TSG-RAN Meeting #9
Hawaii, US, 20 - 22 September 2000

TSGRP#9(00)0479

Title: **Agreed CRs to TS 25.133**

Source: **TSG-RAN WG4**

Agenda item: **5.4.3**

Tdoc Num	TS	CR number	Title	TYPE	Status	Cur_Ver	New_Ver
R4-000745	25.133	36	Corrections to definitions, symbols and abbreviations	F	agreed	3.2.0	3.3.0
R4-000761	25.133	44	Proposal for section 7 and A.7	F	agreed	3.2.0	3.3.0
R4-000766	25.133	46	Proposal for section 6	F	agreed	3.2.0	3.3.0
R4-000768	25.133	41	Proposal for section 9	F	agreed	3.2.0	3.3.0
R4-000769	25.133	45	Text proposal for section A.1, A.2 and A.3	F	agreed	3.2.0	3.3.0
R4-000780	25.133	37	Handling of measurement uncertainties in Base station conformance testing (FDD) for RRM measurements	F	agreed	3.2.0	3.3.0
R4-000781	25.133	38	Proposal for section 4	F	agreed	3.2.0	3.3.0
R4-000782	25.133	39	Proposal for section 5	F	agreed	3.2.0	3.3.0
R4-000783	25.133	40	Proposal for section 8	F	agreed	3.2.0	3.3.0

3GPP TSG RAN WG4 Meeting #13 **Document R4-000745**

Turin, Italy, 4 – 8 Sep, 2000

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or for SMG, use the format P-99-xxx

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25.133	CR	36	Current Version:	3.2.0

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

For submission to:	RAN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: RAN WG4 **Date:** 2000-09-07

Subject: Corrections to definitions, symbols and abbreviations

Work item:

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

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

Reason for change:

- Many abbreviations are being added into abbreviation list (Section 3.3)
- Some abbreviations are more like symbols so they are transferred to list of symbols (Section 3.2)
- Some abbreviations are more like definitions so they are transferred to list of definitions (Section 3.1)

Clauses affected: 3.1, 3.2, 3.3

Other specs Affected:

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

Other comments:

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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.

Node B	A logical node responsible for radio transmission / reception in one or more cells to/from the User Equipment. Terminates the Iub interface towards the RNC

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.
CPICH_Ec	Average energy per PN chip for the CPICH
CPICH_Ec/Ior	The ratio of the transmit energy per PN chip of the CPICH to the total transmit power spectral density at the Node B antenna connector.
CPICH_Ec/Io	The ratio of the received energy per PN chip for the CPICH to the total transmit power spectral density
DPCH_Ec/Ior	The ratio of the transmit energy per PN chip of the DPCH to the total transmit power spectral density at the Node B antenna connector.
Ec	Average energy per PN chip.
Io	The total received power density, including signal and interference, as measured at the UE antenna connector.
Ioc	The power spectral density of a band limited noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector.
Ior	The total transmit power spectral density of the downlink at the Node B antenna connector.
$\hat{I}or$	The received power spectral density of the downlink as measured at the UE antenna connector.
OCNS_Ec/Ior	The ratio of the transmit energy per PN chip of the OCNS to the total transmit power spectral density at the Node B antenna connector.
PCCPCH_Ec/Ior	The ratio of the transmit energy per PN chip of the PCCPCH to the total transmit power spectral density at the Node B antenna connector.
PENALTY_TIME	Defined in TS 25.304, subclause 5.2.6.1.5
PICH_Ec/Ior	The ratio of the transmit energy per PN chip of the PICH to the total transmit power spectral density at the Node B antenna connector.
Qhyst	Defined in TS 25.304, subclause 5.2.6.1.5
$Qoffset_{s,n}$	Defined in TS 25.304, subclause 5.2.6.1.5
Qqualmin	Defined in TS 25.304, subclause 5.2.6.1.5
Qrxlevmin	Defined in TS 25.304, subclause 5.2.6.1.5
SCH_Ec/Ior	The ratio of the transmit energy per PN chip of the SCH to the total transmit power spectral density at the Node B antenna connector.
Sintersearch	Defined in TS 25.304, subclause 5.2.6.1.5
Sintrasearch	Defined in TS 25.304, subclause 5.2.6.1.5
SsearchRAT	Defined in TS 25.304, subclause 5.2.6.1.5
T1	Time period 1
T2	Time period 2
TEMP_OFFSET	Defined in TS 25.304, subclause 5.2.6.1.5

$T_{RE-ESTABLISH-REQ}$	The RRC Re-establishment delay requirement, the time between the moment when erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH.
Treselection	Defined in TS 25.304, subclause 5.2.6.1.5
UE_TXPWR_MAX_RACH	Defined in TS 25.304, subclause 5.2.3.1.2.

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
CFN	Connection Frame Number
CPICH	Common Pilot Channel
~~CW~~	~~Continuous wave (unmodulated signal)~~
DL	Down link (forward link)
DPCH	Dedicated Physical Channel
DRX	Discontinuous Reception
~~EIRP~~	~~Equivalent Isotropic Radiated Power~~
FDD	Frequency Division Duplex~~ing~~
~~FER~~	~~Frame Error Ratio~~
OCNS	Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink.
PCCPCH	Primary Common Control Physical Channel
PICH	Paging Indicator Channel
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
~~PPM~~	~~Parts Per Million~~
RSCP	Received Signal Code Power
RRC	Radio Resource Control
RRM	Radio Resource Management
RSSI	Received Signal Strength Indicator
SCH	Synchronisation Channel, power of SCH shall be divided equally between Primary and Secondary Synchronous channels.
SFN	System Frame Number
SIR	Signal to Interference ratio
TDD	Time Division Duplex~~ing~~
TPC	Transmit Power Control
UE	User Equipment
UL	Up link (reverse link)
USIM	Universal Subscriber Identity Module
UTRA	Universal ~~UMTS~~ Terrestrial Radio Access [TR 21.905]
UTRAN	Universal Terrestrial Radio Access Network

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Torino, Italy, 4 – 8 Sep, 2000

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25.133	CR	37	Current Version:	3.2.0

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

For submission to:	RAN #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: RAN WG4 **Date:** 2000-09-05

Subject: Handling of measurement uncertainties in Base station conformance testing (FDD) for RRM measurements

Work item:

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

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

Release:

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

Reason for change: Alignment with draft ITU/R recommendation on handling of measurement uncertainties for a global circulation of terminals

Clauses affected: 3.4 (new subclause)

Other specs affected:

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

Other comments:

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3.4 Test tolerances

The requirements given in the present document make no allowance for measurement uncertainty. The test specification 34.121 and 25.141 define test tolerances. These test tolerances are individually calculated for each test. The test tolerances are then added to the limits in this specification to create test limits. The measurement results are compared against the test limits as defined by the shared risk principle.

Shared Risk is defined in ETR273 Part 1 sub-part 2 section 6.5.

TSG-RAN Working Group 4 meeting #13
Torino, Italy, September 04-08, 2000

***Document* R4-000781**
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25.133	CR	38	Current Version:	3.2.0

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

For submission to:	TSG RAN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: TSG RAN WG4 **Date:** 2000-09-08

Subject: Proposal for section 4

Work item:

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

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

Reason for change: Dividing TS 25.133 into a general part and a testing part.

Clauses affected: 4

Other specs affected:

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

Other comments:

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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.

4 Idle Mode

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

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.

4.1 Cell Selection

4.1.1 Introduction

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in TS25.304. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

NOTE: At the moment, only requirements for *Stored information cell selection* has been defined.

4.1.2 Requirements

4.1.2.1 Stored information cell selection delay

The stored information cell selection delay is defined as the time the UE needs for sending the preamble for RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.

4.1.2.1.1 The cells in the neighbour list belong to different frequencies

Unless otherwise stated, the cell selection delay shall be equal or less than [X] seconds when the cells in the neighbour list belong to less than [3] frequencies.

4.1.2.1.2 No cell is present in the neighbour list

The cell selection delay shall be equal or less than [5] seconds.

4.2 Cell Re-selection

4.2.1 Introduction

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in *Normally Camped* state and the occasions/triggers occur, as specified in 25.304, the UE shall perform the Cell Reselection Evaluation process.

4.2.2 Requirements

4.2.2.1 Number of cells to be monitored

The UE shall be capable of monitoring at least [32] neighbour cells per carrier frequency for at least [3] carriers.

4.2.2.2 Cell re-selection delay

The cell re-selection delay is defined as the time between the occurence of any event which will trigger Cell Reselection Evaluation process, as specified in 25.304, and the moment in time when the UE starts sending the preamble for RRC Connection request for Location Update message to the UTRAN.

4.2.2.2.1 Single carrier case

In a single carrier case, the cell re-selection delay shall be equal or less than [5] seconds.

4.2.2.2.2 Multi carrier case

In a multi carrier case, the cell re-selection delay shall be equal or less than [Nt] seconds.

4.3 UTRAN to GSM Cell Re-Selection

4.3.1 Introduction

The UTRAN to GSM Cell Re-Selection allows a UE, supporting both radio access technologies and camped on a UTRAN cell, to re-select a GSM cell and camp on it according to the cell re-selection criteria described in TS 25.304.

4.3.2 Requirements

4.3.2.1 Cell Re-Selection delay

The cell re-selection delay is defined as the time between the occurence of any event which will trigger Cell Reselection Evaluation process, as specified in 25.304, and the moment in time when the UE starts sending the RR Channel Request message for location update to GSM.

The UTRAN to GSM cell re-selection delay shall be equal or less than [x].

A.4 Idle Mode

A.4.1 Cell selection

Two scenarios are considered:

- Scenario 1: The cells in the neighbour list belong to different frequencies
- Scenario 2: No cell is present in the neighbour list

For each of them a test is proposed.

NOTE: More scenarios will be added later.

A.4.1.1 Scenario 1: the cells in the neighbour list belong to different frequencies

A.4.1.1.1 Test Purpose and Environment

This test is to verify the requirement reported in section 4.1.2.1.1.

This scenario implies the presence of 2 carriers and 6 cells (3 cells per carrier) as reported in Table A.4-1 and A.4-2.

The stored information of the last registered PLMN is used 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 in the UE.

NOTE: Here pilot pollution case with different power levels for cells could be included.

Table A.4-1: General test parameters for Cell Selection in Multi carrier case

Parameter		Unit	Value	Comment
Initial condition	Stored RF channel		Channel1	
	Neighbour cells of Cell1		Cell2, Cell3,Cell4, Cell5, Cell6	
	Neighbour cells of Cell2		Cell1, Cell3,Cell4, Cell5, Cell6	
	Neighbour cells of Cell3		Cell1, Cell2,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell5	

Table A.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: [ ]

A.4.1.2.2 Test Requirements

The requirements reported in section 4.1.2.1.1 shall be verified in more than [X%] of the cases.

A.4.1.2 Scenario 2 : no cell is present in the neighbour list

A.4.1.2.1 Test Purpose and Environment

This test is to verify the requirement reported in section 4.1.2.1.2.

This scenario implies the presence of 1 carrier and 1 cell as reported in Table A.4-3.

The stored information of the last registered PLMN is used 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 A.4-3: 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	[ ]

A.4.1.2.2 Test Requirements

The requirements reported in section 4.1.2.1.2 shall be verified in more than [X %] of the cases.

A.4.2 Cell Re-Selection

Two scenarios are considered:

- Scenario 1: Single carrier case
- Scenario 2: Multi carrier case

For each of them a test is proposed.

NOTE: Existing scenarios cover only requirements in section 4.2.2.2. More scenarios, covering requirements in section 4.2.2.1, will be added later.

A.4.2.1 Scenario 1: Single carrier case

A.4.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the cell re-selection delay in the single carrier case reported in section 4.2.2.2.1.

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.4.4 and A.4-5.

Table A.4.3: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4-4: 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	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
$Qoffset2_{s,n}$	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: [ ]	
Qhyst2	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET2	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Sintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

A.4.2.1.2 Test Requirements

The requirements reported in section 4.2.2.2.1 shall be verified in more than [X %] of the cases.

A.4.2.2 Scenario 2: Multi carrier case

A.4.2.2.1 Test Purpose and Environment

This test is to verify the requirement for the cell re-selection delay in the multi carrier case reported in section 4.2.2.2.2.

This scenario implies the presence of 2 carriers and 6 cells as given in Table A.46 and A.4-7.

Table A.4-6: General test parameters for Cell Re-selection in Multi carrier case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4-7: 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]	

A.4.2.2.2 Test Requirements

The requirements reported in section 4.2.2.2.2 shall be verified in more than [90%] of the cases.

A.4.3 UTRAN to GSM Cell Re-Selection

A.4.3.1 Scenario 1

A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.3.2.1.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected Test parameters are given in Table, A.4.8, A.4.9, A.4-10.

