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Technical Specification

Universal Mobile Telecommunications System (UMTS);
Requirements for Support
of Radio Resource Management (FDD)
(3G TS 25.133 version 3.2.0 Release 1999)

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650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

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Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

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1 Scope

The present document 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.

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

[2] spare

[3] TS 25.101: "UE Radio transmission and reception (FDD)".

[4] TS 25.104: "BTS Radio transmission and reception (FDD)".

[5] TS 25.102: "UE Radio transmission and reception (TDD)".

[6] TS 25.105: "BTS Radio transmission and reception (TDD)".

[7] TS 25.103: "RF parameters in support of RRM".

[8] TS 25.141: "Base station conformance testing (FDD)".

[9] TS 25.142: "Base station conformance testing (TDD)".

[10] TS 25.113: "Base station EMC".

[11] TRS 25.942: "RF System scenarios".

[12] TR 25.922: "RRM Strategies".

[13] TS 25.215: "Physical Layer Measurements (FDD)".

[14] TS 25.225: "Physical Layer Measurements (TDD)".

[15] TS 25.302: "Services provided by Physical Layer".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

The main general definitions strictly related to the Transmission and Reception characteristics but important also for the present document 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 symbol applies:

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

3.3 Abbreviations

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

ACPR	Adjacent Channel Power Ratio
BER	Bit Error Ratio
BLER	Block Error Ratio
BS	Base Station
CW	Continuous wave (unmodulated signal)
DL	Down link (forward link)
EIRP	Equivalent Isotropic Radiated Power
FDD	Frequency Division Duplexing
FER	Frame Error Ratio
PPM	Parts Per Million
RRM	Radio Resource Management
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: Cell selection and cell reselection delays are applicable when the repetition period of all relevant system information blocks is not more than 1280 ms and the length of DRX cycle is not longer than 640 ms.

4.2 RF Cell Selection Scenario

NOTE: Some performance requirements in agreed scenarios are added into this subclause. More scenarios will be added later.

4.2.1 Cell Selection Single carrier Single cell case

4.2.1.1 Cell Selection delay

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.

4.2.1.1.1 Test parameters

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

Table 4-1: Cell selection single carrier single cell case

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	-0.941
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Qqualmin	dB	[ ]
Qrxlevmin	dBm	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]

4.2.1.1.2 Minimum Requirement

Cell selection shall be correct in more than [X %] of the cases. Cell selection is correct if within [5] seconds the UE camps on the cell.

4.2.2 Cell Selection multi carrier multi cell case

4.2.2.1 Cell selection delay

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.

4.2.2.1.1 Test parameters

The stored information of the last registered PLMN is utilised 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: Cell selection multi carrier multi cell case

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	-0.941	-0.941	-0.941	-0.941-	-0.941
$\hat{I}_{or}/I_{oc}$	dB	5.3	2.3	-1.7	6.3	14.3	2.3
I_{oc}	dBm/3.84 MHz	-70			-70		
CPICH_Ec/Io	dB	-13	-16	-20	-19	-11	-23
Propagation Condition		AWGN			AWGN		
Qqualmin	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Qrxlevmin	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
$Qoffset_{s,n}$	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]	C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]	C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]	C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]	C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]	C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]

4.2.2.1.2 Minimum requirement

Cell selection shall be correct in more than [X%] of the cases. 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 subclause. More scenarios will be added later.

4.3.1 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 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.

4.3.1.1.1 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: Cell re-selection single carrier multi-cell case

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/3.84 MHz	–70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_MAX_RACH	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
$Qoffset_{s,n}$	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintrasearch	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.

4.3.1.1.2 Minimum requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [5] seconds the UE re-reselects a new cell, which fulfils the cell re-selection criteria.

4.3.1.1.3 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].]

4.3.1.2 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 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.

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_MAX_RACH	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
$Qoffset_{s,n}$	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[2]		[2]		[2]		[2]		[2]		[2]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

TEMP_OFFSET	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Treselection	s	[5]	[5]	[5]	[5]	[5]	[5]
Sintrasearch	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sintersearch	dB	[-8]	[-8]	[-8]	[-8]	[-8]	[-8]

Time T1 is X seconds and T2 is Y seconds.

4.3.2.1.2 Minimum 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 fulfils the cell re-selection criteria and stays steady on that cell until the channel conditions are changed again.

4.3.3 UTRAN to GSM Cell Re-Selection

NOTE 1: These requirements are depending on supported UE capabilities.

NOTE 2: 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 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.

4.3.3.1.1 Test parameters

Table 4-5: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	10.3	7.3
I_{oc}	dBm/3.84 MHz	–70	
CPICH_Ec/Io	dB	-13	-16
CPICH_RSCP	dBm	[L1]	[L2]
Propagation Condition		AWGN	
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	[ ]	
Qrxlevmin	dBm	[ ]	
UE_TXPWR_MAX_RACH	dBm	[ ]	
$Qoffset_{s,n}$	dB	C1, C2: [ ]	
Qhyst	dB	[ ]	
PENALTY_TIME	s	C2: [ ]	
TEMP_OFFSET	dB	C2: [ ]	
Treselection	s	[ ]	
$Ssearch_{RAT}$	dB	[ ]	

Table 4-6: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-70	-60
RXLEV_ACCESS_MIN	dBm	[ ]	
MS_TXPWR_MAX_CCH	dBm	[ ]	

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.

4.3.3.1.2 Minimum requirement

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

5 RRC Connection mobility

5.1 Handover

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.

5.1.1 FDD Soft/softer Handover

5.1.1.1 General

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

5.1.1.1.1 Maximum number of cells to be reported

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

5.1.1.1.2 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. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH . The delay uncertainty is twice the TTI of the uplink DCCH.

5.1.1.2 Event triggered reporting in AWGN propagation conditions

This test will derive that the terminal makes correct reporting of an event and that the measurement accuracy of the CPICH_Ec/Io and SFN-CFN observed timed difference between Cell 1 and Cell 2 is within defined limits in AWGN propagation condition..

5.1.1.2.1 Test parameters

The DL reference measurement channel 12.2 kbps as specified in Annex A, sub-clause A.3.1 of TS25.101 shall be used with power control turned on. Cell 1 is current active cell. The CPICH_Ec/Io level of Cell 1 is kept constant and the CPICH_Ec/Io level of Cell 2 is changed as illustrated in figure 5-1and table 5.1. Hysteresis, Threshold and Time to Trigger values are given in the table 5.1 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/Io and the SFN-CFN observed timed difference has to reported together with Event 1A 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.

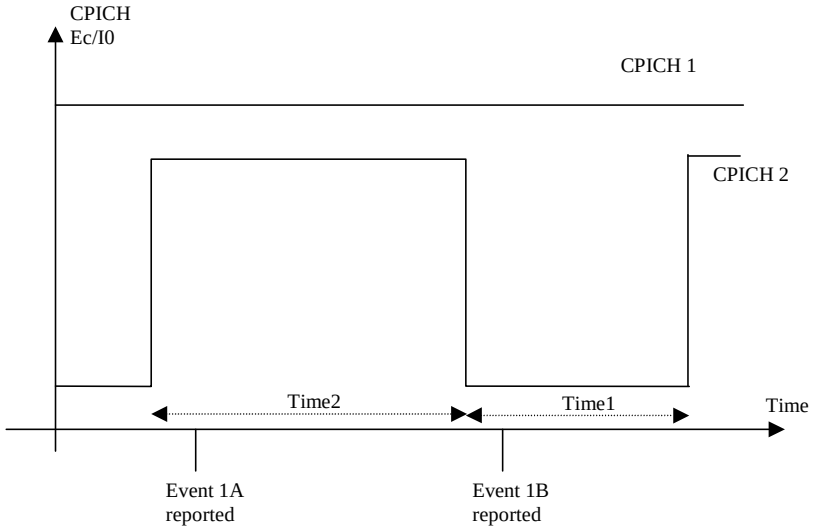

Figure 5-1: Illustration of parameters for soft handover measurement reporting test case

Table 5-1: 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		-17	
OCNS		-1.049		-1.049	
$\hat{I}_{or}/I_{oc}$	dB	0	6.97	-∞	5.97
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/Io	dB	-13	-13	-∞	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	ms	0			
Filter coefficient		0			
Propagation Condition	AWGN				

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

5.1.1.2.2 Minimum requirements

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

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

5.1.1.3 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 the test 4 cells are present where the $\hat{I}_{or}/I_{oc}$ level of Cell 1 and 2 is kept at a constant and the power level of cell 3 and 4 is changed over time by changing ($\hat{I}_{or}/I_{oc}$).

5.1.1.3.1 Test parameters

In figure 5-2 an illustration of the test case is shown with the parameters specified in table 5.2 and 5.3 . 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 SFN-CFN 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.

