TSG RAN Meeting #16 **RP-020282**
Marco Island, FL, USA, 4 - 7 June 2002

Title **CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.123 (1)**
Source **TSG RAN WG4**
Agenda Item **7.4.3**

RAN4 Tdoc	Spec	Curr Ver	New Ver	CR	R	Cat	Ph	Title	Acronym
R4-020634	25.123	3.9.0	3.10.0	182	1	F	R99	Correction to Test Case for Event-triggered reporting in AWGN	TEI
R4-020635	25.123	4.4.0	4.5.0	183	1	A	Rel-4	Correction to Test Case for Event-triggered reporting in AWGN	TEI
R4-020592	25.123	5.0.0	5.1.0	184		A	Rel-5	Correction to Test Case for Event-triggered reporting in AWGN	TEI
R4-020641	25.123	3.9.0	3.10.0	191	1	F	R99	Introduction of measurement-specific test cases	TEI
R4-020642	25.123	4.4.0	4.5.0	192	1	A	Rel-4	Introduction of measurement-specific test cases	TEI
R4-020643	25.123	5.0.0	5.1.0	193	1	A	Rel-5	Introduction of measurement-specific test cases	TEI
R4-020837	25.123	3.9.0	3.10.0	221		F	R99	TFC selection in UE requirements and test case	TEI
R4-020900	25.123	4.4.0	4.5.0	227		A	Rel-4	TFC selection in UE requirements and test case	TEI
R4-020901	25.123	5.0.0	5.1.0	228		A	Rel-5	TFC selection in UE requirements and test case	TEI
R4-020838	25.123	3.9.0	3.10.0	222		F	R99	Introduction of intra-frequency fading test case	TEI
R4-020902	25.123	4.4.0	4.5.0	229		A	Rel-4	1G intra-frequency fading test case	TEI
R4-020903	25.123	5.0.0	5.1.0	230		A	Rel-5	1G intra-frequency fading test case	TEI
R4-020975	25.123	3.9.0	3.10.0	223	1	F	R99	HO interruption times TDD to TDD/FDD/GSM	TEI
R4-020976	25.123	4.4.0	4.5.0	231	1	A	Rel-4	HO interruption times TDD to TDD/FDD/GSM	TEI
R4-020977	25.123	5.0.0	5.1.0	232	1	A	Rel-5	HO interruption times TDD to TDD/FDD/GSM	TEI
R4-020978	25.123	3.9.0	3.10.0	224	1	F	R99	Measurement reporting and capabilities for the support of event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states	TEI
R4-020979	25.123	4.4.0	4.5.0	233	1	A	Rel-4	Measurement reporting and capabilities for the support of event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states (3.84 Mcps TDD option)	TEI

RAN4 Tdoc	Spec	Curr Ver	New Ver	CR	R	Cat	Ph	Title	Acronym
R4-020980	25.123	5.0.0	5.1.0	234	1	A	Rel-5	Measurement reporting and capabilities for the support of event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states (3.84 Mcps TDD option)	TEI

3GPP TSG RAN WG4 Meeting #22 **R4-020634**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123** **CR** **182** ⌘ ev **1** ⌘ Current version: **3.9.0** ⌘

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

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

Title:	⌘	Correction to Test Case for Event 1G triggered reporting of neighbours in AWGN propagation condition
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Currently, Event 1G reporting in CELL DCH state is tested for the 800ms measurement reporting delay requirement in Section 8.1.2 only. This requirement applies to neighbour cells becoming detectable and that the UE needs to be able to identify. It is critical to test for the 200ms measurement reporting delay requirement for the set of 6 strongest in section 8.1.2, as these are seen as the primary candidates for event 1G evaluation.
Summary of change:	⌘	Correction to intra-frequency test case for Event 1G reporting of detectable neighbours in AWGN propagation condition. In addition to the 800ms measurement reporting delay requirement for cells becoming detectable, the 200ms measurement reporting delay requirement for cells which belong to the 6 strongest neighbours is also tested for.
Consequences if not approved:	⌘	Critical measurement and reporting requirements for Handover preparation in CELL DCH state not tested for. Isolated impact analysis: This CR introduces a test for an already existing requirement, UE measurement procedures in CELL_DCH state.

Clauses affected:	⌘	A.8.1.1		
Other specs affected:	⌘	- Other core specifications X Test specifications - O&M Specifications	⌘	TS34.122
Other comments:	⌘	No such test currently exists in TS34.122 Equivalent CRs in other Releases: CR183r1 cat. A to 25.123 v4.4.0, CR184 cat. A		

	to 25.123 v5.0.0

A.8 UE Measurements Procedures

A.8.1 TDD intra frequency measurements

A.8.1.1 Event 1G triggered reporting in AWGN propagation conditions

A.8.1.1.1 Test Purpose and Environment

~~This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A.8-1. General test parameters are given in the table A.8.1A 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 1G shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts. The cell specific test parameters are given in Table A.8.1B below.~~

The purpose of this test is to verify that the UE makes correct reporting of events. This test will partly verify the requirements in section 8.1.2 and section 9.1.

The test parameters are given in Table A.8.1.1 and A.8.1.1A below. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. Three cells shall be present in the test, cell 1 being the serving cell and cell 2 and cell 3 being neighbour cells on the used frequency. All cells shall be synchronised, i.e. share the same frame and timeslot timing.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP shall be reported together with Event 1G. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The DL DPCH shall be transmitted in timeslot 2 and the UL DPCH shall be transmitted in timeslot 10. The TTI of the uplink DCCH shall be 20ms.

Table A.8.1.1~~A~~: General test parameters for Event 1G triggered reporting ~~correct reporting of intra frequency neighbours~~ in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Value~~	~~Comment~~
~~DPCH parameters active cell~~		~~DL Reference Measurement Channel 12.2 kbps~~	~~As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8~~
~~Power Control~~		~~On~~	
~~Active cell~~		~~Cell 1~~	
~~Threshold used frequency~~	~~dB~~	~~-71~~	~~Absolute P-CCPCH RSCP threshold for event 1G~~
~~Hysteresis~~	~~dB~~	~~0~~	
~~Time to Trigger~~	~~ms~~	~~0~~	
~~Filter coefficient~~		~~0~~	
~~Monitored cell list size~~		~~24~~	~~Measurement control information is sent before T1 starts.~~
~~T1~~	~~s~~	~~10~~	
~~T2~~	~~s~~	~~10~~	

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2, Cell 3	
Final condition	Active cell		Cell 1	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Threshold used frequency		dBm	-70	Applicable for Event 1G
Filter coefficient			0	
Monitored cell list size			12 TDD neighbours on Channel 1	
T1		s	6	
T2		s	6	
T3		s	6	

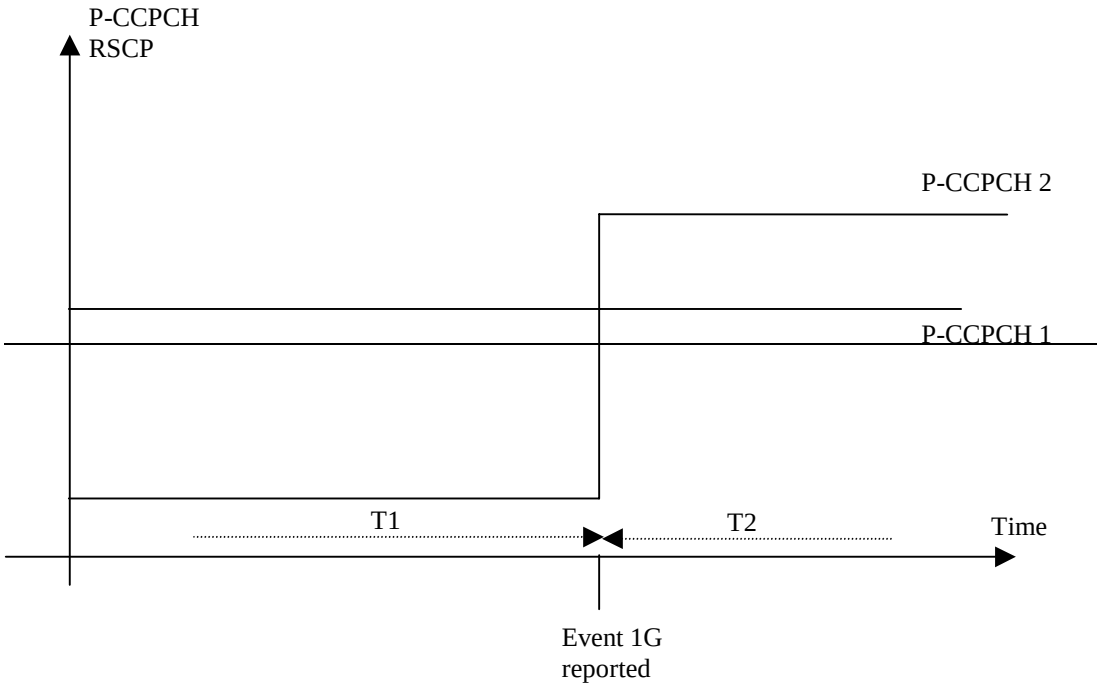


Figure A.8.1: Illustration of parameters for handover measurement reporting test case

Table A.8.1.1AB: Cell specific parameters for correct Event 1G triggered reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1			
P-CCPCH_Ec/Ior	dB	-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	15	15	15	15
PICH_Ec/Ior				-3	-3			-3	-3
OCNS		-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	-3	-Infinity	5	-Infinity	5
I_{oc}	dBm/3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-68		
Propagation Condition		AWGN							

NOTE: The DPCH of all cells are located in an other timeslot than 0 or 8

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
DL timeslot number		0			0			0		
UTRA RF Channel Number		Channel 1			Channel 1			Channel 1		
PCCPCH_Ec/Ior	dB	-3			-3			-3		
SCH_Ec/Ior	dB	-9			-9			-9		
SCH_t_{offset}		0			5			10		
OCNS_Ec/Ior	dB	-3,12			-3,12			-3,12		
$\hat{I}_{or}/I_{oc}$	dB	7	5		5	7	-Inf	-Inf		7
PCCPCH RSCP	dBm	-66	-68		-68	-66	-Inf	-Inf		-66
I_{oc}	dBm / 3,84 MHz	-70								
Propagation Condition		AWGN								

A.8.1.1.2 Test Requirements

A.8.1.1.2 Test Requirements

The UE shall send one Event 1G 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 1G triggered measurement report for Cell 2 with a measurement reporting delay less than 200ms from the beginning of time period T2.

The UE shall send one Event 1G triggered measurement report for Cell 3 with a measurement reporting delay less than 800ms 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.

The rate of correct events correctly reported observed during repeated tests shall be at least 90%.

3GPP TSG RAN WG4 Meeting #22 **R4-020635**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123** **CR** **183** ⌘ ev **1** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘	Correction to Test Case for Event 1G triggered reporting of neighbours in AWGN propagation condition
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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

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

Reason for change:	⌘	Currently, Event 1G reporting in CELL DCH state is tested for the 800ms measurement reporting delay requirement in Section 8.1.2 only. This requirement applies to neighbour cells becoming detectable and that the UE needs to be able to identify. It is critical to test for the 200ms measurement reporting delay requirement for the set of 6 strongest in section 8.1.2, as these are seen as the primary candidates for event 1G evaluation.
Summary of change:	⌘	Correction to intra-frequency test case for Event 1G reporting of detectable neighbours in AWGN propagation condition. In addition to the 800ms measurement reporting delay requirement for cells becoming detectable, the 200ms measurement reporting delay requirement for cells which belong to the 6 strongest neighbours is also tested for.
Consequences if not approved:	⌘	Critical measurement and reporting requirements for Handover preparation in CELL DCH state not tested for. Isolated impact analysis: This CR introduces a test for an already existing requirement, UE measurement procedures in CELL_DCH state.

Clauses affected:	⌘	A.8.1.1		
Other specs affected:	⌘	- Other core specifications X Test specifications - O&M Specifications	⌘	TS34.122
Other comments:	⌘	No such test currently exists in TS34.122 Equivalent CRs in other Releases: CR182r1 cat. F to 25.123 v3.9.0, CR184 cat. A		

	to 25.123 v5.0.0

A.8 UE Measurements Procedures

A.8.1 TDD intra frequency measurements

A.8.1.1 Event 1G triggered reporting in AWGN propagation conditions

A.8.1.1.1 Test Purpose and Environment

A.8.1.1.1.1 3.84 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A.8.1. General test parameters are given in the table A.8.1A 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 1G shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts. The cell specific test parameters are given in Table A.8.1B below.

The purpose of this test is to verify that the UE makes correct reporting of events. This test will partly verify the requirements in section 8.1.2 and section 9.1.

The test parameters are given in Table A.8.1.1 and A.8.1.1A below. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. Three cells shall be present in the test, cell 1 being the serving cell and cell 2 and cell 3 being neighbour cells on the used frequency. All cells shall be synchronised, i.e. share the same frame and timeslot timing.

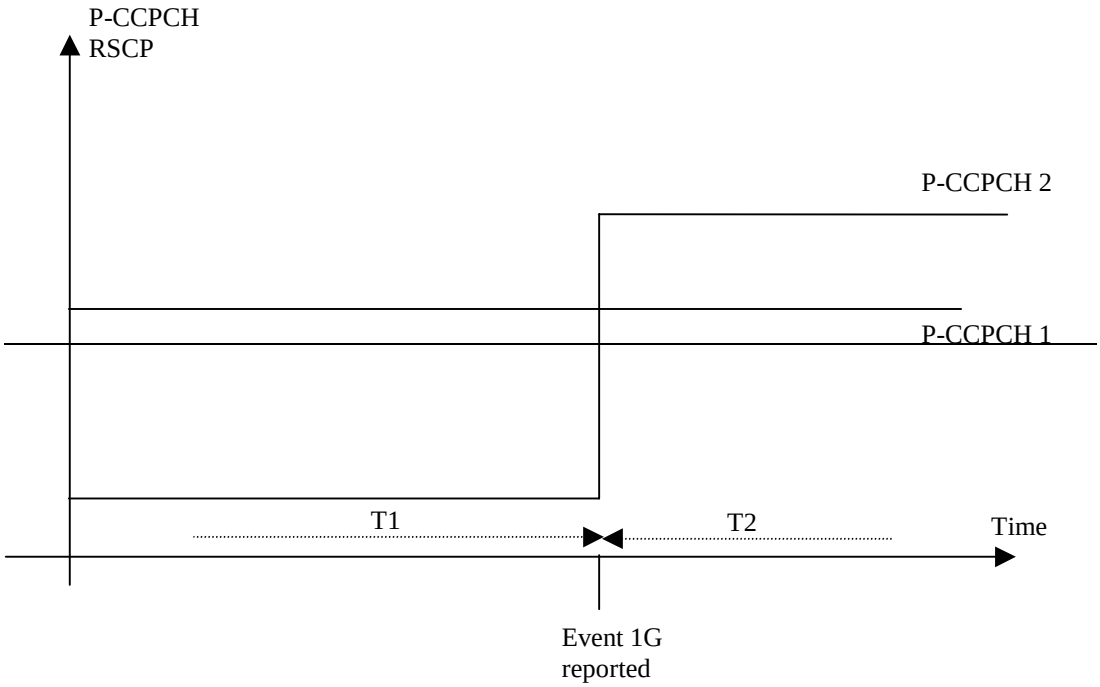
In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP shall be reported together with Event 1G. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The DL DPCH shall be transmitted in timeslot 2 and the UL DPCH shall be transmitted in timeslot 10. The TTI of the uplink DCCH shall be 20ms.

Table A.8.1.1A: General test parameters for Event 1G triggered reporting correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8
Power Control		On	
Active cell		Cell 1	
Threshold used frequency	dB	-71	Absolute P-CCPCH RSCP threshold for event 1G
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2, Cell 3	
Final condition	Active cell		Cell 1	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Threshold used frequency		dBm	-70	Applicable for Event 1G
Filter coefficient			0	
Monitored cell list size			12 TDD neighbours on Channel 1	
T1		s	6	
T2		s	6	
T3		s	6	



~~Figure A.8.1: Illustration of parameters for handover measurement reporting test case~~

Table A.8.1.1A~~B~~: Cell specific parameters for ~~correct~~ Event 1G triggered reporting ~~of intra frequency neighbours~~ in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Cell 1~~				~~Cell 2~~			
~~Timeslot Number~~		~~0~~		~~8~~		~~0~~		~~8~~	
		~~T1~~	~~T2~~	~~T1~~	~~T2~~	~~T1~~	~~T2~~	~~T1~~	~~T2~~
~~UTRA RF Channel Number~~		~~Channel 1~~				~~Channel 1~~			
~~PCCPCH_Ec/Ior~~	~~dB~~	~~-3~~	~~-3~~			~~-3~~	~~-3~~		
~~SCH_Ec/Ior~~	~~dB~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~SCH_t_{offset}~~		~~0~~	~~0~~	~~0~~	~~0~~	~~15~~	~~15~~	~~15~~	~~15~~
~~PICH_Ec/Ior~~				~~-3~~	~~-3~~			~~-3~~	~~-3~~
~~OCNS~~		~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~-3~~	~~-3~~	~~-3~~	~~-3~~	~~-Infinity~~	~~5~~	~~-Infinity~~	~~5~~
~~I_{oc}~~	~~dBm/3.84 MHz~~	~~-70~~							
~~PCCPCH_RSCP~~	~~dB~~	~~-70~~	~~-70~~			~~-Infinity~~	~~-68~~		
~~Propagation Condition~~		~~AWGN~~							

~~Note: The DPCH of all cells are located in an other timeslot than 0 or 8~~

Parameter	**Unit**	**Cell 1**			**Cell 2**			**Cell 3**		
		T1	**T2**	**T3**	**T1**	**T2**	**T3**	**T1**	**T2**	**T3**
DL timeslot number		**0**			**0**			**0**		
UTRA RF Channel Number		Channel 1			Channel 1			Channel 1		
PCCPCH_Ec/Ior	dB	-3			-3			-3		
SCH_Ec/Ior	dB	-9			-9			-9		
SCH_t_{offset}		0			5			10		
OCNS_Ec/Ior	dB	-3,12			-3,12			-3,12		
$\hat{I}_{or}/I_{oc}$	dB	7	5		5	7	-Inf	-Inf		7
PCCPCH RSCP	dBm	-66	-68		-68	-66	-Inf	-Inf		-66
I_{oc}	dBm / 3,84 MHz	-70								
Propagation Condition		AWGN								

A.8.1.1.1.2 1.28 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A. 8.1A. General test parameters are given in the table A.8.1C 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 1G shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts. The cell specific test parameters are given in Table A.8.1D below.

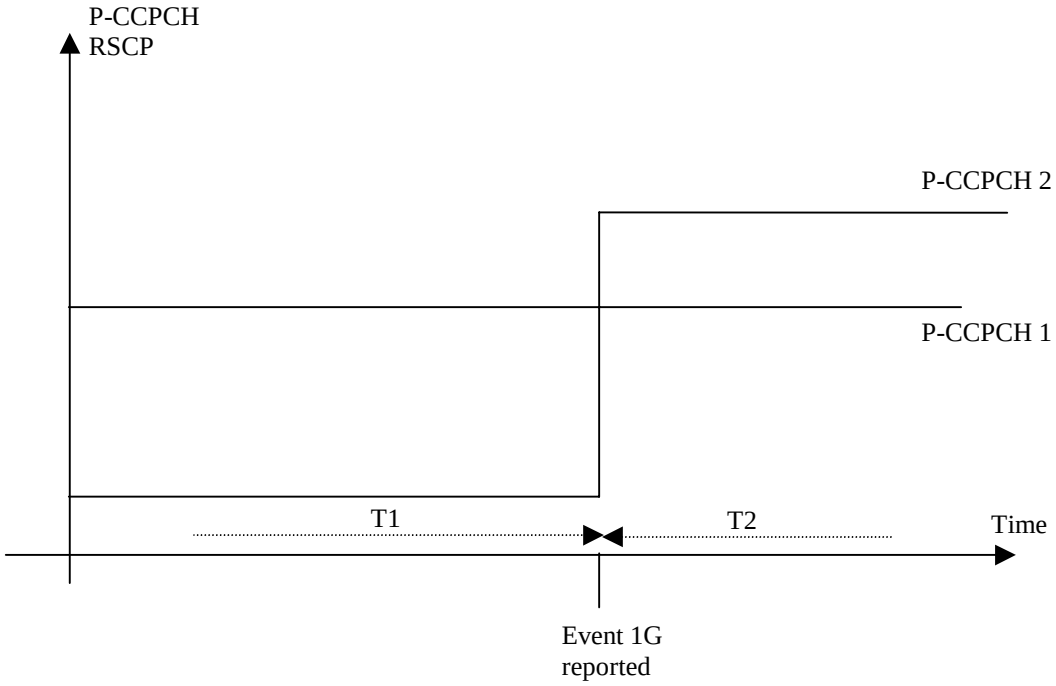


Figure A. 8.1A: Illustration of parameters for handover measurement reporting test case

Table A.8.1C: General test parameters for correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0
Power Control		On	
Active cell		Cell 1	
Threshold used frequency	dB	[-71]	Absolute P-CCPCH RSCP threshold for event 1G
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		[24]	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A. 8.1D: Cell specific parameters for correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	[-70]	[-70]			-Infinity	[-67]		
Propagation Condition		AWGN							

NOTE: The DPCH of all cells are located in a timeslot other than 0.

A.8.1.1.2 Test Requirements

A.8.1.1.2.1 3.84Mcps TDD option

~~The UE shall send one Event 1G 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 1G triggered measurement report for Cell 2 with a measurement reporting delay less than 200ms from the beginning of time period T2.

The UE shall send one Event 1G triggered measurement report for Cell 3 with a measurement reporting delay less than 800ms 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.

The rate of ~~correct~~ events correctly reported ~~observed~~ during repeated tests shall be at least 90%.

A.8.1.1.2.2 1.28Mcps TDD option

The UE shall send one Event 1G 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.

The rate of correct events observed during repeated tests shall be at least 90%.

3GPP TSG RAN WG4 Meeting #22 **R4-020592**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123** **CR** **184** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘	Correction to Test Case for Event 1G triggered reporting of neighbours in AWGN propagation condition
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	Currently, Event 1G reporting in CELL DCH state is tested for the 800ms measurement reporting delay requirement in Section 8.1.2 only. This requirement applies to neighbour cells becoming detectable and that the UE needs to be able to identify. It is critical to test for the 200ms measurement reporting delay requirement for the set of 6 strongest in section 8.1.2, as these are seen as the primary candidates for event 1G evaluation.
Summary of change:	⌘	Correction to intra-frequency test case for Event 1G reporting of detectable neighbours in AWGN propagation condition. In addition to the 800ms measurement reporting delay requirement for cells becoming detectable, the 200ms measurement reporting delay requirement for cells which belong to the 6 strongest neighbours is also tested for.
Consequences if not approved:	⌘	Critical measurement and reporting requirements for Handover preparation in CELL DCH state not tested for. Isolated impact analysis: This CR introduces a test for an already existing requirement, UE measurement procedures in CELL_DCH state.

