TSG RAN Meeting #19 Birmingham, United Kingdom, 11 - 14 March, 2003

RP-030026

Title CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.123

Source TSG RAN WG4

Agenda Item 8.4.3

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-020018	25.123	288		F	R99	3.11.0	Correction of interruption time in TDD Hard Handover	TEI
R4-020019	25.123	289		Α	Rel-4	4.7.0	Correction of interruption time in TDD Hard Handover	TEI
R4-020020	25.123	290		Α	Rel-5	5.3.0	Correction of interruption time in TDD Hard Handover	TEI
R4-020049	25.123	293		F	R99	3.11.0	Transmitted code power accuracy	TEI
R4-020050	25.123	294		Α	Rel-4	4.7.0	Transmitted code power accuracy	TEI
R4-020051	25.123	295		Α	Rel-5	5.3.0	Transmitted code power accuracy	TEI
R4-020052	25.123	296		F	R99	3.11.0	UE Timer accuracy for TDD	TEI
R4-020053	25.123	297		Α	Rel-4	4.7.0	UE Timer accuracy for TDD	TEI
R4-020054	25.123	298		Α	Rel-5	5.3.0	UE Timer accuracy for TDD	TEI
R4-020261	25.123	286	1	F	Rel-4	4.7.0	Correction of interruption time in TDD Hard Handover	LCRTDD-RF
R4-020262	25.123	287	1	Α	Rel-5	5.3.0	Correction of interruption time in TDD Hard Handover	LCRTDD-RF

3GPP TSG RAN WG4 (Radio) Meeting #26

R4-030261

Madrid, Spain 17 - 22 February, 2003

CHANGE REQUEST									
*	25.123	CR 286	⊭rev	1	¥	Current version:	4.7.0	¥	
For <u>HEL</u>	P on using this for	m, see bottom c	of this page or	look	at th	e pop-up text over	r the	mbols.	

Proposed change affects: UICC apps# ME X Radio Access Network X Core Network

Title:

** Correction of interruption time in TDD Hard Handover

Title:	ж	Correction of interruption time in TDI) Hard Handover	
Source:	\mathfrak{H}	RAN WG4		
Work item code	: #	LCRTDD-RF	Date: ₩	04/03/2003
Category:	\mathbb{H}	F	Release: ₩	Rel-4
		Use one of the following categories:	Use <u>one</u> of	the following releases:
		F (correction)	2	(GSM Phase 2)
		A (corresponds to a correction in an	earlier release) R96	(Release 1996)
		B (addition of feature),	R97	(Release 1997)
		C (functional modification of feature)	R98	(Release 1998)
		D (editorial modification)	R99	(Release 1999)
		Detailed explanations of the above categor	ries can Rel-4	(Release 4)
		be found in 3GPP <u>TR 21.900</u> .	Rel-5	(Release 5)
			Rel-6	(Release 6)

Reason for change:
In this test case, the delay uncertainty of the TTI of the uplink DCH is not taken into consideration. The timing of CFN between cell1 and cell2 is not always aligned in this test case described in TS25.123 A5.1. If the timing of CFN between cell1 and cell2 isn't aligned, uplink DCH may not be able to be transmitted within the given test requirement. The transmission delay of a maximum TTI of the uplink DCH occurs to align the timing of uplink DCH transmission with the maximum uplink TTI boundary of the target cell. This delay isn't taken into consideration with the interruption time.

The transmission delay to align the timing of uplink DCH transmission with the maximum uplink TTI boundary of the target cell is added to the interruption time. Requirements for Hard Handover of TDD 1.28Mcps Option are not in line with other requirements and test cases in TS 25.123 and TS 25.133.

other requirements and test cases in 10 25.125 and 10 25.155.

Summary of change: # To add the maximum TTI of the uplink DCH to the interruption time
To define DCH parameter as UL Reference Measurement Channel 12.2 kbps.
This changes are made for TDD/TDD requirements and corresponding test
cases for the TDD 1.28Mcps Option. The according changes to 3.84Mcps TDD
Option are treated in separate CRs 288, 289 and 290.

The requirements are now given by a formula, and the contributors to this requirements are defined in more detail by this requirement, where the values for unknown cells have been revised.

Consequences if # Even "Good UE" may not pass the test. The UE may not transmit uplink DCH at

not approved:	the uplink TTI boundary.
Clauses affected:	策 5, A.5
Other specs affected:	Y N X Other core specifications # 05.10/45.010 X Test specifications 34.122 O&M Specifications
Other comments:	# Equivalent CRs in other Releases: CR287r1 cat. A to 25.123 v5.3.0

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

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

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 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 [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 [18]. CELL_FACH, CELL_PCH and URA_PCH states are described in [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 [16]. The handover procedure may cause the UE to change its frequency.

5.1.2 Requirements

5.1.2.1 TDD/TDD handover delay

5.1.2.1.1 3.84 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [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 performance value defined in [16] plus the interruption time stated in section 5.1.2.2.1.

5.1.2.1.2 1.28 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [16].

When the UE receives a RRC message that implies a 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 start transmission 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 or the SYNC-UL in case that a handover to 1.28 Mcps TDD option with SYNCH uplink exchange is recommended at the designated activation time

where $D_{handover}$ equals the RRC procedure performance value defined [16] 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.

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 considered as known by the UE, if either or both of the following conditions are true:

- the target cell has been measured during the last 5 seconds
- the UE has had a radio link connected to the target cell during the last 5 seconds.

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

5.1.2.2.2 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 DPCH or the SYNC-UL in case that a handover with SYNCH uplink exchange is recommended, shall be less than the value in table 5.1 A defined in the equation below. 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,

$$\underline{T_{interrupt}} = \underline{T_{offset}} + \underline{T_{UL}} + 30*F_{SFN} + 20*KC + 180*UC + 10*F_{max} ms$$

where,

<u>T_{offset}</u> 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
<u>F_{SFN}</u>	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

 $\underline{F_{max}}$ denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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.

 cell in the handover command message
 Maximum delay [ms]

 Known Cell
 Unknown Cell

 SFN not to be decoded
 SFN needs be to be decoded

 be decoded
 decoded

 Intra-frequency
 40

 70
 350

 400

 70
 350

 400

Table 5.1A: TDD/ TDD handover - interruption time

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 <u>interruption time</u> 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 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].

5.2.2 Requirements

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

5.2.2.1 TDD/FDD handover delay

5.2.2.1.1 3.84 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

When the UE receives a RRC message implying 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 performance value as defined in [16] plus the interruption time stated in section 5.2.2.2.

5.2.2.1.2 1.28 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

When the UE receives a RRC message that implies a 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 performance value defined in [16] plus the interruption time stated in section 5.2.2.2.2.

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 DPCH 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.

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

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

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

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.

7

The phase reference is the Primary CPICH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] 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, is dependent on whether the target cell is known for the UE or not.

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

 $T_{interrupt} = T_{IU} + 40 + 50 * KC + 150 * UC + 10 * F_{max} ms$

where.

 T_{IU} The interruption uncertainty when changing the timing from the old to the new cell. $T_{\rm III}$ can be up

to one frame (10 ms).

Equal to 1 if a known target cell is indicated in the RRC message implying 1.28Mcps TDD/FDD KC

handover and equal to 0 otherwise.

UC Equal to 1 if an unknown target cell is indicated in the RRC message implying 1.28Mcps

TDD/FDD handover and equal to 0 otherwise.

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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 for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] is required.