Table A.4.8: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.9: 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	[ ]	
$Qoffset1_{s,n}$	dB	C1, C2: [ ]	
Qhyst1	dB	[ ]	
PENALTY_TIME	s	C2: [ ]	
TEMP_OFFSET1	dB	C2: [ ]	
Treselection	s	[ ]	
$Ssearch_{RAT}$	dB	[ ]	

Table A.4.10: 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	[ ]	

A.4.3.1.2 Test Requirements

The requirements reported in section 4.3.2.1 shall be verified in more than [90%] of the cases.

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Turin, Italy, 4 – 8 Sep, 2000

e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

25.133	CR	39	Current Version:	3.2.0

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

For submission to:	RAN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: TSG RAN WG#4 **Date:** 2000-09-07

Subject: Proposal for new section 5 and A.5

Work item:

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

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

Reason for change: Separation of general requirements and test cases for UE hand over functions.

Clauses affected: 5

Other specs Affected:

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

Other comments:

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.

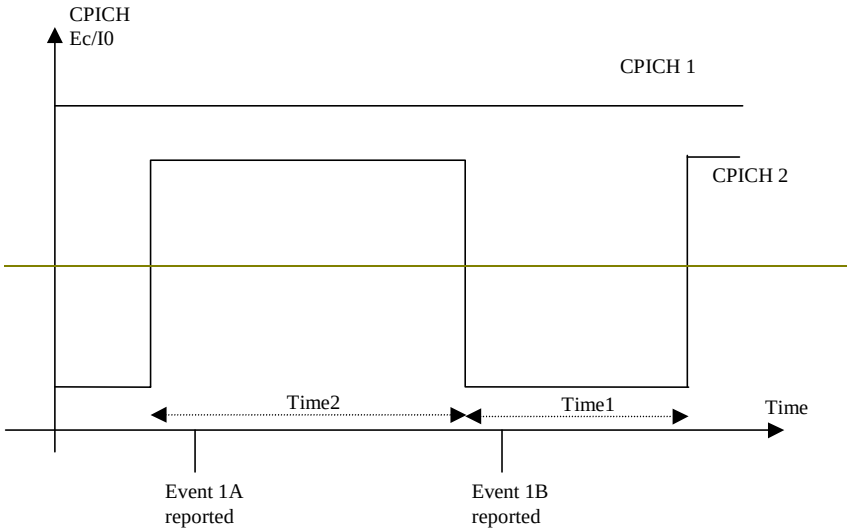


Figure 5-1: Illustration of parameters for soft handover measurement reporting test case

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.

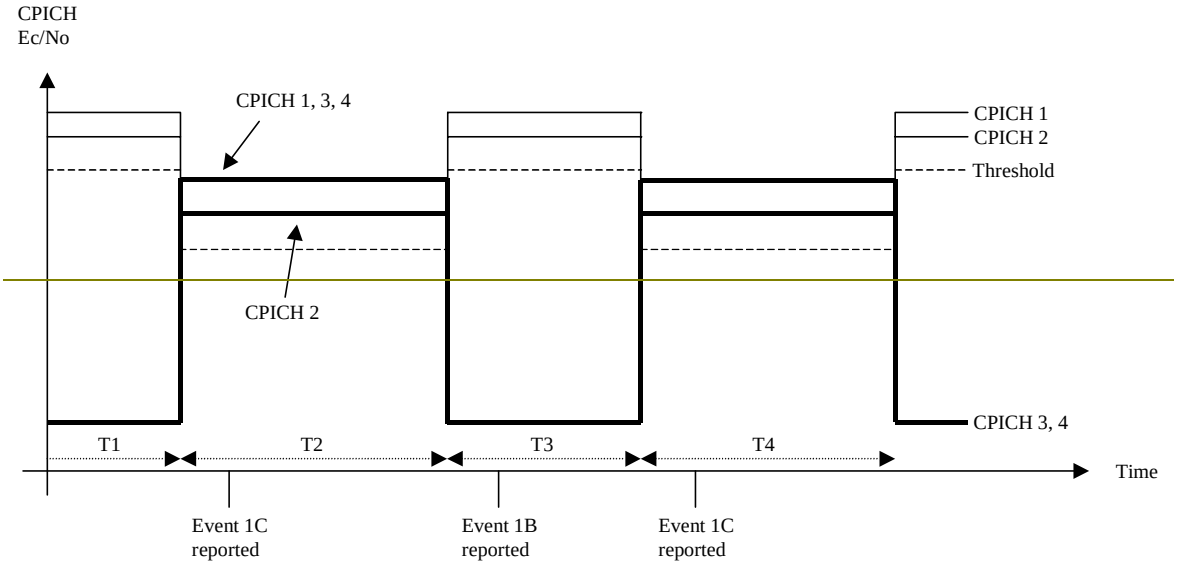
5.1.1.3 Event triggered reporting of multiple neighbours in AWGN propagation condition

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] %.

Time	Value	Cell 1 to 2	Cell 3 to 4
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.

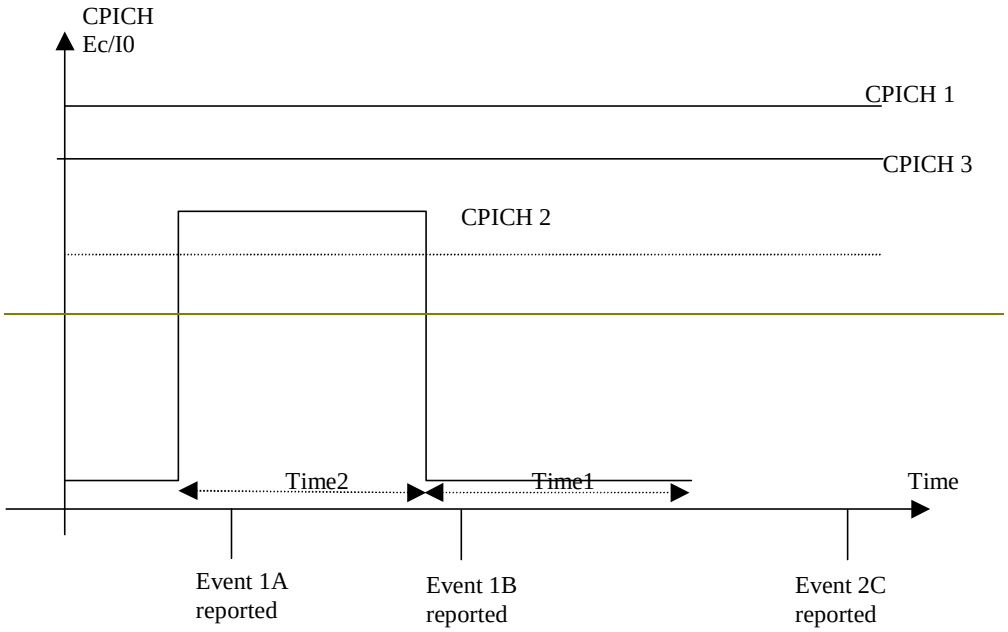


Figure 5-3: Illustration of parameters for handover measurement reporting test case

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.~~

---

5 UTRAN Connected Mode Mobility

This section contains the requirements on the mobility procedures in UTRAN connected mode such as handover and cell re-selection.
Requirements related to the measurements in support of the execution of the UTRAN connected mode mobility procedures are specified, currently not necessarily for all UTRAN connected mode states, in section 8 .
The radio links the UE shall use are controlled by UTRAN with RRC signalling.
UE behaviour in response to UTRAN RRC messages is described in TS25.331.

The purpose of Cell reselection in CELL_FACH, CELL_PCH and URA_PCH states is that the UE shall select a better cell according to the cell reselection criteria in TS 25.304. CELL_FACH, CELL_PCH and URA_PCH states are described in TS 25.331.

5.1 FDD/FDD Soft Handover

5.1.1 Introduction

Soft handover is a function in which the UE is connected to several UTRAN access points at the same time. Addition and/or release of radio links are controlled by the ACTIVE SET UPDATE procedure.

The soft handover function includes a measurement phase, a decision algorithm in UTRAN and the ACTIVE SET UPDATE procedure.

5.1.2 Requirements

5.1.2.1 Active set dimension

The UE shall be capable of supporting at least [6] radio links in the active set.

5.1.2.2 Active set update delay

The active set update delay is defined as the time from when the UE has received the ACTIVE SET UPDATE message from UTRAN, or at the time stated through the activation time when to perform the active set update, to the time when the UE successfully uses the set of radio links stated in that message for power control.

The active set update delay is depending on the number of known cells referred to in the ACTIVE SET UPDATE message. A cell is known if either:

- the UE has had radio links connected to the cell in the previous (old) active set, or
- the cell has been reported by the UE in a measurement report during the last [5] seconds.

The active set update delay shall be less than [50]+[10]*KC+[100]*OC ms, where

KC is the number of known cells in the active set update message.

OC is the number of cells that are not known in the active set update message.

If the UE have radio links in the active set that it can not use for data detection (due to low signal level), the UE shall every [150] ms search for the radio link and start to use it as soon as it is found.

Editor's note: the wording of the last sentence might need reformulation.

5.2 FDD/FDD Hard Handover

5.2.1 Introduction

The purpose of FDD/FDD hard handover is to change the frequency of the connection between UE and UTRAN or to change cell if the network does not support macrodiversity.

The hard handover procedure is initiated from UTRAN with a RRC message that implies a hard handover (PHYSICAL CHANNEL RECONFIGURATION, RADIO BEARER SETUP, RADIO BEARER RECONFIGURATION, RADIO BEARER RELEASE, or TRANSPORT CHANNEL RECONFIGURATION).

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.

5.2.2 Requirements

5.2.2.1 Hard handover delay

When the UE receives a RRC message that implies a hard handover, the UE shall start transmission of the new uplink DPCCH within [X ms] from the end of the last TTI containing the RRC command. However, if the command includes an indicated activation time, the UE shall start transmission of the new uplink DPCCH l at the designated starting time, or within the time interval defined above, whichever is the later.

5.2.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old DTCH and the time the UE starts transmission of the new uplink DPCCH, shall be less than the value in table 5-2. This requirement does not include a delay due to SFN decoding of the new cell when this is needed.

Table 5-2: FDD/FDD hard handover - interruption time

Number of new cells present in the handover command message	Interruption time [ms]	
	Cells in monitored cells list and reported to UTRAN	Cells outside monitored cells list
1	[20]	[4000]

5.3 FDD/TDD Handover

5.3.1 Introduction

The purpose of FDD/TDD hard handover is to change the mode between FDD and TDD. The handover procedure is initiated from UTRAN with a RRC message that implies a hard handover (PHYSICAL CHANNEL RECONFIGURATION, RADIO BEARER SETUP, RADIO BEARER RECONFIGURATION, RADIO BEARER RELEASE, or TRANSPORT CHANNEL RECONFIGURATION).
Compressed mode according to the UE Capability may be used to be able to make any measurements on the other mode.

5.3.2 Requirements

These requirements shall apply only to FDD/TDD UE.

5.3.2.1 Hard handover delay

When the UE receives a RRC message that implies a hard handover, the UE shall start transmission of the new uplink DPCCH within [X ms] from the end of the last TTI containing the RRC command. However, if the command includes an indicated activation time, the UE shall start transmission of the new uplink DPCCH at the designated starting time, or within the time interval defined above, whichever is the later.

5.3.2.2 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DTCH and the time the UE starts transmission of the new uplink DPCCH , shall be less than the

value in table 5-3. These requirement do not include a delay due to SFN decoding of the new cell when this is needed.

Table 5-3: FDD/TDD interruption time

Number of new cells present in the handover command message	Interruption time [ms]	
	Cells in monitored cells list and reported to UTRAN	Cells outside monitored cells list
1	[]	[]

5.4 FDD/GSM Handover

5.4.1 Introduction

The purpose of inter-system handover from UTRAN FDD to GSM is to transfer a connection between the UE and UTRAN FDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (INTER-SYSTEM HANDOVER COMMAND).
Compressed mode according to the UE Capability may be used to be able to make measurements on GSM.

NOTE: Support of Blind Handover should be stated.

5.4.2 Requirements

The requirements in this section shall apply to UE supporting FDD and GSM.

5.4.2.1 Inter-system handover delay

When the UE receives a RRC INTER-SYSTEM HANDOVER COMMAND it shall be ready to transmit (as specified in GSM 05.10) 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 the time interval defined above, whichever is the later.

5.4.2.2 Interruption time

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.

5.5 Cell Re-selection in CELL_FACH

5.5.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

5.5.2 Requirements

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

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.

5.5.2.1 Cell re-selection delay

The cell re-selection delay is defined as the time between the occurence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the RRC CELL UPDATE message to the UTRAN.