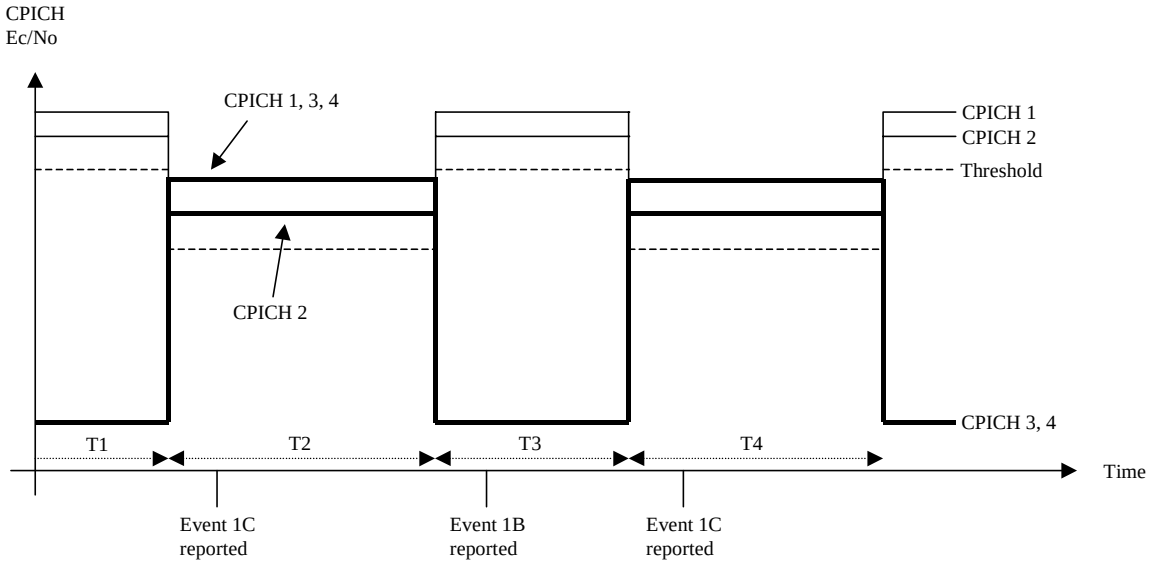

Figure 5.2: Illustration of the test case

Table 5.2: Parameters for Event triggered reporting of multiple neighbours in AWGN

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	ms	0							
Filter cofficient		0							
Propagation Condition		AWGN							

Table 5-3: Parameters for Event triggered reporting of multiple neighbours in AWGN

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	-∞	18.5	-∞	18.5	-∞	17.5	-∞	17.5
I_{oc}	dBm/3.84 MHz	-85							
CPICH_Ec/Io	dB	-∞	-15.5	-∞	-15.5	-∞	-16.5	-∞	-16.5
Threshold	dB	3							
Hysteresis	dB	0							
Time to Trigger	ms	0							
Filter coefficient		0							
Propagation Condition		AWGN							

5.1.1.3.2 Minimum requirements

In table 5-4 the test case is described in detail for each time interval T1 to T4 and Minimum Requirements are given for each time interval.

Table 5-4: Minimum requirements for Event triggered reporting of multiple neighbours in AWGN

Time	Value	Cell 1 to 2	Cell 3 to 4
T1	>20 s	Included in the active set, keeping a constant Îor/Ioc level over the test.	Not visible, e.g. the UE has never had synchronisation to them before.
T2	10 s		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 SFN-CFN 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 SFN-CFN 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 SFN-CFNobserved 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 SFN-CFN 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 triggered. Together with the event a report containing measured CPICH Ec/Io for all remaining 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 SFN-CFN 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 SFN-CFN 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 SFN-CFN observed time difference for Cell 4 shall have an accuracy of ±[Y] chips in [90] % of the reports.

5.1.1.4 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 CPICH_Ec/Io level of Cell 1 is kept constant and the power level of Cell 2 is changed using ($\hat{I}_{or}/I_{oc}$).

5.1.1.4.1 Test parameters

The test parameters are specified in table 5-5. 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 shall be used. Only the event number is reported in this case. New measurement control information, which defines neighbour cells etc., is sent always during time period Time 1. The number of neighbour cells in the measurement control information is 24.

Table 5-5: 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	6.97	-∞	5.97
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/Io	dB	-13	-13	-∞	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	ms	0			
Filter coefficient		0			
Propagation Condition	Case 5 as specified in Annex B of TS25.101				

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

5.1.1.4.2 Minimum requirement

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

5.1.1.5 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.

5.1.1.5.1 Test parameters

The test parameters are specified in table 5-6. 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, Time to Trigger values and reporting period for active cell 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 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 5-6: 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	1.68	-3.32
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-18
Threshold	dB	3	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Reporting period	ms	TBD	
Filter coefficient		0	
Propagation Condition	AWGN		

5.1.1.5.2 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.

5.1.1.6 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.

5.1.1.7 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 5.7 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 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.

5.1.2.1 General

5.1.2.1.1 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.

5.1.2.1.2 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. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH . The delay uncertainty is twice the TTI of the uplink DCCH.

5.1.2.1.3 Test parameters for DL compressed mode

The DL reference measurement channel 12.2 kbps shall be used, with power control turned on Test parameters for DL compressed mode are given in Annex A5 (table A-26) of TS25.101.

5.1.2.2 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 unused frequency. 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 Test parameters

The CPICH_Ec/Io 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 Figure5-3. Hysteresis, Absolute threshold and Time to Trigger values are given in the table 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 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.

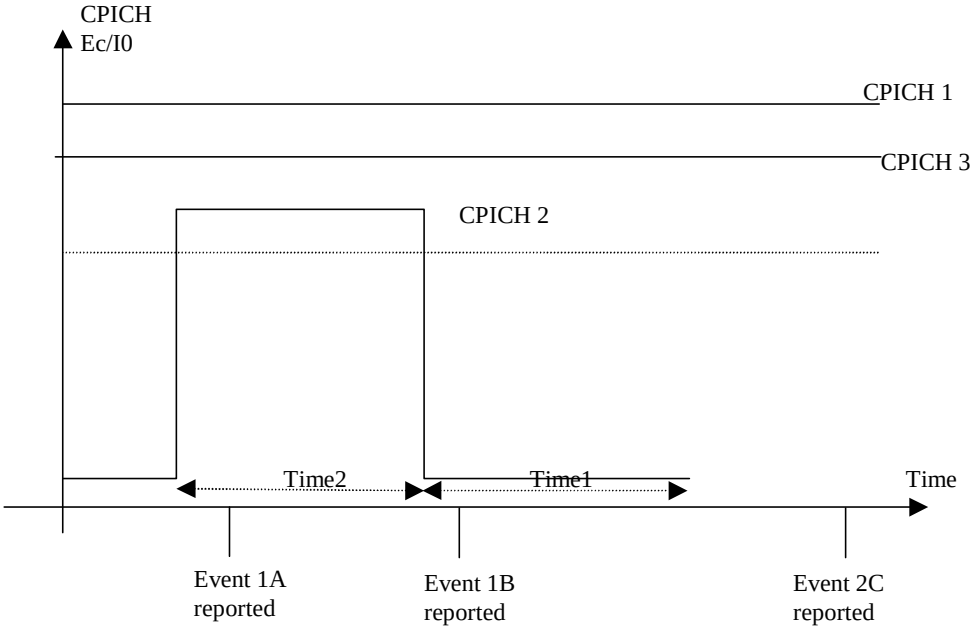

Figure 5-3: Illustration of parameters for handover measurement reporting test case

Table-5-8: 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	-∞	2.39	-1.8	-1.8
I_{oc}	dBm/3.84 MHz	-70				-70	
CPICH_Ec/Io	dB	-13	-13	-∞	-15	-14	-14
Absolute Threshold (Ec/No)	dB	-18					
Hysteresis	dB	0					
Time to Trigger	ms	0					
Filter coefficient		0					
Propagation Condition		AWGN					

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

5.1.2.2.2 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 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 CPICH_Ec/Io level of Cell 1 and Cell 2 are kept constant

5.1.2.3.1 Test parameters

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 5-9: 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	-1.8
I_{oc}	dBm/3.84 MHz	-70	-70
CPICH_Ec/Io	dB	-13	-14
Absolute Threshold (Ec/No)	dB	-18	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Propagation Condition	Case 5 as specified in Annex B of TS25.101		

5.1.2.3.2 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.