Clauses affected:	⌘	A.8.1.1
Other specs affected:	⌘	- Other core specifications ⌘ - Test specifications - O&M Specifications
Other comments:	⌘	- Equivalent CRs in other Releases: CR182r1 cat. F to 25.123 v3.9.0, CR183r1 cat.

	A to 25.123 v4.4.0

A.8 UE Measurements Procedures

A.8.1 TDD intra frequency measurements

A.8.1.1 Event 1G triggered reporting in AWGN propagation conditions

A.8.1.1.1 Test Purpose and Environment

A.8.1.1.1.1 3.84 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A.8.1. General test parameters are given in the table A.8.1A 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 1G shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts. The cell specific test parameters are given in Table A.8.1B below.

The purpose of this test is to verify that the UE makes correct reporting of events. This test will partly verify the requirements in section 8.1.2 and section 9.1.

The test parameters are given in Table A.8.1.1 and A.8.1.1A below. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. Three cells shall be present in the test, cell 1 being the serving cell and cell 2 and cell 3 being neighbour cells on the used frequency. All cells shall be synchronised, i.e. share the same frame and timeslot timing.

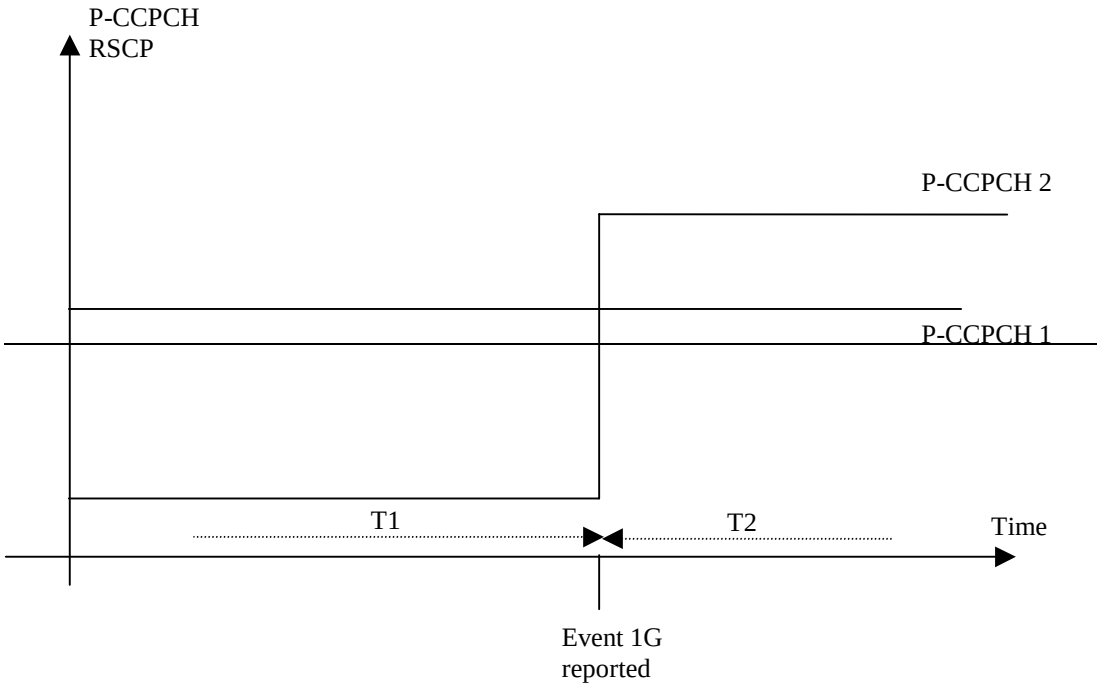
In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP shall be reported together with Event 1G. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The DL DPCH shall be transmitted in timeslot 2 and the UL DPCH shall be transmitted in timeslot 10. The TTI of the uplink DCCH shall be 20ms.

Table A.8.1.1A: General test parameters for Event 1G triggered reporting correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8
Power Control		On	
Active cell		Cell 1	
Threshold used frequency	dB	-71	Absolute P-CCPCH RSCP threshold for event 1G
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2, Cell 3	
Final condition	Active cell		Cell 1	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Threshold used frequency		dBm	-70	Applicable for Event 1G
Filter coefficient			0	
Monitored cell list size			12 TDD neighbours on Channel 1	
T1		s	6	
T2		s	6	
T3		s	6	



~~Figure A.8.1: Illustration of parameters for handover measurement reporting test case~~

Table A.8.1.1AB: Cell specific parameters for correct Event 1G triggered reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	15	15	15	15
PICH_Ec/Ior				-3	-3			-3	-3
OCNS		-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	-3	-Infinity	5	-Infinity	5
I_{oc}	dBm/3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-68		
Propagation Condition		AWGN							

Note: The DPCH of all cells are located in an other timeslot than 0 or 8

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
DL timeslot number		0			0			0		
UTRA RF Channel Number		Channel 1			Channel 1			Channel 1		
PCCPCH_Ec/Ior	dB	-3			-3			-3		
SCH_Ec/Ior	dB	-9			-9			-9		
SCH_t_{offset}		0			5			10		
OCNS_Ec/Ior	dB	-3,12			-3,12			-3,12		
$\hat{I}_{or}/I_{oc}$	dB	7	5		5	7	-Inf	-Inf		7
PCCPCH RSCP	dBm	-66	-68		-68	-66	-Inf	-Inf		-66
I_{oc}	dBm / 3,84 MHz	-70								
Propagation Condition		AWGN								

A.8.1.1.1.2 1.28 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A. 8.1A. General test parameters are given in the table A.8.1C 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 1G shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts. The cell specific test parameters are given in Table A.8.1D below.

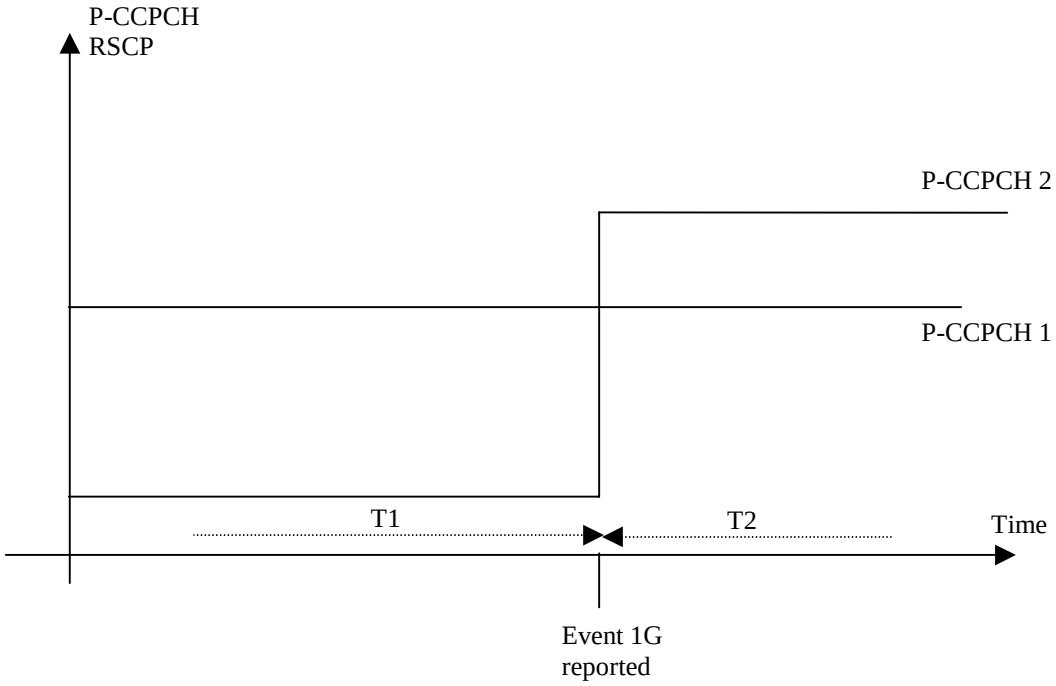


Figure A. 8.1A: Illustration of parameters for handover measurement reporting test case

Table A.8.1C: General test parameters for correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0
Power Control		On	
Active cell		Cell 1	
Threshold used frequency	dB	[-71]	Absolute P-CCPCH RSCP threshold for event 1G
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		[24]	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A. 8.1D: Cell specific parameters for correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	[-70]	[-70]			-Infinity	[-67]		
Propagation Condition		AWGN							

NOTE: The DPCH of all cells are located in a timeslot other than 0.

A.8.1.1.2 Test Requirements

A.8.1.1.2.1 3.84Mcps TDD option

~~The UE shall send one Event 1G 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 1G triggered measurement report for Cell 2 with a measurement reporting delay less than 200ms from the beginning of time period T2.

The UE shall send one Event 1G triggered measurement report for Cell 3 with a measurement reporting delay less than 800ms 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.

The rate of ~~correct~~ events correctly reported ~~observed~~ during repeated tests shall be at least 90%.

A.8.1.1.2.2 1.28Mcps TDD option

The UE shall send one Event 1G 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.

The rate of correct events observed during repeated tests shall be at least 90%.

3GPP TSG RAN WG4 Meeting #22 **R4-020641**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123** **CR** **191** ⌘ ev **1** ⌘ Current version: **3.9.0** ⌘

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

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

Title:	⌘	Measurement test cases in section A.9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Currently, no measurement-specific test cases are defined for UE measurement accuracy requirements in Section 9. In order to keep the testing time reasonable, the whole I0 range from –94dBm…-50dBm cannot be tested as currently specified in Annex A.9.
Summary of change:	⌘	Introduction of measurement-specific test cases for P-CCPCH RSCP, CPICH RSCP, Timeslot ISCP, UTRA carrier RSSI, SFN-SFN observed time difference type 1 and SFN-CFN observed time difference measurements. Test parameter tables updated, i.e. PICH Ec/Ior and DPCH Ec/Ior removed, because no longer relevant in the context of these measurement tests.
Consequences if not approved:	⌘	Critical UE measurement accuracy requirements cannot be tested. Isolated impact analysis: This CR introduces test cases for already existing critical requirements on UE measurement accuracies.

Clauses affected:	⌘	A.9		
Other specs affected:	⌘	- Other core specifications X Test specifications - O&M Specifications	⌘	TS34.122
Other comments:	⌘	No such tests currently exist in TS34.122 Equivalent CRs in other Releases: CR192r1 cat. A to 25.123 v4.4.0, CR193r1 cat. A to 25.123 v5.0.0		

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 25.102 annex A. This measurement channel is used both in active cell and cells to be measured.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

A.9.1 Measurement Performance for UE

~~If not otherwise stated, the test parameters in table A.9.1 should be applied for UE RX measurements requirements in this clause.~~

~~A.9.1.1 TDD intra frequency measurements~~

~~In this case all cells are on the same frequency. The table A.9.1 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.~~

~~Table A.9.1 Intra frequency test parameters for UE RX Measurements~~

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~	
~~UTRA RF Channel number~~		~~Channel 1~~		~~Channel 1~~	
~~Timeslot~~		~~0~~	~~8~~	~~0~~	~~8~~
~~P-CCPCH Ec/Ior~~	~~dB~~	~~-3~~	~~-~~	~~-3~~	~~-~~
~~SCH Ec/Ior~~	~~dB~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~PICH_Ec/Ior~~	~~dB~~	~~-~~	~~-3~~	~~-~~	~~-3~~
~~OCNS~~	~~dB~~	~~-3,12~~	~~-3,12~~	~~-3,12~~	~~-3,12~~
~~Îor/Ioc~~	~~dB~~	~~[ ]~~		~~[ ]~~	
~~Ioc~~	~~dBm/ 3,84 MHz~~	~~-70~~		~~-70~~	
~~Range 1:Io~~ ~~Range 2: Io~~	~~dBm~~	~~-94..-70~~ ~~-94.. 50~~		~~-94..-70~~ ~~-94.. 50~~	
~~Propagation condition~~	~~-~~	~~AWGN~~		~~AWGN~~	

~~Note 1: *P-CCPCH_RSCP1,2* ≥ [102] dBm.~~

~~Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* | ≤ 20 dB.~~

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

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

~~Note 5: The DPCH of all cells are located in an other timeslot than 0 or 8~~

~~A.9.1.2 TDD inter frequency measurements~~

~~In this case all cells are on the same frequency. The table A.9.2 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.~~

Table A.9.2 Inter frequency test parameters for UE RX Measurements

Parameter	Unit	Cell 1		Cell 2	
UTRA RF Channel number		Channel 1		Channel 2	
Timeslot		0	8	0	8
P-CCPCH Ec/Ior	dB	-3	-	-3	-
SCH Ec/Ior	dB	-9	-9	-9	-9
PICH_Ec/Ior	dB	-	-3	-	-3
OCNS	dB	-3,12	-3,12	-3,12	-3,12
Îor/Ioc	dB	[ ]		[ ]	
Ioc	dBm/ 3,84 MHz	-70		-70	
Range 1:Io Range 2: Io	dBm	-94..-70 -94..-50		-94..-70 -94..-50	
Propagation condition	-	AWGN		AWGN	

Note 1: *P-CCPCH_RSCP1,2* ≥ [102] dBm.

Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* | ≤ 20 dB.

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

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

Note 5: The DPCH of all cells are located in an other timeslot than 0 or 8

A.9.1.3 FDD inter frequency measurements

In this case both cells are in different frequency. Table A.9.3 and notes 1-6 define the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.3 CPICH Inter frequency test parameters

Parameter	Unit	Cell 1		Cell 2
Timeslot Number		0	8	n.a
UTRA RF Channel Number		Channel 1		Channel 2
CPICH_Ec/Ior	dB	n.a.	n.a.	-10
P-CCPCH_Ec/Ior	dB	-3		-12
SCH_Ec/Ior	dB	-9	-9	-12
SCH_t_{offset}		0	0	n.a.
PICH_Ec/Ior			-3	-15
DPCH_Ec/Ior	dB	n.a.	n.a.	-15
OCNS	dB	-3.12	-3.12	-1,11
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]	10,5
I_{oc}	dBm/3,84 MHz	-70		Note 5
Range 1:Io Range 2: Io	dBm	-94..-70 -94..-50		-94..-70 -94..-50
Propagation condition	-	AWGN		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*

Note 6: The DPCH of the TDD cell is located in an other timeslot than 0 or 8

A.9.1.4 UTRA carrier RSSI inter frequency measurements

The table A.9.4 and notes 1,2 define the limits of signal strengths, where the requirement is applicable.

Table A.9.4: UTRA carrier 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 2	Note 2
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*.			

A.9.1.1 P-CCPCH RSCP

A.9.1.1.1 Test Purpose and Environment

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 9.1.1.1.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2.

Both P-CCPCH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

Table A.9.1: P-CCPCH RSCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	0	0	0	0	0
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.7		-59.8		-98.7	
Îor/Ioc	dB	5	2	9	2	3	0
PCCPCH RSCP, Note 1	dBm	-73.7	-76.7	-53.8	-60.8	-98.7	-101.7
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

P-CCPCH RSCP inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.2.

Table A.9.2: P-CCPCH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.1	-98.7	-97
Îor/Ioc	dB	5	5	7	2	3	0
PCCPCH RSCP, Note 1	dBm	-73.2	-73.2	-54.8	-55.1	-98.7	-100
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.1.2 Test Requirements

The P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.1.1.1.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.2 CPICH measurements

A.9.1.2.1 CPICH RSCP

A.9.1.2.1.1 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 9.1.1.2 and applies to UE's supporting this capability.

The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

A.9.1.2.1.1.1 Inter frequency test parameters

In this case both cells are on different frequencies. Cell 1 is a UTRA TDD cell and cell 2 is a UTRA FDD cell. No second Beacon timeslot shall be provided for cell 1.

CPICH RSCP inter frequency absolute accuracy requirements are tested by using test parameters in Table A.9.3.

Table A.9.3: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	n.a.	0	n.a.
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	n.a.	-10	n.a.	-10
PCCPCH_Ec/Ior	dB	-3	-12	-3	-12
SCH_Ec/Ior	dB	-9	-12	-9	-12
SCH t_{offset}		5	n.a.	5	n.a.
PICH_Ec/Ior	dB	n.a.	-15	n.a.	-15
OCNS_Ec/Ior	dB	-3.12	-0.94	-3.12	-0.94
Ioc	dBm/ 3.84 MHz	-57.7	-60	-84.7	-84
$\hat{I}$or/Ioc	dB	7	9.54	3	0
PCCPCH RSCP, Note 1	dBm	-53.7	n.a.	-84.7	n.a.
CPICH RSCP, Note 1	dBm	n.a.	-60.46	n.a.	-94
Io, Note 1	dBm/3.84 MHz	-50	-50	-80	-81
Propagation condition	-	AWGN		AWGN	
NOTE 1: PCCPCH RSCP, CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					

A.9.1.2.1.2 Test Requirements

The CPICH RSCP measurement accuracy shall meet the requirements in section 9.1.1.2.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.2.2 CPICH Ec/Io

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.3 exists.

A.9.1.3 Timeslot ISCP

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the Timeslot ISCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.1.3.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.3.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2.

The Timeslot ISCP intra frequency absolute accuracy requirements are tested by using test parameters in Table A.9.4.

Table A.9.4: Timeslot ISCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	0	0	0	0	0
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.7		-59.8		-98.7	
Îor/Ioc	dB	5	2	9	2	3	0
Timeslot ISCP, Note 1	dBm	-73.7	-70.7	-57.8	-50.8	-98.7	-95.7
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Timeslot ISCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.3.2 Test Requirements

The Timeslot ISCP measurement accuracy shall meet the requirements in section 9.1.1.3.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.4 UTRA Carrier RSSI

A.9.1.4.1 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 9.1.1.4.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.4.1.1 Inter frequency test parameters

In this case both cells are on different frequencies. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

Both UTRA Carrier RSSI absolute and relative accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.1	-98.7	-97
Îor/Ioc	dB	5	5	7	2	3	0
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.4.2 Test Requirements

The UTRA Carrier RSSI absolute measurement accuracy shall meet the requirements in section 9.1.1.4.

The UTRA Carrier RSSI relative measurement accuracy shall meet the requirements in Table A.9.6 by taking into account the effect of thermal noise and noise added by the receiver.

Table A.9.6: UTRA Carrier RSSI relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.5 GSM carrier RSSI

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.5 exists.

A.9.1.6 SIR

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.6 exists.

A.9.1.7 Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.7 exists.

A.9.1.8 SFN-SFN observed time difference

A.9.1.8.1 SFN-SFN observed time difference type 1

A.9.1.8.1.1 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 9.1.1.8.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0…9830400 chip.

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

A.9.1.8.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The SFN-SFN observed time difference type 1 accuracy requirements in the intra-frequency case are tested by using test parameters in Table A.9.7.

Table A.9.7: SFN-SFN observed time difference type 1 Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.8.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The SFN-SFN observed time difference type 2 accuracy requirements in the inter-frequency case are tested by using test parameters in Table A.9.8.

Table A.9.8: SFN-SFN observed time difference type 1 Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.8.1.2 Test Requirements

The SFN-SFN observed time difference type 1 measurement accuracy shall meet the requirements in section 9.1.1.8.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.8.2 SFN-SFN observed time difference type 2

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements on SFN-SFN observed time difference type 2 in sections 9.1.1.8 exists.

A.9.1.9 Observed time difference to GSM cell

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.9 exists.

A.9.1.10 SFN-CFN observed time difference

A.9.1.10.1 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 9.1.1.10.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0…256 frames.

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

A.9.1.10.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The SFN-CFN observed time difference accuracy requirements in the intra-frequency case are tested by using test parameters in Table A.9.9.

Table A.9.9: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.10.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The SFN-CFN observed time difference accuracy requirements in the inter-frequency case are tested by using test parameters in Table A.9.10.

Table A.9.10: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.10.2 Test Requirements

The SFN-CFN observed time difference measurement accuracy shall meet the requirements in section 9.1.1.10.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.11 UE transmitted power

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.11 exists.

3GPP TSG RAN WG4 Meeting #22 **R4-020642**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123** **CR** **192** ⌘ ev **1** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘	Measurement test cases in section A.9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Currently, no measurement-specific test cases are defined for UE measurement accuracy requirements in Section 9. In order to keep the testing time reasonable, the whole I0 range from –94dBm…-50dBm cannot be tested as currently specified in Annex A.9.
Summary of change:	⌘	Introduction of measurement-specific test cases for P-CCPCH RSCP, CPICH RSCP, Timeslot ISCP, UTRA carrier RSSI, SFN-SFN observed time difference type 1 and SFN-CFN observed time difference measurements. Test parameter tables updated, i.e. PICH Ec/Ior and DPCH Ec/Ior removed, because no longer relevant in the context of these measurement tests.
Consequences if not approved:	⌘	Critical UE measurement accuracy requirements cannot be tested. Isolated impact analysis: This CR introduces test cases for already existing critical requirements on UE measurement accuracies.

Clauses affected:	⌘	A.9		
Other specs affected:	⌘	- Other core specifications X Test specifications - O&M Specifications	⌘	TS34.122
Other comments:	⌘	No such tests currently exist in TS34.122 Equivalent CRs in other Releases: CR191r1 cat. F to 25.123 v3.9.0, CR193r1 cat. A to 25.123 v5.0.0		

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 25.102 annex A. This measurement channel is used both in active cell and cells to be measured.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

A.9.1 Measurement Performance for UE (3.84 Mcps TDD option)

~~If not otherwise stated, in this clause the test parameters in table A.9.1 should be applied for 3.84 Mcps TDD UE RX measurements requirements and the test parameters in table A.9.1A should be applied for 1.28 Mcps TDD UE RX measurements requirements.~~

A.9.1.1 P-CCPCH RSCP

A.9.1.1.1 Test Purpose and Environment

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 9.1.1.1.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2.

Both P-CCPCH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

Table A.9.1: P-CCPCH RSCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	0	0	0	0	0
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH Ec/Ior	dB	-3		-3		-3	
SCH Ec/Ior	dB	-9		-9		-9	
SCH t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.7		-59.8		-98.7	
Îor/Ioc	dB	5	2	9	2	3	0
PCCPCH RSCP, Note 1	dBm	-73.7	-76.7	-53.8	-60.8	-98.7	-101.7
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

P-CCPCH RSCP inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.2.

Table A.9.2: P-CCPCH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.1	-98.7	-97
Îor/Ioc	dB	5	5	7	2	3	0
PCCPCH RSCP, Note 1	dBm	-73.2	-73.2	-54.8	-55.1	-98.7	-100
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.1.2 Test Requirements

The P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.1.1.1.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.2 CPICH measurements

A.9.1.2.1 CPICH RSCP

A.9.1.2.1.1 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 9.1.1.2 and applies to UE's supporting this capability.

The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

A.9.1.2.1.1.1 Inter frequency test parameters

In this case both cells are on different frequencies. Cell 1 is a UTRA TDD cell and cell 2 is a UTRA FDD cell. No second Beacon timeslot shall be provided for cell 1.

