message for power control. The active set update delay is defined as the time between the active set update start and the active set stop.

The active set update delay for different number of added cells is stated in the table below. There is different requirement on the active set update delay depending on if the cell has been within the monitored set of cells for the last [FFS] [s] or not.

[Editor's Note: the requirement of an active set update of at least [1] second after the reception of the UTRAN acknowledgement as proposed in R4-99712, shall be considered as a starting point for the setting of this requirement]

Table 5-7

Number of new cells present in the active set update message	Maximum active set update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1		
2		
3		
4		
5		
6		
…		

If an active set update includes a combination of cells included and not included in the monitored set the maximum active set update delay is the sum of respective maximum delays.

5.1.2.1.8 BS Functionality in Site Selection Diversity Transmission (SSDT) Mode

Site Selection Diversity Transmission (SSDT) is an optional feature of BS. This requirement for SSDT mode ensures that BS correctly reacts to Layer 1 feedback signaling messages from UE.

5.1.2.1.8.1.1 Minimum Requirements

For the conditions specified in Table 5-5, the BS shall transmit or not transmit the downlink DPDCH channel.

Table 5-8: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set in BS	DB	-5			
Uplink: $\frac{DPCH\_E_c}{I_o}$	DB	Q_{th} + 10	Q_{th} + 10	Q_{th} - 3	Q_{th} – 3
Cell ID transmitted by UE	-	A	B	A	B
Transmission Of downlink DPCCH	-	Yes	Yes	yes	Yes
Transmission Of downlink DPDCH	-	Yes	No	yes	Yes

The above test should be for repeated for each of the three code sets “long”, “medium” and “short” Cell ID code sets. The UE emulator can check the power ratio of downlink DPDCH/DPCCH in order to confirm whether BS transmitted the DPDCH.

5.1.2.2 FDD Hard Handover

The hard handover procedure is initiated from UTRAN with an handover command message. The hard handover procedure may cause the UE to change its frequency.

5.1.2.2.1 Requirements

5.1.2.2.1.1 Maximum number of cells/frequencies to be monitored on other frequencies

The UE shall be capable of measuring the CPICH of at least [FFS] cells on a maximum of [FFS] frequencies, different from the frequency currently used by the UE.

The cells and frequencies are given to the UE in a measurement control message(s), and the measurement slots available with compressed mode is given through physical channel reconfiguration parameters.

5.1.2.2.1.2 Measurement reporting delay

The measurement reporting delay start is defined as the time from when a report is triggered at the physical layer, and in the end of an available [FFS] ms measurement slot, according to the event or periodic mechanism set to trigger the measurement report. The measurement reporting delay end is defined as the time when the UE tries to transmit the measurement report over the Uu interface.

The measurement reporting delay is defined as the time between the measurement reporting delay start and the measurement reporting delay stop.

[Editors Note: The details for this requirement and the relation to compressed mode are FFS.]

For all possible events defined in the measurement control messages as inter-frequency measurement reporting criteria, the measurement reporting delay shall not exceed the time stated in the table below.

Table 5-9

TTI for DCCH carrying measurement report [ms]	Maximum measurement reporting delay [ms]
10	
20	
40	
80	

5.1.2.2.1.2.1 System Level Requirement on Measurement Reporting Delay

[This Section specifies a system level requirement on measurement reporting delay for the network scenario described; when the values in in Section 5.1.2.2.1.2 will be specified, also the requirement described in this section will be taken into account; in this way a merge between the two sections will be possible]

For hard handover purposes, the measurement reporting delay shall not exceed [5] seconds under the following network conditions: Initial serving cell at $\hat{I}_{or}$ = -70 dBm/3.84MHz, with 6 neighbours at $\hat{I}_{or}$ = -75 dBm/3.84MHz. Then the new cell is switched on at $\hat{I}_{or}$ = -60 dBm/3.84MHz, all steady signals.

5.1.2.2.1.3 Hard Handover Delay

The hard handover delay is defined as the time from when the UE receives the handover command message from UTRAN, until the UE successfully uses the entire set of radio links stated in that message for power control.

The hard handover delay is stated in the table below. There is different requirement on the hard handover delay depending on if the cell has been within the monitored set of cells for the last [FFS] [s] or not.

Table 5-10

Number of new cells present in the handover command message	Maximum active set update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1-6…		

5.1.3.3 ~~5.1.3.3~~ FDD/TDD Handover

The handover procedure is initiated from UTRAN with an handover command message. The handover procedure may cause the UE to change its frequency. Compressed mode according to the UE Capability may be used to be able to make any measurements on other frequencies.

5.1.3.3.1 Requirements

5.1.3.3.1.1 Maximum number of cells/frequencies to be monitored on other frequencies

The UE shall be capable of measuring the requested measurement quantity of at least [FFS] cells on a maximum of [FFS] frequencies, different from the frequency currently used by the UE.

The cells and frequencies are given to the UE in a measurement control message(s), and the measurement slots available with compressed mode is given through physical channel reconfiguration parameters.

5.1.3.3.1.2 Measurement reporting delay

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface.

5.1.3.3.1.2.1 Test parameters for DL compressed mode

The DL reference measurement channel 12.2 kbps shall be used, with power control turned on [see 25.101]. Test parameters for DL compressed mode are given in Annex?? of TS25.101.

5.1.3.3.1.2.2 Correct reporting of TDD neighbours in AWGN propagation condition

This test will derive that the terminal makes correct reporting of an event . Cell 1 is current active cell, Cell 2 is a TDD cell. The power level of P-CCPCH RSCP of cell 2 and the CPICH Ec/Io of cell 1 is changed. Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is FFS.

Table 5-9

Parameter	Unit	Cell 1		Cell 2			
Timeslot Number		n.a.		0		8	
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2			
CPICH_Ec/Ior	dB	[]	[]	n.a.		n.a.	
PCCPCH_Ec/Ior	dB	[]	[]	-3	-3		
SCH_Ec/Ior	dB	[]	[]	-9	-9	-9	-9
SCH_t_{offset}		n.a.	n.a.	15	15	15	15
PICH_Ec/Ior		[]	[]			-3	-3
DCH_Ec/Ior	dB	[]	[]	[]	[]	[]	[]
OCNS	dB	[]	[]	-4.28	-4.28	-4.28	-4.28
$\hat{I}_{or}/I_{oc}$	dB	[]	[]	[]	[]	[]	[]
I_{oc}	dBm/3.84 MHz	-70		-70			
CPICH_Ec/Io		[]		n.a.			
PCCPCH_RSCP	dB	n.a.	n.a.	[]	[]	[]	[]
Absolute Threshold (SIR)	dB	[]					
Hysteresis	dB	[]					
Time to Trigger	msec	[]					
Propagation Condition		AWGN		AWGN			

5.1.3.3.1.2.2.1 Minimum Requirements

The measurement reporting delay shall be less then [5] seconds in [90]% of the cases.

All the reported entities shall be within the requirements, as defined in section 10.

Editor's note: Reported quantities are not defined in the test

The BLER of the DCH shall not exceed [TBD] value.

5.1.2.1.3.5 Handover Delay

The handover delay is defined as the time from when the UE receives the handover command message from UTRAN, until the UE successfully uses the entire set of radio links stated in that message for power control.

The handover delay is stated in the table below. There is different requirement on the handover delay depending on if the cell has been within the monitored set of cells for the last [FFS] [s] or not.

Table 5-10

Number of new cells present in the handover command message	Maximum update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1-6…		

~~5.1.3.3.1 Requirements~~

~~5.1.3.3.2 RF Parameters~~

5.1.4 Handover 3G to 2G

In the early days of UMTS deployment it can be anticipated that the service area will not be as contiguous and extensive as existing second generation systems. It is also anticipated that UMTS network will be an overlay on the 2nd generation network and utilise the latter, in the minimum case, as a fall back to ensure continuity of service and maintain a good QoS as perceived by the user.

5.1.4.1 Handover to GSM

This section presents some of the important aspects of GSM handover required to be performed by the UE. For the full specifications reference should be made the GSM recommendations.

The underlying requirement is to ensure continuity of service to the UMTS user. The handover requirements for 3G to GSM should be comparable to GSM to GSM handover requirements.

The MS (GSM terminology) shall be able to monitor up to [32] carriers.

The MS shall be able synchronize to [6] carriers

The MS shall be able to report back to the network on the [6] strongest cells with correctly identified BSIC.

The MS shall be able to perform this task at levels down to the reference sensitivity level or reference interference levels as specified in GSM 05.05.

The MS shall demodulate the SCH on the BCCH carrier of each surrounding cell and decode the BSIC as often as possible, and as a minimum at least once every [10 seconds].

5.1.4.1.1 Requirements

5.1.4.1.2. RF Parameters

5.2 Radio Link Management

5.2.1 Link adaptation

5.2.1.1 Definition of the function

Radio link adaptation is the ability of the UE to select the suitable transport format combination from the assigned transport format combination set, in order to maintain inner loop power control, in the case of reaching its maximum transmit power. This is necessary for supporting the highest bit-rate as possible when enough transmit power is not available.

5.2.1.2 Link adaptation delay minimum requirement

In this section, the UE maximum transmit power is defined as the UE maximum output power, which is defined by the UE power class.

When the UE output power is approaching the UE maximum transmit power and the inner loop power control can no longer be maintained for coverage reasons, the UE shall adapt to the transport format combination corresponding to the next lower bit-rate. Before doing that, the UE output power measured over at least [t1] ms shall be [margin1] dB within the maximum (margin1 is FFS).

As soon as the UE output power is [margin1] dB below the UE maximum transmit power and the UE has enough data to send, it shall continuously estimate whether the output power needed for a switch to the transport format combination corresponding to the next higher bit-rate does not exceed [margin1] dB below the maximum. Before the UE switches to the next higher rate transport format it shall have enough power to support that up-switch for at least [t2] ms.

The minimum delay requirements t1 and t2 shall be zero or a multiple of 10 ms. (Whether t1, t2 and margin1 should be configurable is FFS).

5.2.1.3 Link adaptation maximum delay requirement

As soon as the UE has detected the switching feasibility, it shall start to use the transport format combination corresponding to the new bit-rate selected within 10 ms.

~~5.3 Cell Update~~

~~5.4 URA Update~~

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.133	CR	004	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: *list expected approval meeting # here ↑*		for approval	X	strategic		*(for SMG use only)*
		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: Editorial corrections

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	X

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: The measurement definitions were incomplete. This CR will update the missing definitions

Clauses affected: Section 10, 10.1.

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications	X	→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

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Draft 3G TS 25.133 V3.x.x (1999-12)

Technical Specification

3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) RAN WG4; Requirements for Support of Radio Resource Management (FDD)

Reference

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Contents

Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

x the first digit:

presented to TSG for information;

presented to TSG for approval;

Indicates TSG approved document under change control.