<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

Para	ameter	Unit	Value	Comment
DCH parame	ters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Contro	ol		On	
Target quality DTCH	y value on	BLER	0.01	
Initial	Active cell		Cell 1	
conditions			Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
0		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigg	jer	ms	0	
Filter coefficie	ent		0	
Monitored cell list size			6 TDD neighbours on Channel 1	
T1	T1		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							С	ell 2			
DL timeslot number			0			4			0			5		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	
UTRA RF Channel Number				Cha	nnel 1			Channel 1						
PCCPCH_Ec/lor	dB		-3			n.a.			-3			n.a		
SCH_Ec/lor	dB		-9			n.a.			-9			n.a.		
SCH_t _{offset}	dB		0			n.a.			5			n.a.		
DPCH_Ec/lor	dB		n.a.		Not	e 1	n.a.	n.a.			n	.a.	Note 1	
OCNS_Ec/lor	dB		-3,12		Not	e 2	n.a.	n.a.	-3	,12	n	.a.	Note 2	
\hat{I}_{or}/I_{oc}	dB				1	1			-Inf. 3		-Inf.		3	
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	f70		n.a.			
I_{oc}	dBm/ 3,84 MHz	-70												
Propagation Condition							AW	/GN						

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

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

Para	ameter	Unit	Value	Comment			
DCH parame	ters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2			
Power Contro	ol		On				
Target quality	/ value on	BLER	0.01				
Initial	Active cell		Cell 1				
conditions	Neighbour cell		Cell 2				
Final Active cell condition			Cell 2				
HCS			Not used				
0		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 Trigg	er	ms	0				
Threshold no frequency	n-used	dBm	-80	Applicable for Event 2C			
Filter coefficion	ent		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							Ce	ell 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/lor	dB		-3			n.a.		-3			n.a.		
SCH_Ec/lor	dB	-9			n.a.			-9			n.a.		
SCH_t _{offset}	dB		0		n.a.			5			n.a.		
DPCH_Ec/lor	dB		n.a.		Note	e 1	n.a.		n.a.		n.a	а.	Note 1
OCNS_Ec/lor	dB		-3,12		Note	e 2	n.a.	n.a.	-3,	12	n.a	a.	Note 2
\hat{I}_{or}/I_{oc}	dB				1			-Inf.	7	7	-In	f.	7
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	-6	6		n.a	
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition							AW	GN					

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

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 in the single carrier case 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 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 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

Par	ameter	Unit	Value	Comment
DPCH param	DPCH parameters		DL <u>and UL</u> Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2.2 and A.2.1.2
Power Contro	ol		On	
Target quality	value on DPCH	BLER	0.01	
Initial	Active cell		Cell 1	
conditions	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
0		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigg	er	ms	0	
Filter coefficie	ent		0	
Monitored ce	Monitored cell list size		6 TDD neighbours on Channel 1	
T1	T1		5	
T2		S	5	
T3	·	s	5	

Table A.5.1.6: Cell specific test parameters for intra-frequency handover

Parameter	Unit				Cell 1				
Timeslot Number			0		DwPTS	5			
		T1	T2 T3	T1	T2 T3	T1 T2	T3		
UTRA RF Channel			Channel 1						
Number				Ci	iailiei i				
PCCPCH_Ec/lor	dB		-3			n.a.			
DwPCH_Ec/lor					0				
DPCH_Ec/lor	dB		n.a.		n.a.	Note1	n.a.		
OCNS_Ec/lor	dB		-3			Note2	2		
\hat{I}_{or}/I_{oc}	dB		3		3	3			
I_{oc}	dBm/ 1.28 MHz				-70				
PCCPCH_RSCP	dBm		-70		n.a.	n.a.			
Propagation Condition		AWGN							
Parameter	Unit	Cell 2							
Timeslot Number			0		DwPTS	5			
		T1	T2 T3	T1	T2 T3	T1 T2	T3		
UTRA RF Channel Number				Cł	nannel 1				
PCCPCH_Ec/lor	dB		-3			n.a.			
DwPCH_Ec/lor					0				
DPCH_Ec/lor	dB		n.a.		n.a.	n.a.	Not e1		
OCNS_Ec/lor	dB		-3			Note2)		
\hat{I}_{or}/I_{oc}	dB	-Inf.	5	-Inf.	5	-Inf.	5		
I_{oc}	dBm/ 1.28 MHz				-70				
PCCPCH_RSCP	dBm	-Inf.	-68		n.a. n.a.				
Propagation Condition		AWGN							

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to $I_{\rm or}$

A.5.1.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than 40-80 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 in the dual carrier case as reported in section 5.1.2.1.2.

The test consists of three successive time periods, with a time duration T1, T2 and T3. 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 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.5.1.7: General test parameters for inter-frequency handover

Para	meter	Unit	Value	Comment
DPCH parar	DPCH parameters		DL and UL Reference Measurement	As specified in TS 25.102 section A.2.2.2
			Channel 12.2 kbps	and A.2.1.2
Power Contr	rol		On	
Target qualit	ty value on	BLER	0.01	
Initial	Active cell		Cell 1	
conditions	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold no frequency	on used	dBm	-75	Absolute RSCP threshold for event 2C
0		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trig	ger	ms	0	
Filter coeffic	ient		0	
Monitored co	ell list size		6 TDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T1		S	5	
T2		S	10	
T3		S	5	

TableA.5.1.8: Cell Specific parameters for inter-frequency handover

Parameter	Unit	С			Cell 1					
Timeslot Number			0			DwPTS			5	
		T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel					Ck	annol 1	1			
Number			Channel 1							
PCCPCH_Ec/lor	dB		-3						n.a.	
DwPCH_Ec/lor						0				
DPCH_Ec/lor	dB		n.a.			n.a.		No	ote1	n.a.
OCNS_Ec/lor	dB		-3						Note2	
\hat{I}_{or}/I_{oc}	dB		3			3			3	
I_{oc}	dBm/ 1.28 MHz			-70			-70			
PCCPCH_RSCP	dBm		-70		n.a.		n.a.			
Propagation Condition		AWGN								
Parameter	Unit	Cell 2								
Timeslot Number			0		DwPTS		5			
		T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number					Cł	nannel 2	2			
PCCPCH_Ec/lor	dB		-3						n.a.	
DwPCH_Ec/lor					0					
DPCH_Ec/lor	dB		n.a.		n.a.		n	ı.a.	Not e1	
OCNS_Ec/lor	dB	-3						Note2		
\hat{I}_{or}/I_{oc}	dB	-Inf.	9)	-Inf.	9)	-1	Inf.	9
I_{oc}	dBm/ 1.28 MHz				-70					
PCCPCH_RSCP	dBm	-Inf.	-6	64	n.a.			n.a.		
Propagation Condition		AWGN								
Note 1: The DPCH level	is contro	ntrolled by the power control loop								

The DPCH level is controlled by the power control loop Note 1:

The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 2:

A.5.1.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than 40-80 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 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

Parai	meter	Unit	Value	Comment
DCH par	DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power	Control		On	
	ity value on CH	BLER	0.01	
Initial	Active cell		Cell 1	TDD cell
conditions	Neighbour cell		Cell 2	FDD cell
Final condition	Active cell		Cell 2	FDD cell
H	CS		Not used	
()	dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hyste	eresis	dB	3	Hysteresis parameter for event 2B
Time to	Trigger	ms	0	
	eshold used lency	dBm	-71	Applicable for Event 2B
Threshold	non-used iency	dBm	-80	Applicable for Event 2B
	d frequency		1	Applicable for Event 2B
Filter co	efficient		0	
Monitored	cell list size		6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
Т	SI	S	1.28	The value shall be used for all cells in the test.
T	1	S	5	
Т	2	S	15	
Т	3	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				Chan	nol 1		
Number				Criarii	ilei i		
PCCPCH_Ec/lor	dB		-3			n.a.	
SCH_Ec/lor	dB	-9			n.a.		
SCH_t _{offset}	dB	0			n.a.		
DPCH_Ec/lor	dB		n.a.		Note 1		n.a.
OCNS_Ec/lor	dB		-3,12		Note 2		n.a.
\hat{I}_{or}/I_{oc}	dB	5		1	5 -1		1
PCCPCH RSCP	dBm	-68	-7	'4	n.a.		
	dBm/						
I_{oc}	3,84			-7	0		
	MHz						
Propagation Condition		AWGN					
Note 1: The DPCH level	is controll	led by the i	power cont	rol loop			

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor

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

Parameter	Unit	Cell	2		
		T1, T2	Т3		
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12	2		
SCH_Ec/lor	dB	-12	2		
PICH_Ec/lor	dB	-18	5		
DPCH_Ec/lor	dB	n.a.	Note 1		
OCNS_Ec/lor	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		AWO	SN		
Note 1: The DPCH level is controlled by the power control loop					

The DPCH level is controlled by the power control loop

The power of the OCNS channel that is added shall make the total Note 2: 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 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

A.5.2.2.1 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 5.2.2.2.