CPICH RSCP inter frequency absolute accuracy requirements are tested by using test parameters in Table A.9.3.

Table A.9.3: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	n.a.	0	n.a.
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	n.a.	-10	n.a.	-10
PCCPCH_Ec/Ior	dB	-3	-12	-3	-12
SCH_Ec/Ior	dB	-9	-12	-9	-12
SCH t_{offset}		5	n.a.	5	n.a.
PICH_Ec/Ior	dB	n.a.	-15	n.a.	-15
OCNS_Ec/Ior	dB	-3.12	-0.94	-3.12	-0.94
Ioc	dBm/ 3.84 MHz	-57.7	-60	-84.7	-84
$\hat{I}$or/Ioc	dB	7	9.54	3	0
PCCPCH RSCP, Note 1	dBm	-53.7	n.a.	-84.7	n.a.
CPICH RSCP, Note 1	dBm	n.a.	-60.46	n.a.	-94
Io, Note 1	dBm/3.84 MHz	-50	-50	-80	-81
Propagation condition	-	AWGN		AWGN	
NOTE 1: PCCPCH RSCP, CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					

A.9.1.2.1.2 Test Requirements

The CPICH RSCP measurement accuracy shall meet the requirements in section 9.1.1.2.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.2.2 CPICH Ec/Io

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.3 exists.

A.9.1.3 Timeslot ISCP

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the Timeslot ISCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.1.3.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.3.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2.

The Timeslot ISCP intra frequency absolute accuracy requirements are tested by using test parameters in Table A.9.4.

Table A.9.4: Timeslot ISCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	0	0	0	0	0
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.7		-59.8		-98.7	
Îor/Ioc	dB	5	2	9	2	3	0
Timeslot ISCP, Note 1	dBm	-73.7	-70.7	-57.8	-50.8	-98.7	-95.7
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Timeslot ISCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.3.2 Test Requirements

The Timeslot ISCP measurement accuracy shall meet the requirements in section 9.1.1.3.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.4 UTRA Carrier RSSI

A.9.1.4.1 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 9.1.1.4.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.4.1.1 Inter frequency test parameters

In this case both cells are on different frequencies. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

Both UTRA Carrier RSSI absolute and relative accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.1	-98.7	-97
Îor/Ioc	dB	5	5	7	2	3	0
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.4.2 Test Requirements

The UTRA Carrier RSSI absolute measurement accuracy shall meet the requirements in section 9.1.1.4.

The UTRA Carrier RSSI relative measurement accuracy shall meet the requirements in Table A.9.6 by taking into account the effect of thermal noise and noise added by the receiver.

Table A.9.6: UTRA Carrier RSSI relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.5 GSM carrier RSSI

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.5 exists.

A.9.1.6 SIR

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.6 exists.

A.9.1.7 Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.7 exists.

A.9.1.8 SFN-SFN observed time difference

A.9.1.8.1 SFN-SFN observed time difference type 1

A.9.1.8.1.1 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 9.1.1.8.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0…9830400 chip.

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

A.9.1.8.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The SFN-SFN observed time difference type 1 accuracy requirements in the intra-frequency case are tested by using test parameters in Table A.9.7.

Table A.9.7: SFN-SFN observed time difference type 1 Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.8.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The SFN-SFN observed time difference type 2 accuracy requirements in the inter-frequency case are tested by using test parameters in Table A.9.8.

Table A.9.8: SFN-SFN observed time difference type 1 Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.8.1.2 Test Requirements

The SFN-SFN observed time difference type 1 measurement accuracy shall meet the requirements in section 9.1.1.8.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.8.2 SFN-SFN observed time difference type 2

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements on SFN-SFN observed time difference type 2 in sections 9.1.1.8 exists.

A.9.1.9 Observed time difference to GSM cell

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.9 exists.

A.9.1.10 SFN-CFN observed time difference

A.9.1.10.1 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 9.1.1.10.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0…256 frames.

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

A.9.1.10.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The SFN-CFN observed time difference accuracy requirements in the intra-frequency case are tested by using test parameters in Table A.9.9.

Table A.9.9: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.10.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The SFN-CFN observed time difference accuracy requirements in the inter-frequency case are tested by using test parameters in Table A.9.10.

Table A.9.10: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.10.2 Test Requirements

The SFN-CFN observed time difference measurement accuracy shall meet the requirements in section 9.1.1.10.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.11 UE transmitted power

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.11 exists.

A.9.1A Measurement Performance for UE (1.28 Mcps TDD option)

A.9.1A.1 TDD intra frequency measurements

~~A.9.1.1.1 3.84 Mcps TDD option~~

~~In this case all cells are on the same frequency. The table A.9.1 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.~~

~~Table A.9.1 Intra frequency test parameters for UE RX Measurements~~

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~	
~~UTRA RF Channel number~~		~~Channel 1~~		~~Channel 1~~	
~~Timeslot~~		~~0~~	~~8~~	~~0~~	~~8~~
~~P-CCPCH Ec/Ior~~	~~dB~~	~~-3~~	~~-~~	~~-3~~	~~-~~
~~SCH Ec/Ior~~	~~dB~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~PICH_Ec/Ior~~	~~dB~~	~~-~~	~~-3~~	~~-~~	~~-3~~
~~OCNS~~	~~dB~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~
~~Îor/Ioc~~	~~dB~~	~~[-]~~		~~[-]~~	
~~Ioc~~	~~dBm/ 3,84 MHz~~	~~-70~~		~~-70~~	
~~Range 1:Io~~ ~~Range 2: Io~~	~~dBm~~	~~-94.. 70~~ ~~-94.. 50~~		~~-94.. 70~~ ~~-94.. 50~~	
~~Propagation condition~~	~~-~~	~~AWGN~~		~~AWGN~~	

~~Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.~~

~~Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* |≤ 20 dB.~~

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

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

~~Note 5: The DPCH of all cells are located in an other timeslot than 0 or 8~~

~~A.9.1.1.2 1.28 Mcps TDD option~~

If not otherwise stated, the test parameters in table A.9.1A should be applied for UE RX measurements requirements in this section.

Table A. 9.1A Intra frequency test parameters for UE RX Measurements

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
Range 1:Io Range 2:Io	dBm	-94..-70 –94..-50				-94..-70 –94..-50			
Propagation condition	AWGN								

Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.

Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* |≤ 20 dB.

Note 3: $|Io - P\text{-}CCPCH\_RSCP| \leq$ [20] dB.

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

Note 5: The DPCH of all cells are located in a timeslot other than 0

A.9.1A.2 TDD inter frequency measurements

~~A.9.1.2.1 3.84 Mcps TDD option~~

~~In this case all cells are on the same frequency. The table A.9.2 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.~~

~~Table A.9.2: Inter frequency test parameters for UE RX Measurements~~

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~	
~~UTRA RF Channel number~~		~~Channel 1~~		~~Channel 2~~	
~~Timeslot~~		~~0~~	~~8~~	~~0~~	~~8~~
~~P-CCPCH Ec/Ior~~	~~dB~~	~~-3~~	~~-~~	~~-3~~	~~-~~
~~SCH Ec/Ior~~	~~dB~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~PICH_Ec/Ior~~	~~dB~~	~~-~~	~~-3~~	~~-~~	~~-3~~
~~OCNS~~	~~dB~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~
~~Îor/Ioc~~	~~dB~~	~~[-]~~		~~[-]~~	
~~Ioc~~	~~dBm/ 3,84 MHz~~	~~-70~~		~~-70~~	
~~Range 1:Io~~ ~~Range 2: Io~~	~~dBm~~	~~-94.. 70~~ ~~-94..-50~~		~~-94.. 70~~ ~~-94..-50~~	
~~Propagation condition~~	~~-~~	~~AWGN~~		~~AWGN~~	

~~Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.~~

~~Note 2: $|$ *P-CCPCH_RSCP1 – PCCPCH_RSCP2* $| \leq$ 20 dB.~~

~~Note 3: $|$ *Io – P-CCPCH_Ec/Ior* $| \leq$ [20] dB.~~

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

~~Note 5: The DPCH of all cells are located in an other timeslot than 0 or 8~~

~~A.9.1.2.2 1.28 Mcps TDD option~~

If not otherwise stated, the test parameters in table A. 9.2A should be applied for UE RX measurements requirements in this section.

Table A. 9.2A: Intra frequency test parameters for UE RX Measurements

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
Range 1:Io Range 2:Io	dBm	-94..-70 –94..-50				-94..-70 –94..-50			
Propagation condition	AWGN								

Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.

Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* |≤ 20 dB.

Note 3: | *Io –P-CCPCH_RSCP1,2*| ≤ [20] dB.

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

Note 5: The DPCH of all cells are located in a timeslot other than 0

A.9.1A.3 FDD inter frequency measurements

~~A.9.1.3.1 3.84 Mcps TDD option~~

~~In this case both cells are in different frequency. Table A.9.3 and notes 1-6 define the limits of signal strengths and code powers, where the requirement is applicable.~~

~~Table A.9.3 CPICH Inter frequency test parameters~~

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~
~~Timeslot Number~~		~~0~~	~~8~~	~~n.a~~
~~UTRA RF Channel Number~~		~~Channel 1~~		~~Channel 2~~
~~CPICH_Ec/Ior~~	~~dB~~	~~n.a.~~	~~n.a.~~	~~-10~~
~~P-CCPCH_Ec/Ior~~	~~dB~~	~~-3~~		~~-12~~
~~SCH_Ec/Ior~~	~~dB~~	~~-9~~	~~-9~~	~~-12~~
~~SCH_t_{offset}~~		~~0~~	~~0~~	~~n.a.~~
~~PICH_Ec/Ior~~			~~-3~~	~~-15~~
~~DPCH_Ec/Ior~~	~~dB~~	~~n.a.~~	~~n.a.~~	~~-15~~
~~OCNS~~	~~dB~~	~~-4.28~~	~~-4.28~~	~~-1,11~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~[]~~	~~[]~~	~~10,5~~
~~I_{oc}~~	~~dBm/3,84 MHz~~	~~-70~~		~~Note 5~~
~~Range 1:Io~~ ~~Range 2: Io~~	~~dBm~~	~~-94..-70~~ ~~-94..-50~~		~~-94..-70~~ ~~-94..-50~~
~~Propagation condition~~	~~-~~	~~AWGN~~		~~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*~~

~~Note 6: The DPCH of the TDD cell is located in an other timeslot than 0 or 8~~

(void)

A.9.1A.4 UTRA carrier RSSI inter frequency measurements

~~A.9.1.4.1 3.84 Mcps TDD option~~

~~The table A.9.4 and notes 1,2 define the limits of signal strengths, where the requirement is applicable.~~

~~Table A.9.4: 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~~	~~Note 2~~	~~Note 2~~
~~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*.~~			

~~A.9.1.4.2 1.28 Mcps TDD option~~

The table A.9.4A and notes 1,2 define the limits of signal strengths, where the requirement is applicable.

Table A.9.4A: 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/1.28 MHz	Note 2	Note 2
Range 1: Io Range 2: Io	dBm/1.28 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*.			

3GPP TSG RAN WG4 Meeting #22 **R4-020643**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123** **CR** **193** ⌘ ev **1** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘	Measurement test cases in section A.9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Currently, no measurement-specific test cases are defined for UE measurement accuracy requirements in Section 9. In order to keep the testing time reasonable, the whole I0 range from –94dBm…-50dBm cannot be tested as currently specified in Annex A.9.
Summary of change:	⌘	Introduction of measurement-specific test cases for P-CCPCH RSCP, CPICH RSCP, Timeslot ISCP, UTRA carrier RSSI, SFN-SFN observed time difference type 1 and SFN-CFN observed time difference measurements. Test parameter tables updated, i.e. PICH Ec/Ior and DPCH Ec/Ior removed, because no longer relevant in the context of these measurement tests.
Consequences if not approved:	⌘	Critical UE measurement accuracy requirements cannot be tested. Isolated impact analysis: This CR introduces test cases for already existing critical requirements on UE measurement accuracies.

Clauses affected:	⌘	A.9
Other specs affected:	⌘	- Other core specifications ⌘ - Test specifications - O&M Specifications
Other comments:	⌘	- Equivalent CRs in other Releases: CR191r1 cat. F to 25.123 v3.9.0, CR192r1 cat. A to 25.123 v4.4.0

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 25.102 annex A. This measurement channel is used both in active cell and cells to be measured.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

A.9.1 Measurement Performance for UE (3.84 Mcps TDD option)

~~If not otherwise stated, in this clause the test parameters in table A.9.1 should be applied for 3.84 Mcps TDD UE RX measurements requirements and the test parameters in table A.9.1A should be applied for 1.28 Mcps TDD UE RX measurements requirements.~~

A.9.1.1 P-CCPCH RSCP

A.9.1.1.1 Test Purpose and Environment

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 9.1.1.1.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2.

Both P-CCPCH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

Table A.9.1: P-CCPCH RSCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	0	0	0	0	0
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH Ec/Ior	dB	-3		-3		-3	
SCH Ec/Ior	dB	-9		-9		-9	
SCH t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.7		-59.8		-98.7	
Îor/Ioc	dB	5	2	9	2	3	0
PCCPCH RSCP, Note 1	dBm	-73.7	-76.7	-53.8	-60.8	-98.7	-101.7
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

P-CCPCH RSCP inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.2.

Table A.9.2: P-CCPCH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.1	-98.7	-97
Îor/Ioc	dB	5	5	7	2	3	0
PCCPCH RSCP, Note 1	dBm	-73.2	-73.2	-54.8	-55.1	-98.7	-100
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.1.2 Test Requirements

The P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.1.1.1.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.2 CPICH measurements

A.9.1.2.1 CPICH RSCP

A.9.1.2.1.1 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 9.1.1.2 and applies to UE's supporting this capability.

The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

A.9.1.2.1.1.1 Inter frequency test parameters

In this case both cells are on different frequencies. Cell 1 is a UTRA TDD cell and cell 2 is a UTRA FDD cell. No second Beacon timeslot shall be provided for cell 1.

CPICH RSCP inter frequency absolute accuracy requirements are tested by using test parameters in Table A.9.3.

Table A.9.3: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	n.a.	0	n.a.
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	n.a.	-10	n.a.	-10
PCCPCH_Ec/Ior	dB	-3	-12	-3	-12
SCH_Ec/Ior	dB	-9	-12	-9	-12
SCH_t_{offset}		5	n.a.	5	n.a.
PICH_Ec/Ior	dB	n.a.	-15	n.a.	-15
OCNS_Ec/Ior	dB	-3.12	-0.94	-3.12	-0.94
Ioc	dBm/ 3.84 MHz	-57.7	-60	-84.7	-84
$\hat{I}$or/Ioc	dB	7	9.54	3	0
PCCPCH RSCP, Note 1	dBm	-53.7	n.a.	-84.7	n.a.
CPICH RSCP, Note 1	dBm	n.a.	-60.46	n.a.	-94
Io, Note 1	dBm/3.84 MHz	-50	-50	-80	-81
Propagation condition	-	AWGN		AWGN	
NOTE 1: PCCPCH RSCP, CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					

A.9.1.2.1.2 Test Requirements

The CPICH RSCP measurement accuracy shall meet the requirements in section 9.1.1.2.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.2.2 CPICH Ec/Io

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.3 exists.

A.9.1.3 Timeslot ISCP

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the Timeslot ISCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.1.3.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.3.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2.

The Timeslot ISCP intra frequency absolute accuracy requirements are tested by using test parameters in Table A.9.4.

Table A.9.4: Timeslot ISCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	0	0	0	0	0
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.7		-59.8		-98.7	
Îor/Ioc	dB	5	2	9	2	3	0
Timeslot ISCP, Note 1	dBm	-73.7	-70.7	-57.8	-50.8	-98.7	-95.7
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Timeslot ISCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.3.2 Test Requirements

The Timeslot ISCP measurement accuracy shall meet the requirements in section 9.1.1.3.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.4 UTRA Carrier RSSI

A.9.1.4.1 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 9.1.1.4.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12.

A.9.1.4.1.1 Inter frequency test parameters

In this case both cells are on different frequencies. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

Both UTRA Carrier RSSI absolute and relative accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.1	-98.7	-97
Îor/Ioc	dB	5	5	7	2	3	0
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.4.2 Test Requirements

The UTRA Carrier RSSI absolute measurement accuracy shall meet the requirements in section 9.1.1.4.

The UTRA Carrier RSSI relative measurement accuracy shall meet the requirements in Table A.9.6 by taking into account the effect of thermal noise and noise added by the receiver.

Table A.9.6: UTRA Carrier RSSI relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.5 GSM carrier RSSI

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.5 exists.

A.9.1.6 SIR

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.6 exists.

A.9.1.7 Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.7 exists.

A.9.1.8 SFN-SFN observed time difference

A.9.1.8.1 SFN-SFN observed time difference type 1

A.9.1.8.1.1 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 9.1.1.8.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0…9830400 chip.

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

A.9.1.8.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The SFN-SFN observed time difference type 1 accuracy requirements in the intra-frequency case are tested by using test parameters in Table A.9.7.

Table A.9.7: SFN-SFN observed time difference type 1 Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.8.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The SFN-SFN observed time difference type 2 accuracy requirements in the inter-frequency case are tested by using test parameters in Table A.9.8.

Table A.9.8: SFN-SFN observed time difference type 1 Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.8.1.2 Test Requirements

The SFN-SFN observed time difference type 1 measurement accuracy shall meet the requirements in section 9.1.1.8.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.8.2 SFN-SFN observed time difference type 2

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements on SFN-SFN observed time difference type 2 in sections 9.1.1.8 exists.

A.9.1.9 Observed time difference to GSM cell

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.9 exists.

A.9.1.10 SFN-CFN observed time difference

A.9.1.10.1 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 9.1.1.10.

Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0…256 frames.

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2.

A.9.1.10.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. The SFN-CFN observed time difference accuracy requirements in the intra-frequency case are tested by using test parameters in Table A.9.9.

Table A.9.9: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.10.1.2 Inter frequency test parameters

In this case both cells are on different frequencies. The SFN-CFN observed time difference accuracy requirements in the inter-frequency case are tested by using test parameters in Table A.9.10.

Table A.9.10: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t_{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Îor/Ioc	dB	5	5	7	3	3	3
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

A.9.1.10.2 Test Requirements

The SFN-CFN observed time difference measurement accuracy shall meet the requirements in section 9.1.1.10.

The rate of correct measurements observed during repeated tests shall be at least 90%.

A.9.1.11 UE transmitted power

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.11 exists.

A.9.1A Measurement Performance for UE (1.28 Mcps TDD option)

A.9.1A.1 TDD intra frequency measurements

~~A.9.1.1.1 3.84 Mcps TDD option~~

~~In this case all cells are on the same frequency. The table A.9.1 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.~~

~~Table A.9.1 Intra frequency test parameters for UE RX Measurements~~

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~	
~~UTRA RF Channel number~~		~~Channel 1~~		~~Channel 1~~	
~~Timeslot~~		~~0~~	~~8~~	~~0~~	~~8~~
~~P-CCPCH Ec/Ior~~	~~dB~~	~~-3~~	~~-~~	~~-3~~	~~-~~
~~SCH Ec/Ior~~	~~dB~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~PICH_Ec/Ior~~	~~dB~~	~~-~~	~~-3~~	~~-~~	~~-3~~
~~OCNS~~	~~dB~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~
~~Îor/Ioc~~	~~dB~~	~~[-]~~		~~[-]~~	
~~Ioc~~	~~dBm/ 3,84 MHz~~	~~-70~~		~~-70~~	
~~Range 1:Io~~ ~~Range 2: Io~~	~~dBm~~	~~-94.. 70~~ ~~-94.. 50~~		~~-94.. 70~~ ~~-94.. 50~~	
~~Propagation condition~~	~~-~~	~~AWGN~~		~~AWGN~~	

~~Note 1: *P-CCPCH_RSCP1,2* ≥ [102] dBm.~~

~~Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* |≤ 20 dB.~~

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

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

~~Note 5: The DPCH of all cells are located in an other timeslot than 0 or 8~~

~~A.9.1.1.2 1.28 Mcps TDD option~~

If not otherwise stated, the test parameters in table A.9.1A should be applied for UE RX measurements requirements in this section.

Table A. 9.1A Intra frequency test parameters for UE RX Measurements

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
Range 1:Io Range 2:Io	dBm	-94..-70 –94..-50				-94..-70 –94..-50			
Propagation condition	AWGN								

Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.

Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* |≤ 20 dB.

Note 3: $|Io - P\text{-}CCPCH\_RSCP| \leq$ [20] dB.

Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor $\hat{I}or/Ioc$.

Note 5: The DPCH of all cells are located in a timeslot other than 0

A.9.1A.2 TDD inter frequency measurements

~~A.9.1.2.1 3.84 Mcps TDD option~~

~~In this case all cells are on the same frequency. The table A.9.2 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.~~

~~Table A.9.2: Inter frequency test parameters for UE RX Measurements~~

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~	
~~UTRA RF Channel number~~		~~Channel 1~~		~~Channel 2~~	
~~Timeslot~~		~~0~~	~~8~~	~~0~~	~~8~~
~~P-CCPCH Ec/Ior~~	~~dB~~	~~-3~~	~~-~~	~~-3~~	~~-~~
~~SCH Ec/Ior~~	~~dB~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~PICH_Ec/Ior~~	~~dB~~	~~-~~	~~-3~~	~~-~~	~~-3~~
~~OCNS~~	~~dB~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~
~~$\hat{I}or/Ioc$~~	~~dB~~	~~[ ]~~		~~[ ]~~	
~~Ioc~~	~~dBm/ 3,84 MHz~~	~~-70~~		~~-70~~	
~~Range 1:Io~~ ~~Range 2: Io~~	~~dBm~~	~~-94.. 70~~ ~~-94..-50~~		~~-94.. 70~~ ~~-94..-50~~	
~~Propagation condition~~	~~-~~	~~AWGN~~		~~AWGN~~	

~~Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.~~

~~Note 2: $|$ *P-CCPCH_RSCP1 – PCCPCH_RSCP2* $| \leq$ 20 dB.~~

~~Note 3: $|$ *Io – P-CCPCH_Ec/Ior* $| \leq$ [20] dB.~~

~~Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor $\hat{I}or/Ioc$.~~

~~Note 5: The DPCH of all cells are located in an other timeslot than 0 or 8~~

~~A.9.1.2.2 1.28 Mcps TDD option~~

If not otherwise stated, the test parameters in table A. 9.2A should be applied for UE RX measurements requirements in this section.

Table A. 9.2A: Intra frequency test parameters for UE RX Measurements

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
Range 1:Io Range 2:Io	dBm	-94..-70 –94..-50				-94..-70 –94..-50			
Propagation condition	AWGN								

Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.

Note 2: $| P\text{-}CCPCH\_RSCP1 - PCCPCH\_RSCP2 | \leq$ 20 dB.

Note 3: $| Io - P\text{-}CCPCH\_RSCP1,2 | \leq$ [20] dB.