Y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the specification.

1 Scope

This Technical Specification specifies requirements for support of Radio Resource Management for FDD. These requirements include requirements on measurements in UTRAN and the UE as well as requirements on node dynamical behaviour and interaction, in terms of delay and response characteristics.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an TS shall also be taken to refer to later versions published as an EN with the same number.

[1] 3GPP Homepage: www.3GPP.org

[2] 25.150 Introduction

[3] 25.101 ~~MS~~ UE Radio transmission and reception (FDD)

[4] 25.104 BTS Radio transmission and reception (FDD)

[5] 25.102 ~~MS~~ UE Radio transmission and reception (TDD)

[6] 25.105 BTS Radio transmission and reception (TDD)

[7] 25.103 RF parameters in support of RRM

[8] 25.141 Base station conformance testing (FDD)

[9] 25.142 Base station conformance testing (TDD)

[10] 25.113 Base station EMC

[11] 25.942 RF System scenarios

[12] 25.922 RRM Strategies

[13] 25.215 Physical Layer Measurements (FDD)

[14] 25.225 Physical Layer Measurements (TDD)

[15] 25.302 Services provided by Physical Layer

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purpose of the present document the following definitions apply.

The main general definitions strictly related to the Transmission and Reception characteristics but important also for this specification can be found in [3] for UE FDD, in [4] for BS FDD, in [5] for UE TDD, in [6] for BS TDD.

3.2 Symbols

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

<symbol> <Explanation>

Symbol	Explanation
[…]	Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken;
~~$\hat{I}_{or}$~~	~~"RXLEV", see 25.101 or 25.102 section 3.3 and Annex C~~.

3.3 Abbreviations

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

RRM	Radio Resource Management
~~**ACPR**~~	~~Adjacent Channel Power Ratio~~
BS	Base Station
BER	Bit Error Rate
BLER	Block Error Rate
CW	Continuous wave (unmodulated signal)
DL	Down link (forward link)
EIRP	Equivalent Isotropic Radiated Power
FDD	Frequency Division Duplexing
FER	Frame Error ~~Rate~~Ratio
PPM	Parts Per Million
RSSI	Received Signal Strength Indicator
SIR	Signal to Interference ratio
TDD	Time Division Duplexing
TPC	Transmit Power Control
UE	User Equipment
UL	Up link (reverse link)
UTRA	UMTS Terrestrial Radio Access

4 Idle Mode Tasks

4.1 Introduction

Note: The paging period and the repetition rate of relevant system information blocks needs to be defined.

4.2 RF Cell Selection Scenario

[Note: Some performance requirements in agreed scenarios are added into this section. More scenarios will be added later]

4.2.1 Requirements for Cell Selection Single carrier Single cell case

4.2.1.1 Cell Selection delay

The UE shall be capable of selecting a suitable cell within [5] seconds from switch on in the test case defined in following section in Table 4-1. The cell selection delay is defined as a time the UE needs for sending RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.

4.2.1.2 Test Parameters

The stored information of the last registered PLMN is utilized in this test. The stored information includes UTRA RF CHANNEL NUMBER. The active cell in the test does not contain any neighbour cells in its measurement control information.

Table 4-1:

Parameter	**Unit**	**Cell 1**
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
OCNS	dB	To Be Calculated
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-60
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Qmin	dB	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]

4.2.1.3 Performance Requirements

Correct cell selection shall be greater than [X%] with [Y%] confidence. Cell selection is correct if within [5] seconds the UE camps on the cell,.

4.2.2 Requirements for Cell Selection multi carrier multi cell case

4.2.2.1 Cell selection delay

The UE shall be capable of selecting a suitable cell within [5+x] seconds from switch on in the test case defined in following section in Table 4-2. The cell selection delay is defined as a time the UE needs for sending RRC Connection Request for Location Registration message to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.

4.2.2.2 Test Parameters

The stored information of the last registered PLMN is utilized in this test. The stored information includes one of the UTRA RF CHANNEL NUMBERs used in the test. All the cells in the test are given in the measurement control information of each cell, which are on the RF carrier stored to the UE.

[Note: Here pilot pollution case with different power levels for cells could be included]

Table 4-2:

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
UTRA RF Channel Number		Channel 1	Channel 1	Channel 1	Channel 2	Channel 2	Channel 2
CPICH_Ec/Ior	dB	-10	-10	-10	-10	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12	-12	-12	-12	-12
SCH_Ec/Ior	dB	-12	-12	-12	--12	-12	-12
PICH_Ec/Ior	dB	-15	-15	-15	-15	-15	-15
OCNS	dB	To Be Calculated	To Be Calculated	To Be Calculated	To Be Calculated	To Be Calculated	To Be Calculated
$\hat{I}_{or}/I_{oc}$	dB	0	-4.8	-9.5	-4.8	5.9	-9.5
I_{oc}	dBm/3.84 MHz	-60			-60		
CPICH_Ec/Io	dB	-13	-16	-20	-16	-11	-20
Propagation Condition		AWGN			AWGN		
Qmin	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

4.2.2.3 Performance Requirements

Correct cell selection shall be greater than [X%] with [Y%] confidence. Cell selection is correct if within [5+x] seconds the UE camps on the cell, which fulfils the cell selection criteria.

4.3 RF Cell Re-Selection Scenario

[Note: One performance requirement in agreed scenario is added into this section. More scenarios will be added later]

4.3.1 Requirements for Cell Re-Selection single carrier multi cell case

4.3.1.1 Cell re-selection delay

When the UE is camped on one of the cells, the UE shall be capable of re-selecting a new cell in the test case defined in the following section in within [5] seconds from it becoming a cell to be re-selected according the cell re-selection criteria. The cells, which are possible to be re-reselected during the test are belonging to different location areas. The cell re-selection delay is then defined as a time the UE needs for sending RRC Connection Request for Location Update message to UTRAN.

4.3.1.2 Test Parameters

One of the 6 cells in Table 4-3 is serving cell and all others are given in the measurement control information of the serving cell. 2 of the cells are possible for cell re-selection and 4 of the cells are steady interfering cells.

Table 4-3:

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
$\hat{I}_{or}/I_{oc}$	dB	-4.8	0	0	-4.8	-9.5		-9.5		-9.5		-9.5	
I_{oc}	dBm/3.84 MHz	-60											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

Time T1 is X seconds and T2 is Y seconds.

Note: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

4.3.1.3 Performance Requirements

Correct cell re-selection shall be greater than [X%] with [Y%] confidence. Cell re-selection is correct if within [5] seconds the UE re-reselects a new cell, which fulfills the cell re-selection criteria.

4.3.1.4 Cell List Size

[The UE shall be capable of recording at least [6] of the strongest cells according to the cell re-selection criteria. The number of the strongest cells recorded inside the UE shall be at least [6].]

4.3.1.5 Maximum number of cells to be monitored

For re-selection purposes, the UE shall be capable of monitoring at least up to 32 neighbouring cells given in the measurement control information. The exact number of cells to be monitored will be determined by the measurement control information broadcast in the serving cell.

4.4 PLMN Selection and Re-Selection Scenario

4.5 Location Registration Scenario

5 RRC Connection mobility

5.1 Handover

5.1.1 Introduction

The handover process should be implemented in both the UE and UTRAN. The UE measurements and which radio links the UE shall use is controlled by UTRAN with RRC signalling.

Measurements are specified in TS25.215 and UE behaviour in response to UTRAN RRC messages is described in TS25.331.

5.1.2 Handover 3G to 3G

5.1.2.1 FDD Soft/Softer Handover

The soft handover procedure is initiated from UTRAN with an active set update message.

5.1.2.1.1 Maximum number of cells to be reported

The UE shall be capable of reporting the CPICH of at least [6] cells given in a measurement control message(s).

5.1.2.1.2 Measurement reporting delay

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface.

5.1.2.1.3 Test parameters

For section *5.1.2.1.3.1, 5.1.2.1.3.2* and *5.1.2.1.3.3* DL reference measurement channel 12.2 kbps shall be used but with power control turned on [see 25.101].

5.1.2.1.3.1 Correct reporting of neighbours and timing measurement accuracy in AWGN propagation condition

This test will derive that the terminal makes correct reporting of an event and that the measurement accuracy of the CFN-SFN observed timed difference between Cell 1 and Cell 2 is within defined limits. Cell 1 is current active cell, as illustrated in Figure 5-1. The power level of Cell 1 is kept constant and the power level of Cell 2 is changed using ($\hat{I}_{or}/I_{oc}$). Hysteresis, Threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, SFN has to be decoded for neighbour cells. CPICH Ec/I0 and the CFN-SFN observed timed difference has to reported together with Event 1A reporting. CPICH Ec/I0 shall be reported for Event 1B reporting. New measurement control information, which defines neighbour cells etc., is always sent during time period Time 1. The number of neighbour cells in the measurement control information is 24.

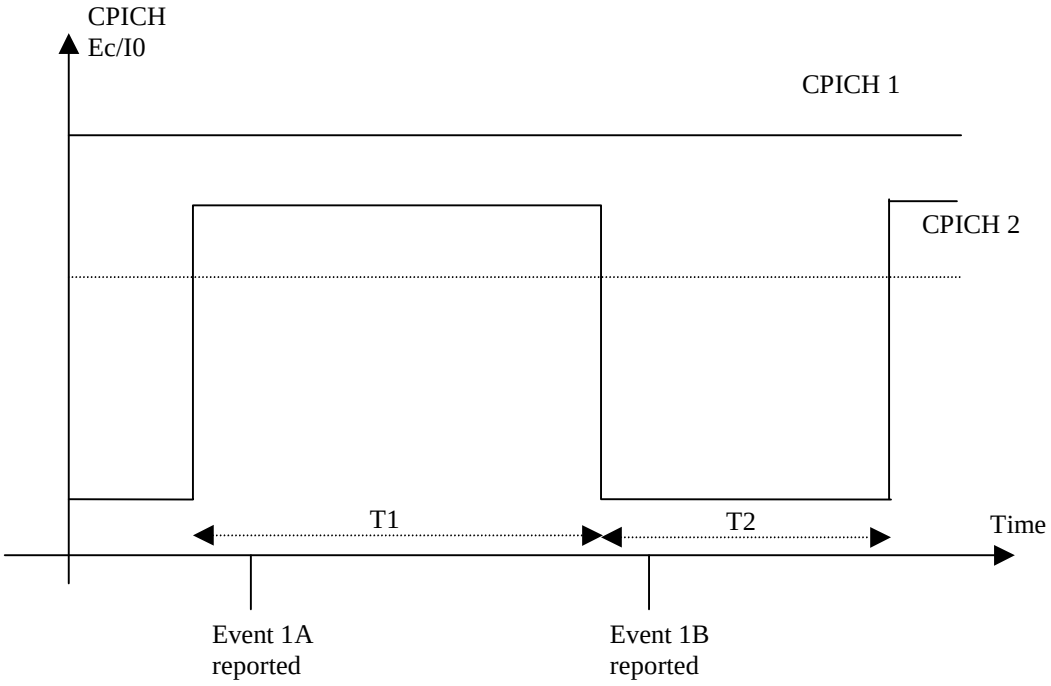

Figure 5-1: Illustration of parameters for soft handover measurement reporting test case

Table 5-1

Parameter	Unit	Cell 1		Cell 2	
		Time 1	Time 2	Time 1	Time 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
DPCH_Ec/Ior	dB	TBD		TBD	
OCNS		[To Be Calculated]		[To Be Calculated]	
$\hat{I}_{or}/I_{oc}$	dB	0	0	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-60			
CPICH_Ec/Io	dB	-13	-13	-Infinity	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	msec	0			
Propagation Condition	AWGN				

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

The measurement reporting delay shall be less then 0.8 seconds in 90% of the cases with 95% confidence.