The test parameters are given in Table A.5.2.4, A.5.2.5 and A.5.2.6 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 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.5.2.4: General test parameters for TDD/FDD handover

Parar	neter	Unit	Value	Comment
DCH par	ameters		DL and UL Reference	As specified in TS 25.102 section annex
			Measurement Channels 12.2 kbps	A and TS 25.101 annex A
Power	Control		On	
Initial	Active cell		Cell 1	TDD cell
conditions	Neighbour cell		Cell 2	FDD cell
Final condition	Active cell		Cell 2	FDD cell
C)	dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hyste	eresis	dB	3	Hysteresis parameter for event 2B
Time to	Time to Trigger		0	
Absolute thr	Absolute threshold used		-71	Applicable for Event 2B
frequ	ency			
Threshold frequ		dBm	-80	Applicable for Event 2B
	d frequency		1	Applicable for Event 2B
Filter co	efficient		0	
Monitored of	cell list size		6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
Т	SI	S	1.28	The value shall be used for all cells in the test.
Т	1	S	5	
Т	2	S	15	
Т	3	S	5	

Table A.5.2.5: Cell 1 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 1						
Timeslot number		0						
		T1	T2	T3	T1	T2	T3	
UTRA RF Channel				Chan	nel 1			
Number				Onani				
PCCPCH_Ec/lor	dB		-3		n.a.			
DPCH_Ec/lor dB		n.a.			Note 1		n.a.	
OCNS_Ec/lor	dB	-3			Note 2		n.a.	
\hat{I}_{or}/I_{oc}	dB	5 -1		5		-1		
PCCPCH RSCP	dBm	-68	-74		n.a.			
I_{oc}	dBm/ 1.28 MHz	-70						
Propagation Condition		AWGN						
Note 1: The DPCH level is controlled by the power control loop								
Note 2: The power of	THE OCINO C	nannei ma	i is added s	snan make	the total p	ower non	i trie cell	

Table A.5.2.6: Cell 2 specific test parameters for TDD/FDD handover

Parameter	Unit		Cell 2		
		T1	T2	T3	
CPICH_Ec/lor	dB		-10		
PCCPCH_Ec/lor	dB		-12		
SCH_Ec/lor	dB		-12		
PICH_Ec/lor	dB		-15		
DPCH_Ec/lor	dB	n.a.		Note 1	
OCNS_Ec/lor	dB	-0.941		Note 2	
CPICH_RSCP	dBm	-Inf	'	75	
\hat{I}_{or}/I_{oc}	dB	-Inf	:	5	
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 $I_{\rm or}$

A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 130 140 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 (Radio) Meeting #26

UICC apps #

R4-030262

ME X Radio Access Network X Core Network

Rel-6

(Release 6)

Madrid, Spain 17 - 22 February, 2003

Proposed change affects:

	CHANG	SE REQ	UE	ST	-		CR-Form-v7
*	25.123 CR 287	жrev	1	¥	Current version:	5.3.0	¥
For <u>HEL</u>	P on using this form, see bottom of	this page or	look	at th	ne pop-up text over	r the ℋ syr	nbols.

Title: 器 Correction of interruption time in TDD Hard Handover Source: ₩ RAN WG4 ₩ A Category: Release: # Rel-5 Use one of the following categories: Use <u>one</u> of the following releases: **F** (correction) (GSM Phase 2) 2 **A** (corresponds to a correction in an earlier release) R96 (Release 1996) R97 (Release 1997) **B** (addition of feature), **C** (functional modification of feature) R98 (Release 1998) **D** (editorial modification) R99 (Release 1999) Detailed explanations of the above categories can Rel-4 (Release 4) be found in 3GPP TR 21.900. Rel-5 (Release 5)

Reason for change: # In this test case, the delay uncertainty of the TTI of the uplink DCH is not taken into consideration. The timing of CFN between cell1 and cell2 is not always aligned in this test case described in TS25.123 A5.1. If the timing of CFN between cell1 and cell2 isn't aligned, uplink DCCH may not be able to be transmitted within the given test requirement. The transmission delay of a maximum TTI of the uplink DCH occurs to align the timing of uplink DCH transmission with the maximum uplink TTI boundary of the target cell. This delay isn't taken into consideration with

> The transmission delay to align the timing of uplink DCH transmission with the maximum uplink TTI boundary of the target cell is added to the interruption time. Requirements for Hard Handover of TDD 1.28Mcps Option are not in line with other requirements and test cases in TS 25.123 and TS 25.133.

the interruption time.

Summary of change: ₩ To add the maximum TTI of the uplink DCH to the interruption time To define DCH parameter as UL Reference Measurement Channel 12.2 kbps. This changes are made for TDD/TDD requirements and corresponding test cases for the TDD 1.28Mcps Option. The according changes to 3.84Mcps TDD Option are treated in separate CRs 288, 289 and 290.

> The requirements are now given by a formula, and the contributors to this requirements are defined in more detail by this requirement, where the values for unknown cells have been revised.

Consequences if not approved:

Even "Good UE" may not pass the test. The UE may not transmit uplink DCH at the uplink TTI boundary.

Clauses affected:	第 5, A.5
Other specs affected:	Y N X Other core specifications # 05.10/45.010 X Test specifications 34.122 O&M Specifications
Other comments:	# Equivalent CRs in other Releases: CR286r1 cat. F to 25.123 v4.7.0

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

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

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 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 [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 [18]. CELL_FACH, CELL_PCH and URA_PCH states are described in [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 [16]. The handover procedure may cause the UE to change its frequency.

5.1.2 Requirements

5.1.2.1 TDD/TDD handover delay

5.1.2.1.1 3.84 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [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 performance value defined in [16] plus the interruption time stated in section 5.1.2.2.1.

5.1.2.1.2 1.28 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [16].

When the UE receives a RRC message that implies a 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 start transmission 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 or the SYNC-UL in case that a handover to 1.28 Mcps TDD option with SYNCH uplink exchange is recommended at the designated activation time

where $D_{handover}$ equals the RRC procedure performance value defined [16] 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.

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 considered as known by the UE, if either or both of the following conditions are true:

- the target cell has been measured during the last 5 seconds
- the UE has had a radio link connected to the target cell during the last 5 seconds.

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

5.1.2.2.2 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 DPCH or the SYNC-UL in case that a handover with SYNCH uplink exchange is recommended, shall be less than the value in table 5.1 A defined in the equation below. 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,

$$\underline{T_{interrupt}} = \underline{T_{offset}} + \underline{T_{UL}} + 30 * \underline{F_{SFN}} + 20 * \underline{KC} + 180 * \underline{UC} + 10 * \underline{F_{max}} \underline{ms}$$

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
<u>F_{SFN}</u>	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

 $\underline{F_{max}}$ denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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.

 cell in the handover command message
 Maximum delay [ms]

 Known Cell
 Unknown Cell

 SFN not to be decoded
 SFN needs to be decoded

 be decoded
 decoded

 Intra-frequency
 40

 70
 350

 400

Table 5.1A: TDD/ TDD handover - interruption time

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 <u>interruption time</u> requirement in <u>Table 5.1A</u> 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 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]

5.2.2 Requirements

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

5.2.2.1 TDD/FDD handover delay

5.2.2.1.1 3.84 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

6

When the UE receives a RRC message implying 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 performance value as defined in [16] plus the interruption time stated in section 5.2.2.2.

5.2.2.1.2 1.28 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

When the UE receives a RRC message that implies a 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.

 $D_{handover}$ equals the RRC procedure performance value defined in [16] plus the interruption time stated in section 5.2.2.2.2.

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 DPCH 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.

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

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

where,

Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell. T_{offset}

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

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.

7

The phase reference is the Primary CPICH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] 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, is dependent on whether the target cell is known for the UE or not.

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

 $T_{interrupt} = T_{IU} + 40 + 50 * KC + 150 * UC + 10 * F_{max} ms$

where.

 T_{IU} The interruption uncertainty when changing the timing from the old to the new cell. $T_{\rm III}$ can be up

to one frame (10 ms).

Equal to 1 if a known target cell is indicated in the RRC message implying 1.28Mcps TDD/FDD KC

handover and equal to 0 otherwise.

UC Equal to 1 if an unknown target cell is indicated in the RRC message implying 1.28Mcps

TDD/FDD handover and equal to 0 otherwise.

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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 for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] is required.