5.5.2.1.1 All cells in the neighbour list belong to the same frequency

The cell re-selection delay in CELL_FACH state shall be less than [x] seconds when all cells in the neighbour list belong to the same frequency

5.5.2.1.2 The cells in the neighbour list belong to different frequencies

NOTE: This requirement should be reconsidered based on RAN2 decisions.
The cell re-selection delay in CELL_FACH state shall be less than [x] seconds when the cells in the neighbour list belong to less than [3] frequencies.

5.6 Cell Re-selection in CELL_PCH

5.6.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

5.6.2 Requirements

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.

5.6.2.1 Cell re-selection delay

The cell re-selection delay is defined as the time between the occurence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the preamble for RRC CELL UPDATE message to the UTRAN.

5.6.2.1.1 All cells in the neighbour list belong to the same frequency

The cell re-selection delay in CELL_PCH state shall be less than [x] seconds when all cells in the neighbour list belong to the same frequency

5.6.2.1.2 The cells in the neighbour list belong to different frequencies

The cell re-selection delay in CELL_PCH state shall be less than [x] seconds when the cells in the neighbour list belong to less than [3] frequencies.

5.7 Cell Re-selection in URA_PCH

5.7.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

5.7.2 Requirements

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.
5.7.2.1 Cell re-selection delayThe cell re-selection delay is then defined as the time between the occurence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the preamble for RRC CELL UPDATE message to the UTRAN.

5.7.2.1.1 All cells in the neighbour list belong to the same frequency

The cell re-selection delay in URA_PCH state shall be less than [x] seconds when all cells in the neighbour list belong to the same frequency

5.7.2.1.2 The cells in the neighbour list belong to different frequencies

The cell re-selection delay in URA_PCH state shall be less than [x] seconds when the cells in the neighbour list belong to less than [3] frequencies.

A.5 UTRAN Connected Mode Mobility

A.5.1 FDD/FDD Soft Handover

NOTE: This section is included for consistency with numbering with section 5; currently no test covering requirements in sections 5.1.2.1 and 5.1.2.2 exists.

A.5.2 FDD/FDD Hard Handover

NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.2.2.1 and 5.2.2.2 exists.

A.5.3 FDD/TDD Hard Handover

NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.3.2.1 and 5.3.2.2 exists.

A.5.4 Inter-system Handover from UTRAN FDD to GSM

NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.4.2.1 and 5.4.2.2 exists.

A.5.5 Cell Re-selection in CELL_FACH

A.5.5.1 One frequency present in neighbour list

A.5.5.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in the single carrier case reported in section 5.5.2.1.1.
The test parameters are given in Table A.5.1 and A.5.2

Table A.5.1 General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.2 Cell specific test parameters for 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	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

A.5.5.1.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.5.2.1.1

A.5.5.2 Two frequencies present in the neighbour list

A.5.5.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.5.2.1.2.The test parameters are given in Table A5-3 and A5-4.

Table A.5.3: General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.4: Cell specific test parameters for Cell re-selection in CELL_FACH state

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	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

A.5.5.2.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.5.2.1.2

A.5.6 Cell Re-selection in CELL_PCH

A.5.6.1 One frequency present in the neighbour list

A.5.6.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_PCH state in section 5.6.2.1.1.
The test parameters are given in Table A5.5 and A5.6

Table A.5.5: General test parameters for Cell Re-selection in CELL_PCH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.6: Cell specific test parameters for Cell re-selection in CELL_PCH state

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	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

A.5.6.1.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.6.2.1.1A.5.6.2 Two frequencies present in the neighbour list

A.5.6.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_PCH state in in section 5.6.2.1.2.

The test parameters are given in Table A.5.7 and A.5.8

Table A.5.7: General test parameters for Cell Re-selection in CELL_PCH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.8: Cell specific test parameters for Cell re-selection in CELL_PCH state

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	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

A.5.6.2.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.6.2.1.2A.5.7 Cell Re-selection in URA_PCH

A.5.7.1 One frequency present in the neighbour list

A.5.7.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in URA_PCH state in in section 5.7.2.1.1.
The test parameters are given in Table A.5.9 and A.5.10.
Cells possible for re-selection shall belong to different UTRAN Registration Areas (URA).

Table A.5.9: General test parameters for Cell Re-selection in URA_PCH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.10: Cell specific test parameters for Cell re-selection in URA_PCH state

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	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

A.5.7.1.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.7.2.1.1

A.5.7.2 Two frequencies present in the neighbour list

A.5.7.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in URA_PCH state in section 5.7.2.1.2.
The test parameters are given in Table A5.11 and A5.12.

Cells possible for re-selection shall belong to different UTRAN Registration Areas (URA).

Table A.5.11: General test parameters for Cell Re-selection in URA_PCH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.12: Cell specific test parameters for Cell re-selection in URA_PCH state

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	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	

A.5.7.2.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.7.2.1.2

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Torino, Italy, 04-08 Sept 2000

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e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.133	CR	40	Current Version:	3.2.0

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

For submission to:	TSG RAN#9	for approval	X	Strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: TSG RAN WG4 **Date:**

Subject: Proposal for new section 8

Work item:

Category: *(only one category Shall be marked With an X)*

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

Reason for change: Separation of general requirements and test cases for UE measurement functions.

Clauses affected: 5, 8 (new)

Other specs affected:

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

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8 UE Measurements Procedures

8.1 Measurements in CELL_DCH State

8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_DCH state. The requirements are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. Compressed mode is specified in TS 25.215.

8.1.2 Requirements

8.1.2.1 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network request the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. If a compressed mode pattern sequence is activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

8.1.2.1.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify\ intra} = Max\left\{[800]ms, T_{basic\ identify\ FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\}$$

8.1.2.1.2 UE CPICH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is [200] ms. When no transmission gap pattern sequence is activated, the UE shall be capable of performing CPICH measurements for [8] detected intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of [200] ms. When one or more transmission gap pattern sequences are activated, the UE shall be capable of performing CPICH measurements for as many detected intra-frequency cells as defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.s.t and 9.p.q.

$$Y_{measurement\ intra} = Floor\left\{X_{basic\ measurement\ FDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}}\right\}$$

$X_{basic\ measurement\ FDD}$ = [8]

$T_{Measurement\ Period\ Intra}$ = [200] ms. The measurement period for Intra frequency CPICH measurements.

T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing.

$T_{basic_identify_FDD,\ intra}$ = TBD ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

Note: It is still under consideration how to incorporate a time needed for adjusting asynchronous timing between intra and inter frequency measurement periods and UE HW settling time into the equations.

8.1.2.1.3 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.1.4 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.1.3 Event Triggered Reporting.

8.1.2.1.5 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. 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.

Editors Note: The test cases in section A.8 will need revisions to reflect the general requirements.

Unless otherwise stated, event triggered measurement reporting delay shall be less than 800 ms.

If a cell, which the UE has detected and at least once measured over the measurement period indicated by the L3 filter coefficient, becomes undetectable for the UE and then within [5] seconds the cell becomes detectable again and triggers an event, the measurement reporting delay shall be less than [TBD] ms. This requirement shall apply when the timing to the cell that triggered the event has not changed more than +/-[32] chips from the time when the cell was detectable and at least once measured before becoming undetectable until the event was triggered.

8.1.2.2 FDD inter frequency measurements

In the CELL_DCH state when a transmission gap pattern sequence with the “FDD measurements” purpose and gap lengths of 5, 7, 10 or 14 slots is provided by the network the UE shall continuously measure detected inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

8.1.2.2.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify\ \ inter} = Max\left\{[5]\,s, T_{basic\ identify\ FDD,inter} \cdot \frac{T_{Measurement\ \ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\}$$

8.1.2.2.2 Measurement period

When transmission gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.x.y and 9.z.y with measurement period given by

$$T_{\text{measurement inter}} = Max\left\{[480]ms, T_{\text{basic measurement FDD inter}} \cdot \frac{T_{\text{Measurement Period, Inter}}}{T_{\text{Inter}}} \cdot N_{Freq}\right\}$$

If the UE does not need compressed mode to perform inter-frequency measurements, the measurement period for inter frequency measurements is [480] ms.

$T_{Measurement_Period\ Inter}$ = [480] ms. The period used for calculating the measurement period $T_{measurement_inter}$ for inter frequency CPICH measurements.

$T_{Inter:}$ This is the minimum time that is available for inter frequency measurements , during the period $T_{Measurement_Period\ inter}$ with an arbitrarily chosen timing. The minimum time is calculated by using the actual idle length within the tranmission gap as given in the table 11 of Annex B in TS 25.212.

$T_{basic_identify_FDD,inter}$ = TBD ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

$T_{basic_measurement_FDD\ inter}$ = TBD ms. This is the time period used in the equation for defining the measurement period for inter frequency CPICH measurements.

N_{Freq}: Number of FDD frequencies indicated in the measurement control information.

Note: It is still under consideration how to incorporate a time needed for adjusting asynchronous timing between intra and inter frequency measurement periods and UE HW settling time into the equations.

8.1.2.2.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.2.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. 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.

The measurement reporting delay shall be less than [5] seconds.

8.1.2.3 TDD measurements

The requirements in this section apply only to UE supporting both TDD and FDD mode.

Editors note: The requirements in this section need to be revised.

The requirements in this section apply when a compressed mode pattern according to the parameters in TS 25.101, Annex A5, Table A-22 is used.

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.

8.1.2.3.1 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.3.2 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

Editors note: The measurement accuracy in combination with event triggered reporting is an open issue and the above sentence shall be revised when this is settled.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.. This measurement reporting delay excludes a delay uncertanty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertanty is twice the TTI of the uplink DCCH.

The measurement reporting delay shall be less then [5] seconds.

8.1.2.4 GSM measurements

The requirements in this section applies only to UE supporting FDD and GSM.

Editors note: The following requirements have been taken as a working assumption, but might need revision when RAN WG2 concludes the feasibility of several measurement purposes for GSM measurements.

In CELL_DCH state when a transmission gap pattern sequence is provided by the UTRAN the UE shall continously measure GSM cells and search for new GSM cells given in the monitored set.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.

If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC “verified” according to section 9.2.5.2. If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified according to section 9.2.5.2.

If the UE does not need compressed mode to perform GSM measurements, the requirements in GSM 05.08 shall apply.

8.1.2.4.1 GSM carrier RSSI

A UE supporting GSM measurements shall be able to measure GSM carrier RSSI levels of GSM cells from the monitored set with acquisition speed defined in table 8.x. This measurement shall be based on a transmission gap pattern sequence with purpose “GSM carrier RSSI measurements”

In the CELL_DCH state the measurement period for the GSM carrier RSSI measurement is [480] ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in GSM 05.08, when the given measurement time allows the UE to the take the same amount of GSM carrier RSSI samples as stated in the GSM specification during the measurement period.

Table 8.x

TGL	Number of GSM carrier RSSI samples in each gap.
3	1
4	2

5	3
7,10,14	5

8.1.2.4.2 BSIC verification

The procedure for UE measurements on a GSM cell with BSIC verified requested can be divided in the following two tasks:

1. Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the FDD and GSM cell. The UE shall trigger the initial BSIC identification within the available transmission gaps with purpose "GSM Initial BSIC identification".

2. BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available transmission gaps with purpose "GSM BSIC re-confirmation".

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.

The BSIC of a GSM cell is considered to be "verified" if the UE has demodulated the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every $T_{re\text{-}confirm\ GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". The time requirement for initial BSIC identification, $T_{identify\ GSM}$, and the BSIC re-confirmation interval $T_{re\text{-}confirm\ GSM}$ can be found in the sections below.

If GSM measurements are requested with BSIC verified the UE shall be able to report at least the [6] strongest GSM cells with BSIC verified.

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.

8.1.2.4.2.1 Initial BSIC identification

This measurement shall be based on a transmission gap pattern sequence with purpose "GSM Initial BSIC identification"

For GSM cells that is requested with BSIC verified the UE shall attempt to demodulate the SCH on the BCCH carrier of as many GSM cells indicated in the measurement control information as possible. The UE shall give priority for synchronisation attempts in signal strength order. The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified as $T_{identify\ GSM}$ in Table 8.y. When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ GSM}$

Table 8.y: The maximum time for identification of a previously not identified GSM cell

	TGL1	TGL2	TGD	TGPL1	TGPL2	$T_{identify\ GSM}$ (ms)
Pattern 1	7	0	0	2	0	
Pattern 2	7	0	0	3	0	
Pattern 3	7	0	2	9	0	
Pattern 4	7	0	3	12	0	
Pattern 5	14	0	0	2	0	
Pattern 6	14	0	2	6	0	
Pattern 7	14	0	2	8	0	
Pattern 8	14	0	2	12	0	
Pattern 9	10	0	12	48	0	
Pattern 10	10	0	0	48	0	

Note: The details of the initial BSIC identification procedure must be further clarified.