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

Note 5: The DPCH of all cells are located in a timeslot other than 0

A.9.1A.3 FDD inter frequency measurements

~~A.9.1.3.1 3.84 Mcps TDD option~~

~~In this case both cells are in different frequency. Table A.9.3 and notes 1-6 define the limits of signal strengths and code powers, where the requirement is applicable.~~

~~Table A.9.3 CPICH Inter frequency test parameters~~

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~
~~Timeslot Number~~		~~0~~	~~8~~	~~n.a~~
~~UTRA RF Channel Number~~		~~Channel 1~~		~~Channel 2~~
~~CPICH_Ec/Ior~~	~~dB~~	~~n.a.~~	~~n.a.~~	~~-10~~
~~P-CCPCH_Ec/Ior~~	~~dB~~	~~-3~~		~~-12~~
~~SCH_Ec/Ior~~	~~dB~~	~~-9~~	~~-9~~	~~-12~~
~~SCH_t_{offset}~~		~~0~~	~~0~~	~~n.a.~~
~~PICH_Ec/Ior~~			~~-3~~	~~-15~~
~~DPCH_Ec/Ior~~	~~dB~~	~~n.a.~~	~~n.a.~~	~~-15~~
~~OCNS~~	~~dB~~	~~-4.28~~	~~-4.28~~	~~-1,11~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~[]~~	~~[]~~	~~10,5~~
~~I_{oc}~~	~~dBm/3,84 MHz~~	~~-70~~		~~Note 5~~
~~Range 1:Io~~ ~~Range 2: Io~~	~~dBm~~	~~-94.. 70~~ ~~-94..-50~~		~~-94.. 70~~ ~~-94..-50~~
~~Propagation condition~~	~~-~~	~~AWGN~~		~~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*~~

~~Note 6: The DPCH of the TDD cell is located in an other timeslot than 0 or 8~~

(void)

A.9.1A.4 UTRA carrier RSSI inter frequency measurements

~~A.9.1.4.1 3.84 Mcps TDD option~~

~~The table A.9.4 and notes 1,2 define the limits of signal strengths, where the requirement is applicable.~~

~~Table A.9.4: 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~~	~~Note 2~~	~~Note 2~~
~~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*.~~			

~~A.9.1.4.2 1.28 Mcps TDD option~~

The table A.9.4A and notes 1,2 define the limits of signal strengths, where the requirement is applicable.

Table A.9.4A: 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/1.28 MHz	Note 2	Note 2
Range 1: Io Range 2: Io	dBm/1.28 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*.			

3GPP TSG RAN WG4 Meeting #23 **R4-020837**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123 CR 221** ⌘ ev **-** ⌘ Current version: **3.9.0** ⌘

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

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

Title:	⌘	TFC selection in UE requirements and test case
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Current requirements on TFC selection in UE are not yet finalized for MAC indication time, evaluation of the Elimination criterion and evaluation of the Recovery criterion. Furthermore, no test case exists for the existing requirements on TFC selection in UE of section 6A.2.
Summary of change:	⌘	MAC indication time to higher layers of the available bit rate for every logical channel set to 15ms. Conditions for the Elimination criterion to be fulfilled defined. Conditions for the Recovery criterion to be fulfilled defined. Allowed L1 processing time for evaluation of elimination criterion increased from 15 to 35 ms. Note added for UE output power tolerance for UE Tx power measurements outside the measurement range. Introduction of test case for TFC selection in UE.
Consequences if not approved:	⌘	Critical requirements on TFC selection in UE not finalized, i.e. the existing TFC selection in UE algorithm as specified by TS25.321 is not feasible. Uniform UE behaviour when reaching UE maximum allowed Tx power cannot be guaranteed. The TFC selection in UE test case will cover critical, already existing system requirements of TS25.321 (MAC specification) and TS25.123 (RRM TDD). **Isolated impact analysis:** This CR is a correction to an already existing function, TFC selection in UE, where the specification is incomplete and where parts of critical requirements and a test case are missing.

	Note that this CR does not impact the TFC selection in UE algorithm as specified in TS25.321 (MAC).

Clauses affected:	⌘	2, 6A.2, 6A.3, new A.6A.2		
Other specs affected:	⌘	- Other core specifications X Test specifications - O&M Specifications	⌘	TS34.122
Other comments:	⌘	No test covering TFC selection in UE currently exists in TS34.122 Equivalent CRs in other Releases: CR227 cat. A to 25.123 v4.4.0, CR228 cat. A to 25.123 v5.0.0		

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

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

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP ~~TS~~ TR 25.922: "RRM Strategies".

[13] ~~(void)~~3GPP TS 25.321: “MAC protocol specification”

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE procedures in idle mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 05.05: "Radio transmission and reception".

< Next changed section >

6A.2 Transport format combination selection in UE

6A.2.1 Introduction

When the UE estimates that a certain TFC would require more power than the maximum transmit power, it shall limit the usage of transport format combinations for the assigned transport format combination 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. The ~~T~~transport format combination selection in UE is described in ~~section 11.4 of TS 25.321~~[13].

6A.2.2 Requirements

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a given ~~TFC~~CCTrCH in its associated timeslots~~. The UE transmit power estimation shall be made using the UE transmitted power measured over the measurement period and the gain factors of the corresponding TFC.~~

In the case of a single CCTrCH or multiple CCTrCHs having mutually exclusive timeslot assignments, ~~The~~ the UE shall consider the *Eliminiation* criterion for a given TFC of a CCTrCH to be fulfilled if for 3 successive frames the estimated UE transmit power ~~needed for this TFC~~ is greater than the Maximum UE transmitter power for at least ~~X out of Y successive measurement periods~~one timeslot associated with the CCTrCH in each frame.

In the case of multiple CCTrCHs not having mutually exclusive timeslot assignments, if for a given CCTrCH for 3 successive frames the estimated UE transmit power is greater than the Maximum UE transmitter power for at least one timeslot associated with the CCTrCH in each frame, the UE shall consider the *Elimination* criterion for a given TFC to be fulfilled if the use of this TFC will cause the estimated UE transmit power to continue to be greater than the Maximum UE transmitter power in at least one timeslot associated with the CCTrCH.

In the case of multi-frame operation of UL Physical Channels, the UE shall only consider active frames for the evaluation of the *Elimination* criterion.

If the *Elimination* criterion for a given TFC is fulfilled, ~~The~~ the MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within ~~[15 ms]~~T_{notify} from the moment the *Elimination* criterion was fulfilled.

The UE shall not consider the *Recovery* criterion for a given TFC to be fulfilled until the use of this TFC will not cause ~~if~~ the estimated UE transmit power ~~needed for this TFC has not been~~ to be greater than the Maximum UE transmitter power for ~~at least Y successive measurement periods~~ all UL timeslots associated with the TFC for a minimum of 3 successive frames.

In the case of multi-frame operation of UL Physical Channels, the UE shall only consider active frames for the evaluation of the *Recovery* criterion.

If the *Recovery* criterion for a given TFC is fulfilled, ~~The~~ the MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovery* criterion was fulfilled.

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of

$$(T_{notify} + T_{modify} + T_{L1\_proc}).$$

where:

T_{notify} equals ~~[~~15~~]~~ ms, and

T_{modify} equals MAX(T_{adapt_max},T_{TTI}), and

$T_{L1\ proc}$ equals ~~1~~3~~5~~ ms, and

T_{adapt_max} equals MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N}), and

N equals the number of logical channels that need to change rate, and

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6.1 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6A.1: T_{adapt}

Service	**T_{adapt} [ms]**
UMTS AMR	40
UMTS AMR 2	60

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [5].

6A.3 Maximum allowed UL TX Power

6A.3.1 Introduction

UTRAN may limit the power the UE is using on the uplink by setting the maximum allowed UL TX power IE defined in ~~TS25.331~~[16].

6A.3.2 Requirements

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.2.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

For UE output powers that are outside the range covered by the UE transmitted power measurement the UE output power shall not exceed the Maximum allowed UL TX Power with more than the tolerances specified for the UL Power Control in [5].

< Next changed section >

A.6A.2 Transport format combination selection in UE

A.6A.2.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6A.2.

A.6A.2.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6A.2 for a 64 kbps UL reference RAB intended for packet data services, i.e. Interactive or Background, PS as defined in TS 34.108 and multiplexed to a 3.4 kbps DCCH.

The test parameters are given in Table A.6A.5, A.6A.6, A.6A.7 and Table A.6A.8 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6A.6 can be found in TS 34.108 section "Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH".

Table A.6A.5: General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	Gain factors for TFC0 to TFC9 shall be set to 1.
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	0	Value of IE "Maximum allowed UL Tx power
Primary CCPCH Tx power	dBm	18	Value of IE "Primary CCPCH Tx power"
UL timeslot interference	dBm	-80	Value of IE "UL timeslot interference" This value shall apply to all timeslots
α		1	IE "Alpha" either not sent or explicitly set to value
UL target SIR	dB	6	
DPCH constant offset	dB	adjustable	Value of IE "DPCH constant power
T1	s	10	
T2	s	10	

Table A.6A.6: Transport channel parameters for UL reference RAB, Interactive or Background and DCCH

Parameter	Unit	64 kbps RAB	DCCH 3.4kbps
Transport Channel Number		1	2
Transmission Time Interval	ms	20	40
Type of Error Protection		Turbo coding	Convolutional coding
Coding Rate		1/3	
Size of CRC	bits	16	
Transport Block Size	bits	336	148
Transport Block Set Size	bits	336*B (B=0,1,2,3,4)	148*B (B=0,1)
Transport Format Set TF0 TF1 TF2 TF3 TF4	bits	 0x336 1x336 2x336 3x336 4x336	 0x148 1x148 N/A N/A N/A

Table A.6A.7: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6A.8: Physical channel parameters

Parameter	Unit	Value
UL timeslot		7
Burst type		1
Resource units		{(spreading factor 16 x 1 code) + (spreading factor 4 x 1 code)} x 1 time slot
TFCI	bits	16
TPC	bits	2
Frame allocation		Continuous

The test shall be performed in AWGN channel propagation conditions. The P-CCPCH in the DL shall be transmitted in timeslot 0.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.6A.5 shall be signalled to the UE.

During time period T1:

With the received P-CCPCH power level set to –60 dBm, the value of the DPCH constant value shall be adjusted such that the mean UE output power is -10 dBm. These conditions are held steady during period T1.

During time period T2:

At the beginning of time period T2, the received P-CCPCH power level shall be decreased by 20 dB.

A.6A.2.2 Test Requirements

A.6A.2.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within 170 ms from beginning of time period T2.

The rate of correct TFC selections observed during repeated tests shall be at least 90%.

NOTE: The delay from the beginning of T2 can be expressed as: $T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI} + T_{offset}$, where:

T_{detect_block}	Equal to 30 ms, the time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported. This defines the maximum time to detect that the *Elimination* criterion is fulfilled for UL_TFC8 and UL_TFC9.
T_{notify}	Equal to 15 ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.
T_{modify}	Equal to MAX(T_{adapt_max},T_{TTI}) = MAX(0, 40) = 40 ms.
T_{adapt_max}	Equals to 0 ms for the case without codec.
T_{TTI}	See section 6A.2. Equals 40 ms in the test case.
T_{L1_proc}	Equals 35 ms.
T_{align_TTI}	Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40 ms in this test case.
T_{offset}	Equal to 10 ms, the maximum time between reception of the DL beacon timeslot and the UL DPCH timeslot.

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Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123 CR 222** ⌘ ev **-** ⌘ Current version: **3.9.0** ⌘

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

Title:	⌘	Introduction of Test Case for correct reporting of intra-frequency neighbours in Fading propagation condition
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Sufficient L1 filtering of the UE P-CCPCH RSCP measurement is critical for correct Event 1G reporting in fading conditions. Currently, no test case exists that verifies requirements on correct Event 1G triggered reporting of neighbours in fading propagation conditions.
Summary of change:	⌘	Introduction of intra-frequency test case for correct Event 1G triggered reporting of neighbours in fading propagation condition
Consequences if not approved:	⌘	Critical missing test case for correct reporting of neighbours in CELL_DCH state. Isolated impact analysis: This CR introduces a test case on already existing requirements on UE measurement procedures in CELL_DCH state.
Clauses affected:	⌘	New A.8.1.3
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications - O&M Specifications
	⌘	TS25.102, TS34.122
Other comments:	⌘	Accompanying CR102 to TS25.102 R99 and corresponding cat-A's. No such test currently exists in TS34.122. Equivalent CRs in other Releases: CR229 cat. A to 25.123 v4.4.0, CR230 cat. A to 25.123 v5.0.0

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 performs sufficient layer 1 filtering of the P-CCPCH RSCP measurement which is the base for Event 1G evaluation. This test is performed in fading propagation conditions and will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8.1.3 and A.8.1.3A below. The test consists of one time period with time duration of T1. Two cells shall be present in the test, cell 1 being the current serving cell and cell 2 being a neighbour cell on the used frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP shall be reported together with Event 1G. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The TTI of the UL DCCH shall be 20ms.

Table A.8.1.3: 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 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 1	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	200	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	Sent before the beginning of time period T1
T1		s	200	

Table A.8.1.3A: Cell specific test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Cell 1		Cell 2	
		T1	T1	T1	T1
DL timeslot number		0	8	0	8
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.	-3	n.a.
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH_t_{offset}		0	0	2	2
PICH_Ec/Ior	dB	n.a.	-3	n.a.	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	7	7	2	2
PCCPCH RSCP	dBm	-66	n.a.	-71	n.a.
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		Case 4 as specified in TS25.102 Annex B			

A.8.1.3.2 Test Requirements

The number of Event 1G triggered measurement reports during time period T2 shall be less than 60.

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CHANGE REQUEST

⌘ **25.123** **CR** **223** ⌘ **rev** **1** ⌘ Current version: **3.9.0** ⌘

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

Title:	⌘	Corrections to TDD-TDD and FDD-TDD Handover interruption time requirements
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Requirements on TDD-TDD HO interruption time for the unknown cell case unrealistic. Requirements on FDD-TDD HO interruption time still not finalized, i.e. in square brackets. UE behaviour for TDD-GSM handover to a GSM target cell when synchonisation cannot be achieved with one attempt is not specified. HO delay requirement for TDD/FDD HO test case still in square brackets. Misleading side-conditions for TDD/TDD inter-frequency and TDD/FDD HO test cases.
Summary of change:	⌘	TDD-TDD HO interruption time corrected from 350 ms to 200 ms for the unknown cell case plus additional 30 ms for the case when SFN decoding is needed. TDD-FDD HO interruption time set to 100 ms for the known cell case and 200 ms for the unknown cell case. Corrections to TDD-GSM handover requirement section. HO delay requirement for TDD/FDD HO test case set to 100 ms according to requirements in section 5.2. Removal of "W used / non-used frequency" for TDD cells from general test paremeters in TDD/TDD inter-frequency and TDD/FDD HO test cases because not needed for quality estimate of TDD cells.
Consequences if not approved:	⌘	Critical requirements on Handover interruption times for TDD-TDD and TDD-FDD either missing, incomplete or not feasible. **Isolated Impact Analysis**

	This CR contains corrections to existing requirements which are either partially missing or incomplete or not feasible. Note that this CR does not affect Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	2; 5.1; 5.2; 5.3; A.5.1; A.5.2		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	TS34.122
Other comments:	⌘	No tests covering Handover interruption time requirements currently exist in TS34.122. Equivalent CRs in other Releases: CR231r1 cat. A to 25.123 v4.4.0, CR232r1 cat. A to 25.123 v5.0.0		

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

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

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP TR 25.922: "RRM Strategies".

[13] ~~(void)~~3GPP TS 25.214: “Physical layer procedures (FDD)”.

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE procedures in idle mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 05.05: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

[21] 3GPP TS 05.08: “Digital cellular telecommunications system (Phase 2+); Radio subsystem link control”

[22] 3GPP TS 05.10: “Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization”

< Next changed section >

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~~[16].

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~~[18]. CELL_FACH, CELL_PCH and URA_PCH states are described in ~~TS 25.331~~ [16].

5.1 TDD/TDD Handover

5.1.1 Introduction

~~The purpose of TDD/TDD handover is to change the cell of the connection between UE and UTRAN.~~ The TDD/TDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover~~, refer to TS25.331~~ as described in [16].

The TDD/TDD handover procedure may cause the UE to change its frequency.

5.1.2 Requirements

5.1.2.1 TDD/TDD ~~H~~handover delay

RRC ~~P~~rprocedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover~~,~~ are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying TDD/TDD handover with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure ~~delay~~ performance value defined in ~~TS25.331 Section 13.5.2~~[16] plus the interruption time stated in section 5.1.2.2.

5.1.2.2 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH, is dependent on whether the target cell is known for the UE or not.~~shall be less than the value in table 5.1 for intra-frequency handover and TDD/TDD inter-frequency handover . There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not.~~

If TDD/TDD intra-frequency or inter-frequency handover is commanded, the interruption time shall be less than,

$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC$ ms

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise

An intra-frequency or inter-frequency TDD target cell shall be ~~regarded as~~considered known by the UE, if ~~either~~ or both of the following conditions are true:

- ~~it~~ the target cell has been measured during the last 5 seconds~~ or,~~
- the UE has had a ~~dedicated connection~~ radio link ~~existed between the UE and the~~connected to the target cell during the last 5 seconds.

~~The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:~~

- ~~a handover with timing maintain is commanded by the UTRAN or~~
- ~~the SFN of the target cell is known by the UE~~

~~Table 5.1 TDD/TDD handover – interruption time~~

~~TDD/TDD handover case~~	**~~Maximum delay [ms]~~**			
	~~Known Cell~~		**~~Unknown Cell~~**	
	~~SFN not to be decoded~~	**~~SFN needs to be decoded~~**	**~~SFN not to be decoded~~**	**~~SFN needs to be decoded~~**
~~Intra-frequency~~	~~40~~	~~70~~	~~350~~	~~400~~
~~Inter-frequency~~	~~40~~	~~70~~	~~350~~	~~400~~

~~The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation, which can be up to one frame (10ms). And the time that can elapse till the appearance of the slot in which the new uplink DPCH shall be transmitted , which can be up to one frame (10ms).~~

The interruption time requirements ~~in Table 5.1~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~sufficient for successful synchronisation with one attempt.

~~NOTE: One synchronisation attempt can consist of coherent averaging using several frames.~~

5.2 TDD/FDD Handover

5.2.1 Introduction

The purpose of TDD/FDD handover is to change the radio access mode ~~between~~ from ~~F~~TDD ~~and~~ to ~~T~~FDD.

The TDD/FDD handover procedure is initiated from UTRAN with a ~~handover command~~ RRC message that implies a hard handover~~, refer to TS25.331~~ as described in [16]. ~~The handover procedure causes the UE to change its frequency.~~

5.2.2 Requirements

The~~se~~ requirements in this section shall apply ~~only~~ to UE supporting TDD~~/~~ and FDD ~~UE~~.

~~The requirements do not apply if FDD macro diversity is used.~~

5.2.2.1 TDD/FDD ~~H~~handover delay

RRC ~~P~~procedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover, are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying ~~hard~~ TDD/FDD handover with the activation time "now" or earlier than -$D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure ~~delay~~ performance value as defined in ~~TS25.331 Section 13.5.2~~[16] plus the interruption time stated in section 5.2.2.2.

5.2.2.2 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old D~~T~~PCH and the time the UE starts transmission of the new uplink DPCCH~~.~~, is dependent on whether the target cell is known for the UE or not. ~~The interruption time shall be less than the value in table 5.2.~~

If TDD/FDD handover is commanded, the interruption time shall be less than,

$$T_{interrupt} = T_{offset} + 40 + 50*KC + 150*UC \text{ ms}$$

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell.
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/FDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/FDD handover and equal to 0 otherwise

~~There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not.~~

~~The definition of known cell can be found in section 5.1.2.2.~~

~~Table 5.2 TDD/FDD interruption time~~

~~cell present in the handover command message~~	~~Maximum delay [ms]~~		
	~~Known Cell~~		~~Unknown cell~~
	~~SFN not to be decoded~~	~~SFN needs to be decoded~~	~~SFN needs to be decoded~~
~~1~~	~~[100]~~	~~[130]~~	~~[400]~~

~~The interruption time includes the interruption uncertainty when changing the timing from the old TDD to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.~~

An inter-frequency FDD target cell shall be considered known by the UE, if the target cell has been measured by the UE during the last 5 seconds.

The phase reference is the Primary CPICH.

The interruption time requirements ~~in Table 5.2~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~ sufficient for successful synchronisation with one attempt.

Note that the requirements in this section assume that N312 has the smallest possible value, i.e. only one in-sync indication as described in [13] is required.

5.3 TDD/GSM Handover

5.3.1 Introduction

The purpose of inter-RAT handover from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND)~~. The procedure is~~ as described in ~~TS25.331 section 8.3.7~~[16].

5.3.2 Requirements

The~~se~~ requirements in this section shall apply ~~only~~ to UE supporting TDD~~/GSM UE~~ and GSM.

~~This clause presents some of the important aspects of GSM handover required to be performed by the UE.~~

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

5.3.2.1 TDD/GSM ~~H~~handover delay

The RRC procedure performance value for the RRC HANDOVER FROM UTRAN COMMAND shall be 50 ms.

If the activation time is used in the RRC HANDOVER FROM UTRAN COMMAND, it corresponds to the CFN of the UTRAN channel.

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND with the activation time "now" or earlier than ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to transmit ~~(~~as specified in ~~GSM 05.10)~~ [22] on the new channel of the new RAT within ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

~~-~~If the access is delayed to an indicated activation time later than ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to transmit ~~(~~as specified in ~~GSM 05.10)~~ [22] on the new channel of the new RAT at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure performance value plus the interruption time stated in section 5.3.2.2.

~~The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.~~

~~Table 5.3: TDD/GSM handover – handover delay~~

~~UE synchronisation status~~	~~handover delay [ms]~~
~~The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received~~	~~90~~
~~The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received~~	~~190~~

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 ~~channel~~ DPCH and the time the UE is ready to transmit on the new channel of the new RAT, is dependent on whether the UE has synchonised to the target cell or not before receiving the RRC HANDOVER FROM UTRAN COMMAND.

The interruption time for the purpose of TDD/GSM handover shall be less than the value in Table 5.14. ~~The requirement in Table 5.4 for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.~~

Table 5.41: TDD/GSM ~~handover -~~ interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	40
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	140

The requirements in Table 5.1 for the case where the UE has not synchronised to the GSM target cell before receiving the RRC HANDOVER FROM UTRAN COMMAND shall apply only if the signal quality of the GSM target cell is sufficient for successful synchronisation with one attempt.

If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in [16].

< Next changed section >

A.5 UTRAN Connected Mode Mobility

A.5.1 TDD/TDD Handover

A.5.1.1 Handover to intra-frequency cell

A.5.1.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the intra-frequency handover delay in CELL_DCH state in the single carrier case reported in section 5.1.2.1.

The test parameters are given in Table A.5.1.1 and A.5.1.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP and SFN-CFN observed timed difference shall be reported together with Event 1G. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The UL DPCH shall be transmitted in timeslot 12.