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

Para	ameter	Unit	Value	Comment
DCH parame	DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Contro	ol		On	
Target quality DTCH	value on	BLER	0.01	
Initial	Active cell		Cell 1	
conditions	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
0		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigg	er	ms	0	
Filter coefficie	ent		0	
Monitored ce	Monitored cell list size		6 TDD neighbours on Channel 1	
T1	T1		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/lor	dB		-3			n.a.			-3		n.a.		
SCH_Ec/lor	dB		-9			n.a.			-9			n.a	
SCH_t _{offset}	dB	0				n.a.		5			n.a.		
DPCH_Ec/lor	dB		n.a.		Not	e 1	n.a.		n.a.		n	.a.	Note 1
OCNS_Ec/lor	dB		-3,12		Not	e 2	n.a.	n.a.	-3	,12	n	.a.	Note 2
\hat{I}_{or}/I_{oc}	dB				1			-Inf.	;	3	-1	nf.	3
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	-7	70		n.a	
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition							AW	/GN					

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

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

Para	ameter	Unit	Value	Comment
DCH parame	ters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Contro	Power Control		On	
Target quality	/ value on	BLER	0.01	
Initial	Active cell		Cell 1	
conditions	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
0	0		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 Trigg	er	ms	0	
Threshold no frequency	n-used	dBm	-80	Applicable for Event 2C
Filter coefficion	ent		0	
Monitored ce	II 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	T2		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/lor	dB	-3				n.a.		-3			n.a.		
SCH_Ec/lor	dB		-9			n.a.			-9	-9 n.a.			
SCH_t _{offset}	dB		0			n.a.	n.a.		5			n.a	
DPCH_Ec/lor	dB		n.a.		Note	e 1	n.a.	n.a.		n.a	а.	Note 1	
OCNS_Ec/lor	dB		-3,12		Note	e 2	n.a.	n.a3,12		n.a	a.	Note 2	
\hat{I}_{or}/I_{oc}	dB				1			-Inf.	7	7	-In	f.	7
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	-6	6		n.a	
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition							AW	GN					

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

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 in the single carrier case 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 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 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

Par	ameter	Unit	Value	Comment
DPCH param	eters		DL <u>and UL</u> Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2.2 and A.2.1.2
Power Contro	ol		On	
Target quality	value on DPCH	BLER	0.01	
Initial	Active cell		Cell 1	
conditions	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
0		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigg	er	ms	0	
Filter coefficie	ent		0	
Monitored ce	Monitored cell list size		6 TDD neighbours on Channel 1	
T1	T1		5	
T2		S	5	
T3	·	s	5	

Table A.5.1.6: Cell specific test parameters for intra-frequency handover

Parameter	Unit				(Cell 1					
Timeslot Number		0				DwPTS	3	5			
		T1	T2	T3	T1	T2	T3	T1	T2	T3	
UTRA RF Channel				•	Ch	onnol 1	1			•	
Number			Channel 1								
PCCPCH_Ec/lor	dB		-3						n.a.		
DwPCH_Ec/lor						0					
DPCH_Ec/lor	dB		n.a.			n.a.		No	ote1	n.a.	
OCNS_Ec/lor	dB		-3						Note2	<u> </u>	
\hat{I}_{or}/I_{oc}	dB		3			3			3		
I_{oc}	dBm/ 1.28 MHz	-70									
PCCPCH_RSCP	dBm		-70 n.a.						n.a.		
Propagation Condition						AWGN					
Parameter	Unit				(Cell 2					
Timeslot Number			0			DwPTS			5		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	
UTRA RF Channel Number					Ch	nannel 1	1				
PCCPCH_Ec/lor	dB		-3						n.a.		
DwPCH_Ec/lor						0					
DPCH_Ec/lor	dB		n.a.			n.a.		n	ı.a.	Not e1	
OCNS_Ec/lor	dB		-3						Note2		
\hat{I}_{or}/I_{oc}	dB	-Inf.	5	5	-Inf.	5	5	-	Inf.	5	
I_{oc}	dBm/ 1.28 MHz	-70									
PCCPCH_RSCP	dBm	-Inf.	-6	88		n.a.			n.a.		
Propagation Condition			•			AWGN			•	•	

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to $I_{\rm or}$

A.5.1.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than 80 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 in the dual carrier case as reported in section 5.1.2.1.2.

The test consists of three successive time periods, with a time duration T1, T2 and T3. 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 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.5.1.7: General test parameters for inter-frequency handover

Para	meter	Unit	Value	Comment
DPCH parar	neters		DL and UL Reference Measurement	As specified in TS 25.102 section A.2.2.2
			Channel 12.2 kbps	and A.2.1.2
Power Contr	Power Control		On	
Target qualit	Target quality value on DPCH		0.01	
Initial	Active cell		Cell 1	
conditions	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold no frequency	on used	dBm	-75	Absolute RSCP threshold for event 2C
0		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trig	ger	ms	0	
Filter coeffic	ient		0	
	Monitored cell list size		6 TDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T1	T1		5	
T2		S	10	
T3		S	5	

TableA.5.1.8: Cell Specific parameters for inter-frequency handover

Parameter	Unit				(Cell 1				
Timeslot Number			0			DwPTS	3		5	
		T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel					Ck	nannel 1	1			
Number					Ci	larinei	I			
PCCPCH_Ec/lor	dB		-3						n.a.	
DwPCH_Ec/lor						0				
DPCH_Ec/lor	dB		n.a.			n.a.		No	ote1	n.a.
OCNS_Ec/lor	dB		-3						Note2	
\hat{I}_{or}/I_{oc}	dB		3			3			3	
I_{oc}	dBm/ 1.28 MHz	-70								
PCCPCH_RSCP	dBm		-70			n.a.			n.a.	
Propagation Condition					,	AWGN				
Parameter	Unit					Cell 2				
Timeslot Number			0			DwPTS	3		5	
		T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number					Cł	nannel 2	2			
PCCPCH_Ec/lor	dB		-3						n.a.	
DwPCH_Ec/lor						0				
DPCH_Ec/lor	dB		n.a.			n.a.		n	ı.a.	Not e1
OCNS_Ec/lor	dB		-3						Note2	
\hat{I}_{or}/I_{oc}	dB	-Inf. 9 -			-Inf.	9)	-1	Inf.	9
I_{oc}	dBm/ 1.28 MHz	-70								
PCCPCH_RSCP	dBm	-Inf.	-6	64		n.a.			n.a.	
Propagation Condition		AWGN								
Note 1: The DPCH level	is contro	alled by the power control loop								

The DPCH level is controlled by the power control loop Note 1:

The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 2:

A.5.1.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than 80 40 ms from the beginning of time period T3.

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

A.5.2 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

Parar	meter	Unit	Value	Comment		
DCH pai	rameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2		
Power	Control		On			
	ity value on CH	BLER	0.01			
Initial	Active cell		Cell 1	TDD cell		
conditions	Neighbour cell		Cell 2	FDD cell		
Final condition	Active cell		Cell 2	FDD cell		
HC	CS		Not used			
()	dB	0	Cell individual offset. This value shall be used for all cells in the test.		
Hyste	eresis	dB	3	Hysteresis parameter for event 2B		
Time to	Trigger	ms	0			
	eshold used lency	dBm	-71	Applicable for Event 2B		
	non-used	dBm	-80	Applicable for Event 2B		
W non-used	d frequency		1	Applicable for Event 2B		
	efficient		0			
Monitored (Monitored cell list size		6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2			
Т	T _{SI}		1.28	The value shall be used for all cells in the test.		
Т	T1		5			
Т	T2		15			
Т	3	S	5			

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

Parameter	Unit			Cel	l 1			
DL timeslot number		0			2			
		T1 T2 T3		T1	T2	T3		
UTRA RF Channel				Chan	nol 1			
Number				Criarii	ilei i			
PCCPCH_Ec/lor	dB		-3			n.a.		
SCH_Ec/lor	dB		-9			n.a.		
SCH_t _{offset}	dB		0		n.a.			
DPCH_Ec/lor	dB		n.a.		Note 1		n.a.	
OCNS_Ec/lor	dB		-3,12		Note 2		n.a.	
\hat{I}_{or}/I_{oc}	dB	5		1	5 -1		1	
PCCPCH RSCP	dBm	-68	-7	'4		n.a.		
	dBm/							
I_{oc}	3,84	-70						
	MHz							
Propagation Condition		AWGN						
Note 1: The DPCH level	is controll	led by the i	power cont	rol loop				

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor

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

Parameter	Unit	Cell	2			
		T1, T2	Т3			
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12	2			
SCH_Ec/lor	dB	-12	2			
PICH_Ec/lor	dB	-18	5			
DPCH_Ec/lor	dB	n.a.	Note 1			
OCNS_Ec/lor	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 i	s controlled	hy the power control	loon			

The DPCH level is controlled by the power control loop

The power of the OCNS channel that is added shall make the total Note 2: 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 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

A.5.2.2.1 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 5.2.2.2.