5.1.2.4 Hard Handover Delay

When the UE receives a RRC message that implies a hard handover (PHYSICAL CHANNEL RECONFIGURATION, RADIO BEARER SETUP, RADIO BEARER RECONFIGURATION, RADIO BEARER RELEASE, or TRANSPORT CHANNEL RECONFIGURATION), it shall be ready to transmit on the new channel within [X ms] from the last TTI containing the RRC command. However, if the command includes an indicated starting time, the UE shall be ready to transmit on the new channel at the designated starting time, or within [X ms], whichever is the later. The interruption time, i.e. the time between the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than the value in table 5-10. The ready to transmit means that the UE should initiate L1 uplink synchronisation. This hard handover delay does not include a delay due to SFN decoding of the new cell in case it is needed.

The hard handover delay requirements are defined in the table (5-10).

Table 5-10: FDD/FDD hard handover delay

Number of new cells present in the handover command message	Maximum hard handover delay [ms]	
	Cells in neighbour list and reported to UTRAN	Cells outside neighbour cell list
1	[20]	[4000]
2	[]	[]
3	[]	[]
4	[]	[]
5	[]	[]
6	[]	[]

5.1.2.5 Cell Re-selection in Cell_FACH

NOTE: For Inter-frequency cell re-selection in Cell_FACH state, the cell re-selection delay is dependent on the amount of Measurement Occasions that is provided by the network.

Cell selection and cell reselection delays are applicable when the repetition period of all relevant system information blocks is not more than 1280 ms.

5.1.2.5.1 Cell re-selection single carrier multi cell case

5.1.2.5.1.1 Cell re-selection delay

When the UE is camped in Cell_FACH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.5.1.2 Test parameters

Table 5-11: Cell Re-selection in Cell_FACH

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/3.84 MHz	–70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_ MAX_RACH	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qoffset	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintrasearch	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.

5.1.2.5.1.3 Minimum requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.5.2 Cell re-selection multi carrier multi cell case

NOTE: The scheduling of Measurement Occasions needs to be defined for the purpose of these scenarios.

5.1.2.5.2.1 Cell re-selection delay

When the UE is camped in Cell_FACH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.5.2.2 Test Parameters

Table 5-12: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_ and_reselection_ quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_ MAX_RACH	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qoffset	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintersearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

Time T1 is X seconds and T2 is Y seconds.

5.1.2.5.2.3 Minimum requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.6 Cell Re-selection in Cell_PCH

Cell selection and cell reselection delays are applicable when the repetition period of all relevant system information blocks is not more than 1280 ms and the length of DRX cycle is not longer than [640] ms.

5.1.2.6.1 Requirements for Cell re-selection single carrier multi cell case

5.1.2.6.1.1 Cell re-selection delay

When the UE is camped in Cell_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.6.1.2 Test Parameters

Table 5-13: Cell re-selection single carrier multi cell case

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/3.84 MHz	–70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_ MAX_RACH	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qoffset	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintrasearch	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.

5.1.2.6.1.3 Performance Requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [5] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.6.5 Cell re-selection multi carrier multi cell case

5.1.2.6.5.1 Cell re-selection delay

When the UE is camped in Cell_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.6.5.2 Test Parameters

Table 5-14: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_ and_reselection_ quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_ MAX_RACH	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qoffset	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintersearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

Time T1 is X seconds and T2 is Y seconds.

5.1.2.6.5.3 Minimum Requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.7 Cell Re-selection in URA_PCH

Cell selection and cell reselection delays are applicable when the repetition period of all relevant system information blocks is not more than 1280 ms and the length of DRX cycle is not longer than [640] ms.

5.1.2.7.1 Requirements for Cell re-selection single carrier multi cell case

5.1.2.7.1.1 Cell re-selection delay

When the UE is camped URA_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.7.1.2 Test Parameters

Table 5-15: Cell re-selection single carrier multi cell case

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/3.84 MHz	–70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_ MAX_RACH	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qoffset	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

All cells shall belong to different UTRAN Registration Areas (URA)

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.

5.1.2.7.1.3 Minimum Requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.7.2 Requirements for Cell re-selection multi carrier multi cell case

5.1.2.7.2.1 Cell re-selection delay

When the UE is camped in URA_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.7.2.2 Test Parameters

Table 5-16: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_ and_reselection_ quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_ MAX_RACH	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qoffset	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintersearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

All cells shall belong to different UTRAN Registration Areas (URA)
Time T1 is X seconds and T2 is Y seconds.

5.1.2.7.2.3 Minimum Requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.3 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.

5.1.3.1 General

5.1.3.1.1 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.

5.1.3.1.2 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.

5.1.3.1.3 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 A.4 of TS25.101.

5.1.3.2 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.

5.1.3.2.1 Test parameters

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 5-16: Correct reporting of TDD neighbours in AWGN

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	ms	[ ]					
Filter coefficient		[ ]					
Propagation Condition		AWGN					

5.1.3.2.2 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 clause 8.

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

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

5.1.3.3 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 5-17: FDD/TDD handover delay

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

5.1.4 Handover 3G to 2G

5.1.4.1 Handover to GSM

The requirements in this section shall apply to multi-RAT UE.

5.1.4.1.1 BSIC Verification

Note: The definition of the BSIC verification will be inserted when it is clarified.

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in GSM 05.05.

5.1.4.1.2 Switching requirements

When the UE receives a RRC INTER-SYSTEM HANDOVER COMMAND it shall be ready to transmit on the new channel within 120 ms from the last TTI containing the RRC command, unless the access is delayed to an indicated starting time, in which case it shall be ready to transmit on the new channel at the designated starting time, or within 120 ms, whichever is the later. The interruption time, i.e. the time between the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than 40 ms.

The definition of “ready to transmit” is specified in GSM 05.10.

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 minimum delay requirement

In this sub clause, 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.

6 RRC Connection Control

6.1 Requirements for RRC Re-establishment

6.1.1 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 within $T_{RE\text{-}ESTABLISH}$ seconds from when the CPHY-Out-Of-Synch primitive indicates lost synchronisation. The RRC Re-establishment delay requirement ($T_{RE\text{-}ESTABLISH\text{-}REQ}$) is defined as the time between the moment when erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH. This is 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.

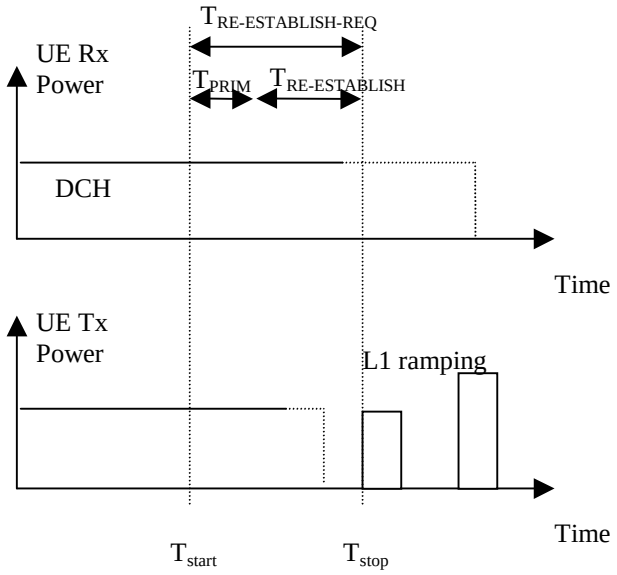

Figure 6.1: RRC Connection Re-establishment Requirement

6.1.1.1 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. 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, sub-clause 4.3.1.1.1 System information shall be provided in the same manner as for the test for cell re-selection, sub-clause 4.3.1.1.1.

The following additional parameters are needed:

Table 6-1: Test parameters for RRC connection re-establishment

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

6.1.1.2 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.

6.1.1.3 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.

6.1.1.4 Minimum requirements

RRC Re-establishment is correct if within $T_{RE\text{-}ESTABLISH\text{-}REQ}$ seconds the UE tries to re-establish the RRC connection with the target cell. $T_{RE\text{-}ESTABLISH\text{-}REQ}$ is defined in Table 6.2.

Table 6.2: Requirements for RRC Re-establishment

	Test 1	Test 2
Intra Frequency, T313=0	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 1000 ms	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 3200 ms
Intra Frequency, T313=3	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 4000 ms	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 6200 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 sub-clause specifies time delay requirements on Physical Channel Reconfiguration and Transport Channel configuration in different reconfiguration cases.]

6.3 Requirements for Random Access

The UE shall have capability to calculate initial power according to the open loop algorithm and apply this power level at the first preamble and increase the power on additional preambles. The UE shall stop transmit preambles upon a ACK/NACK on the AICH has been received or if the maximum number of preambles within on cycle has been reached. Upon an ACK has been received the UE shall transmit a message otherwise the ramping procedure shall be repeated.