Table A.5.1.1: General test parameters for Handover to intra-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	
T1		s	10	
T2		s	10	
T3		s	10	

Table A.5.1.2: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1						Cell 2					
DL timeslot number		**0**			**4**			**0**			**5**		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.			-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.			-9			n.a.		
SCH_t_{offset}	dB	0			n.a.			5			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.	n.a.			n.a.		Note 1
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.	n.a.	-3,12		n.a.		Note 2
$\hat{I}_{or}/I_{oc}$	dB	1						-Inf.	3		-Inf.		3
PCCPCH RSCP	dBm	-72			n.a.			-Inf.	-70		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition		AWGN											
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .													

A.5.1.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 40 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.1.2 Handover to inter-frequency cell

A.5.1.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter-frequency handover delay in CELL_DCH state in the dual carrier case reported in section 5.1.2.1.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.5.1.3 and A.5.1.4 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The PCCPCH RSCP and SFN-CFN observed time difference of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the last the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. The UL DPCH shall be transmitted in timeslot 12.

Table A.5.1.3: General test parameters for Handover to inter-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-80	Applicable for Event 2C
~~W non-used frequency~~			~~1~~	~~Applicable for Event 2C~~
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T_{SI}		s	1,28	The value shall be used for all cells in the test.
T1		s	10	
T2		s	10	
T3		s	10	

TableA.5.1.4: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit	Cell 1						Cell 2					
DL timeslot number		**0**			**4**			**2**			**5**		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 2					
PCCPCH_Ec/Ior	dB	-3			n.a.			-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.			-9			n.a.		
SCH_t_{offset}	dB	0			n.a.			5			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.	n.a.			n.a.		Note 1
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.	n.a.	-3,12		n.a.		Note 2
$\hat{I}_{or}/I_{oc}$	dB	1						-Inf.	7		-Inf		7
PCCPCH RSCP	dBm	-72			n.a.			-Inf.	-66		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition		AWGN											
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .													

A.5.1.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 40 ms from the beginning of time period T2.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.2 TDD/FDD Handover

A.5.2.1 Test purpose and Environment

The purpose of this test is to verify the requirement for the TDD/FDD handover delay in CELL_DCH state reported in section 5.2.2.1.

The test parameters are given in Table A.5.2.1, A.5.2.2 and A.5.2.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G and 2B shall be used. The CPICH_RSCP of the best cell on the unused frequency shall be reported together with Event 2B reporting. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

Table A.5.2.1: General test parameters for TDD/FDD handover

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	TDD cell
	Neighbour cell		Cell 2	FDD cell
Final condition	Active cell		Cell 2	FDD cell
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	3	Hysteresis parameter for event 2B
Time to Trigger		ms	0	
Absolute threshold used frequency		dBm	-71	Applicable for Event 2B
Threshold non-used frequency		dBm	-80	Applicable for Event 2B
~~W used frequency~~			~~1~~	~~Applicable for Event 2B~~
W non-used frequency			1	Applicable for Event 2B
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	5	
T2		s	15	
T3		s	5	

Table A.5.2.2: Cell 1 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 1					
DL timeslot number		**0**			**2**		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.		
SCH_t_{offset}	dB	0			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.
$\hat{I}_{or}/I_{oc}$	dB	5	-1		5	-1	
PCCPCH RSCP	dBm	-68	-74		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70					
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .							

Table A.5.2.3: Cell 2 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 2	
		T1, T2	**T3**
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	n.a.	Note 1
OCNS_Ec/Ior	dB	-0,941	Note 2
CPICH_RSCP	dBm	-83	-77
$\hat{I}_{or}/I_{oc}$	dB	-3	3
I_{oc}	dBm/3. 84 MHz	-70	
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

A.5.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than ~~[130]~~100 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

3GPP TSG RAN WG4 Meeting #23 **R4-020978**

Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.123** **CR** **224** ⌘ **rev** **1** ⌘ Current version: **3.9.0** ⌘

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

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

Title:	⌘	Measurement reporting and capabilities for the support of event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

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

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

Reason for change: ⌘

Missing delay requirements for RACH reporting in case SFN-SFN observed time difference is to be reported in CELL_FACH state.

Requirements on parallel measurements in CELL_DCH state, such as TrCH BLER and UE transmitted power still in square brackets.

Requirements on maximum number of intra-frequency reporting criteria don't allow simultaneous application of event- and periodic event triggered reporting for event types 1G, 1H and 1I. The current allowed E_{cat} = 4 intra-frequency event triggers are a strict minimum for system operation, i.e. a maximum of 2 1G event-trigger for Handover monitoring and one ISCP threshold for both 1H and 1I events. In anticipated Inter-cell or Intra-cell handover scenarios, the availability of additonal event triggers for example in conjunction with 1H and 1I periodic reporting is key to efficient system operation.

Missing requirements on maximum number of TVM triggers (event- or periodic) in CELL_FACH state

Summary of change: ⌘

A UE is allowed an additonal 50 ms per cell in RACH access delay in case SFN-SFN reporting on RACH is requested by UTRAN.

In addition to P-CCPCH RSCP and TS ISCP measurements, a UE is requested to support 1 TrCH BLER per TrCH and 1 UE transmitted power measurement in CELL_DCH state.

Number of allowed intra-frequency event triggers in CELL_DCH state increased from 4 to 6 in order to account for the possibility of periodic reporting for the purpose of inter- and intra-cell handover scenarios.

Support of 2 TVM triggers per Transport Channel in CELL_FACH state.

Consequences if not approved:	⌘	Critical requirements on UE support of measurement reporting and capabilities for the event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states either missing, incomplete or not feasible. **Isolated Impact Analysis** This CR contains corrections to existing requirements which are either partially missing or incomplete. Note that this CR does not affect Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	New 5.7; 8.2; 8.3; new 8.5		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	TS34.122
Other comments:	⌘	No requirements and tests covering the corrected functionalities currently exist in TS34.122. Equivalent CRs in other Releases: CR233r1 cat. A to 25.123 v4.4.0, CR234r1 cat. A to 25.123 v5.0.0		

5.7 RACH reporting

5.7.1 Introduction

The network may request the UE to report on RACH P-CCPCH RSCP for the serving cell and up to 6 strongest monitored set cells and SFN-SFN observed time difference between the serving cell and up to 6 different monitored set cells.

5.7.2 Requirements

If all of the following conditions are true, the UE is allowed to have an additional delay of N_{RACH}*50 ms in RACH transmission compared to the normal RACH transmission delay.

- SFN-SFN observed time difference measurement results are required to be reported on RACH
- The set of cells on which the SFN-SFN observed time difference measurement is to be reported has not changed since the previous RACH measurement report
- The UE has not measured the SFN-SFN observed time differences for the cells to be reported on RACH in the CELL_FACH state according to the requirements defined in Section 8.4.2.2

If at least one of the previous conditions is false, the UE shall be able to report the requested measurement results on RACH within a normal RACH transmission delay.

N_{RACH} is the number of cells requiring SFN decoding prior to the reporting of SFN-SFN observed time difference measurement results on RACH.

< Next changed section >

8.2 ~~Parallel~~ Measurements in CELL_DCH State with special requirements

8.2.1 Introduction

~~The purpose with this section is to ensure that all UE can handle a certain number of measurements in parallel.~~This section contains specific requirements for certain measurements beyond those specified in section 8.1. The measurements are defined in ~~TS 25.225~~[14], the measurement model is defined in ~~TS 25.302~~[15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in ~~TS 25.331~~[16] ~~and measurements reporting delays are specified in section 8.1~~. ~~For the description of the i~~Idle intervals ~~see TS 25.225, Annex A~~for the purpose of measurements are described in [14].

8.2.2 Requirements

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

The UE shall be able to perform parallel measurements according to table 8.2.

In addition to the requirements in table 8.2, ~~the~~ a UE in CELL_DCH state shall ~~in parallel, in state CELL_DCH,~~ also be able to measure and report the quantities according to section 8.~~2~~1.

Table 8.2: Parallel measurement requirements

Measurement quantity	Number of parallel measurements possible to request from the UE	Note
Transport channel BLER	~~[~~1~~]~~ per ~~TrCh~~Transport Channel	
UE transmitted power	~~[~~1~~]~~ per UL timeslot	
SFN-SFN observed time difference type 2	~~[-]~~1	
UE GPS Timing of Cell Frames for UP	~~[-]~~1	Only applicable for UE with this capability

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

8.3 Capabilities for Support of Event Triggering and Reporting Criteria in CELL_DCH state

8.3.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

The UE can be requested to make measurements under different measurement identity numbers. With each identity number there may be associated multiple number of events. The purpose of this section is to set some limits on the number of different reporting criteria the UE may be requested to track in parallel.

8.3.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.6.

For the measurement categories: Intra-frequency, Inter frequency and Inter-RAT the UE need not support more than 14 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

For the measurement category Intra-frequency the UE shall support at least 2 reporting criteria for event type 1G and at least 4 reporting criteria for an arbitrary combination of event types 1H and 1I.

Table 8.6: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Intra-frequency	46	Applicable for periodic reporting or TDD events (1G-1I).
Inter-frequency	6	Applicable for periodic reporting or Event 2A-2F
Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
UP measurements	2	Only applicable for UE with this capability.

< Next changed section >

8.5 Capabilities for Support of Event Triggering and Reporting Criteria in CELL_FACH state

8.5.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

8.5.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

Table 8.8: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Traffic volume measurements	2 + (2 per Transport Channel)	

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Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.123 CR 227** ⌘ ev **-** ⌘ Current version: **4.4.0** ⌘

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

Title:	⌘	TFC selection in UE requirements and test case (3.84 Mcps TDD option)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Current requirements on TFC selection in UE are not yet finalized for MAC indication time, evaluation of the Elimination criterion and evaluation of the Recovery criterion. Furthermore, no test case exists for the existing requirements on TFC selection in UE of section 6A.2.
Summary of change:	⌘	MAC indication time to higher layers of the available bit rate for every logical channel set to 15ms. Conditions for the Elimination criterion to be fulfilled defined. Conditions for the Recovery criterion to be fulfilled defined. Allowed L1 processing time for evaluation of elimination criterion increased from 15 to 35 ms. Note added for UE output power tolerance for UE Tx power measurements outside the measurement range. Introduction of test case for TFC selection in UE.
Consequences if not approved:	⌘	Critical requirements on TFC selection in UE not finalized, i.e. the existing TFC selection in UE algorithm as specified by TS25.321 is not feasible. Uniform UE behaviour when reaching UE maximum allowed Tx power cannot be guaranteed. The TFC selection in UE test case will cover critical, already existing system requirements of TS25.321 (MAC specification) and TS25.123 (RRM TDD). **Isolated impact analysis:** This CR is a correction to an already existing function, TFC selection in UE, where the specification is incomplete and where parts of critical requirements and a test case are missing.

	Note that this CR does not impact the TFC selection in UE algorithm as specified in TS25.321 (MAC).

Clauses affected:	⌘	2, 6A.2, 6A.3, A.6A.2		
Other specs affected:	⌘	- Other core specifications X Test specifications - O&M Specifications	⌘	TS34.122
Other comments:	⌘	No test covering TFC selection in UE currently exists in TS34.122 Equivalent CRs in other Releases: CR221 cat. F to 25.123 v3.9.0, CR228 cat. A to 25.123 v5.0.0		

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

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

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP ~~TS~~ TR 25.922: "RRM Strategies".

[13] ~~(void)~~3GPP TS 25.321: “MAC protocol specification”

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE procedures in idle mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 45.005: "Radio transmission and reception".

< Next changed section >

6A.2 Transport format combination selection in UE

6A.2.1 Introduction

When the UE estimates that a certain TFC would require more power than the maximum transmit power, it shall limit the usage of transport format combinations for the assigned transport format combination 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. The ~~T~~transport format combination selection in UE is described in ~~section 11.4 of TS 25.321~~[13].

6A.2.2 Requirements

6A.2.2.1 3.84 Mcps TDD option

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a given ~~TFC~~CCTrCH in its associated timeslots~~. The UE transmit power estimation shall be made using the UE transmitted power measured over the measurement period and the gain factors of the corresponding TFC.~~

In the case of a single CCTrCH or multiple CCTrCHs having mutually exclusive timeslot assignments, ~~The~~ the UE shall consider the *Eliminiation* criterion for a given TFC of a CCTrCH to be fulfilled if for 3 successive frames the estimated UE transmit power ~~needed for this TFC~~ is greater than the Maximum UE transmitter power for at least ~~X out of Y successive measurement periods~~one timeslot associated with the CCTrCH in each frame.

In the case of multiple CCTrCHs not having mutually exclusive timeslot assignments, if for a given CCTrCH for 3 successive frames the estimated UE transmit power is greater than the Maximum UE transmitter power for at least one timeslot associated with the CCTrCH in each frame, the UE shall consider the *Elimination* criterion for a given TFC to be fulfilled if the use of this TFC will cause the estimated UE transmit power to continue to be greater than the Maximum UE transmitter power in at least one timeslot associated with the CCTrCH.

In the case of multi-frame operation of UL Physical Channels, the UE shall only consider active frames for the evaluation of the *Elimination* criterion.

If the *Elimination* criterion for a given TFC is fulfilled, ~~The~~ the MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within ~~[15 ms]~~T_{notify} from the moment the *Elimination* criterion was fulfilled.

The UE shall not consider the *Recovery* criterion for a given TFC to be fulfilled until the use of this TFC will not cause ~~if~~ the estimated UE transmit power ~~needed for this TFC has not been~~ to be greater than the Maximum UE transmitter power for ~~at least Y successive measurement periods~~ all UL timeslots associated with the TFC for a minimum of 3 successive frames.

In the case of multi-frame operation of UL Physical Channels, the UE shall only consider active frames for the evaluation of the *Recovery* criterion.

If the *Recovery* criterion for a given TFC is fulfilled, ~~The~~ the MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovery* criterion was fulfilled.

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of

$$(T_{notify} + T_{modify} + T_{L1\_proc}).$$

where:

T_{notify} equals ~~[~~15~~]~~ ms, and

T_{modify} equals MAX(T_{adapt_max},T_{TTI}), and

$T_{L1\ proc}$ equals ~~1~~35 ms, and

T_{adapt_max} equals MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N}), and

N equals the number of logical channels that need to change rate, and

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6.1 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6A.1: T_{adapt}

Service	**T_{adapt} [ms]**
UMTS AMR	40
UMTS AMR 2	60

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [5].

6A.2.2.2 1.28 Mcps TDD option

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a given TFC. The UE transmit power estimation shall be made using the UE transmitted power measured over the measurement period and the gain factors of the corresponding TFC.

The UE shall consider the *Eliminiation* criterion for a given TFC to be fulfilled if the estimated UE transmit power needed for this TFC is greater than the Maximum UE transmitter power for at least X out of Y successive measurement periods. The MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within [15 ms] from the moment the *Elimination* criterion was fulfilled.

The UE shall consider the *Recovery* criterion for a given TFC to be fulfilled if the estimated UE transmit power needed for this TFC has not been greater than the Maximum UE transmitter power for at least Y successive measurement periods. The MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovery* criterion was fulfilled.

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of (T_{notify} + T_{modify}+ T_{L1_proc}).

where:

T_{notify} equals [15] ms, and

T_{modify} equals MAX(T_{adapt_max},T_{TTI}), and

$T_{L1\ proc}$ equals 15 ms, and

T_{adapt_max} equals MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N}), and

N equals the number of logical channels that need to change rate, and

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6A.2 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6A.2: T_{adapt}

Service	T_{adapt} [ms]
AMR	40

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [5].

6A.3 Maximum allowed UL TX Power

6A.3.1 Introduction

UTRAN may limit the power the UE is using on the uplink by setting the maximum allowed UL TX power IE defined in ~~TS25.331~~[16].

6A.3.2 Requirements

6A.3.2.1 3.84 Mcps option

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.2.1.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

For UE output powers that are outside the range covered by the UE transmitted power measurement the UE output power shall not exceed the Maximum allowed UL TX Power with more than the tolerances specified for the UL Power Control in [5].

6A.3.2.2 1.28 Mcps option

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.2.1.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

< Next changed section >

A.6A.2 Transport format combination selection in UE ~~for 1.28Mcps TDD option~~

A.6A.2.1 3.84 Mcps TDD option

A.6A.2.1.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6A.2.

A.6A.2.1.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6A.2 for a 64 kbps UL reference RAB intended for packet data services, i.e. Interactive or Background, PS as defined in TS 34.108 and multiplexed to a 3.4 kbps DCCH.

The test parameters are given in Table A.6A.9, A.6A.10, A.6A.11 and Table A.6A.12 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6A.10 can be found in TS 34.108 section "Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH".

Table A.6A.9: General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	Gain factors for TFC0 to TFC9 shall be set to 1.
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	0	Value of IE "Maximum allowed UL Tx power
Primary CCPCH Tx power	dBm	18	Value of IE "Primary CCPCH Tx power"
UL timeslot interference	dBm	-80	Value of IE "UL timeslot interference" This value shall apply to all timeslots
α		1	IE "Alpha" either not sent or explicitly set to value
UL target SIR	dB	6	
DPCH constant offset	dB	adjustable	Value of IE "DPCH constant power
T1	s	10	
T2	s	10	

Table A.6A.10: Transport channel parameters for UL reference RAB, Interactive or Background and DCCH

Parameter	Unit	64 kbps RAB	DCCH 3.4kbps
Transport Channel Number		1	2
Transmission Time Interval	ms	20	40
Type of Error Protection		Turbo coding	Convolutional coding
Coding Rate		1/3	
Size of CRC	bits	16	
Transport Block Size	bits	336	148
Transport Block Set Size	bits	336*B (B=0,1,2,3,4)	148*B (B=0,1)
Transport Format Set	bits		
TF0		0x336	0x148
TF1		1x336	1x148
TF2		2x336	N/A
TF3		3x336	N/A
TF4		4x336	N/A

Table A.6A.11: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6A.12: Physical channel parameters

Parameter	Unit	Value
UL timeslot		7
Burst type		1
Resource units		{(spreading factor 16 x 1 code) + (spreading factor 4 x 1 code)} x 1 time slot
TFCI	Bits	16
TPC	Bits	2
Frame allocation		Continuous

The test shall be performed in AWGN channel propagation conditions. The P-CCPCH in the DL shall be transmitted in timeslot 0.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.6A.5 shall be signalled to the UE.

During time period T1:

With the received P-CCPCH power level set to –60 dBm, the value of the DPCH constant value shall be adjusted such that the mean UE output power is -10 dBm. These conditions are held steady during period T1.

During time period T2:

At the beginning of time period T2, the received P-CCPCH power level shall be decreased by 20 dB.

A.6A.2.1.2 Test Requirements

A.6A.2.1.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within 170 ms from beginning of time period T2.

The rate of correct TFC selections observed during repeated tests shall be at least 90%.

NOTE: The delay from the begining of T2 can be expressed as: $T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI} + T_{offset}$, where:

T_{detect_block}	Equal to 30 ms, the time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported. This defines the maximum time to detect that the *Elimination* criterion is fulfilled for UL_TFC8 and UL_TFC9.
T_{notify}	Equal to 15 ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.
T_{modify}	Equal to $MAX(T_{adapt\_max}, T_{TTI}) = MAX(0, 40)=40ms$
T_{adapt_max}	Equals to 0 ms for the case without codec.
T_{TTI}	See section 6A.2. Equals 40 ms in the test case.
T_{L1_proc}	Equals 35 ms.
T_{align_TTI}	Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.
T_{offset}	Equal to 10 ms, the maximum time between reception of the DL beacon timeslot and the UL DPCH timeslot.

A.6A.2.2 1.28 Mcps TDD option

A.6A.2.2.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6.4.

A.6A.2.2.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6.4 for a RAB intended for packet data services, i.e. Interactive or Background, PS, UL: 64kbps as defined in TS 34.108.

The test parameters are given in Table A.6A.~~9~~13 , A.6A.1~~0~~4 and Table A.6A.1~~1~~5 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6A.~~9~~13 and A.6A.1~~0~~4 can be found in TS 34.108 section "Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH".

Table A.6A.~~9~~13: UL reference RAB, Interactive or Background

	TFI	64 kbps RAB (20ms TTI)	DCCH 3.4kbps (40ms TTI)
TFS	TF0, bits	0x336	0x148
	TF1, bits	1x336	1x148
	TF2, bits	2x336	N/A
	TF3, bits	3x336	N/A
	TF4, bits	4x336	N/A

Table A.6A.10~~4~~: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6A.11~~5~~ General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	
Power Control		On	
TPC step size	dB	1	
Maximum allowed UL TX power	dBm	21	
T1	s	30	
T2	s	10	

The test shall be performed in AWGN channel propagation conditions.

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.x.z shall be signalled to the UE.

During time period T1:

The system simulator shall ensure that the UE output power is commanded to be between 9to 10 dB below the UE Maximum allowed UL TX power.

During time period T2:

The system simulator shall continously send TPC_cmd=Up to the UE from the beginning of T2 until the end of T2.

NOTE: This will emulate that UL_TFC8 to UL_TFC9 can not be supported beacuse the UE reaches the maximum UL Tx power and still UTRAN is sending power-up commands. The time from the beginning of T2 until the UE blocks (stops using) UL_TFC8 and UL_TFC9 shall be measured.

A.6A.2.2.2 Test Requirements

A.6A.2.2.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within [TBD] ms from beginning of time period T2.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE: The delay from the begining of T2 can be expressed as: $T_{ramp} + T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI}$, where:

T_{ramp} Margin added for the increase of UE output power to the UE maximum power. A margin of 7 frames (70ms) is used, i.e. 14 TPC commands.

T_{detect_block} The time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported, i.e. defines the maximum time to detect that the *Limited TFC Set* criterion is fulfilled for UL_TFC8 and UL_TFC9. This figure is currently TBD as X and Y in the general requirement, see section 6.4.2, are not finalised yet.

T_{notify} Equal to [15] ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.

T_{modify} Equal to $MAX(T_{adapt\_max}, T_{TTI}) = MAX(0, 40)=40ms$

T_{adapt_max} Equals to 0ms for the case without codec.

T_{L1_proc} Equals 15ms.

T_{align_TTI} Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.

T_{TTI} See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of $(70 + T_{detect\_block} + [15] + 40 + 15 + 40)$ ms from the beginning of T2.

3GPP TSG RAN WG4 Meeting #23 **R4-020901**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123 CR 228** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘	TFC selection in UE requirements and test case (3.84 Mcps TDD option)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Current requirements on TFC selection in UE are not yet finalized for MAC indication time, evaluation of the Elimination criterion and evaluation of the Recovery criterion. Furthermore, no test case exists for the existing requirements on TFC selection in UE of section 6A.2.
Summary of change:	⌘	MAC indication time to higher layers of the available bit rate for every logical channel set to 15ms. Conditions for the Elimination criterion to be fulfilled defined. Conditions for the Recovery criterion to be fulfilled defined. Allowed L1 processing time for evaluation of elimination criterion increased from 15 to 35 ms. Note added for UE output power tolerance for UE Tx power measurements outside the measurement range. Introduction of test case for TFC selection in UE.
Consequences if not approved:	⌘	Critical requirements on TFC selection in UE not finalized, i.e. the existing TFC selection in UE algorithm as specified by TS25.321 is not feasible. Uniform UE behaviour when reaching UE maximum allowed Tx power cannot be guaranteed. The TFC selection in UE test case will cover critical, already existing system requirements of TS25.321 (MAC specification) and TS25.123 (RRM TDD). **Isolated impact analysis:** This CR is a correction to an already existing function, TFC selection in UE, where the specification is incomplete and where parts of critical requirements and a test case are missing.