The test parameters are given in Table A.5.2.4, A.5.2.5 and A.5.2.6 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 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.5.2.4: General test parameters for TDD/FDD handover

Parar	neter	Unit	Value	Comment
DCH par	ameters		DL and UL Reference	As specified in TS 25.102 section annex
			Measurement Channels 12.2 kbps	A and TS 25.101 annex A
Power	Control		On	
Initial	Active cell		Cell 1	TDD cell
conditions	Neighbour cell		Cell 2	FDD cell
Final condition	Active cell		Cell 2	FDD cell
()	dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hyste	eresis	dB	3	Hysteresis parameter for event 2B
Time to	Trigger	ms	0	
Absolute thr	eshold used	dBm	-71	Applicable for Event 2B
frequ	ency			
Threshold frequ		dBm	-80	Applicable for Event 2B
W non-used			1	Applicable for Event 2B
Filter co	efficient		0	
Monitored of	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.
Т	T1		5	
Т	2	S	15	
Т	3	S	5	

Table A.5.2.5: Cell 1 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 1							
Timeslot number			0		5				
		T1	T2	T3	T1	T2	T3		
UTRA RF Channel Number		Channel 1							
PCCPCH_Ec/lor	dB		-3	n.a.					
DPCH_Ec/lor	dB		n.a.		Note 1		n.a.		
OCNS_Ec/lor	dB		n.a.						
\hat{I}_{or}/I_{oc}	dB	5		-1 5			-1		
PCCPCH RSCP	dBm	-68	-74		n.a.				
I_{oc}	dBm/ 1.28 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									

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.

Table A.5.2.6: Cell 2 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 2							
		T1	T2	T3					
CPICH_Ec/lor	dB	-10							
PCCPCH_Ec/lor	dB		-12						
SCH_Ec/lor	dB		-12						
PICH_Ec/lor	dB		-15						
DPCH_Ec/lor	dB	n.a	Note 1						
OCNS_Ec/lor	dB	-0.9	941	Note 2					
CPICH_RSCP	dBm	-Inf	1	75					
\hat{I}_{or}/I_{oc}	dB	-Inf		5					
I_{oc}	dBm/ 3.84 MHz		-70						
Propagation Condition		AWGN							
Note 1: The DBCH level is controlled by the power central lean									

Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to $I_{\rm or}$

A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 140 130 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 (Radio) Meeting #26

R4-030018

Madrid, Spain 17 - 22 February, 2003

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to 25.123 v5.3.0

How to create CRs using this form:

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- 1) Fill out the above form. The symbols above marked \(\mathcal{H} \) contain pop-up help information about the field that they are closest to.
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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 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 [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 [18]. CELL_FACH, CELL_PCH and URA_PCH states are described in [16].

5.1 TDD/TDD Handover

5.1.1 Introduction

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.

5.1.2 Requirements

5.1.2.1 TDD/TDD handover delay

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [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 performance value defined in [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.

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

$$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC + 10*F_{max} \text{ ms}$$

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

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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

- the target cell has been measured during the last 5 seconds
- the UE has had a radio link connected to the target cell during the last 5 seconds.

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

5.2 TDD/FDD Handover

5.2.1 Introduction

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].

5.2.2 Requirements

The requirements in this section shall apply to UEs supporting TDD and FDD.

5.2.2.1 TDD/FDD handover delay

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

When the UE receives a RRC message implying 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 performance value as defined in [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 DPCH 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.

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

 $T_{interrupt} = T_{offset} + 40 + 50 * KC + 150 * UC + 10 * F_{max}$ 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

 $\underline{F_{max}}$ denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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 for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] is required.

<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

Para	meter	Unit	Value	Comment
DCH paramet	ers		DL and UL Reference	As specified in TS 25.102 section A.2.2_
			Measurement Channel 12.2 kbps	<u>and A.2.1</u>
Power Contro			On	
Target quality DTCH	value on	BLER	0.01	
Initial	Active cell		Cell 1	
conditions	Neighbour cell		Cell 2	
Final condition			Cell 2	
HCS			Not used	
0		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigge	er	ms	0	
Filter coefficie	ent		0	
Monitored cell list size			6 TDD neighbours on Channel 1	
T1	T1		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/lor	dB		-3			n.a.			-3			n.a	l .
SCH_Ec/lor	dB		-9 n.a9				n.a.						
SCH_t _{offset}	dB		0			n.a.			5			n.a.	
DPCH_Ec/lor	dB		n.a.		Not	e 1	n.a.	n.a.		n.a	а.	Note 1	
OCNS_Ec/lor	dB		-3,12		Not	e 2	n.a.	n.a.	-3	,12	n.a	а.	Note 2
\hat{I}_{or}/I_{oc}	dB				1			-Inf.	;	3	-In	ıf.	3
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	-7	70		n.a	i.
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition							AW	/GN					

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

A.5.1.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 40-80 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

Para	meter	Unit	Value	Comment		
DCH paramet	ters		DL and UL Reference	As specified in TS 25.102 section A.2.2_		
			Measurement Channel 12.2 kbps	and A.2.1		
Power Contro	ol		On			
Target quality DTCH	value on	BLER	0.01			
Initial	Active cell		Cell 1			
conditions	Neighbour cell		Cell 2			
Final condition	Active cell		Cell 2			
HCS			Not used			
0		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 Trigg	er	ms	0			
Threshold not frequency	n-used	dBm	-80	Applicable for Event 2C		
Filter coefficie	ent		0			
Monitored cel	l 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			

Table A.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/lor	dB		-3			n.a.			-3			n.a	١.
SCH_Ec/lor	dB		-9			n.a.			-9			n.a	١.
SCH_t _{offset}	dB		0		n.a.			5			n.a.		
DPCH_Ec/lor	dB		n.a.		Not	e 1	n.a.	n.a.			n.a	а.	Note 1
OCNS_Ec/lor	dB		-3,12		Not	e 2	n.a.	n.a.	-3	,12	n.a	a.	Note 2
\hat{I}_{or}/I_{oc}	dB				1			-Inf.		7	-Ir	nf	7
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	-6	66		n.a	١.
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 lor.

A.5.1.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 40-80 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

Parar	neter	Unit	Value	Comment		
DCH par	ameters		DL and UL Reference	As specified in TS 25.102 section annex		
			Measurement Channel 12.2 kbps	A.2.2 and TS 25.101 annex A		
Power	Control		On			
Target qual DT	ity value on CH	BLER	0.01			
Initial	Active cell		Cell 1	TDD cell		
conditions	Neighbour cell		Cell 2	FDD cell		
Final condition	Active cell		Cell 2	FDD cell		
HC	CS		Not used			
()	dB	0	Cell individual offset. This value shall be used for all cells in the test.		
Hyste	eresis	dB	3	Hysteresis parameter for event 2B		
Time to	Trigger	ms	0			
Absolute thr		dBm	-71	Applicable for Event 2B		
Threshold	non-used	dBm	-80	Applicable for Event 2B		
W non-used	d frequency		1	Applicable for Event 2B		
Filter co	efficient		0			
Monitored	Monitored cell list size		Nonitored 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.		
Т	1	S	5			
	2	S	15			
Т	3	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				Chan	ool 1				
Number				Chan	ilei i				
PCCPCH_Ec/lor	dB		-3			n.a.			
SCH_Ec/lor	dB		-9			n.a.			
SCH_t _{offset}	dB	0 n.a.							
DPCH_Ec/lor	dB		n.a.		Note 1		n.a.		
OCNS_Ec/lor	dB		-3,12		No	te 2	n.a.		
\hat{I}_{or}/I_{oc}	dB	5		1	5	-	1		
PCCPCH RSCP	dBm	-68	-7	'4		n.a.			
	dBm/								
I_{oc}	3,84	-70							
	MHz								
Propagation Condition				AW	GN				

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor

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

Parameter	Unit	Cell 2	
		T1, T2	Т3
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
DPCH_Ec/lor	dB	n.a.	Note 1
OCNS_Ec/lor	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 100 140 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 (Radio) Meeting #26