6.3.1 Test Parameters

Table 6-3: RF Parameters for Random Access test

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

Table 6-4: UE parameters for Random Access test

Parameter	Unit	Value
RACH Transport Format IEs - Number of Transport blocks - Octet mode RLC size info (i.e. RLC block size) - Transmission time interval - Type of channel coding - Coding Rate - Rate matching attribute - CRC size	 ms bits	 [] [] [10] [] [] [] []
Access Service Class (ASC) *– PRACH partition* *– Persistence value*	 0..1	 [] []
Maximum number of preamble ramping cycles (M_{max}).		[2]
Maximum number of preambles in one preamble ramping cycle (Preamble Retrans Max)		[20]
The backoff time T_{B01} - T_{B01min} - T_{B01max}	 ms ms	 [] []
Power step when no acquisition indicator is received (Power offset P0)	dB	[3]
Power offset between the last transmitted preamble and the control part of the message (Power offset P p-m)	dB	[0]

Table 6-5: UTRAN parameters for Random Access test

Parameter	Unit	Value
RACH Transport Format IEs		
- Number of Transport blocks -		[]
Octet mode RLC size info (i.e. RLC block size)		[]
- Transmission time interval	ms	[10]
- Type of channel coding		[]
- Coding Rate		[]
- Rate matching attribute		[]
- CRC size	bits	[]
Primary CPICH DL TX power	dBm	[]
UL interference	dBm	[noise floor]
Constant value	dB	[0]

6.3.2 Correct behaviour when receiving an ACK

The UE shall stop transmitting preambles upon a ACK on the AICH has been received and then transmit a message. An ACK shall be transmitted after the [10] preambles have been received by the UTRAN.

6.3.2.1 Minimum requirement

The absolute power applied to the first preamble shall be [-30 dBm] with an accuracy as specified in table 6.3 of 25.101 [3]. The relative power applied to additional preambles shall have an accuracy as specified in section 6.5.2.1 of 25.101 [3].

The UE shall transmit [10] preambles and [1] message.

6.3.3 Correct behaviour when receiving an NACK

The UE shall stop transmitting preambles upon a NACK on the AICH has been received and then repeat the ramping procedure. The NACK shall be transmitted after the [10] preambles have been received by the UTRAN.

6.3.3.1 Minimum requirement

The UE shall transmit [10] preambles in the first ramping cycle and no transmission shall be done by the UE within [] ms after the NACK has been transmitted by the UTRAN. Then the UE shall start the second preamble ramping cycle.

The relative power increase applied to the first preamble of the second cycle shall have an accuracy of +/- [] dB (or +/- [] dB in extreme conditions). The power increase shall be compared to the last preamble of the first cycle.

6.3.4 Correct behaviour at Time-out

The UE shall stop transmit preambles when reaching the maximum number of preambles allowed in a cycle. The UE shall then repeat the ramping procedure until the maximum number of preamble ramping cycles are reached. No ACK/NACK shall be sent by UTRAN during this test.

6.3.4.1 Minimum requirements

The UE shall transmit [2] preambles cycles, consisting of [20] preambles in each preamble cycle.

6.3.5 Correct behaviour when reaching maximum transmit power

The UE shall not exceed the maximum transmit power specified by the UTRAN. No ACK/NACK shall be sent by UTRAN during this test.

6.3.5.1 Minimum Requirements

The absolute power of the preambles belonging to the first or second preamble cycle shall not exceed [15] dBm with an accuracy of +/-[] dB (or +/- [] dB in extreme conditions).

7 Timing characterisitics

7.1 UE Transmit Timing

7.1.1 Initial transmission timing, Maximum timing adjustment size, Minimum 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, minimum and maximum adjustment rate are defined in the following requirements.

7.1.1.1 Minimum requirement

For parameters specified in Table 7-1, 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 time when the first significant path of the corresponding downlink DPCCH/DPDCH frame is received plus 1024 chips.

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be ¼ Chip.

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 200 ms period, the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 200ms period.

Table 7-1: 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	-99
Information data rate	kbps	12.2
Relative delay of path received from cell 2 with respect to cell 1	µs	+2
Propagation condition	AWGN	

7.1.1.2 Example for the structure of the test procedure

The relevant soft handover parameters shall be set such that the UE enters soft handover with cell 1 and cell 2 when both cells are sending a signal.

a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

b) Test system introduces cell 2 into the test system at delay +2 µs from cell 1.

c) Test system verifies that cell 2 is added to the active set.

d) Test system shall verify that the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

e) Test system stops sending cell 1 signal.

f) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements until the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH cell 2.

g) Test system shall verify that the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

h) Test system starts sending cell 1 signal again with its original timing.

i) Test system verifies that cell 1 is added to the active set.

j) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements until the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

k) Test system shall verify that the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

7.2 UE Receive Timing

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

7.2.1 Minimum requirement

TBD

7.3 Signalling requirements

7.3.1 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 subclause. 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 has received the last complete TTI containing RRC message from UTRAN, until the UE successfully has performed actions according to the RRC message and the UE starts to transmit the first TTI of the RRC response message over the Uu interface. The signalling response delay excludes a delay uncertainty resulted when inserting the RRC response message to the TTI of the uplink DCCH . The delay uncertainty is twice the TTI of the uplink DCCH.

7.3.1.1 Test parameters

For all the tests the TTI for the DCCH shall be set to 40 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.

7.3.1.2 Minimum 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..

Delay parts related to actions are listed in table 7.2 below.

Table 7.2: Signalling response delay

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

NOTE: For all actions not listed the requirement on delay is FFS.

7.3.2 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.

7.3.2.1 Test parameters

For all the tests the TTI for the transport channel carrying DCCH shall be 40 ms.

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

The rest of the parameters are TBD.

7.3.2.2 Minimum requirements

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

8 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 clause for FDD, per each measurement the relevant requirements on the reporting range, granularity and 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, sub-clause 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.

8.1 Measurements Performance for UE

8.1.1 CPICH measurements

These measurement consider *CPICH RSCP*, *CPICH Ec/Io*, SFN-CFN observed time difference, SFN-SFN observed time difference type 1 and 2 and UE RX/TX timing measurements.

8.1.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. The table 8-1 and notes 1-4 define the limits of signal strengths and code powers, when the requirements are applicable.

Table 8-1: CPICH Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	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* $\geq$ -114 dBm.

NOTE 2: $|$ *CPICH_RSCP1 – CPICH_RSCP2* $| \leq 20$ dB.

NOTE 3: $|$ *Io – CPICH_Ec/Ior*$| \leq 20$ 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*.

8.1.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. The table 8-2 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.

Table 8-2: CPICH Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	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*.

8.1.2 CPICH RSCP

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

8.1.2.1 Intra frequency measurements accuracy

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

8.1.2.1.1 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 8-1 is present.

Table 8-3: *CPICH_RSCP Intra frequency absolute accuracy*

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH_RSCP	dB	1	± 6	± 9
	dB	2	± 8	± 11

8.1.2.1.2 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 8-4: *CPICH_RSCP Intra frequency relative accuracy*

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH_RSCP	dB	2	± 3	± 3

8.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state is [480 ms], and for CELL_FACH state [960 ms].

8.1.2.2.1 Relative accuracy requirement

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 8-2 is used. In this test cells 1and 2 are present.

Table 8-5: CPICH_RSCP Inter frequency relative accuracy

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH_RSCP	dB	2	± 6	± 6

8.1.2.3 CPICH RSCP measurement report mapping

The reporting range is for *CPICH RSCP* is from 115 ...-25 dBm.

In table 8-6 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-6

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV _00	CPICH RSCP <–115	dBm
CPICH_RSCP_LEV _01	-115 ≤ CPICH RSCP < –114	dBm
CPICH_RSCP_LEV _02	-114 ≤ CPICH RSCP < –113	dBm
…	…	…
CPICH_RSCP_LEV _89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV _90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV _91	-25 ≤ CPICH RSCP	dBm

8.1.3 CPICH Ec/Io

NOTE: This measurement is for Cell selection/re-selection and for handover evaluation.

8.1.3.1 Intra frequency measurements accuracy

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

8.1.3.1.1 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 8-1 is present.

Table 8-7: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH_Ec/Io	dB	2	± 4	± 4

8.1.3.1.2 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 8-1 are present.

Table 8-8: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH_Ec/Io	dB	2	± 3	± 3

8.1.3.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state is [480 ms], and for CELL_FACH state [960 ms].

8.1.3.2.1 Relative accuracy requirement

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 values are relative to active cell value. In this test the parameters in table 8-2 is used. In this test cells 1and 2 are present.

Table 8-9: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH_Ec/Io	dB	2	± 6	± 6

8.1.3.3 CPICH Ec/Io measurement report mapping

The reporting range is for *CPICH Ec/Io* is from -24 ...0 dB.