8.1.2.4.2.2 BSIC re-confirmation

This measurement shall be based on a transmission gap pattern sequence with purpose "GSM BSIC re-confirmation"

The time requirement for BSIC re-confirmation is specified as $T_{re\text{-}confirm\ GSM}$ in Table 8.z.

Table 8.z: The maximum time for BSIC re-confimation

	TGL1	TGL2	TGD	TGPL1	TGPL2	$T_{re\text{-}confirm\ GSM}$ (ms)
Pattern 1						
Pattern 2						
Pattern 3						
Pattern 4						
Pattern 5						
Pattern 6						
Pattern 7						
Pattern 8						
Pattern 9						
Pattern 10						

Note: The details of the BSIC re-confirmation procedure must be further clarified.

8.2 Parallel Measurements in CELL_DCH State

8.2.1 Introduction

The purpose with this section is to ensure that all UE can handle a certain number of measurements in parallel. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331 and measurements reporting delays are specified in section 8.1. Compressed mode is specified in TS 25.215.

8.2.2 Requirements

Editors note: The number of events that the UE shall be able to evaluate shall be considered either in this section or in a new section.

The requirements in section 9 are applicable for a UE performing measurements according to this section.

The UE shall be able to handle at least 32 FDD cells per carrier on at least 3 FDD carriers + 32 GSM cells in the monitored set.

The UE shall be able to perform parallel measurements according to table 8-2.

In addition to the requirements in table 8-2 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to section 8.1.

Table 8-2 Parallel measurement requirements

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.

8.3 Measurements in CELL_FACH State

8.3.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_FACH state. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. Compressed mode is specified in TS 25.215.

8.3.2 Requirements

TBD

NEXT CHANGED SECTION

A.8 UE Measurements Procedures

A.8.1 FDD intra frequency measurements

A.8.1.1 Event triggered reporting in AWGN propagation conditions

A.8.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE 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 are within the defined limits. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8-1 and A.8-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed timed difference shall be reported together with Event 1A. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

TableA.8-1: General test parameters for Event triggered reporting in AWGN propagation conditions

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Active cell		Cell 1	
Reporting Threshold	dB	3	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24	Signalled during time T1.
T1	s		
T2	s		
T3	s		

Table A.8-2: Cell specific test parameters for Event triggered reporting in AWGN propagation conditions

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
CPICH_Ec/Ior	DB	-10			-10		
PCCPCH_Ec/Ior	DB	-12			-12		
SCH_Ec/Ior	DB	-12			-12		
PICH_Ec/Ior	DB	-15			-15		
DPCH_Ec/Ior	DB	-17			-17		
OCNS		-1.049			-1.049		
$\hat{I}_{or}/I_{oc}$	DB	0	6.97	0	-Infinity	5.97	-Infinity
I_{oc}	DBm/ 3.84 MHz	-70					
CPICH_Ec/Io	DB	-13	-13	-13	-Infinity	-14	-Infinity
Propagation Condition		AWGN					

A.8.1.1.2 Test Requirements

The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall send one Event 1B triggered measurement report, with a measurement reporting delay less than [150] ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

A.8.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition

A.8.1.2.1 Test Purpose and Environment

Editors note: Both test cases in Tdoc R4 00 0661 have been agreed for inclusion. They should however be updated to reflect the general requirement in section 8.1.2 regarding appearing and disappearing cells.

The purpose of this test is to verify that the UE makes correct reporting of an event and that the measurement accuracy of the reported values are within the specified limits. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8-3, A.8-4 and A.8-5. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1C and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed time difference shall be reported. The test consists of four successive time periods, with a time duration of T1, T2, T3 and T4 respectively..

Table A.8-3: General test parameters for Event triggered reporting of multiple neighbours in AWGN propagation conditions

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Active cell		Cell 1	
Reporting Threshold	DB	3	
Hysteresis	DB	0	
Time to Trigger	Ms	0	
Filter coefficient		0	
Monitored cell list size		32	
T1	S	>20	
T2	S	10	
T3	S	14	
T4	S	10	

Table A.8-4: Cell specific test parameters for Event triggered reporting of multiple neighbours in AWGN propagation condition

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
Propagation Condition	AWGN								

Table A.8-5: Cell Specific test parameters for Event triggered reporting of multiple neighbours in AWGN propagation condition

Parameter	Unit	Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4
CPICH_Ec/Ior	DB	-10				-10			
PCCPCH_Ec/Ior	DB	-12				-12			
SCH_Ec/Ior	DB	-15				-15			
PICH_Ec/Ior	DB	-15				-15			
DPCH_Ec/Ior	DB	N/A				N/A			
OCNS	DB	-0.941				-0.941			
$\hat{I}_{or}/I_{oc}$	DB	-Inf	18.5	-Inf	18.5	-Inf	17.5	-Inf	17.5
I_{oc}	DBm/3.84 MHz	-85							
CPICH_Ec/Io	DB	-Inf	-15.5	-Inf	-15.5	-Inf	-16.5	-Inf	-16.5
Propagation Condition	AWGN								

A.8.1.2.2 Test Requirements

The UE shall send one Event 1C triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall send one Event 1B triggered measurement report, with a measurement reporting delay less than [150] ms from the beginning of time period T3.

The UE shall send one Event 1C triggered measurement report, with a measurement reporting delay less than150 ms from the beginning of time period T4.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

A.8.1.3 Correct reporting of neighbours in fading propagation condition

A.8.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in a fading propagation condition. This test will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8-6 and A.8-7.In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A shall be used. The test consists of two successive time periods, each with a time duration of T1 and T2 respectively.

Table A.8-6: General test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Active cell		Cell 1	
Reporting Threshold	dB	3	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24	Signalled during time T1.
T1	s		
T2	s		

Table A.8-7: Cell specific test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
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	-Infinity	5.97
I_{oc}	DBm/3.84 MHz	-70			
CPICH_Ec/Io	DB	-13	-13	-Infinity	-14
Propagation Condition	Case 5 as specified in Annex B of TS25.101				

A.8.1.3.2 Test Requirements

The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

A.8.1.4 CPICH_Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition

A.8.1.4.1 Test Purpose and Environment

The purpose of this test is to verify the UE measurement accuracy of CPICH_Ec/Io and that the UE does not send any measurement reports when the reporting criteria is not fulfilled. This test will partly verify the requirements in section 8.1.2 and section 9.1.

The UE measurement accuracy of CPICH_Ec/Io is derived by using the periodical reporting of the active cell's measured CPICH_Ec/Io. The UE false detection resistance is derived by monitoring the amount of false triggered Event

1A measurement reports. The test parameters are given in Table A.8-8 and A.8-9. In the measurement control information it is indicated to the UE that the CPICH_Ec/Io level of the active set cell shall be reported periodically and that event-triggered reporting with Event 1A shall be used.

Table A.8-8: General test parameters for CPICH_Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Active cell		Cell 1	
Reporting Threshold	dB	3	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Reporting period	ms	TBD	
Monitored cell list size		24	

Table A.8-9: Cell specific test parameters for CPICH_Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition

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
Propagation Condition	AWGN		

A.8.1.4.2 Test Requirements

The measurement reports shall have an accuracy according to section 9.

The UE shall not send any Event 1A triggered measurement reports.

A.8.2 FDD inter frequency measurements

A.8.2.1 Correct reporting of neighbours in AWGN propagation condition

A.8.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.2.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in Table A.8-10 and A.8-11 below. 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 unused frequency has to be reported together with Event 2C reporting.

Table A.8-10: General test parameters for Correct reporting of neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Compressed mode		Case 2.1	As specified in TS 25.101 section A.5.
Active cell		Cell 1	
Absolute Threshold (Ec/N0) for Event 2c	dB	-18	
Reporting Threshold	dB	3	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		Total 24 X on frequency Channel 2	Measurement control information is sent before the compressed mode pattern starts.
T1	s		
T2	s		

TableA.8-11: Cell Specific parameters for Correct reporting of neighbours in AWGN propagation condition

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
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
Propagation Condition	AWGN						

A.8.2.1.2 Test Requirements

The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 5 seconds from the beginning of time period T1.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

A.8.2.2 Correct reporting of neighbours in Fading propagation condition

A.8.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.2.The test parameters are given in Table A.8-12 and A.8-13. In the measurement control information it is indicated to the UE that event-triggered reporting 2C shall be used.

Table A.8-12: General test parameters for Correct reporting of neighbours in Fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Compressed mode		Case 2.1	As specified in TS 25.101 section A.5.
Active cell		Cell 1	
Absolute Threshold (Ec/N0) for Event 2c	dB	-18	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		Total 24 X on frequency Channel 2	Measurement control information is sent before the compressed mode pattern starts.

Table A.8-13: Test parameters for Correct reporting of neighbours in Fading propagation condition

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
Propagation Condition	Case 5 as specified in Annex B of TS25.101		

A.8.2.2.2 Test Requirements

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 5 seconds from the start of the test.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

A.8.3 TDD measurements

A.8.3.1 Correct reporting of TDD neighbours in AWGN propagation condition

A.8.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when measuring on a TDD cell. The test will partly verify the requirements in section 8.1.2.3.

The test consists of two successive time periods, with a time duration T1 and T2 respectively. The test parameters are given in Table A.8-14 and A.8-15. In the measurement control information it is indicated to the UE that event triggered reporting with Event XX shall be used.

Table A.8-14: General test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Compressed mode		Case 2.1	As specified in TS 25.101 section A.5.
Active cell		Cell 1	
Reporting Threshold	dB		
Hysteresis	dB		
Time to Trigger	ms		
Filter coefficient			
Monitored cell list size		Total X Y on frequency Channel 2	Measurement control information is sent before the compressed mode pattern starts.
T1	s		
T2	s		

Table A.8-15: Cell specific test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

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.	[ ]	[ ]	[ ]	[ ]
Propagation Condition		AWGN					

A.8.3.1.2 Test Requirements

The UE shall send one Event XX triggered measurement report, with a measurement reporting delay less than X seconds from the start of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

NEXT CHANGED SECTION

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.

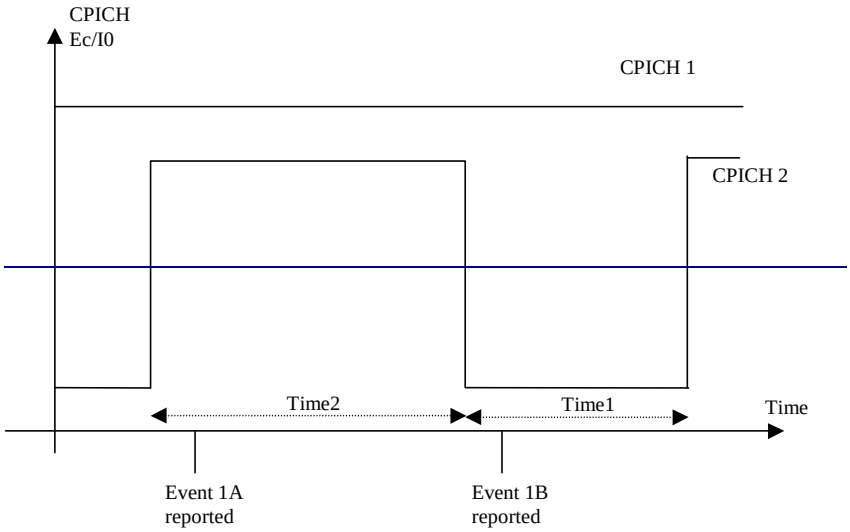

Figure 5-1: Illustration of parameters for soft handover measurement reporting test case

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.

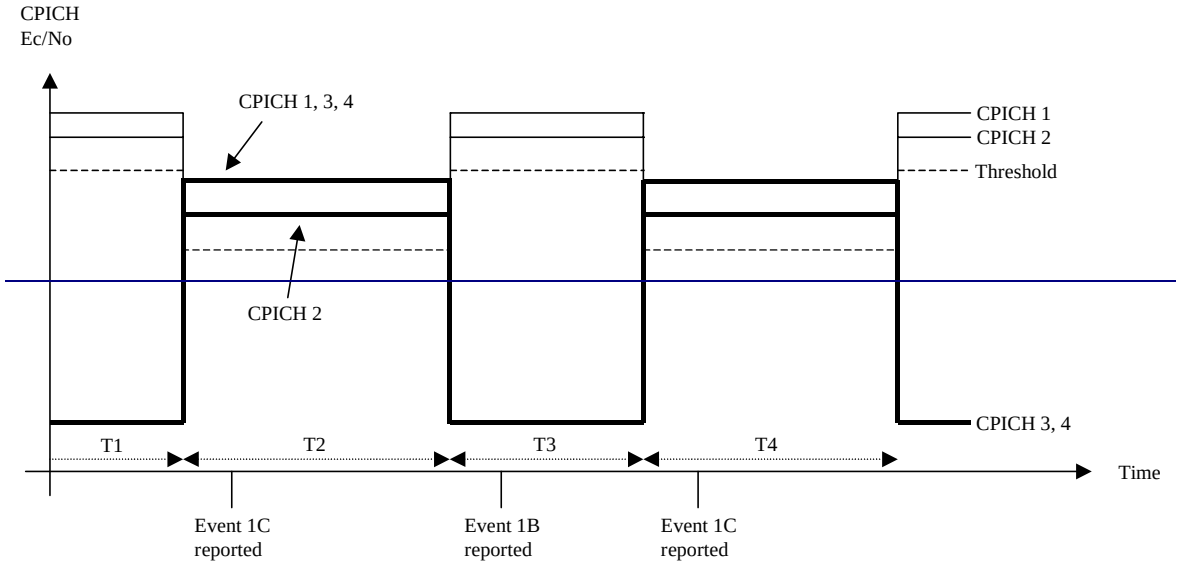

Figure 5.2: Illustration of the test case

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] %.