R4-030019

Madrid, Spain 17 - 22 February, 2003										
		(CHANGE	REC	QUE	ST				CR-Form-v7
*	25.	123 CR	289	жrev		ж	Current vers	sion:	4.7.0	*
For <u>HELP</u> on u	sing t	his form, see	e bottom of this	s page o	r look a	at the	e pop-up tex	t over	the	nbols.
Proposed change a	affect	t s: UICC a	apps#	ME	K Rad	io Ad	ccess Netwo	rk X	Core Ne	twork
Title: ૠ	Cor	rection of int	erruption time	in TDD	Hard H	lando	over			
Source: #	RAI	N WG4								
Work item code: ₩	TEI						Date: #	04/	03/2003	
Category: Ж	Α						Release: #	Rel	I - 4	
•	Detai	F (correction) A (correspond B (addition of C (functional D (editorial m	ds to a correction f feature), modification of the modification) ons of the above	on in an ea feature)		lease	2	(GSN (Rele (Rele (Rele (Rele (Rele	ollowing rele A Phase 2) Pase 1996) Pase 1997) Pase 1998) Pase 1999) Pase 4) Pase 5)	eases:
Passan far abanca	مه .	In this too	t account has dale	01/11000	taintu	of the	TTI of the u	بامنامر	DCH is no	at takan
Reason for change		into conside aligned in th cell1 and ce the given tes DCH occurs	t case, the delation. The time is test case de ll2 isn't aligned it requirement to align the tiroundary of the ion time.	ning of C escribed d, uplink . The tra ming of u	FN bet in TS2 DCCH nsmiss iplink [weer 5.12 may sion o OCH	n cell1 and c 3 A5.1. If the not be able delay of a matransmission	ell2 is timin to be aximu with	not alway g of CFN l transmitte m TTI of the the maxim	vs between ed within he uplink num
			nission delay to uplink TTI bour							
		maximum (iladi y Ol	aro tar	gort	on is added	to tile	Monapli	on unio.
Summary of chang	je: ૠ	To define D	maximum TTI OCH paramete	r as UL	Refere	nce l	Measuremer	nt Cha	nnel 12.2	

Consequences if not approved:	# Even "Good UE" may not pass the test. The UE may not transmit uplink DCH at the uplink TTI boundary.
Clauses affected:	€ 5, A.5
Other specs affected:	Y N X Other core specifications
Other comments:	# Equivalent CRs in other Releases: CR288 cat. F to 25.123 v3.11.0, CR290 cat. A

corresponding test cases.

to 25.123 v5.3.0

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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 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 [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 [18]. CELL_FACH, CELL_PCH and URA_PCH states are described in [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 [16]. The handover procedure may cause the UE to change its frequency.

5.1.2 Requirements

5.1.2.1 TDD/TDD handover delay

5.1.2.1.1 3.84 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [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 performance value defined in [16] plus the interruption time stated in section 5.1.2.2.1.

5.1.2.1.2 1.28 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [16].

When the UE receives a RRC message that implies a 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 start transmission 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 or the SYNC-UL in case that a handover to 1.28 Mcps TDD option with SYNCH uplink exchange is recommended at the designated activation time.

where D_{handover} equals the RRC procedure performance value defined [16] 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.

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

$$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC + 10*F_{max} \text{ ms}$$

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

 $\underline{F_{max}}$ denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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

- the target cell has been measured during the last 5 seconds
- the UE has had a radio link connected to the target cell during the last 5 seconds.

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

5.1.2.2.2 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 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.

Table 5.1A: TDD/ TDD handover - interruption time

cell in the handover command	Maximum delay [ms]							
message	Know	n Cell	Unkno	wn 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 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].

5.2.2 Requirements

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

5.2.2.1 TDD/FDD handover delay

5.2.2.1.1 3.84 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

When the UE receives a RRC message implying 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 performance value as defined in [16] plus the interruption time stated in section 5.2.2.2.

5.2.2.1.2 1.28 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

When the UE receives a RRC message that implies a 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 performance value defined in [16] plus the interruption time stated in section 5.2.2.2.2.

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 DPCH 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.

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

$$T_{interrupt} = T_{offset} + 40 + 50*KC + 150*UC + 10*F_{max} ms$$

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

 $\underline{F_{max}}$ denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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 for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] 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, is dependent on whether the target cell is known for the UE or not.

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

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

where,

${ m T_{IU}}$	The interruption uncertainty when changing the timing from the old to the new cell. $T_{\rm IU}$ can be up to one frame (10 ms).
KC	Equal to 1 if a known target cell is indicated in the RRC message implying 1.28Mcps TDD/FDD handover and equal to 0 otherwise.
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying 1.28Mcps

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.

TDD/FDD handover and equal to 0 otherwise.

The phase reference is the Primary CPICH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] is required.

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

Para	meter	Unit	Value	Comment		
DCH parame	ters		DL <u>and UL</u> Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2 and A.2.1		
Power Contro	ol		On			
Target quality DTCH	value on	BLER	0.01			
Initial	Active cell		Cell 1			
conditions	nditions Neighbour cell		Cell 2			
Final condition	Active cell		Cell 2			
HCS			Not used			
0		dB	0	Cell individual offset. This value shall be used for all cells in the test.		
Hysteresis		dB	0			
Time to Trigg	er	ms	0			
Filter coefficie	Filter coefficient		0			
Monitored cell list size			6 TDD neighbours on Channel 1			
T1	T1		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/lor	dB		-3			n.a.			-3			n.a	
SCH_Ec/lor	dB	-9				n.a.			-9			n.a	
SCH_t _{offset}	dB	0			n.a.		5			n.a.			
DPCH_Ec/lor	dB		n.a.		Not	e 1	n.a.		n.a.		n	.a.	Note 1
OCNS_Ec/lor	dB		-3,12		Not	e 2	n.a.	n.a.	-3	,12	n	.a.	Note 2
\hat{I}_{or}/I_{oc}	dB				1			-Inf.	;	3	-1	nf.	3
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	-7	70		n.a	
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition							AW	/GN					

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

A.5.1.1.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 80.40 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

Para	ameter	Unit	Value	Comment
DCH parame	eters		DL and UL Reference	As specified in TS 25.102 section A.2.2
			Measurement Channel 12.2 kbps	and A.2.1
Power Contro	ol		On	
Target quality	Target quality value on DTCH		0.01	
Initial	Active cell		Cell 1	
conditions			Cell 2	
Final condition			Cell 2	
HCS	HCS		Not used	
0	0		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 Trigg	ger	ms	0	
Threshold no frequency	on-used	dBm	-80	Applicable for Event 2C
Filter coeffici	ent		0	
Monitored ce	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	

Table A.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							
namo.		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	Т3
UTRA RF Channel Number		Channel 1				Channel 2							
PCCPCH_Ec/lor	dB	-3 n.a.					-3			n.a			
SCH_Ec/lor	dB	-9				n.a.		-9			n.a.		
SCH_t _{offset}	dB		0			n.a.		5			n.a.		
DPCH_Ec/lor	dB		n.a.		Note	e 1	n.a.		n.a.		n.a	а.	Note 1
OCNS_Ec/lor	dB		-3,12		Note	e 2	n.a.	n.a.	-3,	12	n.a	a.	Note 2
\hat{I}_{or}/I_{oc}	dB				1			-Inf.	7	7	-In	ıf.	7
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	-6	6		n.a	
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition							AW	GN					

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

A.5.1.1.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 80 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 in the single carrier case 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 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 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

Para	ameter	Unit	Value	Comment
DPCH parame	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	Active cell		Cell 1	
conditions Neighbouring cell			Cell 2	
Final condition	Active cell		Cell 2	
0			0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigge	er	ms	0	
Filter coefficie	nt		0	
Monitored cell list size			6 TDD neighbours on Channel 1	
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			
Timeslot Number			0		DwPTS	5		
		T1	T2 T3	T1	T2 T3	T1 T2	T3	
UTRA RF Channel		Channel 1						
Number				Ci	iailiei i			
PCCPCH_Ec/lor	dB		-3			n.a.		
DwPCH_Ec/lor					0			
DPCH_Ec/lor	dB		n.a.		n.a.	Note1	n.a.	
OCNS_Ec/lor	dB		-3			Note2)	
\hat{I}_{or}/I_{oc}	dB		3		3	3		
I_{oc}	dBm/ 1.28	-70						
	MHz	-						
PCCPCH_RSCP	dBm	-70 n.a. n.a.						
Propagation Condition		AWGN						
Parameter	Unit	Cell 2						
Timeslot Number			0		DwPTS	5	5	
		T1	T2 T3	T1	T2 T3	T1 T2	T3	
UTRA RF Channel Number				Ch	nannel 1			
PCCPCH_Ec/lor	dB		-3			n.a.		
DwPCH_Ec/lor					0			
DPCH_Ec/lor	dB		n.a.		n.a.	n.a.	Not e1	
OCNS_Ec/lor	dB	-3 Note2)		
\hat{I}_{or}/I_{oc}	dB	-Inf.	5	-Inf.	5	-Inf.	5	
	dBm/	-70						
I_{oc}	1.28 MHz				-70			
I _{oc} PCCPCH_RSCP	_	-Inf.	-68		n.a.	n.a.		