In table 8-10 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-10

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/Io < –24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/Io < –23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/Io < –23	dB
…	…	…
CPICH_Ec/No _48	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _49	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _50	0 ≤ CPICH Ec/Io	dB

8.1.4 DCH 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.

8.1.4.1 Test parameters

Table 8-11: DCH Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-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.*

8.1.5 UTRA Carrier RSSI

NOTE: The purpose of measurement is for Inter-frequency handover evaluation.

8.1.5.1 Test parameters

The table 8-12 and notes 1, 2 define the limits of signal strengths, where the requirement is applicable.

Table 8-12: UTRA RSSI Inter frequency test parameters

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.*

8.1.5.2 Absolute accuracy requirement

The measurement period is in CELL_DCH state [150 ms] for intra frequency measurements and [480 ms] for inter frequency measurements. For CELL_FACH state the measurement period is [600 ms].

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

Table 8-13: *Io* Inter frequency absolute accuracy

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
Io	dBm	1	± 4	± 7
	dBm	2	± 6	± 9

8.1.5.3 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 8-14 are used.

Table 8-14: Io Inter frequency relative accuracy

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
Io	dBm	1	± 7	± 11

8.1.5.4 UTRA Carrier RSSI measurement report mapping

The reporting range for *UTRA carrier RSSI* is from -100 ...-25 dBm.

In table 8-15 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-15

Reported value	Measured quantity value	Unit
UTRA_carrier_RSSI_LEV _00	UTRA carrier RSSI < –100	dBm
UTRA_carrier_RSSI_LEV _01	-100 ≤ UTRA carrier RSSI < –99	dBm
UTRA_carrier_RSSI_LEV _02	-99 ≤ UTRA carrier RSSI < –98	dBm
…	…	…
UTRA_carrier_RSSI_LEV _74	-27 ≤ UTRA carrier RSSI < -26	dBm
UTRA_carrier_RSSI_LEV _75	-26 ≤ UTRA carrier RSSI < -25	dBm
UTRA_carrier_RSSI_LEV _76	-25 ≤ UTRA carrier RSSI	dBm

8.1.6 GSM carrier RSSI

NOTE: The measurement is for Inter radio access technology (RAT) handover.

For terminals supporting this capability.

The accuracy requirement and reporting range is specified in GSM 05.08.

The measurement period in CELL_DCH state is [480 ms], and in CELL_FACH state [960 ms].

[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.]

8.1.7 Transport channel BLER

8.1.7.1 BLER measurement requirement

Transport channel BLER value shall be calculated from a window with the size equal to the reporting interval (see section 10.3.7.78 Periodical reporting criteria in TS 25.331).

8.1.7.2 Transport channel BLER measurement report mapping

The *Transport channel BLER* reporting range is from 0 to 1.

In table 8-16 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-16

Reported value	Measured quantity value	Unit
BLER_LOG _00	Transport channel BLER = 0	-
BLER_LOG _01	$-\infty <$ Log10(Transport channel BLER) < –4.03	-
BLER_LOG _02	-4.03 ≤ Log10(Transport channel BLER) < –3.965	-
BLER_LOG _03	-3.965 ≤ Log10(Transport channel BLER) < –3.9	-
…	…	…
BLER_LOG _61	-0.195 ≤ Log10(Transport channel BLER) < -0.13	-
BLER_LOG _62	-0.13 ≤ Log10(Transport channel BLER) < -0.065	-
BLER_LOG _63	-0.065 ≤ Log10(Transport channel BLER) ≤ 0	-

8.1.8 UE transmitted power

8.1.8.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 8-17 UE transmitted power absolute accuracy

Parameter	Unit	PUEMAX	
		24dBm	21dBm
UE transmitted power=PUEMAX	dB	+1/-3	±2
UE transmitted power=PUEMAX-1	dB	+1.5/-3.5	±2.5
UE transmitted power=PUEMAX-2	dB	+2/-4	±3
UE transmitted power=PUEMAX-3	dB	+2.5/-4.5	±3.5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dB	+3/-5	±4

Note 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in 3G TS 25.101 'UTRA (UE) FDD; Radio Transmission and Reception' section 6.2.1 table 6.1.

Note 2: UE transmitted power is the reported value.

For each empty slot created by compressed mode, the UE L1 shall respond with a value of –50 dBm.

8.1.8.2 UE transmitted power measurement report mapping

The reporting range for *UE transmitted power* is from -50 ...+33 dBm.

In table 8-18 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-18

Reported value	Measured quantity value	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power ≤ -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power ≤ 34	dBm

8.1.9 SFN-CFN observed time difference

Note: This measurement is for handover timing purposes to identify active cell and neighbour cell time difference.

8.1.9.1 Intra frequency measurement requirement

The measurement period in CELL_DCH state is [150 ms].

Test parameters are defined in section 8.1.1, in the table 8-1 and notes 1-4. During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

Table 8-19: Range 2

Parameter	Value	Accuracy
SFN-CFN observed time difference	chip	± 1

8.1.9.2 Inter frequency measurement requirement

The measurement period in CELL_DCH stage is [ ] ms.

Test parameters are defined in section 8.1.1, in the table 8-2 and notes 1-5. During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

Table 8-20: Range 2

Parameter	Value	Accuracy
SFN-CFN observed time difference	chip	± 1

8.1.9.3 CFN-SFN observed time difference measurement report mapping

The reporting range is for *CFN-SFN observed time difference* is from 0 ... 9830400 chip.

In table 8-21 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-21

Reported value	Measured quantity value	Unit
CFN-SFN_TIME _0000000	0 ≤ Time difference ≤ 1	chip
CFN-SFN_TIME _0000001	1 ≤ Time difference < 2	chip
CFN-SFN_TIME _0000002	2 ≤ Time difference < 3	chip
…	…	…
CFN-SFN_TIME _9830397	9830397 ≤ Time difference < 9830398	chip
CFN-SFN_TIME _9830398	9830398 ≤ Time difference < 980399	chip
CFN-SFN_TIME _9830399	9830399 ≤ Time difference ≤ 9830400	chip

8.1.10 SFN-SFN observed time difference

8.1.10.1 SFN-SFN observed time difference type 1

Note: This measurement is for identifying time difference between two cells.

8.1.10.1.1 Measurement requirement

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

The test paremeters are defined in section 8.1.1. During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

Table 8-22: Range 2

Parameter	Value	Accuracy
SFN-SFN observed time difference type1	Chip period	± 1

8.1.10.1.2 SFN_SFN observed time difference type 1 measurement report mapping

The reporting range is for *SFN-SFN observed time difference type 1* is from 0 ... 9830400 chip.

In table 8-23 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-23

Reported value	Measured quantity value	Unit
T1_SFN-SFN_TIME _0000000	0 ≤ Time difference ≤ 1	chip
T1_SFN-SFN_TIME _0000001	1 ≤ Time difference < 2	chip
T1_SFN-SFN_TIME _0000002	2 ≤ Time difference < 3	chip
…	…	…
T1_SFN-SFN_TIME _9830397	9830397 ≤ Time difference < 9830398	chip
T1_SFN-SFN_TIME _9830398	9830398 ≤ Time difference < 980399	chip
T1_SFN-SFN_TIME _9830399	9830399 ≤ Time difference ≤ 9830400	chip

8.1.10.2 SFN-SFN observed time difference type 2

Note: This measurement is for location service purposes to identify time difference between two cells. It is optional for terminal to support a subset of LCS methods.

Note: Requirement on the UE shall be reconsidered when the state of the art technology progress.

8.1.10.2.1 Test parameters

The test scenario is defined in section 8.1.1. During the test the time difference between Cell 1 and 2 can be set to value from –1279.75 to 1280 chips.

8.1.10.2.1.1 Test parameters for IPDL pattern

In table 8-24 shows the idle period parameters.

Table 8-24

Parameter	Unit	Cell 1	Cell 2
IP_Status	-	continous	continous
IP_Spacing	Frames	[10]	[10]
IP_Lenght	Symbols	10	10
IP_Offset	frame	NA	NA
Seed	integer	[13]	[4]
Burst_Start		NA	NA
Burst_Length		NA	NA
Burst_Freq		NA	NA

Note: The total signal *Io* will change only downwards during BS transmission gap.

8.1.10.2.2 Intra frequency measurement requirement accuracy without IPDL period active

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

Table 8-25: Range 2

Parameter	Value	Accuracy
SFN-SFN observed time difference type2	Chip period	± 0.5

8.1.10.2.3 Intra frequency measurement requirement accuracy with IPDL period active

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

Table 8-26: Range 2

Parameter	Value	Accuracy
SFN-SFN observed time difference type 2	Chip period	± 0.5

8.1.10.2.4 Inter frequency measurement requirement accuracy

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

Table 8-27: Range 2

Parameter	Value	Accuracy
SFN-SFN observed time difference type 2	Chip period	± 1

8.1.10.2.5 SFN-SFN observed time difference type 2 measurement report mapping

The reporting range is for *SFN-SFN observed time difference type 2* is from –1279.75 ... 1280 chip.