All the reported entities shall be within the requirements, as defined in section 10.

5.1.2.1.3.2 Correct reporting of neighbours in Fading propagation condition

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell. The power level of Cell 1 is kept constant and the power level of Cell 2 is changed using ($\hat{I}_{or}/I_{oc}$). Hysteresis, Threshold and Time to Trigger values are given in the table below and they are signaled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A shall be used. Only the event number is reported in this case. New measurement control information, which defines neighbor cells etc., is sent always during time period Time 1. The number of neighbor cells in the measurement control information is 24.

Table 5-2

Parameter	Unit	Cell 1		Cell 2	
		Time 1	Time 2	Time 1	Time 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
DPCH_Ec/Ior	dB	TBD		TBD	
OCNS		[To Be Calculated]		[To Be Calculated]	
$\hat{I}_{or}/I_{oc}$	dB	0	0	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-60			
CPICH_Ec/Io	dB	-13	-13	-Infinity	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	msec	0			
Propagation Condition	2-tap Rayleigh fading, 0 dB, -10 dB, 50km/h, 100 km/h				

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

The measurement reporting delay shall be less then XX seconds in YY% with ZZ % confidence.

5.1.2.1.3.3 CPICH_Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition

The test case will derive the terminal's measurement accuracy of CPICH_Ec/Io and false detection resistance. The terminal measurement accuracy of CPICH_Ec/Io is derived using the periodical reporting of active cell's measured CPICH_Ec/Io. The terminal's false detection resistance is derived by recording the amount of erroneous reports. Both Cell 1 and Cell 2 powers ($\hat{I}_{or}/I_{oc}$) are constant during the test case. Cell 2 is near to reporting range. Hysteresis, Threshold and Time to Trigger values are given in the table below and they are signaled from test device. In the measurement control information it is indicated to the UE that the CPICH_Ec/Io level of the active set cell has to reported periodically (and reporting period) and event-triggered reporting will also be used. The number of neighbour cells in the measurement control information is 24.

Table 5-3

Parameter	Unit	Cell 1	Cell 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
DPCH_Ec/Ior	dB	TBD	TBD
OCNS		[To Be Calculated]	[To Be Calculated]
$\hat{I}_{or}/I_{oc}$	dB	0	-7.25
I_{oc}	dBm/3.84 MHz	-60	
CPICH_Ec/Io	dB	-13	-18
Threshold	dB	3	
Hysteresis	dB	0	
Time to Trigger	msec	0	
Propagation Condition	AWGN		

In the periodical reporting the accuracy of the reported CPICH_Ec/Io for cell 1 shall be within given accuracy limits in X% of the reports with Y% confidence.

Event triggered report rate shall not exceed X reports in Y seconds.

5.1.2.1.4 Active set dimension

The active set is defined as set of radio links simultaneously involved in a specific communication service between an User Equipment and a UTRAN access point. The UE shall be capable of supporting at least [6] radio links in the active set.

5.1.2.1.5 Active set update delay

The active set update delay start is defined as the time from when the UE receives the active set update message from UTRAN, or at the time stated through the activation time when to perform the active set update. The activation time stop is defined as the time when the UE successfully only uses the set of radio links stated in that message for power control. The active set update delay is defined as the time between the active set update start and the active set stop.

The active set update delay for different number of added cells is stated in the table below. There is different requirement on the active set update delay depending on if the cell has been within the monitored set of cells for the last [FFS] [s] or not.

[Editor's Note: the requirement of an active set update of at least [1] second after the reception of the UTRAN acknowledgement as proposed in R4-99712, shall be considered as a starting point for the setting of this requirement]

Table 5-4

Number of new cells present in the active set update message	Maximum active set update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1		
2		
3		
4		
5		
6		

…		

If an active set update includes a combination of cells included and not included in the monitored set the maximum active set update delay is the sum of respective maximum delays.

5.1.2.1.6 BS Functionality in Site Selection Diversity Transmission (SSDT) Mode

Site Selection Diversity Transmission (SSDT) is an optional feature of BS. This requirement for SSDT mode ensures that BS correctly reacts to Layer 1 feedback signaling messages from UE.

5.1.2.1.6.1.1 Minimum Requirements

For the conditions specified in Table 5-5, the BS shall transmit or not transmit the downlink DPDCH channel.

Table 5-5: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set in BS	DB	-5			
Uplink: $\frac{DPCH\_E_c}{I_o}$	DB	Q_{th} + 10	Q_{th} + 10	Q_{th} - 3	Q_{th} – 3
Cell ID transmitted by UE	-	A	B	A	B
Transmission Of downlink DPCCH	-	Yes	Yes	yes	Yes
Transmission Of downlink DPDCH	-	Yes	No	yes	Yes

The above test should be for repeated for each of the three code sets “long”, “medium” and “short” Cell ID code sets. The UE emulator can check the power ratio of downlink DPDCH/DPCCH in order to confirm whether BS transmitted the DPDCH.

5.1.2.2 FDD Hard Handover

The hard handover procedure is initiated from UTRAN with an handover command message. The hard handover procedure may cause the UE to change its frequency.

5.1.2.2.1 Requirements

5.1.2.2.1.1 Maximum number of cells/frequencies to be monitored on other frequencies

The UE shall be capable of measuring the CPICH of at least [FFS] cells on a maximum of [FFS] frequencies, different from the frequency currently used by the UE.

The cells and frequencies are given to the UE in a measurement control message(s), and the measurement slots available with compressed mode is given through physical channel reconfiguration parameters.

5.1.2.2.1.2 Measurement reporting delay

The measurement reporting delay start is defined as the time from when a report is triggered at the physical layer, and in the end of an available [FFS] ms measurement slot, according to the event or periodic mechanism set to trigger the measurement report. The measurement reporting delay end is defined as the time when the UE tries to transmit the measurement report over the Uu interface.

The measurement reporting delay is defined as the time between the measurement reporting delay start and the measurement reporting delay stop.

[Editors Note: The details for this requirement and the relation to compressed mode are FFS.]

For all possible events defined in the measurement control messages as inter-frequency measurement reporting criteria, the measurement reporting delay shall not exceed the time stated in the table below.

Table 5-6

TTI for DCCH carrying measurement report [ms]	Maximum measurement reporting delay [ms]
10	
20	
40	
80	

5.1.2.2.1.2.1 System Level Requirement on Measurement Reporting Delay

[This Section specifies a system level requirement on measurement reporting delay for the network scenario described; when the values in Table 5-6 in Section 5.1.2.2.1.2 will be specified, also the requirement described in this section will be taken into account; in this way a merge between the two sections will be possible]

For hard handover purposes, the measurement reporting delay shall not exceed [5] seconds under the following network conditions: Initial serving cell at $\hat{I}_{or}$ = -70 dBm/3.84MHz, with 6 neighbours at $\hat{I}_{or}$ = -75 dBm/3.84MHz. Then the new cell is switched on at $\hat{I}_{or}$ = -60 dBm/3.84MHz, all steady signals.

5.1.2.2.1.3 Hard Handover Delay

The hard handover delay is defined as the time from when the UE receives the handover command message from UTRAN, until the UE successfully uses the entire set of radio links stated in that message for power control.

The hard handover delay is stated in the table below. There is different requirement on the hard handover delay depending on if the cell has been within the monitored set of cells for the last [FFS] [s] or not.

Table 5-7

Number of new cells present in the handover command message	Maximum active set update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1-6…		

5.1.3.3 FDD/TDD Handover

5.1.3.3.1 Requirements

5.1.3.3.2 RF Parameters

5.1.4 Handover 3G to 2G

In the early days of UMTS deployment it can be anticipated that the service area will not be as contiguous and extensive as existing second generation systems. It is also anticipated that UMTS network will be an overlay on the 2nd generation network and utilise the latter, in the minimum case, as a fall back to ensure continuity of service and maintain a good QoS as perceived by the user.

5.1.4.1 Handover to GSM

This section presents some of the important aspects of GSM handover required to be performed by the UE. For the full specifications reference should be made the GSM recommendations.

The underlying requirement is to ensure continuity of service to the UMTS user. The handover requirements for 3G to GSM should be comparable to GSM to GSM handover requirements.

The MS (GSM terminology) shall be able to monitor up to [32] carriers.

The MS shall be able synchronize to [6] carriers

The MS shall be able to report back to the network on the [6] strongest cells with correctly identified BSIC.

The MS shall be able to perform this task at levels down to the reference sensitivity level or reference interference levels as specified in GSM 05.05.

The MS shall demodulate the SCH on the BCCH carrier of each surrounding cell and decode the BSIC as often as possible, and as a minimum at least once every [10 seconds].

5.1.4.1.1 Requirements

5.1.4.1.2. RF Parameters

5.2 Radio Link Management

5.2.1 Link adaptation

5.2.1.1 Definition of the function

Radio link adaptation is the ability of the UE to select the suitable transport format combination from the assigned transport format combination set, in order to maintain inner loop power control, in the case of reaching its maximum transmit power. This is necessary for supporting the highest bit-rate as possible when enough transmit power is not available.

5.2.1.2 Link adaptation delay minimum requirement

In this section, the UE maximum transmit power is defined as the UE maximum output power, which is defined by the UE power class.

When the UE output power is approaching the UE maximum transmit power and the inner loop power control can no longer be maintained for coverage reasons, the UE shall adapt to the transport format combination corresponding to the next lower bit-rate. Before doing that, the UE output power measured over at least [t1] ms shall be [margin1] dB within the maximum (margin1 is FFS).