	Note that this CR does not impact the TFC selection in UE algorithm as specified in TS25.321 (MAC).

Clauses affected:	⌘	2, 6A.2, 6A.3, A.6A.2		
Other specs affected:	⌘	- Other core specifications - Test specifications - O&M Specifications	⌘	
Other comments:	⌘	- Equivalent CRs in other Releases: CR221 cat. F to 25.123 v3.9.0, CR227 cat. A to 25.123 v4.4.0		

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

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

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP ~~TS~~ TR 25.922: "RRM Strategies".

[13] ~~(void)~~3GPP TS 25.321: “MAC protocol specification”

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE procedures in idle mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 45.005: "Radio transmission and reception".

< Next changed section >

6A.2 Transport format combination selection in UE

6A.2.1 Introduction

When the UE estimates that a certain TFC would require more power than the maximum transmit power, it shall limit the usage of transport format combinations for the assigned transport format combination 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. The ~~T~~transport format combination selection in UE is described in ~~section 11.4 of TS 25.321~~[13].

6A.2.2 Requirements

6A.2.2.1 3.84 Mcps TDD option

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a given ~~TFC~~CCTrCH in its associated timeslots~~. The UE transmit power estimation shall be made using the UE transmitted power measured over the measurement period and the gain factors of the corresponding TFC.~~

In the case of a single CCTrCH or multiple CCTrCHs having mutually exclusive timeslot assignments, ~~The~~ the UE shall consider the *Eliminiation* criterion for a given TFC of a CCTrCH to be fulfilled if for 3 successive frames the estimated UE transmit power ~~needed for this TFC~~ is greater than the Maximum UE transmitter power for at least ~~X out of Y successive measurement periods~~one timeslot associated with the CCTrCH in each frame.

In the case of multiple CCTrCHs not having mutually exclusive timeslot assignments, if for a given CCTrCH for 3 successive frames the estimated UE transmit power is greater than the Maximum UE transmitter power for at least one timeslot associated with the CCTrCH in each frame, the UE shall consider the *Elimination* criterion for a given TFC to be fulfilled if the use of this TFC will cause the estimated UE transmit power to continue to be greater than the Maximum UE transmitter power in at least one timeslot associated with the CCTrCH.

In the case of multi-frame operation of UL Physical Channels, the UE shall only consider active frames for the evaluation of the *Elimination* criterion.

If the *Elimination* criterion for a given TFC is fulfilled, ~~The~~ the MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within ~~[15 ms]~~T_{notify} from the moment the *Elimination* criterion was fulfilled.

The UE shall not consider the *Recovery* criterion for a given TFC to be fulfilled until the use of this TFC will not cause ~~if~~ the estimated UE transmit power ~~needed for this TFC has not been~~ to be greater than the Maximum UE transmitter power for ~~at least Y successive measurement periods~~ all UL timeslots associated with the TFC for a minimum of 3 successive frames.

In the case of multi-frame operation of UL Physical Channels, the UE shall only consider active frames for the evaluation of the *Recovery* criterion.

If the *Recovery* criterion for a given TFC is fulfilled, ~~The~~ the MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovery* criterion was fulfilled.

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of

$$(T_{notify} + T_{modify} + T_{L1\_proc}).$$

where:

T_{notify} equals ~~[~~15~~]~~ ms, and

T_{modify} equals MAX(T_{adapt_max},T_{TTI}), and

$T_{L1\ proc}$ equals ~~1~~35 ms, and

T_{adapt_max} equals MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N}), and

N equals the number of logical channels that need to change rate, and

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6.1 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6A.1: T_{adapt}

Service	**T_{adapt} [ms]**
UMTS AMR	40
UMTS AMR 2	60

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [5].

6A.2.2.2 1.28 Mcps TDD option

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a given TFC. The UE transmit power estimation shall be made using the UE transmitted power measured over the measurement period and the gain factors of the corresponding TFC.

The UE shall consider the *Eliminiation* criterion for a given TFC to be fulfilled if the estimated UE transmit power needed for this TFC is greater than the Maximum UE transmitter power for at least X out of Y successive measurement periods. The MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within [15 ms] from the moment the *Elimination* criterion was fulfilled.

The UE shall consider the *Recovery* criterion for a given TFC to be fulfilled if the estimated UE transmit power needed for this TFC has not been greater than the Maximum UE transmitter power for at least Y successive measurement periods. The MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovery* criterion was fulfilled.

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of (T_{notify} + T_{modify}+ T_{L1_proc}).

where:

T_{notify} equals [15] ms, and

T_{modify} equals MAX(T_{adapt_max},T_{TTI}), and

$T_{L1\ proc}$ equals 15 ms, and

T_{adapt_max} equals MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N}), and

N equals the number of logical channels that need to change rate, and

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6A.2 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6A.2: T_{adapt}

Service	T_{adapt} [ms]
AMR	40

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [5].

6A.3 Maximum allowed UL TX Power

6A.3.1 Introduction

UTRAN may limit the power the UE is using on the uplink by setting the maximum allowed UL TX power IE defined in ~~TS25.331~~[16].

6A.3.2 Requirements

6A.3.2.1 3.84 Mcps option

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.2.1.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

For UE output powers that are outside the range covered by the UE transmitted power measurement the UE output power shall not exceed the Maximum allowed UL TX Power with more than the tolerances specified for the UL Power Control in [5].

6A.3.2.2 1.28 Mcps option

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.2.1.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

< Next changed section >

A.6A.2 Transport format combination selection in UE ~~for 1.28Mcps TDD option~~

A.6A.2.1 3.84 Mcps TDD option

A.6A.2.1.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6A.2.

A.6A.2.1.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6A.2 for a 64 kbps UL reference RAB intended for packet data services, i.e. Interactive or Background, PS as defined in TS 34.108 and multiplexed to a 3.4 kbps DCCH.

The test parameters are given in Table A.6A.9, A.6A.10, A.6A.11 and Table A.6A.12 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6A.10 can be found in TS 34.108 section "Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH".

Table A.6A.9: General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	Gain factors for TFC0 to TFC9 shall be set to 1.
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	0	Value of IE "Maximum allowed UL Tx power
Primary CCPCH Tx power	dBm	18	Value of IE "Primary CCPCH Tx power"
UL timeslot interference	dBm	-80	Value of IE "UL timeslot interference" This value shall apply to all timeslots
α		1	IE "Alpha" either not sent or explicitly set to value
UL target SIR	dB	6	
DPCH constant offset	dB	adjustable	Value of IE "DPCH constant power
T1	s	10	
T2	s	10	

Table A.6A.10: Transport channel parameters for UL reference RAB, Interactive or Background and DCCH

Parameter	Unit	64 kbps RAB	DCCH 3.4kbps
Transport Channel Number		1	2
Transmission Time Interval	ms	20	40
Type of Error Protection		Turbo coding	Convolutional coding
Coding Rate		1/3	
Size of CRC	bits	16	
Transport Block Size	bits	336	148
Transport Block Set Size	bits	336*B (B=0,1,2,3,4)	148*B (B=0,1)
Transport Format Set	bits		
TF0		0x336	0x148
TF1		1x336	1x148
TF2		2x336	N/A
TF3		3x336	N/A
TF4		4x336	N/A

Table A.6A.11: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6A.12: Physical channel parameters

Parameter	Unit	Value
UL timeslot		7
Burst type		1
Resource units		{(spreading factor 16 x 1 code) + (spreading factor 4 x 1 code)} x 1 time slot
TFCI	Bits	16
TPC	Bits	2
Frame allocation		Continuous

The test shall be performed in AWGN channel propagation conditions. The P-CCPCH in the DL shall be transmitted in timeslot 0.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.6A.5 shall be signalled to the UE.

During time period T1:

With the received P-CCPCH power level set to –60 dBm, the value of the DPCH constant value shall be adjusted such that the mean UE output power is -10 dBm. These conditions are held steady during period T1.

During time period T2:

At the beginning of time period T2, the received P-CCPCH power level shall be decreased by 20 dB.

A.6A.2.1.2 Test Requirements

A.6A.2.1.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within 170 ms from beginning of time period T2.

The rate of correct TFC selections observed during repeated tests shall be at least 90%.

NOTE: The delay from the begining of T2 can be expressed as: $T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI} + T_{offset}$, where:

T_{detect_block}	Equal to 30 ms, the time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported. This defines the maximum time to detect that the *Elimination* criterion is fulfilled for UL_TFC8 and UL_TFC9.
T_{notify}	Equal to 15 ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.
T_{modify}	Equal to $MAX(T_{adapt\_max}, T_{TTI}) = MAX(0, 40)=40ms$
T_{adapt_max}	Equals to 0 ms for the case without codec.
T_{TTI}	See section 6A.2. Equals 40 ms in the test case.
T_{L1_proc}	Equals 35 ms.
T_{align_TTI}	Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.
T_{offset}	Equal to 10 ms, the maximum time between reception of the DL beacon timeslot and the UL DPCH timeslot.

A.6A.2.2 1.28 Mcps TDD option

A.6A.2.2.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6.4.

A.6A.2.2.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6.4 for a RAB intended for packet data services, i.e. Interactive or Background, PS, UL: 64kbps as defined in TS 34.108.

The test parameters are given in Table A.6A.~~9~~13 , A.6A.1~~0~~4 and Table A.6A.1~~1~~5 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6A.~~9~~13 and A.6A.1~~0~~4 can be found in TS 34.108 section "Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH".

Table A.6A.~~9~~13: UL reference RAB, Interactive or Background

	TFI	64 kbps RAB (20ms TTI)	DCCH 3.4kbps (40ms TTI)
TFS	TF0, bits	0x336	0x148
	TF1, bits	1x336	1x148
	TF2, bits	2x336	N/A
	TF3, bits	3x336	N/A
	TF4, bits	4x336	N/A

Table A.6A.10~~4~~: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6A.11~~5~~ General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	
Power Control		On	
TPC step size	dB	1	
Maximum allowed UL TX power	dBm	21	
T1	s	30	
T2	s	10	

The test shall be performed in AWGN channel propagation conditions.

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.x.z shall be signalled to the UE.

During time period T1:

The system simulator shall ensure that the UE output power is commanded to be between 9to 10 dB below the UE Maximum allowed UL TX power.

During time period T2:

The system simulator shall continously send TPC_cmd=Up to the UE from the beginning of T2 until the end of T2.

NOTE: This will emulate that UL_TFC8 to UL_TFC9 can not be supported beacuse the UE reaches the maximum UL Tx power and still UTRAN is sending power-up commands. The time from the beginning of T2 until the UE blocks (stops using) UL_TFC8 and UL_TFC9 shall be measured.

A.6A.2.2.2 Test Requirements

A.6A.2.2.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within [TBD] ms from beginning of time period T2.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE: The delay from the begining of T2 can be expressed as: $T_{ramp} + T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI}$, where:

T_{ramp} Margin added for the increase of UE output power to the UE maximum power. A margin of 7 frames (70ms) is used, i.e. 14 TPC commands.

T_{detect_block} The time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported, i.e. defines the maximum time to detect that the *Limited TFC Set* criterion is fulfilled for UL_TFC8 and UL_TFC9. This figure is currently TBD as X and Y in the general requirement, see section 6.4.2, are not finalised yet.

T_{notify} Equal to [15] ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.

T_{modify} Equal to $MAX(T_{adapt\_max}, T_{TTI}) = MAX(0, 40)=40ms$

T_{adapt_max} Equals to 0ms for the case without codec.

T_{L1_proc} Equals 15ms.

T_{align_TTI} Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.

T_{TTI} See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of $(70 + T_{detect\_block} + [15] + 40 + 15 + 40)$ ms from the beginning of T2.

3GPP TSG RAN WG4 Meeting #23 **R4-020902**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123 CR 229** ⌘ ev **-** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘	Introduction of Test Case for correct reporting of intra-frequency neighbours in Fading propagation condition (3.84 Mcps TDD option)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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

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

Reason for change:	⌘	Sufficient L1 filtering of the UE P-CCPCH RSCP measurement is critical for correct Event 1G reporting in fading conditions. Currently, no test case exists that verifies requirements on correct Event 1G triggered reporting of neighbours in fading propagation conditions.
Summary of change:	⌘	Introduction of intra-frequency test case for correct Event 1G triggered reporting of neighbours in fading propagation condition
Consequences if not approved:	⌘	Critical missing test case for correct reporting of neighbours in CELL_DCH state. Isolated impact analysis: This CR introduces a test case on already existing requirements on UE measurement procedures in CELL_DCH state.

Clauses affected:	⌘	New A.8.1.3
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications - O&M Specifications
	⌘	TS25.102, TS34.122
Other comments:	⌘	Accompanying CR102 to TS25.102 R99 and corresponding cat-A's. No such test currently exists in TS34.122. Equivalent CRs in other Releases: CR222 cat. F to 25.123 v3.9.0, CR230 cat. A to 25.123 v5.0.0

A.8.1.3 Correct reporting of neighbours in fading propagation condition

A.8.1.3.1 3.84 Mcps TDD option

A.8.1.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs sufficient layer 1 filtering of the P-CCPCH RSCP measurement which is the base for Event 1G evaluation. This test is performed in fading propagation conditions and will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8.1.3 and A.8.1.3A below. The test consists of one time period with time duration of T1. Two cells shall be present in the test, cell 1 being the current serving cell and cell 2 being a neighbour cell on the used frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP shall be reported together with Event 1G. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The TTI of the UL DCCH shall be 20ms.

Table A.8.1.3: 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 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 1	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	200	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	Sent before the beginning of time period T1
T1		s	200	

Table A.8.1.3A: Cell specific test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Cell 1		Cell 2	
		T1	T1	T1	T1
DL timeslot number		**0**	**8**	**0**	**8**
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.	-3	n.a.
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH_t_{offset}		0	0	2	2
PICH_Ec/Ior	dB	n.a.	-3	n.a.	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	7	7	2	2
PCCPCH RSCP	dBm	-66	n.a.	-71	n.a.
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		Case 4 as specified in TS25.102 Annex B			

A.8.1.3.1.2 Test Requirements

The number of Event 1G triggered measurement reports during time period T2 shall be less than 60.

A.8.1.3.2 1.28 Mcps TDD option

Void

3GPP TSG RAN WG4 Meeting #23 **R4-020903**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.123 CR 230** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘	Introduction of Test Case for correct reporting of intra-frequency neighbours in Fading propagation condition (3.84 Mcps TDD option)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Sufficient L1 filtering of the UE P-CCPCH RSCP measurement is critical for correct Event 1G reporting in fading conditions. Currently, no test case exists that verifies requirements on correct Event 1G triggered reporting of neighbours in fading propagation conditions.
Summary of change:	⌘	Introduction of intra-frequency test case for correct Event 1G triggered reporting of neighbours in fading propagation condition
Consequences if not approved:	⌘	Critical missing test case for correct reporting of neighbours in CELL_DCH state. Isolated impact analysis: This CR introduces a test case on already existing requirements on UE measurement procedures in CELL_DCH state.

Clauses affected:	⌘	New A.8.1.3
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications - O&M Specifications
	⌘	TS25.102
Other comments:	⌘	Accompanying CR102 to TS25.102 R99 and corresponding cat-A's. Equivalent CRs in other Releases: CR222 cat. F to 25.123 v3.9.0, CR229 cat. A to 25.123 v4.4.0

A.8.1.3 Correct reporting of neighbours in fading propagation condition

A.8.1.3.1 3.84 Mcps TDD option

A.8.1.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs sufficient layer 1 filtering of the P-CCPCH RSCP measurement which is the base for Event 1G evaluation. This test is performed in fading propagation conditions and will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8.1.3 and A.8.1.3A below. The test consists of one time period with time duration of T1. Two cells shall be present in the test, cell 1 being the current serving cell and cell 2 being a neighbour cell on the used frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP shall be reported together with Event 1G. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The TTI of the UL DCCH shall be 20ms.

Table A.8.1.3: 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 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 1	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	200	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	Sent before the beginning of time period T1
T1		s	200	

Table A.8.1.3A: Cell specific test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Cell 1		Cell 2	
		T1	T1	T1	T1
DL timeslot number		**0**	**8**	**0**	**8**
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.	-3	n.a.
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH_t_{offset}		0	0	2	2
PICH_Ec/Ior	dB	n.a.	-3	n.a.	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	7	7	2	2
PCCPCH RSCP	dBm	-66	n.a.	-71	n.a.
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		Case 4 as specified in TS25.102 Annex B			

A.8.1.3.1.2 Test Requirements

The number of Event 1G triggered measurement reports during time period T2 shall be less than 60.

A.8.1.3.2 1.28 Mcps TDD option

Void

3GPP TSG RAN WG4 Meeting #23 **R4-020976**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.123** **CR** **231** ⌘ **rev** **1** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘	Corrections to TDD-TDD and FDD-TDD Handover interruption time requirements for 3.84 Mcps TDD option
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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

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

Reason for change:	⌘	Requirements on TDD-TDD HO interruption time for the unknown cell case unrealistic. Requirements on FDD-TDD HO interruption time still not finalized, i.e. in square brackets. UE behaviour for TDD-GSM handover to a GSM target cell when synchonisation cannot be achieved with one attempt is not specified. HO delay requirement for TDD/FDD HO test case still in square brackets. Misleading side-conditions for TDD/TDD inter-frequency and TDD/FDD HO test cases.
Summary of change:	⌘	TDD-TDD HO interruption time corrected from 350 ms to 200 ms for the unknown cell case plus additional 30 ms for the case when SFN decoding is needed. TDD-FDD HO interruption time set to 100 ms for the known cell case and 200 ms for the unknown cell case. Corrections to TDD-GSM handover requirement section. HO delay requirement for TDD/FDD HO test case set to 100 ms according to requirements in section 5.2. Removal of "W used / non-used frequency" for TDD cells from general test paremeters in TDD/TDD inter-frequency and TDD/FDD HO test cases because not needed for quality estimate of TDD cells.
Consequences if not approved:	⌘	Critical requirements on Handover interruption times for TDD-TDD and TDD-FDD either missing, incomplete or not feasible. **Isolated Impact Analysis**

	This CR contains corrections to existing requirements which are either partially missing or incomplete or not feasible. Note that this CR does not affect Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	2; 5.1; 5.2; 5.3; A.5.1; A.5.2		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	TS34.122
Other comments:	⌘	No tests covering Handover interruption time requirements currently exist in TS34.122. Equivalent CRs in other Releases: CR223r1 cat. F to 25.123 v3.9.0, CR232r1 cat. A to 25.123 v5.0.0		

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

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

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP TR 25.922: "RRM Strategies".

[13] ~~(void)~~3GPP TS 25.214: “Physical layer procedures (FDD)”.

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE procedures in idle mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 45.005: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

[21] 3GPP TS 45.008: “Digital cellular telecommunications system (Phase 2+); Radio subsystem link control”

[22] 3GPP TS 45.010: “Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization”

< Next changed section >

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~~[16].

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~~[18]. CELL_FACH, CELL_PCH and URA_PCH states are described in ~~TS 25.331~~ [16].

5.1 TDD/TDD Handover

5.1.1 Introduction

5.1.1.1 3.84 Mcps TDD option

The TDD/TDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover as described in [16].

The TDD/TDD handover procedure may cause the UE to change its frequency.

5.1.1.2 1.28 Mcps TDD option

The purpose of TDD/TDD handover is to change the cell of the connection between UE and UTRAN. The handover procedure is initiated from UTRAN with a RRC message that implies a handover, refer to TS25.331.The handover procedure may cause the UE to change its frequency.

For 1.28 Mcps TDD, at the beginning of the measurement process the UE shall find synchronisation to the cell to measure using the synchronisation channel (DwPCH). This is described under 'cell search' in 3GPP RAN TS25.201, TS25.221 TS25.222, TS25.223, TS25.224, TS25.225' if the monitored cell is a 1.28 Mcps TDD cell. For a TDD cell to monitor after this procedure the exact timing of the midamble of the P-CCPCH is known and the measurements can be performed. Depending on the UE implementation and if timing information about the cell to monitor is available, the UE may perform the measurements on the P-CCPCH directly without prior DwPCH synchronisation.

5.1.2 Requirements

5.1.2.1 TDD/TDD ~~H~~handover delay

5.1.2.1.1 3.84 Mcps TDD option

RRC ~~P~~procedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover~~,~~ are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying TDD/TDD handover with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure ~~delay~~ performance value defined in ~~TS25.331 Section 13.5.2~~[16] plus the interruption time stated in section 5.1.2.2.

5.1.2.1.2 1.28 Mcps TDD option

Procedure delay for all procedures, that can command a handover, are specified in TS25.331.

When the UE receives a RRC message that implies a handover, with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command,,the UE shall start transmission $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.2.

5.1.2.2 Interruption time

5.1.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH, is dependent on whether the target cell is known for the UE or not.~~shall be less than the value in table 5.1 for intra-frequency handover and TDD/TDD inter-frequency handover . There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not.~~

If TDD/TDD intra-frequency or inter-frequency handover is commanded, the interruption time shall be less than,

$$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC \text{ ms}$$

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise

An intra-frequency or inter-frequency TDD target cell shall be ~~regarded as~~considered known by the UE, if ~~either~~ or both of the following conditions are true:

- ~~it~~ the target cell has been measured during the last 5 seconds ~~or,~~
- the UE has had a ~~dedicated connection~~ radio link ~~existed between the UE and the~~connected to the target cell during the last 5 seconds.

~~The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:~~

- ~~a handover with timing maintain is commanded by the UTRAN or~~
- ~~the SFN of the target cell is known by the UE~~

~~**Table 5.1 TDD/TDD handover – interruption time**~~

~~TDD/TDD handover case~~	~~Maximum delay [ms]~~			
	~~Known Cell~~		~~Unknown Cell~~	
	~~SFN not to be decoded~~	~~SFN needs to be decoded~~	~~SFN not to be decoded~~	~~SFN needs to be decoded~~
~~Intra-frequency~~	~~40~~	~~70~~	~~350~~	~~400~~
~~Inter-frequency~~	~~40~~	~~70~~	~~350~~	~~400~~

~~The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation, which can be up to one frame (10ms). And the time that can elapse till the appearance of the slot in which the new uplink DPCH shall be transmitted , which can be up to one frame (10ms).~~

The interruption time requirements ~~in Table 5.1~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~sufficient for successful synchronisation with one attempt.