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to $I_{\rm or}$

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 in the dual carrier case as reported in section 5.1.2.1.2.

The test consists of three successive time periods, with a time duration T1, T2 and T3. 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 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.5.1.7: General test parameters for inter-frequency handover

Para	Parameter		Value	Comment
DPCH parar	meters		DL Reference Measurement	As specified in TS 25.102 section A.2.2.2
			Channel 12.2 kbps	
Power Conti	-		On	
Target quali	Target quality value on DPCH		0.01	
Initial	Active cell		Cell 1	
conditions	conditions Neighbour cell		Cell 2	
Final conditions			Cell 2	
Threshold no frequency	Threshold non used frequency		-75	Absolute RSCP threshold for event 2C
0		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trig	ger	ms	0	
Filter coeffic	ient		0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T1		S	5	
T2		S	10	
T3		S	5	

TableA.5.1.8: Cell Specific parameters for inter-frequency handover

Parameter	Unit	Cell 1								
Timeslot Number			0		DwPTS		5			
		T1	T2 T3	T1	T2 T3	T1	T2	T3		
UTRA RF Channel				Ck	nannel 1					
Number				Ci	iaiiiei i					
PCCPCH_Ec/lor	dB		-3				n.a.			
DwPCH_Ec/lor					0					
DPCH_Ec/lor	dB		n.a.		n.a.	No	ote1	n.a.		
OCNS_Ec/lor	dB		-3				Note2			
\hat{I}_{or}/I_{oc}	dB		3		3		3			
I_{oc}	dBm/ 1.28 MHz	-70								
PCCPCH_RSCP	dBm	-70 n.a. n.a.								
Propagation Condition		AWGN								
Parameter	Unit			(Cell 2					
Timeslot Number			0		DwPTS		5			
		T1	T2 T3	T1	T2 T3	T1	T2	T3		
UTRA RF Channel Number				Cł	nannel 2					
PCCPCH_Ec/lor	dB		-3				n.a.			
DwPCH_Ec/lor					0					
DPCH_Ec/lor	dB		n.a.		n.a.	n	ı.a.	Not e1		
OCNS_Ec/lor	dB	-3 Note2								
\hat{I}_{or}/I_{oc}	dB	-Inf.	9	-Inf.	9	-1	Inf.	9		
I_{oc}	dBm/ 1.28 MHz	-70								
PCCPCH_RSCP	dBm	-Inf.	-64		n.a.		n.a.			
Propagation Condition				-	AWGN					
Note 1: The DDCH level	ic contro	llad by t	the nower cont	rol loon						

The DPCH level is controlled by the power control loop Note 1:

The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 2:

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 T3.

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

Parar	neter	Unit	Value	Comment
DCH par	rameters		DL and UL Reference	As specified in TS 25.102 section annex
			Measurement Channel 12.2 kbps	A.2.2 and TS 25.101 annex A
Power			On	
	ity value on	BLER	0.01	
	CH			
Initial	Active cell		Cell 1	TDD cell
conditions	Neighbour cell		Cell 2	FDD cell
Final	Active cell		Cell 2	FDD cell
condition				
HC	CS		Not used	
(0		0	Cell individual offset. This value shall be used for all cells in the test.
Hyste	Hysteresis		3	Hysteresis parameter for event 2B
Time to	Trigger	ms	0	
Absolute thr	eshold used	dBm	-71	Applicable for Event 2B
frequ				
Threshold frequ		dBm	-80	Applicable for Event 2B
	d frequency		1	Applicable for Event 2B
Filter co	efficient		0	
Monitored	Monitored cell list size		6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
Т	T _{SI}		1.28	The value shall be used for all cells in the test.
Т	1	S	5	
Т	2	S	15	
Т	3	S	5	

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

Parameter	Unit			Cel	l 1				
DL timeslot number		0			2				
		T1	T2	T3	T1	T2	T3		
UTRA RF Channel				Chan	ool 1				
Number				Chan	ilei i				
PCCPCH_Ec/lor	dB		-3			n.a.			
SCH_Ec/lor	dB		-9			n.a.			
SCH_t _{offset}	dB	0			n.a.				
DPCH_Ec/lor	dB		n.a.		Note 1		n.a.		
OCNS_Ec/lor	dB		-3,12		Note 2		n.a.		
\hat{I}_{or}/I_{oc}	dB	5		1	5	-	1		
PCCPCH RSCP	dBm	-68	-7	'4		n.a.			
	dBm/								
I_{oc}	3,84	-70							
	MHz	łz							
Propagation Condition		AWGN							
Note 1: The DPCH level	is controll	ed by the i	oower conti	rol loop		•			

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor

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

Parameter	Unit	Cel	I 2			
		T1, T2	Т3			
CPICH_Ec/lor	dB	-1	0			
PCCPCH_Ec/lor	dB	-1	2			
SCH_Ec/lor	dB	-1	2			
PICH_Ec/lor	dB	-15				
DPCH_Ec/lor	dB	n.a.	Note 1			
OCNS_Ec/lor	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				

The DPCH level is controlled by the power control loop Note 1:

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 140100 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

A.5.2.2.1 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 5.2.2.2.

The test parameters are given in Table A.5.2.4, A.5.2.5 and A.5.2.6 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 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.5.2.4: General test parameters for TDD/FDD handover

Parameter		Unit	Value	Comment				
DCH pa	rameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A				
Power	Control		On					
Initial	Active cell		Cell 1	TDD cell				
conditions	Neighbour cell		Cell 2	FDD cell				
Final condition	Active cell		Cell 2	FDD cell				
(0	dB	0	Cell individual offset. This value shall be used for all cells in the test.				
Hyste	eresis	dB	3	Hysteresis parameter for event 2B				
Time to	Trigger	ms	0					
	reshold used Jency	dBm	-71	Applicable for Event 2B				
Threshold	I non-used Jency	dBm	-80	Applicable for Event 2B				
	d frequency		1	Applicable for Event 2B				
Filter co	efficient		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.				
Т	1	S	5					
Т	2	S	15					
Т	- 3	S	5					

Table A.5.2.5: Cell 1 specific test parameters for TDD/FDD handover

Parameter	Unit			Cel	l 1										
Timeslot number			0		5										
		T1	T2	T3	T1	T2	T3								
UTRA RF Channel Number			Channel 1												
PCCPCH_Ec/lor	dB		-3			n.a.									
DPCH_Ec/lor	dB		n.a.		Not	n.a.									
OCNS_Ec/lor	dB		-3		Not	n.a.									
\hat{I}_{or}/I_{oc}	dB	5	-1	1	5 -1										
PCCPCH RSCP	dBm	-68	-74			n.a.									
I_{oc}	dBm/ 1.28 MHz			-70	0										
Propagation Condition AWGN															
		•	•	•	Note 1: The DPCH level is controlled by the power control loop										

to be equal to lor.

Table A.5.2.6: Cell 2 specific test parameters for TDD/FDD handover

Parameter	Unit		Cell 2					
		T1	T2	T3				
CPICH_Ec/lor	dB		-10					
PCCPCH_Ec/lor	dB		-12					
SCH_Ec/lor	dB		-12					
PICH_Ec/lor	dB		-15					
DPCH_Ec/lor	dB	n.a. Note 1						
OCNS_Ec/lor	dB	-0.9	941	Note 2				
CPICH_RSCP	dBm	-Inf	1	75				
\hat{I}_{or}/I_{oc}	dB	-Inf		5				
I_{oc}	dBm/ 3.84 MHz	-70						
Propagation Condition		AWGN						
Note 1: The DPCH lev	al is controllad	hy the nower	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 $I_{\rm or}$.

A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 130 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 (Radio) Meeting #26

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Madrid, Spain 17 - 22 February, 2003

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to 25.123 v4.7.0

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

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

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 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 [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 [18]. CELL_FACH, CELL_PCH and URA_PCH states are described in [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 [16]. The handover procedure may cause the UE to change its frequency.