As soon as the UE output power is [margin1] dB below the UE maximum transmit power and the UE has enough data to send, it shall continuously estimate whether the output power needed for a switch to the transport format combination corresponding to the next higher bit-rate does not exceed [margin1] dB below the maximum. Before the UE switches to the next higher rate transport format it shall have enough power to support that up-switch for at least [t2] ms.

The minimum delay requirements t1 and t2 shall be zero or a multiple of 10 ms. (Whether t1, t2 and margin1 should be configurable is FFS).

5.2.1.3 Link adaptation maximum delay requirement

As soon as the UE has detected the switching feasibility, it shall start to use the transport format combination corresponding to the new bit-rate selected within 10 ms.

5.3 Cell Update

5.3 ~~5.4~~ URA Update

6 RRC Connection Control

6.1 Requirements for RRC Re-establishment

6.6.1 RRC Re-establishment delay

When the UE is in Cell_DCH state, the UE shall be capable of sending a RRC CONNECTION RE-ESTABLISHMENT CONNECT message, in the test case defined in the following section, within $T_{RLFAIL}+T_{RESELECT}$ seconds from when the radio connection was lost. The RRC Re-establishment delay is defined as the time between the radio connection is lost

to when the UE starts to send preambles on the PRACH. This is exemplified in Figure 6-1, where the RRC Re-establishment delay is the time between T_{start} and T_{stop}.

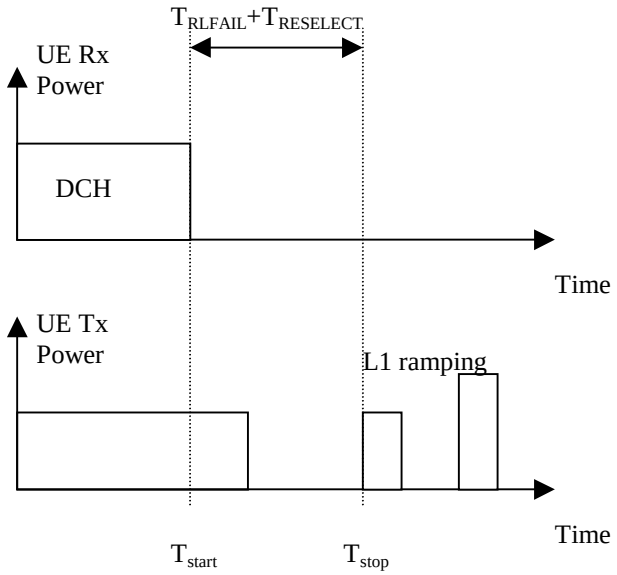

Figure 6-1: RRC Connection Re-establishment Requirement

6.6.2 Test Parameters

This test shall include 6 cells, one serving, one target and four steady interferes. The UE shall be in connected mode with a DL reference measurement channel 12.2 kbps dedicated traffic channel ongoing to one cell (serving cell). Measurement control information shall be signalled from the test device at least 5 seconds before T_{start}. At T_{start} the traffic channel is switched off. T_{stop} is defined as the time when the UE starts to send preambles on PRACH to the target cell.

Unless explicitly stated the test parameters should be similar to the test parameters for Cell Reselection, time T1, section 4.3.1.2. System information shall be provided in the same manner as for the test for cell re-selection, section 4.3.1.2.

The following additional parameters are needed:

Table 6-1

Parameter	**Unit**	**Value**
DPCH_Ec/Ior	dB	TBD
N313	Frames	TBD
T313	msec	0

6.6.2.1 Test 1 – Target Cell known by UE

All six cells in the test shall be given in the measurement control information to the UE before the test is started.

6.6.2.2 Test 2 – Target cell not known by UE

All cells except the target cell shall be in the measurement control information to the UE before the test is started.

6.6.2.3 Performance Requirements

For both test 1 and test 2, correct RRC Re-establishment shall be greater than 90% with 95% confidence. RRC Re-establishment is correct if within T seconds the UE tries to re-establish the RRC connection with the target cell. T is defined in Table 6-2.

Editors note: T_{RLFAIL} is depending on the value set for N313. Once decided, this shall be counted for here.

Table 6-2: Requirements for RRC Re-establishment

	Cell known by UE	**Cell not known by UE**
Intra Frequency	$T=T_{RLFAIL}$+800 ms	$T=T_{RLFAIL}$+3000 ms

6.2 Radio Access Bearer Control

[Editor's Note: Radio Access Bearer Control Procedures are a series of mechanisms used to control the UE and system resources. Some of these procedures cause Physical Channel Reconfiguration and Transport Channel Reconfiguration. This section specifies time delay requirements on Physical Channel Reconfiguration and Transport Channel configuration in different reconfiguration cases.]

7 Power Management

7.1 UE Output power dynamics

Power control is used to limit the interference level. The details on the Output Power Dynamics are specified in S25.71, "UTRA (UE) FDD; Radio Transmission and Reception".

7.1.1 Open Loop Power Control

Open loop power control is the ability of the UE transmitter to set its output power to a specific value.

The UE open loop power control tolerance is specified in S25.71 "UTRA (UE) FDD; Radio Transmission and Reception".

7.1.2 UE Inner Loop Power Control

7.1.2.1. Inner loop power control in Uplink

Inner loop power control in the Uplink is the ability of the UE transmitter to adjust its output power in accordance with the TPC symbols received in the downlink..

7.1.2.1.1 Power control steps

The power control step is the minimum step change in the UL transmitter output power in response to a power control command.

7.1.2.1.1.1 Minimum requirement

The UE transmitter shall have the capability of setting the inner loop output power with a step sizes of 1, 2 and 3 dB
(a)The tolerance of the transmitter output power step due to inner loop power control shall be within the range shown in S25.101 "UTRA (UE) FDD; Radio Transmission and Reception".
(b)The tolerance of the transmitter average output power step due to inner loop power control shall be within the range shown in S25.101 "UTRA (UE) FDD; Radio Transmission and Reception".

7.1.2.2 Inner Loop Power Control in Downlink

Inner loop power control in the downlink is the ability of the UE receiver to estimate the received SIR, compare it with the SIR target and transmit the TPC symbols in accordance to the results of this comparison. The details on the UE implementation requirements are specified in S25.101, "UTRA (UE) FDD; Radio Transmission and Reception".

7.1.2.2.1 Minimum requirement

(c)The downlink tolerance of the SIR measurements shall be within the range shown in S25.101, "UTRA (UE) FDD; Radio Transmission and Reception".
(d)The dynamic range of the SIR measurement of the received signal in the downlink shall be better than shown in S25.101, "UTRA (UE) FDD; Radio Transmission and Reception".

(e) The transmitted TPC symbols must respond to a change in the received SIR within the time period specified in S25.101, "UTRA (UE) FDD; Radio Transmission and Reception".

~~7.2 BS Output Power Dynamics~~

~~Power control is used to limit the interference level. The transmitter uses a quality based power control on both the uplink and downlink; The details on the Output Power Dynamics are specified in S25.104, "UTRA (BS) FDD; Radio Transmission and Reception".~~

~~7.2.1 BS Inner Loop Power Control~~

~~Inner Loop power control is the ability of the BS transmitter to adjust its output power in response to the UL/DL received signal.~~

~~For Inner Loop correction on the Downlink Traffic Channel (with respect to the open loop estimate), the base station adjust its mean output power level in response to each valid power control bit received from MS on the Uplink Traffic Channel. The details on the BS Closed Loop Power Control are specified in S25.104, "UTRA (BS) FDD; Radio Transmission and Reception".~~

~~7.2.1.1 Power Control Steps~~

~~The power control step is the minimum step change in the power of one of the physical channels transmitted by the DL transmitter. The requirements on the Power Control Step are specified in S25.104, "UTRA (BS) FDD; Radio Transmission and Reception".~~

~~7.2.1.2 Power Control Dynamic Range~~

~~The power control dynamic range is difference between the maximum and the minimum transmit output power of a traffic channel for a specified reference condition. The requirements on the Power Control Dynamic Range are specified in S25.104, "UTRA (BS) FDD; Radio Transmission and Reception".~~

~~8 Radio Link Surveillance~~

9 Timing characterisitics

9.1 Synchronisation Performance

9.1.1 Search of other Cells

Search for other cells is used to check whether the UE correctly searches and measures other BS(s) during the specified operation.

9.1.1.1 Minimum requirement

TBD

Table 9-1: Test Parameters for the Search of other Cells

Parameter	Unit	Channel 1		Channel 2	
		Time 1	Time 2	Time 1	Time 2
$PCCPCH\ \frac{E_c}{I_{or}}$	dB				
$\hat{I}_{or}/I_{oc}$	dB				
I_{oc}	dBm/3.84 MHz	-60			
$PCCPCH\ \frac{E_c}{I_o}$	dB				

9.2. UE Transmit Timing

9.2.1 Initial transmission timing, Maximum timing adjustment size and Maximum timing adjustment rate

The UE shall have capability to follow the frame timing change of the connected Node B. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, and maximum adjustment rate are defined in the following requirements.

9.2.1.1 Minimum requirement

For parameters specified in Table 9-2, UE initial transmission timing error shall be less than or equal to ±1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the first significant path of the corresponding downlink DPCCH/DPDCH frame.

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be 1/4 Chip.

The maximum adjustment rate shall be 1/4 chip per 280ms. In particular, within any given 280 ms period, the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 280ms period.

Table 9-2: Test parameters for Transmission timing requirement.

Parameter	Unit	Cell 1 and 2 level

DPCH_Ec/ Ior	dB	-17
$\hat{I}_{or,}$ Cell 1	dBm/3.84 MHz	-96
$\hat{I}_{or,}$ Cell 2	dBm/3.84 MHz	-97
Information data rate	Kbps	12.2
TFCI	-	On
Propagation condition	AWGN	

a) Cell 2 starts transmission 5 seconds after call has been initiated. UE shall maintain it's original timing properties.

b) Cell 1 stop transmission 5 seconds after cell 2 has started transmission. UE shall adjust transmission timing with a maximum change of 1/4 chip per adjustment, and maximum timing adjustment rate of 1/4 chip per 280ms.

9.3 Reception Timing

The reception timing of the MS is determined during the specified operation.

9.3.1 Minimum requirement

TBD

9.4 Signalling requirements

9.4.1 Signalling response delay

For all messages requiring a RRC response to be sent to UTRAN, the UE shall send that response with a maximum signalling response delay specified in this section. This delay consists of several delay parts. The first part is a general processing delay in order to create the response. The second part is dependent on some specific actions the UE shall perform according to that particular message.

The signalling response delay is defined as the time from when the UE receives the RRC message from UTRAN, until the UE successfully has performed actions according to the RRC message and the UE tries to transmit the RRC response message over the Uu interface.