~~NOTE: One synchronisation attempt can consist of coherent averaging using several frames.~~

5.1.2.2.2 1.28 Mcps TDD option

The interruption time i.e. the time between the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH or the SYNC-UL in case that a handover with SYNCH uplink exchange is recommended, shall be less than the value in table 5.1A. There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not..

A cell shall be regarded as known by the UE if either or both of the following conditions are true:

- it has been measured during the last 5 seconds or
- a dedicated connection existed between the UE and the cell during the last 5 seconds.

The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:

- a handover with timing maintain is commanded by the UTRAN or
- the SFN of the target cell is known by the UE or

Table 5.1A: TDD/ TDD handover – interruption time

cell in the handover command message	Maximum delay [ms]			
	Known Cell		Unknown Cell	
	SFN not to be decoded	SFN needs to be decoded	SFN not to be decoded	SFN needs to be decoded
Intra-frequency	[40]	[70]	[350]	[400]
Inter-frequency	[40]	[70]	[350]	[400]

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation. And the time that can elapse till the appearance of the new uplink DPCH or the UpPTS in which the SYNC-UL shall be transmitted , which can be up to one frame (10ms).

The requirement in Table 5.1A for the cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

NOTE: One synchronisation attempt can consist of coherent averaging using several frames.

5.2 TDD/FDD Handover

5.2.1 Introduction

5.2.1.1 3.84 Mcps TDD option

The purpose of TDD/FDD handover is to change the radio access mode from TDD to FDD. The TDD/FDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover as described in [16].

5.2.1.2 1.28 Mcps TDD option

The purpose of TDD/FDD handover is to change the mode between FDD and TDD.

The handover procedure is initiated from UTRAN with a handover command message , refer to TS25.331. The handover procedure causes the UE to change its frequency.

5.2.2 Requirements

The~~se~~ requirements in this section shall apply ~~only~~ to UE supporting TDD~~/~~ and FDD ~~UE~~.

~~The requirements do not apply if FDD macro-diversity is used.~~

5.2.2.1 TDD/FDD ~~H~~handover delay

5.2.2.1.1 3.84 Mcps TDD option

RRC ~~P~~rprocedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover, are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying ~~hard~~ TDD/FDD handover with the activation time "now" or earlier than -$D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure ~~delay~~ performance value as defined in ~~TS25.331 Section 13.5.2~~[16] plus the interruption time stated in section 5.2.2.2.

5.2.2.1.2 1.28 Mcps TDD option

When the UE receives a RRC message that implies a handover, with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2.2.

The requirements do not apply if FDD macro-diversity is used.

5.2.2.2 Interruption time

5.2.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old D~~T~~PCH and the time the UE starts transmission of the new uplink DPCCH~~.~~, is dependent on whether the target cell is known for the UE or not. ~~The interruption time shall be less than the value in table 5.2.~~

If TDD/FDD handover is commanded, the interruption time shall be less than,

$$T_{interrupt} = T_{offset} + 40 + 50*KC + 150*UC \text{ ms}$$

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell.
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/FDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/FDD handover and equal to 0 otherwise

~~There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not.~~

~~The definition of known cell can be found in section 5.1.2.2.~~

~~Table 5.2 TDD/FDD interruption time~~

~~cell present in the handover command message~~	**~~Maximum delay [ms]~~**		
	~~Known Cell~~		**~~Unknown cell~~**
	~~SFN not to be decoded~~	**~~SFN needs to be decoded~~**	**~~SFN needs to be decoded~~**
~~1~~	~~[100]~~	~~[130]~~	~~[400]~~

~~The interruption time includes the interruption uncertainty when changing the timing from the old TDD to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.~~

An inter-frequency FDD target cell shall be considered known by the UE, if the target cell has been measured by the UE during the last 5 seconds.

The phase reference is the Primary CPICH.

The interruption time requirements ~~in Table 5.2~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~ sufficient for successful synchronisation with one attempt.

Note that the requirements in this section assume that N312 has the smallest possible value, i.e. only one in-sync indication as described in [13] is required.

5.2.2.2.2 1.28 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCCH, shall be less than the value in table 5.2A

There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not.

The definition of known cell can be found in section 5.1.2.2.2.

Table 5.2A: 1.28 Mcps TDD/FDD interruption time

cell in the handover command message	Maximum update delay [ms]		
	Known Cell		Unknown Cell
	SFN not to be decoded	SFN needs to be decoded	SFN needs to be decoded
1	[100]	[130]	[400]

The interruption time includes the interruption uncertainty when changing the timing from the old 1.28 Mcps TDD OPTION to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

The requirement in Table 5.2A for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

The requirements do not apply if FDD macro-diversity is used.

5.3 TDD/GSM Handover

5.3.1 Introduction

5.3.1.1 3.84 Mcps TDD option

The purpose of inter-RAT handover from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND) as described in [16].

5.3.1.2 1.28 Mcps TDD option

The purpose of inter-RAT handover from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND). The procedure is described in TS25.331 section 8.3.7.

5.3.2 Requirements

These requirements in this section shall apply ~~only~~ to UE supporting TDD~~/GSM UE~~ and GSM.

~~This clause presents some of the important aspects of GSM handover required to be performed by the UE.~~

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

5.3.2.1 TDD/GSM ~~H~~handover delay

5.3.2.1.1 3.84 Mcps TDD option

The RRC procedure performance value for the RRC HANDOVER FROM UTRAN COMMAND shall be 50 ms.

If the activation time is used in the RRC HANDOVER FROM UTRAN COMMAND, it corresponds to the CFN of the UTRAN channel.

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND with the activation time "now" or earlier than ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to transmit ~~(~~as specified in ~~GSM 45.010)~~ [22] on the new channel of the new RAT within ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

~~-~~If the access is delayed to an indicated activation time later than ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to transmit ~~(~~as specified in ~~GSM 45.010)~~ [22] on the new channel of the new RAT at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure performance value plus the interruption time stated in section 5.3.2.2.

~~The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.~~

~~Table 5.3: TDD/GSM handover – handover delay~~

~~UE synchronisation status~~	~~handover delay [ms]~~
~~The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received~~	~~90~~
~~The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received~~	~~190~~

5.3.2.1.2 1.28 Mcps TDD option

When the UE receives a RRC HANDOVER COMMAND with the activation time "now" or earlier than the value in Table 5.3A from the end of the last TTI containing the RRC command, the UEit shall be ready to transmit (as specified in GSM 45.010) on the new channel within the new RAT within the value in Table 5.3A from the last TTI containing the RRC command, If the access is delayed to an indicated activation time later than the value in Table 5.3A from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in GSM 45.010) on the channel of the new RAT at the designated activation time.

The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.3.A: 1.28 Mcps TDD/GSM handover –handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	90
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	190

5.3.2.2 Interruption time

5.3.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old ~~channel~~ DPCH and the time the UE is ready to transmit on the new channel of the new RAT, is dependent on whether the UE has synchonised to the target cell or not before receiving the RRC HANDOVER FROM UTRAN COMMAND.

The interruption time for the purpose of TDD/GSM handover shall be less than the value in Table 5.4. ~~The requirement in Table 5.4 for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.~~

Table 5.4: TDD/GSM ~~handover –~~ interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	40
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	140

The requirements in Table 5.4 for the case where the UE has not synchronised to the GSM target cell before receiving the RRC HANDOVER FROM UTRAN COMMAND shall apply only if the signal quality of the GSM target cell is sufficient for successful synchronisation with one attempt.

If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in [16].

5.3.2.2.2 1.28 Mcps TDD option

The interruption time, i.e. the time between the end of 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 5.4A. The requirement in Table 5.4A for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.4A: TDD/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	40
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	140

< Next changed section >

A.5 UTRAN Connected Mode Mobility

A.5.1 TDD/TDD Handover

A.5.1.1 3.84Mcps TDD option

A.5.1.1.1 Handover to intra-frequency cell

A.5.1.1.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the intra-frequency handover delay in CELL_DCH state in the single carrier case reported in section 5.1.2.1.

The test parameters are given in Table A.5.1.1 and A.5.1.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP and SFN-CFN observed timed difference shall be reported together with Event 1G. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The UL DPCH shall be transmitted in timeslot 12.

Table A.5.1.1: General test parameters for Handover to intra-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	
T1		s	10	
T2		s	10	
T3		s	10	

Table A.5.1.2: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1						Cell 2					
DL timeslot number		**0**			**4**			**0**			**5**		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.			-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.			-9			n.a.		
SCH_t_{offset}	dB	0			n.a.			5			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.	n.a.			n.a.		Note 1
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.	n.a.	-3,12		n.a.		Note 2
$\hat{I}_{or}/I_{oc}$	dB	1						-Inf.	3		-Inf.		3
PCCPCH RSCP	dBm	-72			n.a.			-Inf.	-70		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition		AWGN											
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .													

A.5.1.1.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 40 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.1.1.2 Handover to inter-frequency cell

A.5.1.1.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter-frequency handover delay in CELL_DCH state in the dual carrier case reported in section 5.1.2.1.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.5.1.3 and A.5.1.4 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The PCCPCH RSCP and SFN-CFN observed time difference of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. The UL DPCH shall be transmitted in timeslot 12.

Table A.5.1.3: General test parameters for Handover to inter-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-80	Applicable for Event 2C
~~W non-used frequency~~			~~1~~	~~Applicable for Event 2C~~
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	10	
T2		s	10	
T3		s	10	

TableA.5.1.4: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit	Cell 1						Cell 2					
DL timeslot number		**0**			**4**			**2**			**5**		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 2					
PCCPCH_Ec/Ior	dB	-3			n.a.			-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.			-9			n.a.		
SCH_t_{offset}	dB	0			n.a.			5			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.	n.a.			n.a.		Note 1
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.	n.a.	-3,12		n.a.		Note 2
$\hat{I}_{or}/I_{oc}$	dB	1						-Inf.	7		-Inf.		7
PCCPCH RSCP	dBm	-72			n.a.			-Inf.	-66		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition		AWGN											
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .													

A.5.1.1.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 40 ms from the beginning of time period T2.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.1.2 1.28Mcps TDD option

A.5.1.2.1 Handover to intra-frequency cell

A.5.1.2.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the intra-frequency handover delay in CELL_DCH state as reported in section 5.1.2.1.2.

The test parameters are given in Table A.5.1.5 and A.5.1.6 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that PCCPCH RSCP and SFN-CFN observed timed difference shall be reported together. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16].

Table A.5.1.5: General test parameters for intra-frequency handover

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2.2
Power Control			On	
Target quality value on DPCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
O		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	5	
T3		s	5	

Table A.5.1.6: Cell specific test parameters for intra-frequency handover

Parameter	Unit	Cell 1						Cell 2					
Timeslot Number		**0**			**5**			**0**			**5**		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 1					
PCCPCH_Ec/Ior	dB	-3						-3					
DPCH_Ec/Ior	dB				Note1		n.a.				n.a.		Note1
OCNS		Note2			Note2			Note2			Note2		
$\hat{I}_{or}/I_{oc}$	dB	3			[x]			-Inf.		5			[x]
I_{oc}	dBm/ 1.28 MHz	-70											
PCCPCH_RSCP	dBm	-70						-Inf.		-68			
Propagation Condition		AWGN											

Note 1: The DPCH level is controlled by the power control loop
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}

A.5.1.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than [40] ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.1.2.2 Handover to inter-frequency cell

A.5.1.2.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter-frequency handover delay in CELL_DCH as reported in section 5.1.2.1.2.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.5.1.7 and A.5.1.8 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The PCCPCH RSCP and SFN-CFN observed timed difference of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at beginning of T2 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16]

Table A.5.1.7: General test parameters for inter-frequency handover

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2.2
Power Control			On	
Target quality value on DPCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold non used frequency		dBm	-75	Absolute RSCP threshold for event 2C
O		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	10	
T2		s	5	

TableA.5.1.8: Cell Specific parameters for inter-frequency handover

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		**0**		**5**		**0**		**5**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DPCH_Ec/Ior	dB			Note1	n.a.			n.a.	Note1
OCNS		Note2		Note2		Note2		Note2	
$\hat{I}_{or}/I_{oc}$	dB	3		[x]		6			[x]
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	-70				-67			
Propagation Condition		AWGN							
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}									

A.5.1.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than [40] ms from the beginning of time period T2.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.2 TDD/FDD Handover

A.5.2.1 3.84 Mcps TDD option

A.5.2.1.1 Test purpose and Environment

The purpose of this test is to verify the requirement for the TDD/FDD handover delay in CELL_DCH state reported in section 5.2.2.1.

The test parameters are given in Table A.5.2.1, A.5.2.2 and A.5.2.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G and 2B shall be used. The CPICH_RSCP of the best cell on the unused frequency shall be reported together with Event 2B reporting. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

Table A.5.2.1: General test parameters for TDD/FDD handover

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	TDD cell
	Neighbour cell		Cell 2	FDD cell
Final condition	Active cell		Cell 2	FDD cell
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	3	Hysteresis parameter for event 2B
Time to Trigger		ms	0	
Absolute threshold used frequency		dBm	-71	Applicable for Event 2B
Threshold non-used frequency		dBm	-80	Applicable for Event 2B
~~W used frequency~~			~~1~~	~~Applicable for Event 2B~~
W non-used frequency			1	Applicable for Event 2B
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	5	
T2		s	15	
T3		s	5	

Table A.5.2.2: Cell 1 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 1					
DL timeslot number		**0**			**2**		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.		
SCH_t_{offset}	dB	0			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.
$\hat{I}_{or}/I_{oc}$	dB	5	-1		5	-1	
PCCPCH RSCP	dBm	-68	-74		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70					
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .							

Table A.5.2.3: Cell 2 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 2	
		T1, T2	T3
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	n.a.	Note 1
OCNS_Ec/Ior	dB	-0.941	Note 2
CPICH_RSCP	dBm	-83	-77
$\hat{I}_{or}/I_{oc}$	dB	-3	3
I_{oc}	dBm/3.84 MHz	-70	
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

A.5.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than ~~[130]~~100 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.2.2 1.28 Mcps TDD option

Void

3GPP TSG RAN WG4 Meeting #23 **R4-020977**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.123** **CR** **232** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘	Corrections to TDD-TDD and FDD-TDD Handover interruption time requirements for 3.84 Mcps TDD option
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	Requirements on TDD-TDD HO interruption time for the unknown cell case unrealistic. Requirements on FDD-TDD HO interruption time still not finalized, i.e. in square brackets. UE behaviour for TDD-GSM handover to a GSM target cell when synchonisation cannot be achieved with one attempt is not specified. HO delay requirement for TDD/FDD HO test case still in square brackets. Misleading side-conditions for TDD/TDD inter-frequency and TDD/FDD HO test cases.
Summary of change:	⌘	TDD-TDD HO interruption time corrected from 350 ms to 200 ms for the unknown cell case plus additional 30 ms for the case when SFN decoding is needed. TDD-FDD HO interruption time set to 100 ms for the known cell case and 200 ms for the unknown cell case. Corrections to TDD-GSM handover requirement section. HO delay requirement for TDD/FDD HO test case set to 100 ms according to requirements in section 5.2. Removal of "W used / non-used frequency" for TDD cells from general test paremeters in TDD/TDD inter-frequency and TDD/FDD HO test cases because not needed for quality estimate of TDD cells.
Consequences if not approved:	⌘	Critical requirements on Handover interruption times for TDD-TDD and TDD-FDD either missing, incomplete or not feasible. **Isolated Impact Analysis**

	This CR contains corrections to existing requirements which are either partially missing or incomplete or not feasible. Note that this CR does not affect Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	2; 5.1; 5.2; 5.3; A.5.1; A.5.2		
Other specs affected:	⌘	- Other core specifications - Test specifications - O&M Specifications	⌘	
Other comments:	⌘	- Equivalent CRs in other Releases: CR223r1 cat. F to 25.123 v3.9.0, CR231r1 cat. A to 25.123 v4.4.0		

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

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

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP TR 25.922: "RRM Strategies".

[13] ~~(void)~~3GPP TS 25.214: “Physical layer procedures (FDD)”.

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE procedures in idle mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 45.005: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

[21] 3GPP TS 45.008: “Digital cellular telecommunications system (Phase 2+); Radio subsystem link control”

[22] 3GPP TS 45.010: “Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization”

< Next changed section >

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~~[16].

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~~[18]. CELL_FACH, CELL_PCH and URA_PCH states are described in ~~TS 25.331~~ [16].

5.1 TDD/TDD Handover

5.1.1 Introduction

5.1.1.1 3.84 Mcps TDD option

The TDD/TDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover as described in [16].

The TDD/TDD handover procedure may cause the UE to change its frequency.

5.1.1.2 1.28 Mcps TDD option

The purpose of TDD/TDD handover is to change the cell of the connection between UE and UTRAN. The handover procedure is initiated from UTRAN with a RRC message that implies a handover, refer to TS25.331.The handover procedure may cause the UE to change its frequency.

For 1.28 Mcps TDD, at the beginning of the measurement process the UE shall find synchronisation to the cell to measure using the synchronisation channel (DwPCH). This is described under 'cell search' in 3GPP RAN TS25.201, TS25.221 TS25.222, TS25.223, TS25.224, TS25.225' if the monitored cell is a 1.28 Mcps TDD cell. For a TDD cell to monitor after this procedure the exact timing of the midamble of the P-CCPCH is known and the measurements can be performed. Depending on the UE implementation and if timing information about the cell to monitor is available, the UE may perform the measurements on the P-CCPCH directly without prior DwPCH synchronisation.

5.1.2 Requirements

5.1.2.1 TDD/TDD ~~H~~handover delay

5.1.2.1.1 3.84 Mcps TDD option

RRC ~~P~~procedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover~~,~~ are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying TDD/TDD handover with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure ~~delay~~ performance value defined in ~~TS25.331 Section 13.5.2~~[16] plus the interruption time stated in section 5.1.2.2.

5.1.2.1.2 1.28 Mcps TDD option

Procedure delay for all procedures, that can command a handover, are specified in TS25.331.

When the UE receives a RRC message that implies a handover, with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command,,the UE shall start transmission $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.2.

5.1.2.2 Interruption time

5.1.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH, is dependent on whether the target cell is known for the UE or not.~~shall be less than the value in table 5.1 for intra-frequency handover and TDD/TDD inter-frequency handover . There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not.~~

If TDD/TDD intra-frequency or inter-frequency handover is commanded, the interruption time shall be less than,

$$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC \text{ ms}$$

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise

An intra-frequency or inter-frequency TDD target cell shall be ~~regarded as~~considered known by the UE, if ~~either~~ or both of the following conditions are true:

- ~~it~~ the target cell has been measured during the last 5 seconds ~~or,~~
- the UE has had a ~~dedicated connection~~ radio link ~~existed between the UE and the~~connected to the target cell during the last 5 seconds.

~~The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:~~

- ~~a handover with timing maintain is commanded by the UTRAN or~~
- ~~the SFN of the target cell is known by the UE~~

~~**Table 5.1 TDD/TDD handover – interruption time**~~

~~TDD/TDD handover case~~	~~Maximum delay [ms]~~			
	~~Known Cell~~		~~Unknown Cell~~	
	~~SFN not to be decoded~~	~~SFN needs to be decoded~~	~~SFN not to be decoded~~	~~SFN needs to be decoded~~
~~Intra-frequency~~	~~40~~	~~70~~	~~350~~	~~400~~
~~Inter-frequency~~	~~40~~	~~70~~	~~350~~	~~400~~

~~The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation, which can be up to one frame (10ms). And the time that can elapse till the appearance of the slot in which the new uplink DPCH shall be transmitted , which can be up to one frame (10ms).~~

The interruption time requirements ~~in Table 5.1~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~sufficient for successful synchronisation with one attempt.

~~NOTE: One synchronisation attempt can consist of coherent averaging using several frames.~~

5.1.2.2.2 1.28 Mcps TDD option

The interruption time i.e. the time between the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH or the SYNC-UL in case that a handover with SYNCH uplink exchange is recommended, shall be less than the value in table 5.1A. There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not..

A cell shall be regarded as known by the UE if either or both of the following conditions are true:

- it has been measured during the last 5 seconds or
- a dedicated connection existed between the UE and the cell during the last 5 seconds.

The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:

- a handover with timing maintain is commanded by the UTRAN or
- the SFN of the target cell is known by the UE or

Table 5.1A: TDD/ TDD handover – interruption time

cell in the handover command message	Maximum delay [ms]			
	Known Cell		Unknown Cell	
	SFN not to be decoded	SFN needs to be decoded	SFN not to be decoded	SFN needs to be decoded
Intra-frequency	[40]	[70]	[350]	[400]
Inter-frequency	[40]	[70]	[350]	[400]

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation. And the time that can elapse till the appearance of the new uplink DPCH or the UpPTS in which the SYNC-UL shall be transmitted , which can be up to one frame (10ms).

The requirement in Table 5.1A for the cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

NOTE: One synchronisation attempt can consist of coherent averaging using several frames.

5.2 TDD/FDD Handover

5.2.1 Introduction

5.2.1.1 3.84 Mcps TDD option

The purpose of TDD/FDD handover is to change the radio access mode from TDD to FDD. The TDD/FDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover as described in [16].

5.2.1.2 1.28 Mcps TDD option

The purpose of TDD/FDD handover is to change the mode between FDD and TDD.

The handover procedure is initiated from UTRAN with a handover command message , refer to TS25.331. The handover procedure causes the UE to change its frequency.

5.2.2 Requirements

The~~se~~ requirements in this section shall apply ~~only~~ to UE supporting TDD~~/~~ and FDD ~~UE~~.

~~The requirements do not apply if FDD macro-diversity is used.~~

5.2.2.1 TDD/FDD ~~H~~handover delay

5.2.2.1.1 3.84 Mcps TDD option

RRC ~~P~~rprocedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover, are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying ~~hard~~ TDD/FDD handover with the activation time "now" or earlier than -$D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure ~~delay~~ performance value as defined in ~~TS25.331 Section 13.5.2~~[16] plus the interruption time stated in section 5.2.2.2.

5.2.2.1.2 1.28 Mcps TDD option

When the UE receives a RRC message that implies a handover, with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2.2.

The requirements do not apply if FDD macro-diversity is used.

5.2.2.2 Interruption time

5.2.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old D~~T~~PCH and the time the UE starts transmission of the new uplink DPCCH~~.~~, is dependent on whether the target cell is known for the UE or not. ~~The interruption time shall be less than the value in table 5.2.~~

If TDD/FDD handover is commanded, the interruption time shall be less than,

$$T_{interrupt} = T_{offset} + 40 + 50*KC + 150*UC \text{ ms}$$

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell.
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/FDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/FDD handover and equal to 0 otherwise

~~There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not.~~

~~The definition of known cell can be found in section 5.1.2.2.~~

~~Table 5.2 TDD/FDD interruption time~~

~~cell present in the handover command message~~	**~~Maximum delay [ms]~~**		
	~~Known Cell~~		**~~Unknown cell~~**
	~~SFN not to be decoded~~	**~~SFN needs to be decoded~~**	**~~SFN needs to be decoded~~**
~~1~~	~~[100]~~	~~[130]~~	~~[400]~~

~~The interruption time includes the interruption uncertainty when changing the timing from the old TDD to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.~~

An inter-frequency FDD target cell shall be considered known by the UE, if the target cell has been measured by the UE during the last 5 seconds.