Time	Value	Cell 1 to 2	Cell 3 to 4
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.

NEXT CHANGED SECTION

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.

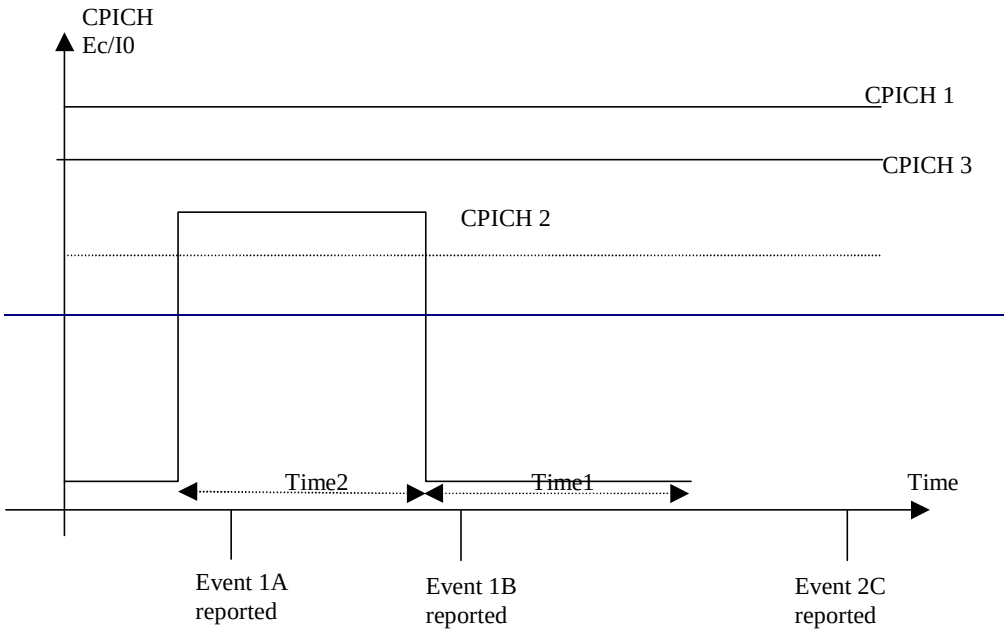

Figure 5-3: Illustration of parameters for handover measurement reporting test case

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.

NEXT CHANGED SECTION

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.

NEXT CHANGED SECTION

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.

NEXT CHANGED SECTION

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.

NEXT CHANGED SECTION

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

TSG-RAN Working Group 4 meeting #13
Torino, Italy, September 04-08, 2000

***Document* R4-000768**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.133	CR	41	Current Version:	3.2.0

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

For submission to:	TSG RAN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source:	RAN WG4	**Date:**	2000-09-08

Subject:	Proposal for section 9

Work item:	

Category: *(only one category shall be marked with an X)*			**Release:**	
F	Correction	X	Phase 2	
A	Corresponds to a correction in an earlier release		Release 96	
B	Addition of feature		Release 97	
C	Functional modification of feature		Release 98	
D	Editorial modification		Release 99	X
			Release 00	

Reason for change:	Dividing TS 25.133 into a general part and a testing part.

Clauses affected:	8

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

Other comments:	

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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* ≥ -114 dBm.

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

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

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

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 Channel 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 $\leq$ Log10(Transport channel BLER) $<$ -3.965	-
BLER_LOG_03	-3.965 $\leq$ Log10(Transport channel BLER) $<$ -3.9	-
…	…	…
BLER_LOG_61	-0.195 $\leq$ Log10(Transport channel BLER) $<$ -0.13	-
BLER_LOG_62	-0.13 $\leq$ Log10(Transport channel BLER) $<$ -0.065	-
BLER_LOG_63	-0.065 $\leq$ Log10(Transport channel BLER) $\leq$ 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
GSM_TIME _0000	0 ≤ Observed time difference to GSM cell < 1x3060/(4096x13)
GSM_TIME _0001	1x3060/(4096x13) ≤ Observed time difference to GSM cell < 2x3060/(4096x13)
GSM_TIME _0002	2x3060/(4096x13)≤ Observed time difference to GSM cell < 3x3060/(4096x13)
GSM_TIME _0003	3x3060/(4096x13) ≤ Observed time difference to GSM cell < 4x3060/(4096x13)
…	…
GSM_TIME _4093	4093x3060/(4096x13) ≤ Observed time difference to GSM cell < 4094x3060/(4096x13)
GSM_TIME _4094	4094x3060/(4096x13) ≤ Observed time difference to GSM cell < 4095x3060/(4096x13)
GSM_TIME _4095	4095x3060/(4096x13) ≤ Observed time difference to GSM cell < 3060/13

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

NOTE 1: *P-CCPCH_RSCP* ≥ -102 dBm.

NOTE 2: $|Io - P\text{-}CCPCH_Ec/Ior| \leq [20]$ dB.

NOTE 3: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor $\hat{I}or/Ioc$.

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

Reported value	Measured quantity value	Unit
…	…	…
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	$-\infty <$ Log10(Physical channel BER) $<$ -2.06375	-
PhCh_BER_LOG_002	-2.06375$\leq$ Log10(Physical channel BER) $<$ -2.055625	-
PhCh_BER_LOG_003	-2.055625 $\leq$ Log10(Physical channel BER) $<$ -2.0475	-
…	…	…
PhCh_BER_LOG_253	-0.024375 $\leq$ Log10(Physical channel BER) $<$ -0.01625	-
PhCh_BER_LOG_254	-0.01625 $\leq$ Log10(Physical channel BER) $<$ -0.008125	-
PhCh_BER_LOG_255	-0.008125 $\leq$ Log10(Physical channel BER) $\leq$ 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	-∞ < 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 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 physical layer measurement model and a complete list of measurements is specified in TS25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 “Physical layer – Measurements (FDD)”. In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

The accuracy requirements in this clause are applicable for AWGN radio propagation conditions.

9.1 Measurement Performance for UE

The requirements in this clause are applicable for a UE:

- in state CELL_DCH and state CELL_FACH.
- performing measurements according to section 8.
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is refered to as point B in the measurement model described in TS25.302.

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

Note: The synchronisation channel side condition for the requirements in this section to apply needs to be further clarified.

Note: It needs to be clarified how the accuracy requirements shall be handled when the UE is measuring on cells using IPDL.

Note: Currently the measurement periods for UE measurements in CELL_FACH state are missing. This needs to be clarified when the requirements in section 8.3 Measurements in CELL_FACH State are completed.

Note: The measurement period for the measurement Observed time difference to GSM cell needs to be clarified when the requirements for that measurement is completed in section 8.

9.1.1 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.

9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

9.1.1.1.1 Absolute accuracy requirement

The accuracy requirements in table 9-1 are valid under the following conditions:

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

Table 9-1: *CPICH_RSCP Intra frequency absolute accuracy*

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-94...-50

9.1.1.1.2 Relative accuracy requirement

The relative accuracy of CPICH RSCP is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on the same frequency

The accuracy requirements in table 9-2 are valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1\right|_{in\ dB} - CPICH_RSCP2\Big|_{in\ dB} \leq 20dB$
- $\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$
- $\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} \leq XdB$

Table 9-2: *CPICH_RSCP Intra frequency relative accuracy*

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_RSCP	dBm	± 3	± 3	-94...-50

9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2.

9.1.1.2.1 Relative accuracy requirement

The relative accuracy of CPICH RSCP in inter frequency case is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on a different frequency.

The accuracy requirements in table 9-3 are valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left| CPICH_RSCP1 \right|_{in\ dB} - CPICH_RSCP2 \left|_{in\ dB} \right| \le 20dB$
- | *Channel 1_Io –Channel 2_Io*| ≤ 20 dB.
- $\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$
- $\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{SCH_E_c}{I_{or}} \right)_{in\ dB} \le XdB$

Table 9-3: CPICH_RSCP Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_RSCP	dBm	± 6	± 6	-94...-50

9.1.1.3 CPICH RSCP measurement report mapping

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

In table 9-4 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-4

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

9.1.2 CPICH Ec/Io

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

9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

9.1.2.1.1 Absolute accuracy requirement

The accuracy requirements in table 9-5 are valid under the following conditions:

- *CPICH_RSCP1* ≥ -114 dBm.
- $\left|\frac{I_o}{\hat{I}_{or}}\right|_{in\ dB} - \left|\frac{CPICH_E_c}{I_{or}}\right|_{in\ dB} \le 20dB$
- $\left|\frac{I_o}{\hat{I}_{or}}\right|_{in\ dB} - \left|\frac{SCH_E_c}{I_{or}}\right|_{in\ dB} \le XdB$

Table 9-5: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	± 4	± 4	-94...-50

9.1.2.1.2 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io is defined as the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on the same frequency.

The accuracy requirements in table 9-6 are valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1|_{in\ dB} - CPICH_RSCP2|_{in\ dB}\right| \le 20dB$

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

Table 9-6: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	± 1.5 for –14 ≤ CPICH Ec/Io ± 2 for –16 ≤ CPICH Ec/Io < -14 ± 3 for –20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2.

9.1.2.2.1 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io in the inter frequency case is defined as the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on a different frequency

The accuracy requirements in table 9-7 are valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1\right|_{in\ dB} - CPICH_RSCP2\left|_{in\ dB}\right| \leq 20dB$
- | *Channel 1_Io –Channel 2_Io*| ≤ 20 dB.
- $\left.\frac{I_o}{\hat{I}_{or}}\right|_{in\ dB} - \left.\left(\frac{CPICH_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$
- $\left.\frac{I_o}{\hat{I}_{or}}\right|_{in\ dB} - \left.\left(\frac{SCH_E_c}{I_{or}}\right)\right|_{in\ dB} \leq XdB$

Table 9-7: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	± 6	± 6	-94...-50

9.1.2.3 CPICH Ec/Io measurement report mapping

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

In table 9-8 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-8

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

9.1.3 UTRA Carrier RSSI

Note: This measurement is for Inter-frequency handover evaluation.

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9-9: *Io* Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
Io	dBm	± 4	± 7	-94...-70
	dBm	± 6	± 9	-94...-50

9.1.3.2 Relative accuracy requirement

The relative accuracy requirement is defined as the UTRAN RSSI measured from one frequency compared to the UTRAN RSSI measured from another frequency.

The accuracy requirements in table 9-10 are valid under the following conditions:

- *| Channel 1_Io –Channel 2_Io | < 20 dB.*

Table 9-10: Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]	Conditions

		Normal condition	Extreme condition	Io [dBm]
Io	dBm	± 7	± 11	-94...-70

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9-11 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-11

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

9.1.4 GSM carrier RSSI

Note: This measurement is for handover between UTRAN and GSM.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for CELL_DCH state can be found in section 8.1.2.4.

If the UE does not need compressed mode to perform GSM measurements, the measurement accuracy requirements for RXLEV in GSM 05.08 shall apply.

If the UE needs compressed mode to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement is stated in section 8.1.2.4.

The reporting range and mapping specified for RXLEV in GSM 05.08 shall apply.