9.4.2 Test Parameters

For all the tests the TTI for the DCCH shall be set to 80 ms.

[Note: There should be one test of reconfiguring TFS and TFCS without changing the physical layer

A similar test could then also be made where a new dedicated physical channel activation is included]

9.4.3 Performance requirements

This signalling response delay shall not exceed the sum of general processing delay and all action delays related to the specific RRC message.

General processing delay shall not exceed 100 ms in 90% of the cases with 95% confidence.

Delay parts related to actions are listed in the table below.

Delay part caused by a specific action	Maximum delay for this action [ms]
Establishment of new dedicated channel	140
Establishment of all radio bearer(s) in one RRC message	50
Re-configuration of all radio bearer(s) in one RRC message	50
Release of all radio bearer(s) in one RRC message	10
…	

For all actions not listed the requirement on delay is zero.

9.4.4 Signalling processing

If several consecutive RRC messages are sent to the UE, the UE shall be able to process the messages in parallel with the receiving of the next messages. The UE shall also perform actions according to the RRC messages and if applicable send answers to the messages in parallel (for those messages where procedure interaction is allowed according to TS 25.331) with receiving new messages.

9.4.5 Test parameters

For all the tests the TTI for the transport channel carrying DCCH shall be 80 ms.

Messages shall be sent to the UE at a rate of 10 messages per second.

The rest of the parameters are TBD.

9.4.6 Performance requirements

The UE shall be able to respond according to the test in 9.4.1 in 90% of the cases with 95% confidence.

10 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The complete list of measurements is specified in TSG RAN WG2 S25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TSG RAN WG1 TS25.215 “Physical layer – Measurements (FDD)”. In this section for FDD, per each measurement the relevant requirements on performance in terms of accuracy are reported.

Unless explicitly stated,

- all measurements shall be reported within the defined requirements in 90% of the cases with 95% confidence, on the confidence level applying for all measurements.
- Measurement periods FFS
- Measurement channel 12.2 kbps as per TS25.101
- Single event reporting

10.1 Measurements Performance for UE

10.1.1 CPICH RSCP

Requirement	**Absolute accuracy:** **Normal Conditions** +/-6dB for levels below –70dBm; +/-8dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Extreme Conditions** +/-9dB for levels below –70dBm; +/-11dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Relative accuracy:** +-3 dB for intra-frequency +-6 dB for inter-frequency Valid when the minimum level > -114 dBm, the difference in signal level < 20 dB and UTRA carrier RSSI>=-94dBm.

10.1.2 RSCP

[Note: there is general assumption that the Pilot Bit Number of DCCH should be equal to 8]

Requirement	**Absolute accuracy:** **Normal Conditions** [ ]dB for levels below –70dBm; [ ]dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Extreme Conditions** +/-[]dB for levels below –70dBm; +/- []dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Relative accuracy:** [ ] dB for intra-frequency Valid when the minimum level > -91-10log10(SF) dBm, the difference in signal level < 20 dB and UTRA carrier RSSI>=-94dBm

10.1.3 SIR

Requirement	**Absolute accuracy**: for []<SIR<[] dB when UTRA carrier RSSI>=-94dBm.

10.1.4 UTRA carrier RSSI

Requirement	**Absolute accuracy:** **Normal Conditions** +/-4dB for levels below –70dBm Valid for levels >-94dBm. **Extreme Conditions** +/-7dB for levels below –70dBm Valid for levels >-94dBm. **Relative accuracy** (between measurements on two carriers): +-5 dB over the full range Valid when the minimum level > -94 dBm and the difference < 20 dB.

10.1.5 GSM carrier RSSI

Requirement	According to the requirements in GSM 05.08

10.1.6 CPICH Ec/No

Requirement	**Absolute accuracy** (measured on one code): +/-4dB over the full range when UTRA carrier RSSI>=-94dBm and CPICH RSCP >= -115dBm. **Relative accuracy** (between measurements on two codes): +-3 dB for intra-frequency +-6 dB for inter-frequency When UTRA carrier RSSI>=-94dBm and CPICH RSCP >= -114dBm.

10.1.7 Transport channel BLER

Requirement	The UE shall report the CRC results

10.1.8 Physical channel BER

Requirement	+/-10% of the absolute Physical channel BER value

10.1.9 UE transmitted power

Requirement	**Absolute accuracy:** **Normal Conditions** +-9dB for the upper 20dB of the range. **Extreme Conditions** +-12dB for the upper 20dB of the range.

10.1.10 CFN-SFN observed time difference

Requirement	+/-0.5 chips period

10.1.11 SFN-SFN observed time difference

Requirement	+/-0.5 chips period for both type 1 and type 2.

10.1.12 UE Rx-Tx time difference

Requirement	+/-1.5 chips period.

10.1.13 Observed time difference to GSM cell

Requirement	+- 20 chips.

10.2 Measurements Performance for UTRAN

10.2.1 RSSI

Requirement	**Relative accuracy:** .FFS

10.2.2 SIR

Requirement	**Absolute accuracy**: +/- 3dB for 0<SIR<10 dB when RSSI>=-105dBm.

10.2.3 Transmitted carrier power

Requirement	**Absolute accuracy:** +-3dB over the full range. **Relative accuracy** (relative to the maximum transmit power): +- []dB over the full range.

10.2.4 Transmitted code power

Requirement	**Absolute accuracy:** +-3dB over the full range. **Relative accuracy** (relative to the maximum transmit power): +- 2dB over the full range.

10.2.5 Transport channel BLER

Requirement	-

10.2.6 Physical channel BER

Requirement	+/-10% of the absolute BER value

10.2.7 Round trip time

Requirement	+/-0.5 chips period

11 Annex A Measurement Definition (Informative)

In this Annex the definitions of those Measurements, whose requirements are specified, in Section 10 of this specification are reported for information. The complete list of measurements is specified in TSG RAN WG2 TS25.302 "Services Provided by Physical Layer". ". The physical layer measurements for FDD are described and defined in TSG RAN WG1 TS25.215 “Physical layer – Measurements (FDD)”.

11.1 Measurements Performance for UE

11.1.1 CPICH RSCP

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the CPICH. The reference point for the RSCP is the antenna connector at the UE.

11.1.2 RSCP

[Editor’s Note: in accordance to RP-99564, while this measurement is agreed in TS 25.215 is not considered yet in TS 25.302; this measurement is here reported for consistency with TDD mode since during WG4#8 it was decided to consider this measurement for TDD]

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the DPCCH after RL combination. The reference point for the RSCP is the antenna connector at the UE.

11.1.3 ISCP

Note that it is not a requirement that the ISCP shall be possible to report to higher layers. The ISCP is defined in this section because it is included in the definition of SIR.

Definition	Interference Signal Code Power, the interference on the received signal after de-spreading. Only the non-orthogonal part of the interference is included in the measurement. The reference point for the ISCP is the antenna connector at the UE.

11.1.4 SIR

Definition	Signal to Interference Ratio, defined as the RSCP divided by ISCP. The SIR shall be measured on DPCCH after RL combination. The reference point for the SIR is the antenna connector of the UE.

11.1.5 UTRA carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a UTRAN downlink carrier. The reference point for the RSSI is the antenna connector at the UE.

11.1.6 GSM carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI is the antenna connector at the UE.

11.1.7 CPICH Ec/No

Definition	The received energy per chip divided by the power density in the band. The Ec/No is identical to RSCP/RSSI. Measurement shall be performed on the CPICH. The reference point for Ec/No is the antenna connector at the UE.

11.1.8 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block after RL combination. BLER estimation is only required for transport channels containing CRC. In connected mode the BLER shall be possible to measure on any transport channel. If requested in idle mode it shall be possible to measure the BLER on transport channel PCH.

11.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination. At most it shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.

11.1.10 UE transmitted power

Definition	The total UE transmitted power on one carrier. The reference point for the UE transmitted power shall be the UE antenna connector.

11.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). and OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.

11.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). And OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter

11.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.

11.1.14 Observed time difference to GSM cell

Definition	Time difference between the Primary CCPCH of the current cell and the timing of the GSM cell. The exact definition and further details on this parameter is contained in Chapter 9 of the TS25.302 "Services Provided by the Physical Layer".

11.2 Measurements Performance for UTRAN

11.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.

11.2.2 SIR

Definition	Signal to Interference Ratio, is defined as the RSCP divided by the ISCP. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.

11.2.3 Transmitted carrier power

Definition	Transmitted carrier power, is the total transmitted power on one carrier from one UTRAN access point. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the total transmitted power measurement shall be the antenna connector. In case of Tx diversity the total transmitted power for each branch shall be measured.

11.2.4 Transmitted code power

Definition	Transmitted code power, is the transmitted power on one carrier, one scrambling code and one channelisation code. Measurement shall be possible on any channelisation code transmitted from the UTRAN access point. The reference point for the transmitted code power measurement shall be the antenna connector. In case of Tx diversity the transmitted code power for each branch shall be measured.

11.2.5 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block. Measurement shall be possible to perform on any transport channel after RL combination in Node B. BLER estimation is only required for transport channels containing CRC.

11.2.6 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination in Node B. It shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.

11.2.7 Round trip time

Note: The relation between this measurement and the TOA measurement defined by WG2 needs clarification.

Definition	Round trip time (RTT), is defined as RTT = $T_{RX} - T_{TX}$, where T_{TX} = The time of transmission of the beginning of a downlink DPCH frame to a UE. T_{RX} = The time of reception of the beginning (the first significant path) of the corresponding uplink DPCCH/DPDCH frame from the UE. Note: The definition of "first significant path" needs further elaboration. Measurement shall be possible on DPCH for each RL transmitted from an UTRAN access point and DPDCH/DPCCH for each RL received in the same UTRAN access point.

History

Document history		
V3.0.0	December 1999	Approved by TSG-RAN

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.133	CR	005	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: *list expected approval meeting # here ↑*		for approval	X	strategic		*(for SMG use only)*
		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: UE measurement requirement update.

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: The measurement definitions were incomplete. This CR will update the missing definitions

Clauses affected: Section 10, 10.1.

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications	X	→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

10 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The complete list of measurements is specified in TSG RAN WG2 S25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TSG RAN WG1 TS25.215 “Physical layer – Measurements (FDD)”. In this section for FDD, per each measurement the relevant requirements on performance in terms of accuracy are reported.

Unless explicitly stated,

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in TS 25.101 annex A, section A.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in TS 25.101 annex C.
- All requirements are defined when UE is in a CELL_DCH or CELL_FACH stage. The difference between modes are the reporting delay. Some of the measurements are not requested to be reported in both stages.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

10.1 Measurements Performance for UE

Test conditions are specified in sections 10.1.1, 10.1.4 and 10.1.7.