In table 8-28 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-28

Reported value	Measured quantity value	Unit
T2_SFN-CFN_TIME _00000	-1279.75 < Time difference ≤ -1279.50	chip
T2_SFN-CFN_TIME _00001	-1279.50 ≤ Time difference < -1279.25	chip
T2_SFN-CFN_TIME _00002	-1279.25 ≤ Time difference < -1279.00	chip
…	…	…
T2_SFN-CFN_TIME _10236	1279.25 ≤ Time difference < 1279.50	chip
T2_SFN-CFN_TIME _10237	1279.50 ≤ Time difference < 1279.75	chip
T2_SFN-CFN_TIME _10238	1279.75 ≤ Time difference ≤ 1280.00	chip

8.1.11 UE Rx-Tx time difference

Note: This measurement is used for call set up purposes to compensate propagation delay of DL and UL.

The UE shall adjust the transmission initial time based on measurement result. See also the detailed requirement for UE TX timing is in the subclause 7.3. This is intra frequency measurement. The test scenario is defined in section 8.1.1 in table 8-1 and notes 1-4.

The measurement period in CELL_DCH state is [100 ms]

8.1.11.1 Measurement requirement

Table 8-29: Range 2

Parameter	Value	Accuracy
UE RX-TX time difference	Chip period	± 1.5

8.1.11.2 UE Rx-Tx time difference measurement report mapping

The reporting range is for *UE Rx-Tx time difference* is from 876 ... 1170 chip.

In table 8-30 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-30

Reported value	Measured quantity value	Unit
RX-TX_TIME _0000	UE Rx-Tx Time difference < 876.00	chip
RX-TX_TIME _0001	876.00 ≤ UE Rx-Tx Time difference < 876.25	chip
RX-TX_TIME _0002	876.25 ≤ UE Rx-Tx Time difference < 876.50	chip
RX-TX_TIME _0003	876.50 ≤ UE Rx-Tx Time difference < 876.75	chip
…	…	…
RX-TX_TIME _1182	1171.25 ≤ UE Rx-Tx Time difference < 1171.50	chip
RX-TX_TIME _1183	1171.50 ≤ UE Rx-Tx Time difference < 1171.75	chip
RX-TX_TIME _1184	1171.75 ≤ UE Rx-Tx Time difference ≤ 1172.00	chip
RX-TX_TIME _1185	1172.00 ≤ UE Rx-Tx Time difference	chip

8.1.12 Observed time difference to GSM cell

Note: This measurement is used for defining the system time difference between UTRAN and GSM cells.

For terminal supporting this capability.

8.1.12.1 Test parameters

Note: The requirement scenario is FFS.

8.1.12.2 Measurement requirement

The time difference is defined as time difference between the beginning of UTRAN P-CCPCH with SFN equal to 0 and the starting point of 51-multiframe of BCCH in GSM system.

Table 8-31:

Parameter	Value	Accuracy
Observed time difference to GSM cell	Chip period	± 20

The measurement period in CELL_DCH state is [10 s].

8.1.12.3 Observed time difference to GSM cell measurement report mapping

The reporting range is for *Observed time difference to GSM cell* is from 0 ... 3060/13 ms.

In table 8-32 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-32

Reported value	Measured quantity value	Unit
GSM_TIME _0000	0 ≤ Observed time difference to GSM cell < 1x3060/(4096x13)	ms
GSM_TIME _0001	1x3060/(4096x13) ≤ Observed time difference to GSM cell < 2x3060/(4096x13)	ms
GSM_TIME _0002	2x3060/(4096x13)≤ Observed time difference to GSM cell < 3x3060/(4096x13)	ms
GSM_TIME _0003	3x3060/(4096x13) ≤ Observed time difference to GSM cell < 4x3060/(4096x13)	ms
…	…	…
GSM_TIME _4093	4093x3060/(4096x13) ≤ Observed time difference to GSM cell < 4094x3060/(4096x13)	ms
GSM_TIME _4094	4094x3060/(4096x13) ≤ Observed time difference to GSM cell < 4095x3060/(4096x13)	ms
GSM_TIME _4095	4095x3060/(4096x13) ≤ Observed time difference to GSM cell < 3060/13	ms

8.1.13 P-CCPCH measurements

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

8.1.13.1 Inter frequency test parameters

In this case the cells are on different frequencies. The table 8-33 and notes 1-3 define the limits of signal strengths and code powers, where the requirement is applicable. Cell 1 is the active cell (FDD) and cell 2 is a TDD cell.

Table 8-33 P-CCPCH inter frequency test parameters

Parameter	Unit	Cell 1	Cell 2
Timeslot Number		n.a.	k
UTRA RF Channel Number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	n.a.
PCCPCH_Ec/Ior	dB	-12	-3
SCH_Ec/Ior	dB	-12	-
SCH_t_{offset}		n.a.	-
PICH_Ec/Ior		-15	-
DPCH_Ec/Ior	dB	[ ]	[ ]
OCNS	dB	[To Be Calculated]	[ ]
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]
I_{oc}	dBm/3.84 MHz	Note 3	-70
Range 1:Io	dBm	-94 ... –70	-94 ... –70
Range 2: Io		-94... –50	-94... –50
Propagation condition	-	AWGN	AWGN

NOTE 1: *P-CCPCH_RSCP* ≥ -102 dBm.

NOTE 2: | *Io* – *P-CCPCH_Ec/Ior*| ≤ [20] dB.

NOTE 3: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

8.1.14 P-CCPCH RSCP

8.1.14.1 Absolute accuracy requirements

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

Table 8-34: P-CCPCH_RSCP Inter frequency absolute accuracy

Parameter	Value	Range	Accuracy	
			Normal conditions	Extreme conditions
P-CCPCH_RSCP	dB	1	± 6	± 9
	dB	2	± 8	± 11

8.1.14.2 P-CCPCH RSCP measurement report mapping

The reporting range is for *P-CCPCH RSCP* is from -115 ... -25 dBm.

In table 8-35 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-35

Reported value	Measured quantity value	Unit
PCCPCH_RSCP_LEV _00	PCCPCH RSCP< -115	dBm
PCCPCH_RSCP_LEV _01	-115 ≤ PCCPCH RSCP< -114	dBm
PCCPCH_RSCP_LEV _02	-114 ≤ PCCPCH RSCP< -113	dBm
PCCPCH_RSCP_LEV _03	-113 ≤ PCCPCH RSCP< -112	dBm
…	…	…
PCCPCH_RSCP_LEV _89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV _90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV _91	-25 ≤ PCCPCH RSCP	dBm

8.1.15 UE GPS Timing of Cell Frames for LCS

For terminals supporting this capability:

Requirement	[ ] chips period.

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

The reporting range is for UE GPS timing of Cell Frames for LCS is from 0 ... 2319360000000 chip.

In table 8-36 the mapping of measured quantity is defined.

Table 8-36

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UE GPS timing of Cell Frames for LCS < 0.125	chip
GPS_TIME_00000000000001	0.125 ≤ UE GPS timing of Cell Frames for LCS < 0.250	chip
GPS_TIME_00000000000002	0.250 ≤ UE GPS timing of Cell Frames for LCS < 0.375	chip
GPS_TIME_18554879999997	2319359999999.625 ≤ UE GPS timing of Cell Frames for LCS < 2319359999999.750	chip
GPS_TIME_18554879999998	2319359999999.750 ≤ UE GPS timing of Cell Frames for LCS < 2319359999999.875	chip
GPS_TIME_18554879999999	2319 359999 999.875 ≤ UE GPS timing of Cell Frames for LCS < 2319360000000.000	chip

8.2 Measurements Performance for UTRAN

8.2.1 RSSI

The measurement period shall be [100] ms.

8.2.1.1 Absolute accuracy requirement

Table 8-37

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

8.2.1.2 Relative accuracy requirement

Table 8-38

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

8.2.1.3 RSSI measurement report mapping

The reporting range for *RSSI* is from -112 ... -50 dBm.

In table 8-39 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-39

Reported value	Measured quantity value	Unit
RSSI_LEV _000	RSSI < –112.0	dBm
RSSI_LEV _001	-112.0 ≤ RSSI < –111.9	dBm
RSSI_LEV _002	-111.9 ≤ RSSI < –111.8	dBm
…	…	…
RSSI_LEV _619	-50.2 ≤ RSSI < -50.1	dBm
RSSI_LEV _620	-50.1 ≤ RSSI < -50.0	dBm
RSSI_LEV _621	-50.0 ≤ RSSI	dBm

8.2.2 SIR

The measurement period shall be 80 ms.