9.1.5 Transport channel BLER

9.1.5.1 BLER measurement requirement

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

9.1.5.2 Transport channel BLER measurement report mapping

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

In table 9-12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-12

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	-

9.1.6 UE transmitted power

9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 9-13 UE transmitted power absolute accuracy

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

9.1.6.2 UE transmitted power measurement report mapping

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

In table 9-14 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-14

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

9.1.7 SFN-CFN observed time difference

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

9.1.7.1 Intra frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

The accuracy requirement in table 9-15 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1\right|_{in\ dB} - CPICH_RSCP2\left|_{in\ dB}\right| \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} \le XdB$

Table 9-15

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm]
SFN-CFN observed time difference	chip	± 1	-94...-50

9.1.7.2 Inter frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2.

The accuracy requirement in table 9-16 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1\right|_{in\ dB} - CPICH_RSCP2\left|_{in\ dB}\right| \le 20dB$
- | *Channel 1_Io –Channel 2_Io*| ≤ 20 dB.
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} \le XdB$

Table 9-16

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm]
SFN-CFN observed time difference	chip	± 1	-94...-50

9.1.7.3 SFN-CFN observed time difference measurement report mapping

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

In table 9-17 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-17

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

9.1.8 SFN-SFN observed time difference

9.1.8.1 SFN-SFN observed time difference type 1

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

9.1.8.1.1 Measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

The accuracy requirement in table 9-18 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1\right|_{in\ dB} - CPICH_RSCP2\left|_{in\ dB}\right| \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} \le XdB$

Table 9-18

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm]
SFN-SFN observed time difference type1	chip	± 1	-94...-50

9.1.8.1.2 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 9-19 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-19

Reported value	Measured quantity value	Unit
T1_SFN-SFN_TIME_0000000	0 ≤ SFN-SFN observed time difference type 1 < 1	chip
T1_SFN-SFN_TIME_0000001	1 ≤ SFN-SFN observed time difference type 1 < 2	chip
T1_SFN-SFN_TIME_0000002	2 ≤ SFN-SFN observed time difference type 1 < 3	chip
…	…	…
T1_SFN-SFN_TIME_9830397	9830397 ≤ SFN-SFN observed time	chip

	difference type 1 < 9830398	
T1_SFN-SFN_TIME_9830398	9830398 ≤ SFN-SFN observed time difference type 1 < 980399	chip
T1_SFN-SFN_TIME_9830399	9830399 ≤ SFN-SFN observed time difference type 1 < 9830400	chip

9.1.8.2 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.

9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

The accuracy requirement in table 9-20 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1\right|_{in\ dB} - CPICH_RSCP2\left|_{in\ dB}\right| \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} \le XdB$

Table 9-20

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm]
SFN-SFN observed time difference type2	chip	± 0.5	-94...-50

9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

The accuracy requirement in table 9-21 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1\right|_{in\ dB} - CPICH_RSCP2\left|_{in\ dB}\right| \le 20dB$

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

Note: Additional general conditions are needed for the requirements in table 9-21 to be valid.

Table 9-21

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm]
SFN-SFN observed time difference type 2	chip	± 0.5	-94...-50

9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2.

The accuracy requirement in table 9-22 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH_RSCP1\right|_{in\ dB} - CPICH_RSCP2\left|_{in\ dB}\right| \leq 20dB$
- *| Channel 1_Io –Channel 2_Io|* ≤ 20 dB.
- $\left|\frac{I_o}{\hat{I}_{or}}\right|_{in\ dB} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$
- $\left|\frac{I_o}{\hat{I}_{or}}\right|_{in\ dB} - \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} \leq XdB$

Table 9-22

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm]
SFN-SFN observed time difference type 2	chip	± 1	-94...-50

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

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

In table 9-23 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-23

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -1280.0000	chip
T2_SFN-SFN_TIME _00001	-1280.0000 ≤ SFN-SFN observed time difference type 2 < -1279.9375	chip
T2_SFN-SFN_TIME _00002	-1279.9375 ≤ SFN-SFN observed time difference type 2 < -1279.8750	chip
…	…	…
T2_SFN-SFN_TIME _40959	1279.8750 ≤ SFN-SFN observed time difference type 2 < 1279.9375	chip
T2_SFN-SFN_TIME _40960	1279.9375 ≤ SFN-SFN observed time difference type 2 < 1280.0000	chip
T2_SFN-SFN_TIME _40961	1280.0000 ≤ SFN-SFN observed time difference type 2	chip

9.1.9 UE Rx-Tx time difference

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

The measurement period in CELL_DCH state is [100 ms]

9.1.9.1 Measurement requirement

Table 9-24

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm]
UE RX-TX time difference	chip	± 1.5	-94...-50

9.1.9.2 UE Rx-Tx time difference measurement report mapping

The reporting range is for *UE Rx-Tx time difference* is from 768 ... 1280 chip.

In table 9-25 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-25

Reported value	Measured quantity value	Unit
RX-TX_TIME _0000	UE Rx-Tx Time difference < 768.000	chip
RX-TX_TIME _0001	768.000 ≤ UE Rx-Tx Time difference < 768.0625	chip

RX-TX_TIME_0002	768.0625 ≤ UE Rx-Tx Time difference < 768.1250	chip
RX-TX_TIME_0003	768.1250 ≤ UE Rx-Tx Time difference < 768.1875	chip
…	…	…
RX-TX_TIME_8190	1279.8125 ≤ UE Rx-Tx Time difference < 1279.8750	chip
RX-TX_TIME_8191	1279.8750 ≤ UE Rx-Tx Time difference < 1279.9375	chip
RX-TX_TIME_8192	1279.9375 ≤ UE Rx-Tx Time difference < 1280.0000	chip
RX-TX_TIME_8193	1280.0000 ≤ UE Rx-Tx Time difference	chip

9.1.10 Observed time difference to GSM cell

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

The requirements in this section are valid for terminals supporting UTRA and GSM.

9.1.10.1 Measurement requirement

Note: The conditions for which the accuracy requirement in table 9-26 is valid are FFS.

Table 9-26

Parameter	Unit	Accuracy [chip]	Conditions
Observed time difference to GSM cell	ms	± 20	

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

9.1.10.2 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 9-27 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-27

Reported value	Measured quantity value
GSM_TIME_0000	0 ≤ Observed time difference to GSM cell < 1x3060/(4096x13)
GSM_TIME_0001	1x3060/(4096x13) ≤ Observed time difference to GSM cell < 2x3060/(4096x13)
GSM_TIME_0002	2x3060/(4096x13)≤ Observed time difference to GSM cell < 3x3060/(4096x13)
GSM_TIME_0003	3x3060/(4096x13) ≤ Observed time difference to GSM cell < 4x3060/(4096x13)
…	…
GSM_TIME_4093	4093x3060/(4096x13) ≤ Observed time difference to GSM cell <

	4094x3060/(4096x13)
GSM_TIME_4094	4094x3060/(4096x13) ≤ Observed time difference to GSM cell < 4095x3060/(4096x13)
GSM_TIME_4095	4095x3060/(4096x13) ≤ Observed time difference to GSM cell < 3060/13

9.1.11 P-CCPCH RSCP

Note: This measurement is used for handover between UTRA FDD and UTRA TDD.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3.

9.1.11.1 Absolute accuracy requirements

The accuracy requirement in table 9-28 is valid under the following conditions:

- *P-CCPCH_RSCP* ≥ -102 dBm.
- | *Io – P-CCPCH_Ec/Ior*| ≤ [20] dB.

Table 9-28: P-CCPCH_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-94...-50

9.1.11.2 P-CCPCH RSCP measurement report mapping

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

In table 9-29 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-29

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

9.1.12 UE GPS Timing of Cell Frames for LCS

The requirements in this section are valid for terminals supporting this capability:

Table 9-30

Parameter	Unit	Accuracy [chip]	Conditions
UE GPS Timing of Cell Frames for LCS	chip	[ ]	

9.1.12.1 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 9-31 the mapping of measured quantity is defined.

Table 9-31

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UE GPS timing of Cell Frames for LCS < 0.0625	chip
GPS_TIME_00000000000001	0.0625 ≤ UE GPS timing of Cell Frames for LCS < 0.1250	chip
GPS_TIME_00000000000002	0.1250 ≤ UE GPS timing of Cell Frames for LCS < 0.1875	chip
...	...	...
GPS_TIME_37109759999997	2319359999999.8125 ≤ UE GPS timing of Cell Frames for LCS < 2319359999999.8750	chip
GPS_TIME_37109759999998	2319359999999.8750 ≤ UE GPS timing of Cell Frames for LCS < 2319359999999.9375	chip
GPS_TIME_37109759999999	2319359999999.9375 ≤ UE GPS timing of Cell Frames for LCS < 2319360000000.0000	chip

9.2 Measurements Performance for UTRAN

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is refered to as point B in the measurement model described in TS25.302.

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

9.2.1 RSSI

The measurement period shall be [100] ms.

9.2.1.1 Absolute accuracy requirement

Table 9-32

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	dBm	± 4	For levels <= -74 dBm

9.2.1.2 Relative accuracy requirement

The relative accuracy of RSSI is defined as the RSSI measured at one frequency compared to the RSSI measured from the same frequency at a different time.

Note: The accuracy requirement and the conditions in table 9-33 to needs to be revised when the definiton of the UTRAN RSSI measurement is decided within WG1.

Table 9-33

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

9.2.1.3 RSSI measurement report mapping

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

In table 9-34 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-34

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

9.2.2 SIR

The measurement period shall be 80 ms.

9.2.2.1 Accuracy requirement

Table 9-35

Parameter	Unit	Accuracy [dB]	Conditions Range
SIR	dB	± 3	For -7<SIR<20 dB when Io > -105 dBm

9.2.2.2 SIR measurement report mapping

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

In table 9-36 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-36

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

9.2.3 Transmitted carrier power

The measurement period shall be [100] ms.

9.2.3.1 Accuracy requirement

Table 9-37

Parameter	Unit	Accuracy [% units]	Conditions Range
Ptot	%	± 5	For 5% ≤ Transmitted carrier power ≤95%

9.2.3.2 Transmitted carrier power measurement report mapping

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

In table 9-38 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-38

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	%

9.2.4 Transmitted code power

The measurement period shall be [100] ms.

9.2.4.1 Absolute accuracy requirement

Table 9-39

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Pcode	dBm	± 3	Over the full range

9.2.4.2 Relative accuracy requirement

The relative accuracy of Transmitted code power is defined as the Transmitted code power measured at one dedicated radio link compared to the Transmitted code power measured from a different dedicated radio link in the same cell.

Table 9-40

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Pcode	dBm	± 2	Over the full range

9.2.4.3 Transmitted code power measurement report mapping

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

In table 9-41 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-41

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

9.2.5 Transport channel BLER

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

9.2.5.1 Accuracy requirement

Table 9-42

Parameter	Unit	Accuracy	Conditions
			Range
BLER	-		

9.2.5.2 Transport channel BLER measurement report mapping

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

In table 9-43 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-43

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	-

9.2.6 Physical channel BER

The measurement period shall be equal to the TTI of the transport channel, to which the Physical channel BER is associated via the IE QE-Selector, see TS 25.433 section 9.2.2.58 QE-Selector.

9.2.6.1 Accuracy requirement

Table 9-44

Parameter	Unit	Accuracy [% of absolute BER value]	Conditions
			Range
BER	-	+/- 10%	

9.2.6.2 Physical channel BER measurement report mapping

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

In table 9-45 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-45

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	-

9.2.7 Round trip time

The measurement period shall be [100] ms.

9.2.7.1 Absolute accuracy requirement

Table 9-46

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
RTT	chip	+/- 0.5	876, …, 2923.50

9.2.7.2 Round trip time measurement report mapping

The *Round trip time* reporting range is from 876.0000 ... 2923.8750 chip.

In table 9-47 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-47

Reported value	Measured quantity value	Unit
RT_TIME_0000	Round trip time < 876.0000	chip
RT_TIME_0001	876.0000 ≤ Round trip time < 876.0625	chip
RT_TIME_0002	876.0625 ≤ Round trip time < 876.1250	chip
RT_TIME_0003	876.1250 ≤ Round trip time < 876.1875	chip
…	…	…
RT_TIME_32764	2922.6875 ≤ Round trip time < 2923.7500	chip
RT_TIME_32765	2923.7500 ≤ Round trip time < 2923.8125	chip
RT_TIME_32766	2923.8125 ≤ Round trip time < 2923.8750	chip
RT_TIME_32767	2923.8750 ≤ Round trip time	chip

9.2.8 Transport Channel BER

The measurement period shall be equal to the TTI of the transport channel. Each reported Transport channel BER measurement shall be an estimate of the BER averaged over one measurement period only.

9.2.8.1 Accuracy requirement

The average of consecutive Transport channel BER measurements is required to fulfil the accuracy stated in table 9-48 if the total number of erroneous bits during these measurements is at least 500 and the absolute BER value for each of the measurements is within the range given in table 9-48.

Table 9-48

Parameter	Unit	Accuracy [% of the absolute BER value]	Conditions Range
TrpBER	-	+/- 10	Convolutional coding 1/3rd with any amount of repetition or a maximum of 25% puncturing: for absolute BER value ≤ 15% Convolutional coding 1/2 with any amount of repetition or no puncturing: for absolute BER value ≤ 15% Turbo coding 1/3rd with any amount of repetition or a maximum of 20% puncturing: for absolute BER value ≤ 15%.