10.1.1 COMMON PILOT MEASUREMENTS

These measurement consider *CPICH RSCP* and *CPICH Ec/Io* measurements.

10.1.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. The table 10-1 and notes 1-4 define the limits of signal strengths and code powers, where the requirement is applicable.

Table 10-1

Parameter	**Unit**	**Cell 1**	**Cell 2**
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	Note 4	Note 4

Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

Note 1: *CPICH_RSCP1,2* ≥ -114 dBm.

Note 2: | *CPICH_RSCP1 – CPICH_RSCP2* |≤ 20 dB.

Note 3: | *Io – CPICH_Ec/Ior*| ≤ 20 dB.

Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io – 13.7 dB= Ioc.*

10.1.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7 [14 slots is FSS]. The table 10-2 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.

Table 10-2

Parameter	**Unit**	**Cell 1**	**Cell 2**
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	Note 5	Note 5
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

Note 1: *CPICH_RSCP1,2* ≥ -114 dBm.

Note 2: | *CPICH_RSCP1 – CPICH_RSCP2* | ≤ 20 dB

Note 3: | *Channel 1_Io –Channel 2_Io*| ≤ 20 dB

Note 4: | *Io – CPICH_Ec/Ior*| ≤ 20 dB

Note 5: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io –10.6 dB = Ioc.*

10.1.2 CPICH RSCP

[Informative note: This measurement is for handover evaluation, DL open loop power control, UL open loop power control and for the calculation of pathloss.]

10.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH stage is [150 ms] and for CELL_FACH stage [600 ms].

10.1.2.1.1 Absolute accuracy requirement

The absolute accuracy of CPICH RSCP is defined as measured one code power after de-spreading. In this test only Cell 1 in table 10-1 is present.

Table 10-3 Range 1

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_RSCP	dB	± 6	± 9

Table 10-4 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_RSCP	dB	± 8	± 11

10.1.2.1.2 Relative accuracy requirement

The relative accuracy of CPICH RSCP is defined as measured code powers from active cell and one or more cells after de-spreading. The reported value is relative to active cell value. In this test Cell 1 and 2 in table 1 are present.

Table 10-5 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_RSCP	dB	± 3	± 3

10.1.2.2 Inter frequency measurement relative accuracy requirement

The measurement period for CELL_DCH stage is [240 ms], and for CELL_FACH stage [960 ms].

The relative accuracy of CPICH RSCP in inter frequency case is defined as measured code powers after de-spreading from active cell and one or more cells received from two or more RF–carriers. The reported values are relative to active cell value. In this test parameters in table 10-2 is used. In this test cells 1and 2 are present.

Table 10-6 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_RSCP	dB	± 6	± 6

10.1.3 CPICH Ec/Io

[Informative note: This measurement is for Cell selection/re-selection and for handover evaluation.]

10.1.3.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH stage is [150 ms], and for CELL_FACH stage [600ms].

10.1.3.1.1 Absolute accuracy requirement

The absolute accuracy of CPICH Ec/Io is defined as measured energy per chip divided by power density in the band from one cell. In this test only Cell 1 in table 10-1 is present.

Table 10-7 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_Ec/Io	dB	± 4	± 4

10.1.3.1.2 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io is defined as measured energy per chip divided by power density in the band received from active cell and one more cells. The reported value is relative to active cell value. In this test Cells 1 and 2 in table 10-1 are present.

Table 10-8 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_Ec/Io	dB	± 3	± 3

10.1.3.2 Inter frequency measurement relative accuracy requirement

The measurement period for CELL_DCH stage is [240 ms], and for CELL_FACH stage [960 ms].

The relative accuracy of CPICH Ec/Io in the inter frequency case is defined as measured energy per chip divided by power density in the band. The reported valus are relative to active cell value. In this test the parameters in table 10-2 is used. In this test cells 1and 2 are present.

Table 10-9 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_Ec/Io	dB	± 6	± 6

10.1.4 DEDICATED CHANNEL MEASUREMENTS

These measurement consider SIR, which is based on dedicated channel. The power ratio between DPDCH bits and DPCCH bits is 1. The relative power of PO1, PO2 and PO3 for TPC, TCFI and Pilot fields are same. The number of dedicated pilot bits is 8. Dedicated channel measurements are always intra frequency type.

10.1.4.1 Test parameters

Table 10-10

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-12	-12
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	Note 5	Note 5
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

Note 1: *DPCH_Ec/Ior* ≥-114 dBm.

Note 2: | *DPCH_Ec/Ior1 – DPCH_Ec/Ior2* |≤ 20 dB

Note 3: | *Io – CPICH_Ec/Ior*| ≤ 20 dB

Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io – 13.7 dB = Ioc.*

10.1.5 SIR

[Informative note: The purpose of this measurement is for DL inner/outer loop power control, DL open loop power control.]

10.1.5.1 Absolute accuracy requirement

The basic measurement period is in CELL_DCH stage is [100 ms].

The SIR absolute accuracy is defined as RSCP divided by ISCP after RL combination. In this test only Cell 1 in table 10-10 is present.

Table 10-11 Range 1

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
DPCCH_SIR	dB	± [ ]	± [ ]

Table 10-12 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
DPCCH_SIR	dB	± [ ]	± [ ]

10.1.6 UTRA Carrier RSSI

[Informative note: The purpose of measurement is for Inter-frequency handover evaluation.]

10.1.6.1 Test parameters for requirement

The table 13 and notes 1,2 define the limits of signal strengths, where the requirement is applicable.

Table 10-13

Parameter	**Unit**	**Cell 1**	**Cell 2**
UTRA RF Channei number	-	Channel 1	Channel 2
Îor/Ioc	dB	-1	-1
Ioc	dBm/ 3.84 MHz	Note 3	Note 3
Range 1: Io *Range 2: Io*	dBm/ 3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

Note 1*:* For relative accuracy requirement | *Channel 1_Io –Channel 2_Io* | *< 20 dB* .

Note 2: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io – 4.13 dB = Ioc.*

10.1.6.2 Absolute accuracy requirement

The measurement period is in CELL_DCH stage [150 ms], and CELL_FACH stage [600 ms].

Absolute accuracy case only one carrier is applied (Cell 1).

Table 10-14 Range 1

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
Io	dBm	± 4	± 7

Table 10-15 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
Io	dBm	± 6	± 9

10.1.6.3 Relative accuracy requirement

The measurement period in CELL_DCH stage is [240 ms], and in CELL_FACH stage [960 ms].

Relative accuracy requirement is defined as active cell frequency UTRAN RSSI compared to measured other frequency UTRAN RSSI level. In relative accuracy test case both carriers in table 10-13 are used.

Table 10-16 Range 1

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
Io	dBm	± 7	± 11

10.1.7 GSM carrier RSSI

[Informative note: The measurement is for Inter radio access technology (RAT) handover.]

For terminals supporting this capability.

The accuracy requirement is specified in GSM 05.08.

[The GSM reporting period is 480 ms. In case of parallel measurements, the reporting period of each single neighbour can be a multiple of 480 ms, and the reporting period of each neighbour can be irregular.]

10.1.8 Transport channel BLER

[Informative note: This measurement is for outer loop power control.]

10.1.8.1 BLER measurement requirement

Transport channel BLER value shall be calculated from a sliding window containing [20] CRC errors.

10.1.9 UE transmitted power

Relative Accuracy

Δ P = 1 dB	+/- 0.5 dB +/- UE Tolerance as per TS 25.101 Table 2
Δ P = 2 dB	+/- 1.0 dB +/- UE Tolerance as per TS25.101 Table 2
Δ P = 3 dB	+/- 1.5 dB +/- UE Tolerance as per TS25.101 Table 2
4≤Δ P≤10 dB	+/- 2.0 dB +/- UE Tolerance as per TS25.101 Table 2
11≤Δ P≤ 15 dB	+/- 3.0 dB +/- UE Tolerance as per TS25.101 Table 2
16≤Δ P≤ 20 dB	+/- 4.0 dB +/- UE Tolerance as per TS25.101 Table 2

The measurement period in CELL_DCH stage is [ ]

10.1.10.1 CFN-SFN observed time difference

Requirement	+/-0.5 chips period

The measurement period in CELL_DCH stage is [150 ms]

10.1.12.1 SFN-SFN observed time difference

Requirement	+/-0.5 chips period for both type 1 and type 2.

The measurement period in CELL_DCH stage is [150 ms], and in CELL_FACH stage [600 ms].

10.1.13 UE Rx-Tx time difference

Requirement	+/-1.5 chips period.

The measurement period in CELL_DCH stage is [ms]

10.1.14.1 Observed time difference to GSM cell

For terminal supporting this capability.

Requirement	+- 20 chips.

10 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The complete list of measurements is specified in TSG RAN WG2 S25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TSG RAN WG1 TS25.215 “Physical layer – Measurements (FDD)”. In this section for FDD, per each measurement the relevant requirements on performance in terms of accuracy are reported.

Unless explicitly stated,

- all measurements shall be reported within the defined requirements in 90% of the cases with 95% confidence, on the confidence level applying for all measurements.
- Measurement periods FFS
- Measurement channel 12.2 kbps as per TS25.101
- Single event reporting

10.1 Measurements Performance for UE

10.1.6CPICH RSCP

Requirement	**Absolute accuracy:** **Normal Conditions** +/-6dB for levels below -70dBm; +/-8dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Extreme Conditions** +/-9dB for levels below -70dBm; +/-11dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Relative accuracy:** +-3 dB for intra-frequency +-6 dB for inter-frequency Valid when the minimum level > -114 dBm, the difference in signal level < 20 dB and UTRA carrier RSSI>=-94dBm.

10.1.7RSCP

[Note: there is general assumption that the Pilot Bit Number of DCCH should be equal to 8]

Requirement	**Absolute accuracy:** **Normal Conditions** [ ]dB for levels below –70dBm; [ ]dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Extreme Conditions** +/ []dB for levels below –70dBm; +/- []dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Relative accuracy:** [ ] dB for intra-frequency Valid when the minimum level > -91-10log10(SF) dBm, the difference in signal level < 20 dB and UTRA carrier RSSI>= 94dBm

10.1.8SIR

Requirement	**Absolute accuracy:** for []<SIR<[] dB when UTRA carrier RSSI>= 94dBm.

10.1.9UTRA carrier RSSI

Requirement	**Absolute accuracy:** **Normal Conditions** +/-4dB for levels below –70dBm Valid for levels > 94dBm. **Extreme Conditions** +/-7dB for levels below –70dBm Valid for levels > 94dBm. **Relative accuracy** (between measurements on two carriers): + 5 dB over the full range Valid when the minimum level > -94 dBm and the difference < 20 dB.