8.2.2.1 Accuracy requirement

Table 8-40

Parameter	Accuracy	Range
SIR	± 3 dB	For -7<SIR<20 dB when RSSI > -105 dBm

8.2.2.2 SIR measurement report mapping

The reporting range for *SIR* is from -11 ... 20 dB.

In table 8-41 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-41

Reported value	Measured quantity value	Unit
UTRAN_SIR_00	SIR < –11.0	dB
UTRAN_SIR_01	-11.0 ≤ SIR < –10.5	dB
UTRAN_SIR_02	-10.5 ≤ SIR < –10.0	dB
…	…	…
UTRAN_SIR_61	19.0 ≤ SIR < 19.5	dB
UTRAN_SIR_62	19.5 ≤ SIR < 20.0	dB
UTRAN_SIR_63	20.0 ≤ SIR	dB

8.2.3 Transmitted carrier power

The measurement period shall be [100] ms.

8.2.3.1 Relative accuracy requirement

Table 8-42

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

8.2.3.2 Transmitted carrier power measurement report mapping

The reporting range for *Transmitted carrier power* is from 0 ... 100 %.

In table 8-43 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-43

Reported value	Measured quantity value	Unit
UTRAN_TX_POWER _000	Transmitted carrier power = 0	%
UTRAN_TX_POWER _001	0 < Transmitted carrier power ≤ 1	%
UTRAN_TX_POWER _002	1 < Transmitted carrier power ≤ 2	%
UTRAN_TX_POWER _003	2 < Transmitted carrier power ≤ 3	%
…	…	…
UTRAN_TX_POWER _098	97 < Transmitted carrier power ≤ 98	%
UTRAN_TX_POWER _099	98 < Transmitted carrier power ≤ 99	%
UTRAN_TX_POWER _100	99 < Transmitted carrier power ≤ 100	%

8.2.4 Transmitted code power

The measurement period shall be [100] ms.

8.2.4.1 Absolute accuracy requirement

Table 8-44

Parameter	Accuracy	Range
Pcode	± 3 dB	Over the full range

8.2.4.2 Relative accuracy requirement

Table 8-45

Parameter	Accuracy	Range
Io	± 2 dB	Over the full range

8.2.4.3 Transmitted code power measurement report mapping

The reporting range for *Transmitted code power* is from -10 ... 46 dBm.

In table 8-46 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-46

Reported value	Measured quantity value	Unit
UTRAN_CODE_POWER _010	-10.0 ≤ Transmitted code power < -9.5	dBm
UTRAN_CODE_POWER _011	-9.5 ≤ Transmitted code power < -9.0	dBm
UTRAN_CODE_POWER _012	-9.0 ≤ Transmitted code power < -8.5	dBm
…	…	…
UTRAN_CODE_POWER _120	45.0 ≤ Transmitted code power < 45.5	dBm
UTRAN_CODE_POWER _121	45.5 ≤ Transmitted code power < 46.0	dBm
UTRAN_CODE_POWER _122	46.0 ≤ Transmitted code power < 46.5	dBm

8.2.5 Transport channel BLER

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

8.2.5.1 Accuracy requirement

Table 8-47

Parameter	Accuracy	Range
BLER		

8.2.5.2 Transport channel BLER measurement report mapping

The *Transport channel BLER* reporting range is from 0 to 1.

In table 8-48 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-48

Reported value	Measured quantity value	Unit
BLER_LOG _00	Transport channel BLER = 0	-
BLER_LOG _01	-∞ < Log10(Transport channel BLER) < –4.03	-
BLER_LOG _02	-4.03 ≤ Log10(Transport channel BLER) < –3.965	-
BLER_LOG _03	-3.965 ≤ Log10(Transport channel BLER) < –3.9	-
…	…	…
BLER_LOG _61	-0.195 ≤ Log10(Transport channel BLER) < -0.13	-
BLER_LOG _62	-0.13 ≤ Log10(Transport channel BLER) < -0.065	-
BLER_LOG _63	-0.065 ≤ Log10(Transport channel BLER) ≤ 0	-

8.2.6 Physical channel BER

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

8.2.6.1 Accuracy requirement

Table 8-49

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

8.2.6.2 Physical channel BER measurement report mapping

The *Physical channel BER* reporting range is from 0 to 1.

In table 8-50 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-50

Reported value	Measured quantity value	Unit
PhCh_BER_LOG_000	Physical channel BER = 0	-
PhCh_BER_LOG_001	-∞ < Log10(Physical channel BER) < -2.06375	-
PhCh_BER_LOG_002	-2.06375≤ Log10(Physical channel BER) < -2.055625	-
PhCh_BER_LOG_003	-2.055625 ≤ Log10(Physical channel BER) < -2.0475	-
…	…	…
PhCh_BER_LOG_253	-0.024375 ≤ Log10(Physical channel BER) < -0.01625	-
PhCh_BER_LOG_254	-0.01625 ≤ Log10(Physical channel BER) < -0.008125	-
PhCh_BER_LOG_255	-0.008125 ≤ Log10(Physical channel BER) ≤ 0	-

8.2.7 Round trip time

The measurement period shall be [100] ms.

8.2.7.1 Absolute accuracy requirement

Table 8-51

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

8.2.7.2 Round trip time measurement report mapping

The *Round trip time* reporting range is from 876.00 ... 2923.50 chip.

In table 8-52 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-52

Reported value	Measured quantity value	Unit
RT_TIME_0000	Round trip time < 876.00	chip
RT_TIME_0001	876.00 ≤ Round trip time < 876.25	chip
RT_TIME_0002	876.25 ≤ Round trip time < 876.50	chip
RT_TIME_0003	876.50 ≤ Round trip time < 876.75	chip
…	…	…
RT_TIME_8188	2922.75 ≤ Round trip time < 2923.00	chip
RT_TIME_8189	2923.00 ≤ Round trip time < 2923.25	chip
RT_TIME_8190	2923.25 ≤ Round trip time < 2923.50	chip
RT_TIME_8191	2923.50 ≤ Round trip time	chip

8.2.8 Transport Channel BER

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

8.2.8.1 Accuracy requirement

Table 8-53

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

8.2.8.2 Transport channel BER measurement report mapping

The *Transport channel BER* reporting range is from 0 to 1.

In table 8-54 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-54

Reported value	Measured quantity value	Unit
TrCh_BER_LOG_000	Transport channel BER = 0	-
TrCh_BER_LOG_001	$-\infty$ < Log10(Transport channel BER) < -2.06375	-
TrCh_BER_LOG_002	-2.06375≤ Log10(Transport channel BER) < -2.055625	-
TrCh_BER_LOG_003	-2.055625 ≤ Log10(Transport channel BER) < -2.0475	-
…	…	…
TrCh_BER_LOG_253	-0.024375 ≤ Log10(Transport channel BER) < -0.01625	-
TrCh_BER_LOG_254	-0.01625 ≤ Log10(Transport channel BER) < -0.008125	-
TrCh_BER_LOG_255	-0.008125 ≤ Log10(Transport channel BER) ≤ 0	-

8.2.9 UTRAN GPS Timing of Cell Frames for LCS

Requirement	[ ] chips period.

8.2.9.1 UTRAN GPS timing of Cell Frames for LCS measurement report mapping

The reporting range is for UTRAN GPS timing of Cell Frames for LCS is from 0 ... 2319360000000 chip.

In table 8-55 the mapping of measured quantity is defined.

Table 8-55

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UTRAN GPS timing of Cell Frames for LCS < 0.125	chip
GPS_TIME_00000000000001	0.125 ≤ UTRAN GPS timing of Cell Frames for LCS < 0.250	chip
GPS_TIME_00000000000002	0.250 ≤ UTRAN GPS timing of Cell Frames for LCS < 0.375	chip
…	…	…
GPS_TIME_18554879999997	2319359999999.625 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319359999999.750	chip
GPS_TIME_18554879999998	2319359999999.750 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319359999999.875	chip
GPS_TIME_18554879999999	2319 359999 999.875 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319360000000.000	chip

8.2.10 Propagation delay

8.2.10.1 Accuracy requirement

Parameter	Accuracy	Range
PropDelay	+/- [] chip	

8.2.10.2 Propagation delay measurement report mapping

The *Propagation delay* reporting range is from 0 ... 765 chip.