9.2.8.2 Transport channel BER measurement report mapping

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

In table 9-49 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-49

Reported value	Measured quantity value	Unit
TrCh_BER_LOG_000	Transport channel BER = 0	-
TrCh_BER_LOG_001	-∞ < 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	-

9.2.9 UTRAN GPS Timing of Cell Frames for LCS

Table 9-50

Parameter	Unit	Accuracy [chip]	Conditions
UTRAN GPS Timing of Cell Frames for LCS	chip	[ ]	

9.2.9.1 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 9-51 the mapping of measured quantity is defined.

Table 9-51

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UTRAN GPS timing of Cell Frames for LCS < 0.0625	chip
GPS_TIME_00000000000001	0.0625 ≤ UTRAN GPS timing of Cell Frames for LCS < 0.1250	chip
GPS_TIME_00000000000002	0.1250 ≤ UTRAN GPS timing of Cell Frames for LCS < 0.1875	chip
…	…	…
GPS_TIME_37109759999997	2319359999999.8125 ≤ UTRAN GPS timing of Cell	chip

	Frames for LCS < 2319359999999.8750	
GPS_TIME_37109759999998	2319359999999.8750 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319359999999.9375	chip
GPS_TIME_37109759999999	2319359999999.9375 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319360000000.0000	chip

9.2.10 PRACH/PCPCH Propagation delay

9.2.10.1 Accuracy requirement

Table 9-52

Parameter	Unit	Accuracy [chip]	Conditions
			Range
PropDelay	chip	+/- []	

9.2.10.2 PRACH/PCPCH Propagation delay measurement report mapping

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

In table 9-53 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9-53

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

A.9 Measurement Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in 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.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

A.9.1 Measurement Performance for UE

A.9.1.1 CPICH RSCP

A.9.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.1.

A.9.1.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. Table A.9-1 defines the limits of signal strengths and code powers, when the requirements are applicable.

When verifying the CPICH RSCP intra frequency absolute accuracy requirement only cell 1 in table A.9-1 shall be present. When verifying the CPICH RSCP intra frequency relative accuracy requirement both cell 1 and 2 in table A.9-1 shall be present.

Table A.9-1: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io –13.7 dB = Ioc*, Note 1	*Io –13.7 dB = Ioc*, Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50

Propagation condition	-	AWGN

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. Table A.9-2 defines the limits of signal strengths and code powers, where the requirement is applicable.

When verifying the CPICH RSCP inter frequency relative accuracy requirement both cell 1 and 2 in table A.9-2 shall be present.

Table A.9-2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io –10.6 dB = Ioc*, Note 1	*Io –10.6 dB = Ioc*, Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.1.2 Test Requirements

The CPICH RSCP measurement accuracy shall meet the requirements in section 9.1.1.

A.9.1.2 CPICH Ec/Io

A.9.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/Io measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.2.

A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Table A.9-3 defines the limits of signal strengths and code powers, where the requirements are applicable.

When verifying the CPICH Ec/Io intra frequency absolute accuracy requirement only cell 1 in table A.9-3 shall be present. When verifying the CPICH Ec/Io intra frequency relative accuracy requirement both cell 1 and 2 in table A.9-3 shall be present.

Table A.9-3: CPICH Ec/Io Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io –13.7 dB = Ioc*, Note 1	*Io –13.7 dB = Ioc*, Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.2.1.2 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]. Table A.9-4 defines the limits of signal strengths and code powers, where the requirement is applicable.

When verifying the CPICH Ec/Io inter frequency relative accuracy requirement both cell 1 and 2 in table A.9-4 shall be present.

Table A.9-4: CPICH Ec/Io Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15

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

NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2.

A.9.1.3 UTRA Carrier RSSI

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3.

Table A.9-5 defines the limits of signal strengths, where the requirement is applicable.

When verifying the UTRA Carrier RSSI absolute accuracy requirement only cell 1 in table A.9-5 shall be present.
When verifying the UTRA Carrier RSSI relative accuracy requirement both cell 1 and 2 in table A.9-5 shall be present.

Table A.9-5: UTRA Carrier 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	*Io –4.13 dB = Ioc*, Note 1	*Io –4.13 dB = Ioc*, Note 1
Range 1: Io *Range 2: Io*	dBm/ 3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3.

A.9.1.4 SFN-CFN observed time difference

A.9.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-CFN observed time difference measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.7.

A.9.1.4.1.1 Intra frequency test parameters

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

In this case all cells are in the same frequency. Table A.9-6 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9-6: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io –13.7 dB = Ioc*, Note 1	*Io –13.7 dB = Ioc*, Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.4.1.2 Inter frequency test parameters

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. Table A.9-7 defines the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9-7: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10

Parameter	Unit	Cell 1	Cell 2
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io –10.6 dB = Ioc*, Note 1	*Io –10.6 dB = Ioc*, Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.4.2 Test Requirements

The SFN-CFN observed time difference measurement accuracy shall meet the requirements in section 9.1.7.

A.9.1.5 SFN-SFN observed time difference

A.9.1.5.1 SFN-SFN observed time difference type 1

A.9.1.5.1.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 1 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.1.

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

In this case all cells are in the same frequency. Table A.9-8 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9-8: SFN-SFN observed time difference type 1 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11

Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io –13.7 dB = Ioc*, Note 1	*Io –13.7 dB = Ioc*, Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.5.1.2 Test Requirements

The SFN-SFN observed time difference type 1 measurement accuracy shall meet the requirements in section 9.1.8.1

A.9.1.5.2 SFN-SFN observed time difference type 2

A.9.1.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 can be set to value from –1279.75 to 1280 chips.

In this case all cells are in the same frequency. Table A.9-9 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9-9: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	**Unit**	**Cell 1**	**Cell 2**
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io –13.7 dB = Ioc*, Note 1	*Io –13.7 dB = Ioc*, Note 1
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9-10 shall be used.

Table A.9-10 SFN-SFN observed time difference type 2 idle period test parameters

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.

A.9.1.5.2.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

A.9.1.6 UE Rx-Tx time difference

A.9.1.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE Rx-Tx time difference measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.9.

Table A.9-11 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9-11: UE Rx-Tx time difference Intra frequency test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	-15
OCNS	dB	-1.11
Îor/Ioc	dB	10.5
Ioc	dBm/ 3.84 MHz	*Io –13.7 dB = Ioc*, Note 1
Range 1:Io	dBm	-94…-70

Range 2: Io		-94…-50
Propagation condition	-	AWGN

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.6.2 Test Requirements

The UE Rx-Tx time difference measurement accuracy shall meet the requirements in section 9.1.9.

A.9.1.7 Observed time difference to GSM cell

A.9.1.7.1 Test Purpose and Environment

The purpose of this test is to verify that the Observed time difference to GSM cell measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.10.

Note: The requirement scenario is FFS.

A.9.1.7.2 Test Requirements

Note: Requirements will be added when the requirement scenario is defined.

A.9.1.8 P-CCPCH RSCP

A.9.1.8.1 Test Purpose and Environment

These measurements consider *P-CCPCH RSCP* measurements. This requirement is only valid for UEs supporting FDD and TDD.

The purpose of this test is to verify that the P-CCPCH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.11.

In this case the cells are on different frequencies. Table A.9-12 defines 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 A.9-12 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 1	-70
Range 1:Io *Range 2: Io*	dBm	-94 ... –70 -94... –50	-94 ... –70 -94... –50
Propagation condition	-	AWGN	AWGN

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.1.8.2 Test Requirements

The P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.1.11.

3GPP TSG RAN WG4 Meeting #13 **Document R4-000761**

Turin, Italy, 4 – 8 Sep, 2000

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25.133	CR	44	Current Version:	3.2.0

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

For submission to:	RAN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: RAN WG4 **Date:** 2000-09-07

Subject: Proposal for section 7 and A.7

Work item:

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

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

Reason for change:

- Separating general requirement and test requirement in section 7.

Clauses affected: 7

Other specs Affected:

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

Other comments:

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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] TS 25.211: “Physical channels and mapping of transport channels onto physical channels (FDD)”. ~~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] TR~~S~~ 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".

[16] TS 25.331: "RRC Protocol Specification".

7 Timing and Signalling Characterisitics

7.1 UE Transmit Timing

Introduction

The UE shall have capability to follow the frame timing change of the connected Node B. The uplink DPCCH/DPDCH frame transmission takes place approximately T_0 chips after the reception of the first detected ~~significant~~ path (in time) of the corresponding downlink DPCCH/DPDCH frame. T_0 is defined in [2]. 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 Requirements

~~For parameters specified in Table 7-1,~~The 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~~ T_0 chips. T_0 is defined in [2].

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.

~~7.2 UE Receive Timing~~

~~7.2.1 Introduction~~

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

~~7.2.2 Requirements~~

~~TBD~~

7.2~~3~~ Signalling Response Delay

7.2~~3~~.1 Introduction

For all messages requiring a RRC response to be sent to UTRAN~~,~~ as defined in [16], 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.

7.2~~3~~.2 Requirements

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.

This signalling response delay shall not exceed the sum of the limit for the general processing delay and all applicable limits for 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 7.12 below.

Table 7.12: 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.

7.37.4 Signalling Processing

7.3.17.4.1 Introduction

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.

7.3.27.4.2 Requirements

The UE shall be able to respond to RRC messages sent to the UE at a rate of 10 messages per second according to the requirements specified in 7.2.27.3.1 test in 9.4.1 in 90 % of the cases.

A.7 Timing and Signalling Characteristics

A.7.1 UE Transmit Timing

A.7.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in section 7.1.2.

For this test two cells on the same frequency are used. Table A.7-1 defines the transmitted signal strengths, the relative timing and the propagation condition used for the two cells.

Table A.7-1: Test parameters for UE Transmitssion Ttiming requirement

Parameter	**Unit**	**Cell 1 and 2 level**
DPCH_Ec/ Ior, Cell 1 and Cell 2	dDB	-17
CPICH_Ec/ Ior, Cell 1 and Cell 2	dB	-10
PCCPH_Ec/ Ior, Cell 1 and Cell 2	dB	-12
SCH_Ec/ Ior, Cell 1 and Cell 2	dB	-12
PICH_Ec/ Ior, Cell 1 and Cell 2	dB	-15
OCNS_Ec/ Ior, Cell 1 and Cell 2	dB	-1.05
$\hat{I}_{or,}$ Cell 1	dBm/3.84 MHz	-96
$\hat{I}_{or,}$ Cell 2	dBm/3.84 MHz	-99
Information data rate	kbps	12.2
Relative delay of path received from cell 2 with respect to cell 1	μs	+2
Propagation condition	AWGN	

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.~~

A.7.1.2 Test Requirements

For parameters specified in Table A.7-1, the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.~~UE initial transmission timing error shall be less than or equal to ±1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the 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.~~

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. The following sequence of events shall be used to verify that the requirements are met.

a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1. T_0 is defined in [2].

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

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

d) Test system shall verify that the UE transmit timing offset is still within T_0 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

e) Test system stops sending cell 1 signals.

f) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements in section 7.1.2 until the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

g) Test system shall verify that the UE transmit timing offset stays within T_0 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

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 stops sending cell 2 signals.

k) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements in section 7.1.2 until the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

l) Test system shall verify that the UE transmit timing offset stays within T_0 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

A.7.2 Signalling Response Delay

A.7.2.1 Test Purpose and Environment

This test shall verify that the UE sends a RRC response to the UTRAN within the delay limits specified in section 7.2.2~~7.3.2~~ for all received messages that require a RCC response to be sent to the UTRAN.

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.

A.7.2.2 Test Requirements

Editors note: This requirement should be rewritten, with exact times for the procedures that will be tested.

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 A.7.2 below.

Table A.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.

A.7.3 Signalling Processing

A.7.3.1 Test Purpose and Environment

This test shall verify that the UE is capable of processing a sequence of received RRC messages within specified delay limits in a certain percentage of the cases.

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.

A.7.3.2 Test Requirements

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

The UE shall be able to respond to all received RRC messages within the delay limits specified in section 7.2.2~~7.3.2~~ in a certain percentage of all cases as defined in 7.3.2~~7.4.2~~.

3GPP WG4 Meeting #13
Torino, Italy, 04-08 Sept 2000

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25.133	**CR**	**45**	Current Version:	3.2.0

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

For submission to:	TSG RAN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: TSG RAN WG#4 **Date:**

Subject: Text proposal for section A.1, A.2 and A.3

Work item:

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

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

Reason for change: This CR proposes text clarifying how different requirements in 25.133 shall be interpreted from a statistical point of view.

Clauses affected: Annex A

Other specs affected:

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

Other comments:

help.doc

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

Annex A (Normative)
Test Cases

A.1 Purpose of Annex

This Annex specifies test specific parameters for some of the functional requirements in chapters 4 to 9. The tests provide additional information to how the requirements should be interpreted for the purpose of conformance testing. The tests in this Annex are described such that one functional requirement may be tested in one or several test and one test may verify several requirements. Some requirements may lack a test.