10.1.10GSM carrier RSSI

Requirement	According to the requirements in GSM 05.08

10.1.11CPICH Ec/No

Requirement	**Absolute accuracy** (measured on one code): +/- 4dB over the full range when UTRA carrier RSSI>= 94dBm and CPICH RSCP >= -115dBm. **Relative accuracy** (between measurements on two codes): + 3 dB for intra-frequency + 6 dB for inter-frequency When UTRA carrier RSSI>=-94dBm and CPICH RSCP >= -114dBm.

10.1.12Transport channel BLER

Requirement	The UE shall report the CRC results

10.1.13Physical channel BER

Requirement	+/- 10% of the absolute Physical channel BER value

10.1.14UE transmitted power

Requirement	**Absolute accuracy:** **Normal Conditions** +- 9dB for the upper 20dB of the range. **Extreme Conditions** +- 12dB for the upper 20dB of the range.

10.1.15CFN-SFN observed time difference

Requirement	+/- 0.5 chips period

10.1.16SFN-SFN observed time difference

Requirement	+/-0.5 chips period for both type 1 and type 2.

10.1.17UE Rx-Tx time difference

Requirement	+/- 1.5 chips period.

10.1.18Observed time difference to GSM cell

Requirement	+- 20 chips.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.133	CR	006	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: RAN#7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 02/03/00

Subject: TDD Measurements Performance Requirements for TS25.133 (FDD)

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	
B	Addition of feature	X
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: To define accuracies on the measurements needed for FDD-TDD Handover

Clauses affected: 10

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

10.1.1 PRIMARY COMMON CONTROL PHYSICAL CHANNEL MEASUREMENTS

These measurements consider *P-CCPCH RSCP* measurements. Only necessary for UEs supporting TDD.

10.1.1.1 Inter frequency test parameters

In this case the cells are on different frequencies. The table 10-x and notes 1-4 define the limits of signal strengths and code powers, where the requirement is applicable.

Table 10-x

Parameter	**Unit**	**Cell 1**
UTRA RF Channel number		Channel 1
Timeslot		k
P-CCPCH Ec/Ior	dB	-3
OCNS	dB	[]
Îor/Ioc	DB	[ ]
Ioc	dBm/ 3.84 MHz	Note 4
Range 1:Io *Range 2: Io*	dBm	-94 ... –70 -94... –50
Propagation condition	-	AWGN

Note 1: *P-CCPCH_RSCP* ≥ -102 dBm.

Note 3: | *Io – P-CCPCH_Ec/Ior*| ≤ [20] dB.

Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

10.1.2 P-CCPCH RSCP

Absolute accuracy requirements

The absolute accuracy of P-CCPCH RSCP is defined as measured one code power after de-spreading.

Range 1

Parameter	Value	Accuracy	
		Normal conditions	Extreme conditions
P-CCPCH_RSCP	dB	± 6	± 9

Range 2

Parameter	Value	Accuracy	
		Normal conditions	Extreme conditions
P-CCPCH_RSCP	dB	± 8	± 11

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.133	CR	007	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG RAN #7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: UTRAN measurement requirement update.

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The measurement definitions were incomplete. This CR will update the missing definitions

Clauses affected: Section 10.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications	X	→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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<--------- double-click here for help and instructions on how to create a CR.

10.2 Measurements Performance for UTRAN

10.2.1 RSSI

~~Requirement~~	~~Relative accuracy:~~ ~~FFS~~

The measurement period shall be [100] ms.

~~10.1.6.2~~10.2.1.1 Absolute accuracy requirement

~~Table 10-14~~

Parameter	Accuracy	Range
Io	± 4 dB	For levels <= -74 dBm

~~10.1.6.3~~10.2.1.2 Relative accuracy requirement

~~Table 10-14~~

Parameter	Accuracy	Range
Io	± [0.5] dB	For changes <= ±5.0dB for levels <= –74dBm

10.2.2 SIR

The measurement period shall be [100] ms.

10.2.2.1 Accuracy requirement

~~Table 10-14~~

Parameter	Accuracy	Range
SIR	± 3 dB	For -7<SIR<7 dB when RSSI > -105 dBm

~~Requirement~~	~~Absolute accuracy:~~ ~~+/- 3dB for 0<SIR<10 dB~~ ~~when RSSI>= -105dBm.~~

10.2.3 Transmitted carrier power

The measurement period shall be [100] ms.

10.2.3.1 Relative accuracy requirement

Table 10-14

Parameter	Accuracy	Range
Ptot	± 5% units	For 5% ≤ Transmitted carrier power ≤95%

~~**Requirement**~~	~~**Absolute accuracy:**~~ ~~± 3dB over the full range.~~ ~~**Relative accuracy** (relative to the maximum transmit power):~~ ~~± []dB over the full range.~~

10.2.4 Transmitted code power

The measurement period shall be [100] ms.

10.2.4.1 Absolute accuracy requirement

Table 10-14

Parameter	Accuracy	Range
Pcode	± 3 dB	Over the full range

10.2.4.2 Relative accuracy requirement

Table 10-14

Parameter	Accuracy	Range
Io	± 2 dB	Over the full range

~~**Requirement**~~	~~**Absolute accuracy:**~~ ~~± 3dB over the full range.~~ ~~**Relative accuracy** (relative to the maximum transmit power):~~ ~~± 2dB over the full range.~~

10.2.5 Transport channel BLER

The measurement period shall be equal to the [TTI] of the transport channel.

10.2.5.1 Accuracy requirement

Table 10-14

Parameter	Accuracy	Range
BLER		

~~**Requirement**~~	~~-~~

10.2.6 Physical channel BER

The measurement period shall be equal to the [TTI] of the transport channel.

10.2.6.1 Accuracy requirement

Table 10-14

Parameter	Accuracy	Range
BER	+/- 10% of the absolute BER value.	

~~**Requirement**~~	~~+/-10% of the absolute BER value~~

10.2.7 Round trip time

The measurement period shall b e[100] ms.

10.2.7.1 Absolute accuracy requirement

Table 10-14

Parameter	Accuracy	Range
RTT	+/- 0.5 chip	[876, …, 2923.75] chips

~~**Requirement**~~	~~+/-0.5 chips period~~

11 Annex A Measurement Definition (Informative)

In this Annex the definitions of those Measurements, whose requirements are specified, in Section 10 of this specification are reported for information. The complete list of measurements is specified in TSG RAN WG2 TS25.302 "Services Provided by Physical Layer". ". The physical layer measurements for FDD are described and defined in TSG RAN WG1 TS25.215 “Physical layer – Measurements (FDD)”.

11.1 Measurements Performance for UE

11.1.1 CPICH RSCP

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the CPICH. The reference point for the RSCP is the antenna connector at the UE.

11.1.2 RSCP

[Editor’s Note: in accordance to RP-99564, while this measurement is agreed in TS 25.215 is not considered yet in TS 25.302; this measurement is here reported for consistency with TDD mode since during WG4#8 it was decided to consider this measurement for TDD]

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the DPCCH after RL combination. The reference point for the RSCP is the antenna connector at the UE.

11.1.3 ISCP

Note that it is not a requirement that the ISCP shall be possible to report to higher layers. The ISCP is defined in this section because it is included in the definition of SIR.

Definition	Interference Signal Code Power, the interference on the received signal after de-spreading. Only the non-orthogonal part of the interference is included in the measurement. The reference point for the ISCP is the antenna connector at the UE.

11.1.4 SIR

Definition	Signal to Interference Ratio, defined as the RSCP divided by ISCP. The SIR shall be measured on DPCCH after RL combination. The reference point for the SIR is the antenna connector of the UE.

11.1.5 UTRA carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a UTRAN downlink carrier. The reference point for the RSSI is the antenna connector at the UE.

11.1.6 GSM carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI is the antenna connector at the UE.

11.1.7 CPICH Ec/No

Definition	The received energy per chip divided by the power density in the band. The Ec/No is identical to RSCP/RSSI. Measurement shall be performed on the CPICH. The reference point for Ec/No is the antenna connector at the UE.

11.1.8 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block after RL combination. BLER estimation is only required for transport channels containing CRC. In connected mode the BLER shall be possible to measure on any transport channel. If requested in idle mode it shall be possible to measure the BLER on transport channel PCH.

11.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination. At most it shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.

11.1.10 UE transmitted power

Definition	The total UE transmitted power on one carrier. The reference point for the UE transmitted power shall be the UE antenna connector.

11.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). And OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.

11.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). And OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter

11.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.

11.1.14 Observed time difference to GSM cell

Definition	Time difference between the Primary CCPCH of the current cell and the timing of the GSM cell. The exact definition and further details on this parameter is contained in Chapter 9 of the TS25.302 "Services Provided by the Physical Layer".

11.2 Measurements Performance for UTRAN

11.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.

11.2.2 SIR

Definition	Signal to Interference Ratio, is defined as: (RSCP/ISCP)×SF. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.~~Signal to Interference Ratio, is defined as the RSCP divided by the ISCP. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.~~

11.2.3 Transmitted carrier power

Definition	Transmitted carrier power is the ratio between the total transmitted power and the maximum transmission power. Total transmitted power is the mean power [W] on one carrier from one UTRAN access point. Maximum transmission power is the mean power [W] on one carrier from UTRAN access point when transmitting at the configured maximum power for the cell~~, is the total transmitted power on one carrier from one UTRAN access point~~. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the total transmitted power measurement shall be the antenna connector. In case of Tx diversity the total transmitted power for each branch shall be measured.

11.2.4 Transmitted code power

Definition	Transmitted code power, is the transmitted power on one carrier, one scrambling code and one channelisation code. Measurement shall be possible on any channelisation code transmitted from the UTRAN access point. The reference point for the transmitted code power measurement shall be the antenna connector. In case of Tx diversity the transmitted code power for each branch shall be measured.

11.2.5 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block. Measurement shall be possible to perform on any transport channel after RL combination in Node B. BLER estimation is only required for transport channels containing CRC.

11.2.6 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination in Node B. It shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.

11.2.7 Round trip time

Note: The relation between this measurement and the TOA measurement defined by WG2 needs clarification.

Definition	Round trip time (RTT), is defined as RTT = $T_{RX} - T_{TX}$, where T_{TX} = The time of transmission of the beginning of a downlink DPCH frame to a UE. T_{RX} = The time of reception of the beginning (the first significant path) of the corresponding uplink DPCCH/DPDCH frame from the UE. Note: The definition of "first significant path" needs further elaboration. Measurement shall be possible on DPCH for each RL transmitted from an UTRAN access point and DPDCH/DPCCH for each RL received in the same UTRAN access point.

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25.133	CR	008	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG RAN#7	for approval	X	Strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: Requirements on parallel measurements

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: In TS 25.133 section 10 no requirements are specified for the amount of parallell measurements that can be performed by the UE. This CR addresses that issue.