In table 8-56 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-56

Reported value	Measured quantity value	Unit
PROP_DELAY_000	0 ≤ Propagation delay < 3	chip
PROP_DELAY_001	3 ≤ Propagation delay < 6	chip
PROP_DELAY_002	6 ≤ Propagation delay < 9	chip
…	…	…
PROP_DELAY_252	756 ≤ Propagation delay < 759	chip
PROP_DELAY_253	759 ≤ Propagation delay < 762	chip
PROP_DELAY_254	762 ≤ Propagation delay < 765	chip
PROP_DELAY_255	765 ≤ Propagation delay	chip

9 UE parallel measurements

9.1 General

The UE shall be able to perform parallel measurements according to table 9-2.

In addition to the requirements in table 9-2 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to table 9-1.

Table 9-1

Measurement quantity	Number of parallel measurements possible to request from the UE
Transport channel BLER	[1] per TrCh
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 presence of the measurements for location services needs to be revised.

9.2 Parallel Measurement Requirements

Table 9-2 shall be read as follows:

If the UE receives a neighbour list of

not more than X1 cells on Freq. #0 and

not more than X2 cells on Freq. #1 and

not more than X3 cells on Freq. #2 and

not more than X4 GSM cells,

the UE L1 shall be able to deliver

Y1 CPICH measurements on Freq. #0 and

Y2 CPICH measurements on Freq. #1 and

Y3 CPICH measurements on Freq. #2 and

Y4 UTRAN carrier RSSI measurements on Freq. #0 and

Y5 UTRAN carrier RSSI measurements on Freq. #1 and

Y6 UTRAN carrier RSSI measurements on Freq. #2 and

Y7 GSM carrier RSSI measurements (BSIC verified)

Y8 GSM carrier RSSI measurements (BSIC non-verified)

with the periodicity given by the measurement periods in section 8 and accuracy requirements given in section 8.

Xn and Yn are numbers taken from the same column in Table 9-2.

Table 9-2: UE Layer 1 parallel measurement capability

Scenario (see annex B)			1a	2b	2c	3a	4b	4c
Neigbour list size	X1	Freq #0	[32]	[24]	[24]	[24]	[24]	[24]
	X2	Freq #1	[0]	[12]	[12]	[0]	[12]	[12]
	X3	Freq #2	[0]	[0]	[12]	[0]	[0]	[12]
	X4	GSM (any band / carrier)	[0]	[0]	[0]	[20] Note4	[12]	[8]
Parallell measurement requirements	Y1	CPICH meas. Freq#0	[6]	[6]	[6]	[6]	[6]	[6]
	Y2	CPICH meas. Freq#1	[0]	[6]	[4]	[0]	[6]	[3]
	Y3	CPICH meas. Freq#2	[0]	[0]	[4]	[0]	[0]	[3]
	Y4	UTRAN carrier RSSI Freq #0	[1]	[1]	[1]	[1]	[1]	[1]
	Y5	UTRAN carrier RSSI Freq #1	[0]	[1]	[1]	[0]	[1]	[1]
	Y6	UTRAN carrier RSSI Freq #2	[0]	[0]	[1]	[0]	[0]	[1]
	Y7	GSM RSSI, BSIC non-verified	[0]	[0]	[0]	[]	[]	[]
	Y8	GSM RSSI, BSIC verified	[0]	[0]	[0]	[]	[]	[]

Note 1: Although table 9-2 puts requirements on L1, these requirements can be verified from L3 with a filter coefficient =0, in the higher layer filter.

Note 2: Compressed mode reference pattern 2.1 is assumed for the requirements in table 9-2. If other compressed mode patterns are used, the UE L1 shall deliver as many measurements as possible.

Note 3: In table 9-2, CPICH measurements can be either the CPICH Ec/Io or the CPICH RSCP measurement.

Note 4: This figure will be checked after the BSIC definition is resolved.

Annex A (Informative): Scenario Description for Parallel Measurements

The following table gives a brief explanation on which scenarios that have been used to set up the parallel measurement requirements.

General Assumptions

- Freq. #0, #1 and #2 are arbitrary UMTS frequencies, assigned for one operator.
- The UE is assumed to have the active set on Freq. #0

Case	Network scenario	Number of UMTS carriers present	Neigbour List Size			
			Freq. #0	Freq. #1	Freq. #2	GSM
1a	single carrier UMTS network with no interaction with GSM networks or other UMTS networks	1	32	0	0	0
2b	multi carrier UMTS network with no interaction with GSM networks	2	24	12	0	0
2c		3	24	12	12	0
3a	single carrier UMTS network together with a GSM network	1	24	0	0	20
4b	multi carrier UMTS network together with a GSM network	2	24	12	0	12
4c		3	24	12	12	8

Annex B (informative): Change History

CRs approved by TSG-RAN#7.

RAN doc	Spec	CR	Re	Phas	Subject	Cat	Current	New
RP-000021	25.133	001		R99	Modification of RL Failure Requirement	F	3.0.0	3.1.0
RP-000021	25.133	002		R99	Idle Mode Tasks	C	3.0.0	3.1.0
RP-000021	25.133	003		R99	Revised UE handover requirements	F	3.0.0	3.1.0
RP-000021	25.133	004		R99	Editorial corrections	D	3.0.0	3.1.0
RP-000021	25.133	005		R99	UE measurement requirement update	F	3.0.0	3.1.0
RP-000021	25.133	006		R99	TDD Measurements Performance Requirements	B	3.0.0	3.1.0
RP-000021	25.133	007		R99	UTRAN measurement requirement update	F	3.0.0	3.1.0
RP-000021	25.133	008		R99	Requirements on parallel measurements	F	3.0.0	3.1.0
RP-000021	25.133	009		R99	Inclusion on transport channel BER.	F	3.0.0	3.1.0

Note on implementation of CR 25.133-003. On page 16 there is a dotted line above title 5.1.2.1.4 ACTIVE SET DIMENSION. The text following is a duplication of version 3.0.0 to the point of sub-clause 5.1.2.2.1.3. HARD HANDOVER DELAY. Therefore all text from page 16 starting from 5.1.2.1.4 ACTIVE SET DIMENSION is moved to sub-clause 5.1.2.2.1.3 HARD HANDOVER DELAY on page 19.

CRs approved by TSG-RAN#8.

RAN Doc	Spec	CR	R	Phas	Subject	Cat	Current	New
RP-000210	25.133	010		R99	Measurement period for UTRAN SIR	F	3.1.0	3.2.0
RP-000210	25.133	011		R99	Measurement period for UE BLER	F	3.1.0	3.2.0
RP-000210	25.133	013		R99	Measurement delay reporting	F	3.1.0	3.2.0
RP-000210	25.133	015		R99	Correction - Propagation conditions	F	3.1.0	3.2.0
RP-000210	25.133	016		R99	Remove requirements on SSDT from 5.1.1.8.	D	3.1.0	3.2.0
RP-000210	25.133	017		R99	Update of test parameters to P-CCPCH	F	3.1.0	3.2.0
RP-000210	25.133	018		R99	Repetition Period of System Information	F	3.1.0	3.2.0
RP-000210	25.133	019		R99	Alignment of Cell Selection/reselection test	F	3.1.0	3.2.0
RP-000210	25.133	020		R99	Editorial corrections for TS25.133	F	3.1.0	3.2.0
RP-000210	25.133	021		R99	Removal of Annex A	F	3.1.0	3.2.0
RP-000210	25.133	022		R99	Requirement for UE Tx Power Measurement	F	3.1.0	3.2.0
RP-000210	25.133	023		R99	Insertion of Range/Mapping from TS 25.215	F	3.1.0	3.2.0
RP-000210	25.133	024		R99	Signalling response delay	F	3.1.0	3.2.0
RP-000210	25.133	025		R99	Missing measurement periods	F	3.1.0	3.2.0
RP-000210	25.133	026		R99	RRC Connection mobility in Cell_FACH,	F	3.1.0	3.2.0
RP-000210	25.133	027		R99	Switching delay requirement for inter-system	F	3.1.0	3.2.0
RP-000210	25.133	028		R99	UE Chip time measurements	F	3.1.0	3.2.0
RP-000210	25.133	029		R99	UE Transmit Timing Adjustment	F	3.1.0	3.2.0
RP-000210	25.133	030		R99	Add GPS timing measurements to TS 25.133	F	3.1.0	3.2.0
RP-000210	25.133	031		R99	Test scenario for UTRAN to GSM cell re-selection	F	3.1.0	3.2.0
RP-000210	25.133	032		R99	Proposed test case for random access procedure	F	3.1.0	3.2.0
RP-000210	25.133	033		R99	Inclusion of measurement granularities and	F	3.1.0	3.2.0
RP-000210	25.133	034		R99	Parallel measurement requirements	F	3.1.0	3.2.0
RP-000210	25.133	035		R99	UE Hard handover switching time	F	3.1.0	3.2.0

History

Document history		
V3.0.0	January 2000	Publication
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