The conformance tests are specified in TS34.121. Statistical interpretation of the requirements is described in Annex A.2.

A.2 Requirement classification for statistical testing

Editors note: Each requirement in the annex have to be gone through and updated with which type it belongs to and in applicable cases, which success rate that defines the requirement. Tdoc R4 00 619 shall be used as a base for that work.

Requirements in this specification are either expressed as absolute requirements with a single value stating the requirement, or expressed as a success rate. There are no provisions for the statistical variations that will occur when the parameter is tested.

Annex A outlines the test in more detail and lists the test parameters needed. The test will result in an outcome of a test variable value for the DUT inside or outside the test limit. Overall, the probability of a "good" DUT being inside the test limit(s) and the probability of a "bad" DUT being outside the test limit(s) should be as high as possible. For this reason, when selecting the test variable and the test limit(s), the statistical nature of the test is accounted for.

The statistical nature depends on the type of requirement. Some have large statistical variations, while others are not statistical in nature at all. When testing a parameter with a statistical nature, a confidence level is set. This establishes the probability that a DUT passing the test actually meets the requirement and determines how many times a test has to be repeated and what the pass and fail criteria are. Those aspects are not covered by TS 25.133. The details of the tests, how many times to run it and how to establish confidence in the tests are described in TS 34.121. This Annex establishes what the test variable is and whether it can be viewed as statistical in nature or not.

A.2.1 Types of requirements in TS 25.133

Time and delay requirements on UE higher layer actions

A very large part of the RRM requirements are delay requirements:

- In idle mode (A.4) there is cell selection delay and cell re-selection delay.
- In UTRAN Connected Mode Mobility (A.5) there is measurement reporting delay and cell re-selection delay.
- In RRC Connection Control (A.6) there is RRC re-establishment delay.

All have in common that the UE is required to perform an action observable in higher layers (e.g. camp on the correct cell) within a certain time after a specific event (e.g. a new strong pilot arises). The delay time is statistical in nature for several reasons, among others that measurements required by the UE are performed in a fading radio environment.

The variations make a strict limit unsuitable for a test. Instead there is a condition set for a correct action by the UE, e.g. that the UE shall camp on the correct cell within X seconds. Then the rate of correct events is observed during repeated tests and a limit is set on the rate of correct events, usually 90% correct events are required. How the limit is applied in the test depends on the confidence required, further detailed are in TS 34.121.

Measurements of power levels, relative powers and time

A very large number of requirements are on measurements that the UE performs:

- In UTRAN Connected Mode Mobility (A.5) there are measurement reports.
- Measurement performance requirements (A.8) has requirements on all type of measurements.

The accuracy requirements on measurements are expressed in this specification as a fixed limit (e.g. +/-X dB), but the measurement error will have a distribution that is not easily confined in fixed limits. Assuming a Gaussian distribution of the error, the limits will have to be set at +/-3.29σ if the probability of failing a "good DUT" in a single test is to be kept at 0.1%. It is more reasonable to set the limit tighter and test the DUT by counting the rate of measurements that are within he limits, in a way similar to the requirements on delay.

Implementation requirements

A few requirements are strict actions the UE should take or capabilities the UE should have, without any allowance for deviations. These requirements are absolute and should be tested as such. Examples are

- "Event triggered report rate" and "Active set dimension" in UTRAN Connected Mode Mobility (A.5)
- "Correct behaviour at time-out" in RRC connection control (A.6)

Physical layer timing requirements

All requirements on "Timing Characteristics" (A.7) are absolute limits on timing accuracy.

BER and BLER requirements

Some measurement report procedures in "UE Measurement procedures" (A.8) have requirements on DCH BLER. These are tested in the same way as BLER requirements in TS 25.101.

A.3 Reserved for Future Use

Editors Note: This section is included in order to make the following section numbering, match the sections in the beginning of this specification.

3GPP WG4 (Radio) meeting#13
4th-8th of September, 2000, Turin, Italy

Document R4-(00)0766
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

25.133	CR	46	Current Version:	3.2.0

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

For submission to:	RAN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: WG4 **Date:** 8-09-2000

Subject: Proposal for chapter 6

Work item:

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

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

Reason for change: To separate core requirements and test requirements

Clauses affected: 6

Other specs affected:

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

Other comments:

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.

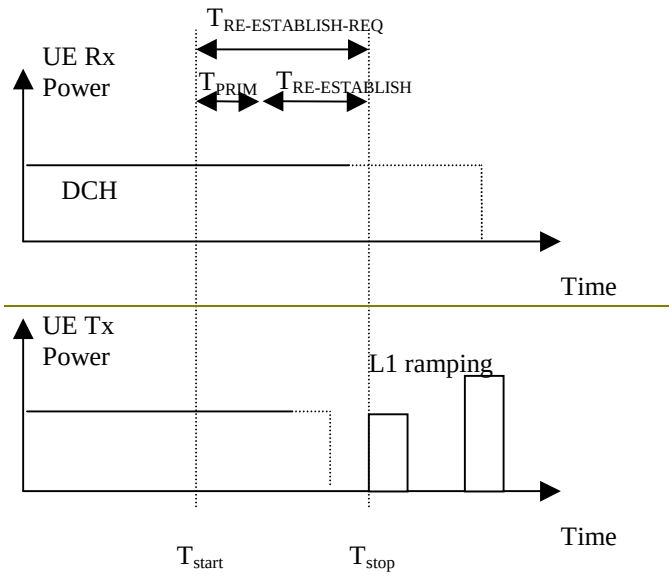

Figure 6.1: RRC Connection Re-establishment Requirement

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 P_0)	dB	[3]

Power offset between the last transmitted preamble and the control part of the message (Power offset $P_{p\text{-}m}$)	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 - Type of channel coding - Coding Rate - Rate matching attribute - CRC size	 ms bits	 [] [] [10] [] [] [] []
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).~~

6 RRC Connection Control

6.1 RRC Re-establishment

6.1.1 Introduction

RRC connection re-establishment is needed, when a UE loses radio connection due to radio link failure. The RRC connection re-establishment procedure is specified in section 8.5.1 of TS 25.331 and a RRC connection re-establishment sequence is described in section 6.4.8 of TS 25.303.

6.1.2 Requirements

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.

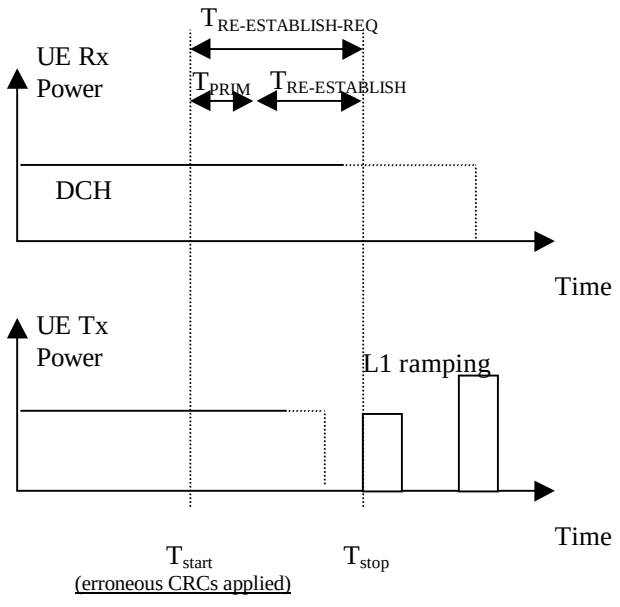

Figure 6.1: RRC Connection Re-establishment Requirement

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

Table 6.2: Requirements for Intra Frequency RRC Re-establishment

	Target cell known by the UE	**Target cell not known by the UE**
Radio link failure timer T313=0 s	$T_{RE-ESTABLISH-REQ}$ = 1000 ms	$T_{RE-ESTABLISH-REQ}$ = 3200 ms
Radio link failure timer T313=3 s	$T_{RE-ESTABLISH-REQ}$ = 4000 ms	$T_{RE-ESTABLISH-REQ}$ = 6200 ms

6.3 Random Access

6.3.1 Introduction

The random access procedure is used when establishing the layer 1 communication between the UE and UTRAN. The random access shall provide a fast access but without disturbing ongoing connections. The random access is specified in section 6 of TS 25.214 and the control of the RACH transmission is specified in section 11.2 of TS 25.321. A random access transmit sequence is described in section 6.7.2 of TS 25.303.

6.3.2 Requirements

The UE shall have capability to calculate initial power according to the open loop algorithm and apply this power level at the first preamble and increase the power on additional preambles. The UE shall 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.

6.3.2.1 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..

The absolute power applied to the first preamble shall have 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].

6.3.2.2 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 when the backoff timer T_{B01} expires.

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

6.3.2.3 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.

6.3.2.4 Correct behaviour when reaching maximum transmit power

The UE shall not exceed the maximum allowed UL TX power configured by the UTRAN.

The absolute power of any preamble shall not exceed the maximum allowed UL TX power +/-[] dB (or +/- [] dB in extreme conditions).

6.4 Transport format combination selection in UE

Editor's note: WG4 has identified an inconsistency in this section and WG2 TS 25.321. This should be resolved

6.4.1 Introduction

When the UE reaches the maximum transmit power is shall limit the usage of transport format combinations for the assigned transport format set, according to the functionality specified in section 11.4 in TS25.321. This in order to make it possible for the network operator to maximise the coverage.Transport format combination selection is described in section 11.4 of TS 25.321.6.4.2 Requirements

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.

For each measurement period of the UE transmitted power measurement the UE shall estimate if it has reached its maximum transmit power or not.

If the UE output power as requested by UTRAN have been larger than the UE maximum transmit power for a period of more than [T1] ms, it shall adapt to the transport format combination corresponding to the next lower bit-rate according to the rules in TS 25.321, at the next of the longest uplink TTIs, following [T1+10] ms from when the UE maximum transmit power was reached.

If the UE has limited the usage of the transport format combination set, according to the above clause, and the UE estimates that it for a period of more than [T2] ms has had sufficient power to support a transport format combination, that has previously been removed, the temporary blocked transport format shall again be considered in the transport format combination selection.

A.6 RRC Connection Control

A.6.1 RRC Re-establishment delay

A.6.1.1 Test Purpose and Environment

The purpose is to verify that the RRC re-establishment delay is within the specified limits. These tests will verify the requirements in section 6.1.2.

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 A.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

A.6.1.1.1 Test 1 – Target Cell known by UE

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

A.6.1.1.2 Test 2 – Target cell not known by UE

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

A.6.1.2 Test 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 A.6.2: Requirements for Intra Frequency RRC Re-establishment

	Test 1	Test 2
Radio link failure timer T313=0 s	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 1000 ms	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 3200 ms
Radio link failure timer T313=3 s	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 4000 ms	$T_{RE\text{-}ESTABLISH\text{-}REQ}$ = 6200 ms

A.6.2 Random Access

A.6.2.1 Test Purpose and Environment

The purpose of these tests are to verify that the behaviour of the random access procedure is according to the requirements and that the PRACH power settings are within specified limits. This tests will verify the requirements in section 6.3.2.

Table A.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]
Number of other transmitted Acquisition Indicators	-	0
AICH_Ec/Ior	dB	[-10]
PICH_Ec/Ior	dB	[-15]
OCNS_Ec/Ior when an AI is not transmitted	dB	[-0.941]
OCNS_Ec/Ior when an AI is transmitted	dB	[-1.516]
$\hat{I}_{or}/I_{oc}$	dB	[0]
I_{oc}	dBm/3.84 MHz	[-70]
CPICH_Ec/Io	dB	[-13]
Propagation Condition		AWGN
UE_TXPWR_MAX_RACH	dBm	[15]

Table A.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} N_{B01min}=N_{B01max}	ms	N/A []
Power step when no acquisition indicator is received (Power offset P_0)	dB	[3]
Power offset between the last transmitted preamble and the control part of the message (Power offset P_{p-m})	dB	[0]
Maximum allowed UL TX power	dBm	[15]

Table A.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 - Type of channel coding - Coding Rate - Rate matching attribute - CRC size	 ms bits	 [] [] [10] [] [] [] []
Primary CPICH DL TX power	dBm	[]
UL interference	dBm	[noise floor]
Constant value	dB	[0]
AICH Power Offset	dB	0

A.6.2.2 Test Requirements

A.6.2.2.1 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 [10] preambles have been received by the UTRAN.

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.

A.6.2.2.2 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 when the backoff timer T_{B01} expires. The NACK shall be transmitted after the [10] preambles have been received by the UTRAN.

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.

A.6.2.2.3 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.

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

A.6.2.2.4 Correct behaviour when reaching maximum transmit power

The UE shall not exceed the maximum allowed UL TX power configured by the UTRAN. No ACK/NACK shall be sent by UTRAN during this test.

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