Clauses affected: 10 Measurements Performance Requirements

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

New section to be included.

11 UE parallel measurements

11.1 General

The UE shall be able to perform parallel measurements according to table NEW-3.

In addition to the requirements in table NEW-3 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to table NEW-1.

Table NEW-1

Measurement quantity	**Number of parallel measurements possible to request from the UE**	**Minimum periodic reporting period (ms)**
Transport channel BLER	[1] per TrCh	[]
Physical channel BER *Editors Note: The precence of this measurement is depending on desicions in WG1.*	[1]	[]
DPCCH SIR	[1]	[]
UE transmitted power	[1]	[]
UE Rx-Tx time difference	[1] including timing to all radio links in active set	[]
SFN-SFN observed time difference type 2	[]	[]
UE GPS Timing of Cell Frames for LCS	[]	[]

Editors Note: The precence of the measurements for location services needs to be revised.

11.2 Parallel Measurement Requirements

Table NEW-2 Network scenarios

Case	**Network sceanrio**	**Number of UMTS carriers present**
1a	single carrier UMTS network with no interaction with GSM networks or other UMTS networks	1
2a	multi carrier UMTS network with no interaction with GSM networks	2
2b		2
2c		3
3a	single carrier UMTS network together with a GSM	1

3b	network	1
4a	multi carrier UMTS network together with a GSM network	2
4b		2
4c		3

Table NEW-3 Layer 1 parallel measurement capability

Case	**Intra-frequency CPICH RSCP or CPICH Ec/Io including cell search. Also the UTRA carrier RSSI shall be reported.**		**Inter-frequency CPICH RSCP or CPICH Ec/Io including cell search. Also one UTRA carrier RSSI per measured carrier shall be reported.**		**Inter-System GSM carrier RSSI**		**Filtering period setting (ms) Note 4**		
							Intra-freq.	Inter-freq	GSM
	Minimum number of neighbours to be reported to higher layers	Neighbour list size Note 1	Minimum number of neighbours to be reported to higher layers Note 2	Neighbour list size Note 3	Minimum number of neighbours to be reported to higher layers	Neighbour list size Note 1			
1a	[6]	[32]	[0]	[0]	[0]	[0]	[150]	-	-
2a	[6]	[20]	[4]	[12]	[0]	[0]	[150]	[240]	-
2b	[6]	[20]	[6]	[12]	[0]	[0]	[150]	[480]	-
2c	[6]	[16]	[4 + 4]	[8 + 8]	[0]	[0]	[150]	[480]	-
3a	[6]	[16]	[0]	[0]	[16]	[16]	[150]	-	[480]
3b	[6]	[12]	[0]	[0]	[20]	[20]	[150]	-	[960] Note 5
4a	[6]	[12]	[3]	[10]	[10]	[10]	[150]	[240]	[480]
4b	[6]	[12]	[6]	[10]	[10]	[10]	[150]	[480]	[960] Note 5
4c	[6]	[10]	[3 + 3]	[6 + 6]	[10]	[10]	[150]	[480]	[480]

Note 1. The total number of neighbours is in total [32]. The detailed share between intra-, inter and GSM cells is FFS.

Note 2. The number of neighbours to be reported is given in the form X or X+Y, where X and Y represents the number of neighbours to report from each carrier respectively, e.g. 4+4 indicates that 4 neighbours shall be measured on each of two inter-frequency carriers and 4 indicates that 4 neighbours shall be measured from 1 inter-frequency carrier.

Note 3. In the same manner as in Note 2, the number of neighbours in the neighbour list is given in the form X or X+Y, where X and Y represents the number of neighbours in the list for each carrier respectively.

Note 4. When the parameters for higher layer filtering is completed by WG2 this column will be updated to indicate the specific parameter setting for the in WG2 (25.331) specified parameters that controls the filtering.

Note 5. The GSM reporting period is 480 ms. In case of multiple measurement tasks, the reporting period of each single neighbour can be a multiple of 480 ms. Reporting period of each neighbour can be irregular.

Pattern for compressed mode measurements:

7 slot gap every 3rd frame, double frame method, 8 gaps / 240 ms, 16 gaps/ 480ms.

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25.133	CR	009	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG RAN #7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: Inclusion on transport channel BER.

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: As a consequence to WG1 changes.

Clauses affected: Section 10, 10.1.

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications	X	→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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10.2 Measurements Performance for UTRAN

10.2.1 RSSI

Requirement	**Relative accuracy:** .FFS

10.2.2 SIR

Requirement	**Absolute accuracy**: +/- 3dB for 0<SIR<10 dB when RSSI>=-105dBm.

10.2.3 Transmitted carrier power

Requirement	**Absolute accuracy:** +-3dB over the full range. **Relative accuracy** (relative to the maximum transmit power): +- []dB over the full range.

10.2.4 Transmitted code power

Requirement	**Absolute accuracy:** +-3dB over the full range. **Relative accuracy** (relative to the maximum transmit power): +- 2dB over the full range.

10.2.5 Transport channel BLER

Requirement	-

10.2.6 Transport Channel BER

The measurement period shall be equal to the [TTI] of the transport channel.

10.2.6.1 Accuracy requirement

Table 10-14

Parameter	Accuracy	Range
TrpBER	+/- []% of the absolute BER value.	

~~10.2.6~~10.2.7 Physical channel BER

The measurement period shall be equal to the [TTI] of the transport channel.

10.2.7.1 Accuracy requirement

Table 10-14

Parameter	Accuracy	Range
BER	+/- 10% of the absolute BER value.	

~~**Requirement**~~	~~+/- 10% of the absolute BER value~~

~~10.2.7~~10.2.8 Round trip time

Requirement	+/-0.5 chips period

11 Annex A Measurement Definition (Informative)

In this Annex the definitions of those Measurements, whose requirements are specified, in Section 10 of this specification are reported for information. The complete list of measurements is specified in TSG RAN WG2 TS25.302 "Services Provided by Physical Layer". ". The physical layer measurements for FDD are described and defined in TSG RAN WG1 TS25.215 “Physical layer – Measurements (FDD)”.

11.1 Measurements Performance for UE

11.1.1 CPICH RSCP

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the CPICH. The reference point for the RSCP is the antenna connector at the UE.

11.1.2 RSCP

[Editor’s Note: in accordance to RP-99564, while this measurement is agreed in TS 25.215 is not considered yet in TS 25.302; this measurement is here reported for consistency with TDD mode since during WG4#8 it was decided to consider this measurement for TDD]

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the DPCCH after RL combination. The reference point for the RSCP is the antenna connector at the UE.

11.1.3 ISCP

Note that it is not a requirement that the ISCP shall be possible to report to higher layers. The ISCP is defined in this section because it is included in the definition of SIR.

Definition	Interference Signal Code Power, the interference on the received signal after de-spreading. Only the non-orthogonal part of the interference is included in the measurement. The reference point for the ISCP is the antenna connector at the UE.

11.1.4 SIR

Definition	Signal to Interference Ratio, defined as the RSCP divided by ISCP. The SIR shall be measured on DPCCH after RL combination. The reference point for the SIR is the antenna connector of the UE.

11.1.5 UTRA carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a UTRAN downlink carrier. The reference point for the RSSI is the antenna connector at the UE.

11.1.6 GSM carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI is the antenna connector at the UE.

11.1.7 CPICH Ec/No

Definition	The received energy per chip divided by the power density in the band. The Ec/No is identical to RSCP/RSSI. Measurement shall be performed on the CPICH. The reference point for Ec/No is the antenna connector at the UE.

11.1.8 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block after RL combination. BLER estimation is only required for transport channels containing CRC. In connected mode the BLER shall be possible to measure on any transport channel. If requested in idle mode it shall be possible to measure the BLER on transport channel PCH.

11.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination. At most it shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.

11.1.10 UE transmitted power

Definition	The total UE transmitted power on one carrier. The reference point for the UE transmitted power shall be the UE antenna connector.

11.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). And OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.

11.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). And OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter

11.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.

11.1.14 Observed time difference to GSM cell

Definition	Time difference between the Primary CCPCH of the current cell and the timing of the GSM cell. The exact definition and further details on this parameter is contained in Chapter 9 of the TS25.302 "Services Provided by the Physical Layer".

11.2 Measurements Performance for UTRAN

11.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.

11.2.2 SIR

Definition	Signal to Interference Ratio, is defined as the RSCP divided by the ISCP. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.

11.2.3 Transmitted carrier power

Definition	Transmitted carrier power, is the total transmitted power on one carrier from one UTRAN access point. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the total transmitted power measurement shall be the antenna connector. In case of Tx diversity the total transmitted power for each branch shall be measured.

11.2.4 Transmitted code power

Definition	Transmitted code power, is the transmitted power on one carrier, one scrambling code and one channelisation code. Measurement shall be possible on any channelisation code transmitted from the UTRAN access point. The reference point for the transmitted code power measurement shall be the antenna connector. In case of Tx diversity the transmitted code power for each branch shall be measured.

11.2.5 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block. Measurement shall be possible to perform on any transport channel after RL combination in Node B. BLER estimation is only required for transport channels containing CRC.

11.2.6 Transport Channel BER

Definition	The transport channel BER is an estimation of the average bit error rate (BER)) of RL-combined DPDCH data. The transport channel (TrCH) BER is measured from the data considering only non-punctured bits at the input of the channel decoder in Node B. It shall be possible to report an estimate of the transport channel BER for a TrCH after the end of each TTI of the TrCH. The reported TrCH BER shall be an estimate of the BER during the latest TTI for that TrCH. Transport channel BER is only required to be reported for TrCHs that are channel coded.

~~11.2.6~~11.2.7 Physical channel BER

Definition	The Physical channel BER is an estimation of the average bit error rate (BER) on the DPCCH after RL combination in Node B. An estimate of the Physical channel BER shall be possible to be reported after the end of each TTI of any of the transferred TrCHs. The reported physical channel BER shall be an estimate of the BER during the latest TTI.~~The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination in Node B. It shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.~~

~~11.2.7~~11.2.8 Round trip time

Note: The relation between this measurement and the TOA measurement defined by WG2 needs clarification.

Definition	Round trip time (RTT), is defined as RTT = $T_{RX} - T_{TX}$, where T_{TX} = The time of transmission of the beginning of a downlink DPCH frame to a UE. T_{RX} = The time of reception of the beginning (the first significant path) of the corresponding uplink DPCCH/DPDCH frame from the UE. Note: The definition of "first significant path" needs further elaboration. Measurement shall be possible on DPCH for each RL transmitted from an UTRAN access point and DPDCH/DPCCH for each RL received in the same UTRAN access point.