The phase reference is the Primary CPICH.

The interruption time requirements ~~in Table 5.2~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~ sufficient for successful synchronisation with one attempt.

Note that the requirements in this section assume that N312 has the smallest possible value, i.e. only one in-sync indication as described in [13] is required.

5.2.2.2.2 1.28 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCCH, shall be less than the value in table 5.2A

There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not.

The definition of known cell can be found in section 5.1.2.2.2.

Table 5.2A: 1.28 Mcps TDD/FDD interruption time

cell in the handover command message	Maximum update delay [ms]		
	Known Cell		Unknown Cell
	SFN not to be decoded	SFN needs to be decoded	SFN needs to be decoded
1	[100]	[130]	[400]

The interruption time includes the interruption uncertainty when changing the timing from the old 1.28 Mcps TDD OPTION to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

The requirement in Table 5.2A for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

The requirements do not apply if FDD macro-diversity is used.

5.3 TDD/GSM Handover

5.3.1 Introduction

5.3.1.1 3.84 Mcps TDD option

The purpose of inter-RAT handover from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND) as described in [16].

5.3.1.2 1.28 Mcps TDD option

The purpose of inter-RAT handover from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND). The procedure is described in TS25.331 section 8.3.7.

5.3.2 Requirements

These requirements in this section shall apply ~~only~~ to UE supporting TDD~~/GSM UE~~ and GSM.

~~This clause presents some of the important aspects of GSM handover required to be performed by the UE.~~

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

5.3.2.1 TDD/GSM ~~H~~handover delay

5.3.2.1.1 3.84 Mcps TDD option

The RRC procedure performance value for the RRC HANDOVER FROM UTRAN COMMAND shall be 50 ms.

If the activation time is used in the RRC HANDOVER FROM UTRAN COMMAND, it corresponds to the CFN of the UTRAN channel.

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND with the activation time "now" or earlier than ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to transmit ~~(~~as specified in ~~GSM 45.010)~~ [22] on the new channel of the new RAT within ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

~~-~~If the access is delayed to an indicated activation time later than ~~the value in Table 5.3~~ $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to transmit ~~(~~as specified in ~~GSM 45.010)~~ [22] on the new channel of the new RAT at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure performance value plus the interruption time stated in section 5.3.2.2.

~~The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.~~

~~Table 5.3: TDD/GSM handover – handover delay~~

~~UE synchronisation status~~	~~handover delay [ms]~~
~~The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received~~	~~90~~
~~The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received~~	~~190~~

5.3.2.1.2 1.28 Mcps TDD option

When the UE receives a RRC HANDOVER COMMAND with the activation time "now" or earlier than the value in Table 5.3A from the end of the last TTI containing the RRC command, the UEit shall be ready to transmit (as specified in GSM 45.010) on the new channel within the new RAT within the value in Table 5.3A from the last TTI containing the RRC command, If the access is delayed to an indicated activation time later than the value in Table 5.3A from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in GSM 45.010) on the channel of the new RAT at the designated activation time.

The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.3.A: 1.28 Mcps TDD/GSM handover –handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	90
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	190

5.3.2.2 Interruption time

5.3.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old ~~channel~~ DPCH and the time the UE is ready to transmit on the new channel of the new RAT, is dependent on whether the UE has synchonised to the target cell or not before receiving the RRC HANDOVER FROM UTRAN COMMAND.

The interruption time for the purpose of TDD/GSM handover shall be less than the value in Table 5.4. ~~The requirement in Table 5.4 for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.~~

Table 5.4: TDD/GSM ~~handover –~~ interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	40
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	140

The requirements in Table 5.4 for the case where the UE has not synchronised to the GSM target cell before receiving the RRC HANDOVER FROM UTRAN COMMAND shall apply only if the signal quality of the GSM target cell is sufficient for successful synchronisation with one attempt.

If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in [16].

5.3.2.2.2 1.28 Mcps TDD option

The interruption time, i.e. the time between the end of 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 5.4A. The requirement in Table 5.4A for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.4A: TDD/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	40
The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received	140

< Next changed section >

A.5 UTRAN Connected Mode Mobility

A.5.1 TDD/TDD Handover

A.5.1.1 3.84Mcps TDD option

A.5.1.1.1 Handover to intra-frequency cell

A.5.1.1.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the intra-frequency handover delay in CELL_DCH state in the single carrier case reported in section 5.1.2.1.

The test parameters are given in Table A.5.1.1 and A.5.1.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP and SFN-CFN observed timed difference shall be reported together with Event 1G. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The UL DPCH shall be transmitted in timeslot 12.

Table A.5.1.1: General test parameters for Handover to intra-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	
T1		s	10	
T2		s	10	
T3		s	10	

Table A.5.1.2: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1						Cell 2					
DL timeslot number		**0**			**4**			**0**			**5**		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.			-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.			-9			n.a.		
SCH_t_{offset}	dB	0			n.a.			5			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.	n.a.			n.a.		Note 1
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.	n.a.	-3,12		n.a.		Note 2
$\hat{I}_{or}/I_{oc}$	dB	1						-Inf.	3		-Inf.		3
PCCPCH RSCP	dBm	-72			n.a.			-Inf.	-70		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition		AWGN											
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .													

A.5.1.1.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 40 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.1.1.2 Handover to inter-frequency cell

A.5.1.1.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter-frequency handover delay in CELL_DCH state in the dual carrier case reported in section 5.1.2.1.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.5.1.3 and A.5.1.4 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The PCCPCH RSCP and SFN-CFN observed time difference of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. The UL DPCH shall be transmitted in timeslot 12.

Table A.5.1.3: General test parameters for Handover to inter-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-80	Applicable for Event 2C
~~W non-used frequency~~			~~1~~	~~Applicable for Event 2C~~
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	10	
T2		s	10	
T3		s	10	

TableA.5.1.4: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit	Cell 1						Cell 2					
DL timeslot number		**0**			**4**			**2**			**5**		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 2					
PCCPCH_Ec/Ior	dB	-3			n.a.			-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.			-9			n.a.		
SCH_t_{offset}	dB	0			n.a.			5			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.	n.a.			n.a.		Note 1
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.	n.a.	-3,12		n.a.		Note 2
$\hat{I}_{or}/I_{oc}$	dB	1						-Inf.	7		-Inf.		7
PCCPCH RSCP	dBm	-72			n.a.			-Inf.	-66		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition		AWGN											
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .													

A.5.1.1.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 40 ms from the beginning of time period T2.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.1.2 1.28Mcps TDD option

A.5.1.2.1 Handover to intra-frequency cell

A.5.1.2.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the intra-frequency handover delay in CELL_DCH state as reported in section 5.1.2.1.2.

The test parameters are given in Table A.5.1.5 and A.5.1.6 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that PCCPCH RSCP and SFN-CFN observed timed difference shall be reported together. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16].

Table A.5.1.5: General test parameters for intra-frequency handover

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2.2
Power Control			On	
Target quality value on DPCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
O		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	5	
T3		s	5	

Table A.5.1.6: Cell specific test parameters for intra-frequency handover

Parameter	Unit	Cell 1						Cell 2					
Timeslot Number		0			5			0			5		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 1					
PCCPCH_Ec/Ior	dB	-3						-3					
DPCH_Ec/Ior	dB				Note1		n.a.				n.a.		Note1
OCNS		Note2			Note2			Note2			Note2		
$\hat{I}_{or}/I_{oc}$	dB	3			[x]			-Inf.	5				[x]
I_{oc}	dBm/ 1.28 MHz	-70											
PCCPCH_RSCP	dBm	-70						-Inf.	-68				
Propagation Condition		AWGN											

Note 1: The DPCH level is controlled by the power control loop
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}

A.5.1.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than [40] ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.1.2.2 Handover to inter-frequency cell

A.5.1.2.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter-frequency handover delay in CELL_DCH as reported in section 5.1.2.1.2.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.5.1.7 and A.5.1.8 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The PCCPCH RSCP and SFN-CFN observed timed difference of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at beginning of T2 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16]

Table A.5.1.7: General test parameters for inter-frequency handover

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2.2
Power Control			On	
Target quality value on DPCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold non used frequency		dBm	-75	Absolute RSCP threshold for event 2C
O		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	10	
T2		s	5	

TableA.5.1.8: Cell Specific parameters for inter-frequency handover

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		**0**		**5**		**0**		**5**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DPCH_Ec/Ior	dB			Note1	n.a.			n.a.	Note1
OCNS		Note2		Note2		Note2		Note2	
$\hat{I}_{or}/I_{oc}$	dB	3		[x]		6			[x]
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	-70				-67			
Propagation Condition		AWGN							
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}									

A.5.1.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than [40] ms from the beginning of time period T2.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.2 TDD/FDD Handover

A.5.2.1 3.84 Mcps TDD option

A.5.2.1.1 Test purpose and Environment

The purpose of this test is to verify the requirement for the TDD/FDD handover delay in CELL_DCH state reported in section 5.2.2.1.

The test parameters are given in Table A.5.2.1, A.5.2.2 and A.5.2.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G and 2B shall be used. The CPICH_RSCP of the best cell on the unused frequency shall be reported together with Event 2B reporting. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

Table A.5.2.1: General test parameters for TDD/FDD handover

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	TDD cell
	Neighbour cell		Cell 2	FDD cell
Final condition	Active cell		Cell 2	FDD cell
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	3	Hysteresis parameter for event 2B
Time to Trigger		ms	0	
Absolute threshold used frequency		dBm	-71	Applicable for Event 2B
Threshold non-used frequency		dBm	-80	Applicable for Event 2B
~~W used frequency~~			~~1~~	~~Applicable for Event 2B~~
W non-used frequency			1	Applicable for Event 2B
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	5	
T2		s	15	
T3		s	5	

Table A.5.2.2: Cell 1 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 1					
DL timeslot number		**0**			**2**		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.		
SCH_t_{offset}	dB	0			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.
$\hat{I}_{or}/I_{oc}$	dB	5	-1		5	-1	
PCCPCH RSCP	dBm	-68	-74		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70					
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .							

Table A.5.2.3: Cell 2 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 2	
		T1, T2	T3
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	n.a.	Note 1
OCNS_Ec/Ior	dB	-0.941	Note 2
CPICH_RSCP	dBm	-83	-77
$\hat{I}_{or}/I_{oc}$	dB	-3	3
I_{oc}	dBm/3.84 MHz	-70	
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

A.5.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than ~~[130]~~100 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.2.2 1.28 Mcps TDD option

Void

3GPP TSG RAN WG4 Meeting #23 **R4-020979**

Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.123** **CR** **233** ⌘ **rev** **1** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘	Measurement reporting and capabilities for the support of event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states (3.84 Mcps TDD option)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change: ⌘

Missing delay requirements for RACH reporting in case SFN-SFN observed time difference is to be reported in CELL_FACH state.

Requirements on parallel measurements in CELL_DCH state, such as TrCH BLER and UE transmitted power still in square brackets.

Requirements on maximum number of intra-frequency reporting criteria don't allow simultaneous application of event- and periodic event triggered reporting for event types 1G, 1H and 1I. The current allowed E_{cat} = 4 intra-frequency event triggers are a strict minimum for system operation, i.e. a maximum of 2 1G event-trigger for Handover monitoring and one ISCP threshold for both 1H and 1I events. In anticipated Inter-cell or Intra-cell handover scenarios, the availability of additonal event triggers for example in conjunction with 1H and 1I periodic reporting is key to efficient system operation.

Missing requirements on maximum number of TVM triggers (event- or periodic) in CELL_FACH state

Summary of change: ⌘

A UE is allowed an additonal 50 ms per cell in RACH access delay in case SFN-SFN reporting on RACH is requested by UTRAN.

In addition to P-CCPCH RSCP and TS ISCP measurements, a UE is requested to support 1 TrCH BLER per TrCH and 1 UE transmitted power measurement in CELL_DCH state.

Number of allowed intra-frequency event triggers in CELL_DCH state increased from 4 to 6 in order to account for the possibility of periodic reporting for the purpose of inter- and intra-cell handover scenarios.

Support of 2 TVM triggers per Transport Channel in CELL_FACH state.

Consequences if not approved:	⌘	Critical requirements on UE support of measurement reporting and capabilities for the event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states either missing, incomplete or not feasible. **Isolated Impact Analysis** This CR contains corrections to existing requirements which are either partially missing or incomplete. Note that this CR does not affect Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	New 5.7; 8.2; 8.3; 8.5		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	TS34.122
Other comments:	⌘	No requirements and tests covering the corrected functionalities currently exist in TS34.122. Equivalent CRs in other Releases: CR224r1 cat. F to 25.123 v3.9.0, CR234r1 cat. A to 25.123 v5.0.0		

5.7 RACH reporting

5.7.1 Introduction

5.7.1.1 3.84 Mcps TDD option

The network may request the UE to report on RACH P-CCPCH RSCP for the serving cell and up to 6 strongest monitored set cells and SFN-SFN observed time difference between the serving cell and up to 6 different monitored set cells.

5.7.1.2 1.28 Mcps TDD option

Void

5.7.2 Requirements

5.7.2.1 3.84 Mcps TDD option

If all of the following conditions are true, the UE is allowed to have an additional delay of N_{RACH}*50 ms in RACH transmission compared to the normal RACH transmission delay.

- SFN-SFN observed time difference measurement results are required to be reported on RACH
- The set of cells on which the SFN-SFN observed time difference measurement is to be reported has not changed since the previous RACH measurement report
- The UE has not measured the SFN-SFN observed time differences for the cells to be reported on RACH in the CELL_FACH state according to the requirements defined in Section 8.4.2.2

If at least one of the previous conditions is false, the UE shall be able to report the requested measurement results on RACH within a normal RACH transmission delay.

N_{RACH} is the number of cells requiring SFN decoding prior to the reporting of SFN-SFN observed time difference measurement results on RACH.

5.7.2.2 1.28 Mcps TDD option

Void

< Next changed section >

8.2 ~~Parallel~~ Measurements in CELL_DCH State with special requirements (3.84 Mcps TDD option)

8.2.1 Introduction

~~The purpose with this section is to ensure that all UE can handle a certain number of measurements in parallel.~~This section contains specific requirements for certain measurements beyond those specified in section 8.1. The measurements are defined in ~~TS 25.225~~[14], the measurement model is defined in ~~TS 25.302~~[15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in ~~TS 25.331~~[16] ~~and measurements reporting delays are specified in section 8.1~~. ~~For the description of the i~~Idle intervals ~~see TS 25.225, Annex A~~for the purpose of measurements are described in [14].

8.2.2 Requirements

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

The UE shall be able to perform parallel measurements according to table 8.2.

In addition to the requirements in table 8.2, ~~the~~ a UE in CELL_DCH state shall ~~in parallel, in state CELL_DCH,~~ also be able to measure and report the quantities according to section 8.~~2~~1.

Table 8.2: Parallel measurement requirements

Measurement quantity	Number of parallel measurements possible to request from the UE	Note
Transport channel BLER	~~[~~1~~]~~ per ~~TrCh~~Transport Channel	
UE transmitted power	~~[~~1~~]~~ per UL timeslot	
SFN-SFN observed time difference type 2	~~[-]~~1	
UE GPS Timing of Cell Frames for UP	~~[-]~~1	Only applicable for UE with this capability

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

8.3 Capabilities for Support of Event Triggering and Reporting Criteria in CELL_DCH state (3.84 Mcps TDD option)

8.3.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

The UE can be requested to make measurements under different measurement identity numbers. With each identity number there may be associated multiple number of events. The purpose of this section is to set some limits on the number of different reporting criteria the UE may be requested to track in parallel.

8.3.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.~~6~~3.

For the measurement categories: Intra-frequency, Inter frequency and Inter-RAT the UE need not support more than 14 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

For the measurement category Intra-frequency the UE shall support at least 2 reporting criteria for event type 1G and at least 4 reporting criteria for an arbitrary combination of event types 1H and 1I.

Table 8.6~~3~~: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Intra-frequency	4~~6~~	Applicable for periodic reporting or TDD events (1G-1I).
Inter-frequency	6	Applicable for periodic reporting or Event 2A-2F
Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
UP measurements	2	Only applicable for UE with this capability.

< Next changed section >

8.5 ~~void~~Capabilities for Support of Event Triggering and Reporting Criteria in CELL_FACH state (3.84 Mcps TDD option)

8.5.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

8.5.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

Table 8.9: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Traffic volume measurements	2 + (2 per Transport Channel)	

8.5A Capabilities for Support of Event Triggering and Reporting Criteria in CELL_FACH state (1.28 Mcps option)

8.5A.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

8.5A.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

Table 8.9A: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Traffic volume measurements	[]	

3GPP TSG RAN WG4 Meeting #23 **R4-020980**

Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.123** **CR** **234** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘	Measurement reporting and capabilities for the support of event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states (3.84 Mcps TDD option)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

Use one of the following releases:

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

Reason for change: ⌘

Missing delay requirements for RACH reporting in case SFN-SFN observed time difference is to be reported in CELL_FACH state.

Requirements on parallel measurements in CELL_DCH state, such as TrCH BLER and UE transmitted power still in square brackets.

Requirements on maximum number of intra-frequency reporting criteria don't allow simultaneous application of event- and periodic event triggered reporting for event types 1G, 1H and 1I. The current allowed E_{cat} = 4 intra-frequency event triggers are a strict minimum for system operation, i.e. a maximum of 2 1G event-trigger for Handover monitoring and one ISCP threshold for both 1H and 1I events. In anticipated Inter-cell or Intra-cell handover scenarios, the availability of additonal event triggers for example in conjunction with 1H and 1I periodic reporting is key to efficient system operation.

Missing requirements on maximum number of TVM triggers (event- or periodic) in CELL_FACH state

Summary of change: ⌘

A UE is allowed an additonal 50 ms per cell in RACH access delay in case SFN-SFN reporting on RACH is requested by UTRAN.

In addition to P-CCPCH RSCP and TS ISCP measurements, a UE is requested to support 1 TrCH BLER per TrCH and 1 UE transmitted power measurement in CELL_DCH state.

Number of allowed intra-frequency event triggers in CELL_DCH state increased from 4 to 6 in order to account for the possibility of periodic reporting for the purpose of inter- and intra-cell handover scenarios.

Support of 2 TVM triggers per Transport Channel in CELL_FACH state.

Consequences if not approved:	⌘	Critical requirements on UE support of measurement reporting and capabilities for the event-triggered and periodic reporting criteria in CELL_DCH and CELL_FACH states either missing, incomplete or not feasible. **Isolated Impact Analysis** This CR contains corrections to existing requirements which are either partially missing or incomplete. Note that this CR does not affect Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	New 5.7; 8.2; 8.3; 8.5		
Other specs affected:	⌘	- Other core specifications - Test specifications - O&M Specifications	⌘	
Other comments:	⌘	- Equivalent CRs in other Releases: CR224r1 cat. F to 25.123 v3.9.0, CR233r1 cat. A to 25.123 v4.4.0		

5.7 RACH reporting

5.7.1 Introduction

5.7.1.1 3.84 Mcps TDD option

The network may request the UE to report on RACH P-CCPCH RSCP for the serving cell and up to 6 strongest monitored set cells and SFN-SFN observed time difference between the serving cell and up to 6 different monitored set cells.

5.7.1.2 1.28 Mcps TDD option

Void

5.7.2 Requirements

5.7.2.1 3.84 Mcps TDD option

If all of the following conditions are true, the UE is allowed to have an additional delay of N_{RACH}*50 ms in RACH transmission compared to the normal RACH transmission delay.

- SFN-SFN observed time difference measurement results are required to be reported on RACH
- The set of cells on which the SFN-SFN observed time difference measurement is to be reported has not changed since the previous RACH measurement report
- The UE has not measured the SFN-SFN observed time differences for the cells to be reported on RACH in the CELL_FACH state according to the requirements defined in Section 8.4.2.2

If at least one of the previous conditions is false, the UE shall be able to report the requested measurement results on RACH within a normal RACH transmission delay.

N_{RACH} is the number of cells requiring SFN decoding prior to the reporting of SFN-SFN observed time difference measurement results on RACH.

5.7.2.2 1.28 Mcps TDD option

Void

< Next changed section >

8.2 ~~Parallel~~ Measurements in CELL_DCH State with special requirements (3.84 Mcps TDD option)

8.2.1 Introduction

~~The purpose with this section is to ensure that all UE can handle a certain number of measurements in parallel.~~This section contains specific requirements for certain measurements beyond those specified in section 8.1. The measurements are defined in ~~TS 25.225~~[14], the measurement model is defined in ~~TS 25.302~~[15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in ~~TS 25.331~~[16] ~~and measurements reporting delays are specified in section 8.1~~. ~~For the description of the i~~Idle intervals ~~see TS 25.225, Annex A~~for the purpose of measurements are described in [14].

8.2.2 Requirements

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

The UE shall be able to perform parallel measurements according to table 8.2.

In addition to the requirements in table 8.2, ~~the~~ a UE in CELL_DCH state shall ~~in parallel, in state CELL_DCH,~~ also be able to measure and report the quantities according to section 8.~~2~~1.

Table 8.2: Parallel measurement requirements

Measurement quantity	Number of parallel measurements possible to request from the UE	Note
Transport channel BLER	~~[~~1~~]~~ per ~~TrCh~~Transport Channel	
UE transmitted power	~~[~~1~~]~~ per UL timeslot	
SFN-SFN observed time difference type 2	~~[-]~~1	
UE GPS Timing of Cell Frames for UP	~~[-]~~1	Only applicable for UE with this capability

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

8.3 Capabilities for Support of Event Triggering and Reporting Criteria in CELL_DCH state (3.84 Mcps TDD option)

8.3.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

The UE can be requested to make measurements under different measurement identity numbers. With each identity number there may be associated multiple number of events. The purpose of this section is to set some limits on the number of different reporting criteria the UE may be requested to track in parallel.

8.3.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.~~6~~3.

For the measurement categories: Intra-frequency, Inter frequency and Inter-RAT the UE need not support more than 14 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

For the measurement category Intra-frequency the UE shall support at least 2 reporting criteria for event type 1G and at least 4 reporting criteria for an arbitrary combination of event types 1H and 1I.

Table 8.6~~3~~: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Intra-frequency	4~~6~~	Applicable for periodic reporting or TDD events (1G-1I).
Inter-frequency	6	Applicable for periodic reporting or Event 2A-2F
Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
UP measurements	2	Only applicable for UE with this capability.

< Next changed section >

8.5 ~~void~~Capabilities for Support of Event Triggering and Reporting Criteria in CELL_FACH state (3.84 Mcps TDD option)

8.5.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

8.5.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

Table 8.9: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Traffic volume measurements	2 + (2 per Transport Channel)	

8.5A Capabilities for Support of Event Triggering and Reporting Criteria in CELL_FACH state (1.28 Mcps option)

8.5A.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

8.5A.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

Table 8.9A: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Traffic volume measurements	[]	