5.1.2 Requirements

5.1.2.1 TDD/TDD handover delay

5.1.2.1.1 3.84 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [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 performance value defined in [16] plus the interruption time stated in section 5.1.2.2.1.

5.1.2.1.2 1.28 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover are specified in [16].

When the UE receives a RRC message that implies a 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 start transmission 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 or the SYNC-UL in case that a handover to 1.28 Mcps TDD option with SYNCH uplink exchange is recommended at the designated activation time.

where D_{handover} equals the RRC procedure performance value defined [16] 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.

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

$$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC + 10*F_{max} \text{ ms}$$

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

 $\underline{F_{max}}$ denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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

- the target cell has been measured during the last 5 seconds
- the UE has had a radio link connected to the target cell during the last 5 seconds.

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

5.1.2.2.2 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 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.

Table 5.1A: TDD/ TDD handover - interruption time

cell in the handover command	Maximum delay [ms]								
message	Know	n 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 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]

5.2.2 Requirements

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

5.2.2.1 TDD/FDD handover delay

5.2.2.1.1 3.84 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

When the UE receives a RRC message implying 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 performance value as defined in [16] plus the interruption time stated in section 5.2.2.2.

5.2.2.1.2 1.28 Mcps TDD option

RRC procedure performance values for all RRC procedures that can command a hard handover, are specified in [16].

When the UE receives a RRC message that implies a 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.

 $D_{handover}$ equals the RRC procedure performance value defined in [16] plus the interruption time stated in section 5.2.2.2.2.

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 DPCH 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.

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

$$T_{interrupt} = T_{offset} + 40 + 50*KC + 150*UC + 10*F_{max} ms$$

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

 $\underline{F_{max}}$ denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

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 for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] 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, is dependent on whether the target cell is known for the UE or not

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

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

where,

${ m T_{IU}}$	The interruption uncertainty when changing the timing from the old to the new cell. $T_{\rm IU}$ can be up to one frame (10 ms).
KC	Equal to 1 if a known target cell is indicated in the RRC message implying 1.28Mcps TDD/FDD handover and equal to 0 otherwise.
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying 1.28Mcps

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.

TDD/FDD handover and equal to 0 otherwise.

The phase reference is the Primary CPICH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is 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 [23] is required.

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

Para	meter	Unit	Value	Comment		
DCH parame	ters		DL <u>and UL</u> Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2 and A.2.1		
Power Contro	ol		On			
Target quality DTCH	value on	BLER	0.01			
Initial	Active cell		Cell 1			
conditions	Neighbour cell		Cell 2			
Final condition	1		Cell 2			
HCS			Not used			
0		dB	0	Cell individual offset. This value shall be used for all cells in the test.		
Hysteresis		dB	0			
Time to Trigg	er	ms	0			
Filter coefficie	ent		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				Cha	nnel 1					Cha	nnel 1			
PCCPCH_Ec/lor	dB		-3			n.a.			-3			n.a	l.	
SCH_Ec/lor	dB		-9			n.a.			-9			n.a.		
SCH_t _{offset}	dB		0			n.a.		5			n.a.			
DPCH_Ec/lor	dB		n.a.		Not	e 1	n.a.	n.a.		n	.a.	Note 1		
OCNS_Ec/lor	dB		-3,12		Note 2 n.a.		n.a.	-3	,12	n	.a.	Note 2		
\hat{I}_{or}/I_{oc}	dB				1	1			-Inf. 3		-Inf.		3	
PCCPCH RSCP	dBm	-72 n.aInf70 n.a.						١.						
I_{oc}	dBm/ 3,84 MHz	-70												
Propagation Condition							AW	/GN						

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

A.5.1.1.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 80.40 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

Par	ameter	Unit	Value	Comment				
DCH parame	eters		DL and UL Reference	As specified in TS 25.102 section A.2.2				
			Measurement Channel 12.2 kbps	and A.2.1				
Power Contr	ol		On					
Target qualit	y value on	BLER	0.01					
Initial	Active cell		Cell 1					
conditions	Neighbour cell		Cell 2					
Final condition	Active cell		Cell 2					
HCS			Not used					
0		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 Trigg	ger	ms	0					
Threshold no frequency	on-used	dBm	-80	Applicable for Event 2C				
Filter coeffici	ent		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				Cha	nnel 1					Cha	hannel 2		
PCCPCH_Ec/lor	dB		-3			n.a.			-3		n.a.		
SCH_Ec/lor	dB	-9 n.a.				n.a.		-9			n.a.		
SCH_t _{offset}	dB		0			n.a.			5			n.a.	
DPCH_Ec/lor	dB		n.a.		Note	e 1	n.a.	n.a.		n.a	а.	Note 1	
OCNS_Ec/lor	dB		-3,12		Note 2 n.a.		n.a.	-3,	12	n.a	a.	Note 2	
\hat{I}_{or}/I_{oc}	dB				1			-Inf.	7	7	-In	f.	7
PCCPCH RSCP	dBm		-72			n.a.		-Inf.	-6	6		n.a	
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition							AW	GN					

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .

A.5.1.1.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to Cell 2 less than 80 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 in the single carrier case 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 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 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

Para	ameter	Unit	Value	Comment
DPCH parame	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	Active cell		Cell 1	
conditions	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
0		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigge	er	ms	0	
Filter coefficie	nt		0	
Monitored cell list size			6 TDD neighbours on Channel 1	
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		
Timeslot Number		0			DwPTS	5	
		T1	T2 T3	T1	T2 T3	T1 T2	T3
UTRA RF Channel				Ch	nannel 1		
Number				Ci	iailiei i		
PCCPCH_Ec/lor	dB		-3			n.a.	
DwPCH_Ec/lor					0		
DPCH_Ec/lor	dB		n.a.		n.a.	Note1	n.a.
OCNS_Ec/lor	dB		-3			Note2)
\hat{I}_{or}/I_{oc}	dB		3		3	3	
I_{oc}	dBm/ 1.28				-70		
	MHz						
PCCPCH_RSCP	dBm	-70 n.a. n.a.					
Propagation Condition		AWGN					
Parameter	Unit	Cell 2					
Timeslot Number			0		DwPTS	5	
		T1	T2 T3	T1	T2 T3	T1 T2	T3
UTRA RF Channel Number				Ch	nannel 1		
PCCPCH_Ec/lor	dB		-3			n.a.	
DwPCH_Ec/lor					0		
DPCH_Ec/lor	dB		n.a.		n.a.	n.a.	Not e1
OCNS_Ec/lor	dB		-3)
\hat{I}_{or}/I_{oc}	dB	-Inf. 5 -Ir		-Inf.	5	-Inf.	5
	dBm/	-70					
I_{oc}	1.28 MHz				-70		
I _{oc} PCCPCH_RSCP	_	-Inf.	-68		n.a.	n.a.	

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 $I_{\rm or}$

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 in the dual carrier case as reported in section 5.1.2.1.2.

The test consists of three successive time periods, with a time duration T1, T2 and T3. 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 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.5.1.7: General test parameters for inter-frequency handover

Para	Parameter Unit		Value	Comment
DPCH parar	DPCH parameters		DL Reference Measurement	As specified in TS 25.102 section A.2.2.2
			Channel 12.2 kbps	
Power Conti	-		On	
Target quali	ty value on	BLER	0.01	
Initial	Active cell		Cell 1	
conditions	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold no frequency	on used	dBm	-75	Absolute RSCP threshold for event 2C
0		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trig	ger	ms	0	
Filter coeffic	ient		0	
Monitored co	ell list size		6 TDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T1		S	5	
T2		S	10	
T3		S	5	

TableA.5.1.8: Cell Specific parameters for inter-frequency handover

Parameter	Unit	Cell 1						
Timeslot Number			0 DwPTS 5					
		T1	T2 T3	T1	T2 T3	T1	T2	T3
UTRA RF Channel				Ck	nannel 1			
Number				Ci	iaiiiei i			
PCCPCH_Ec/lor	dB		-3				n.a.	
DwPCH_Ec/lor					0			
DPCH_Ec/lor	dB		n.a.		n.a.	No	ote1	n.a.
OCNS_Ec/lor	dB		-3				Note2	
\hat{I}_{or}/I_{oc}	dB		3		3		3	
I_{oc}	dBm/ 1.28 MHz	-70						
PCCPCH_RSCP	dBm	-70 n.a. n.a.						
Propagation Condition		AWGN						
Parameter	Unit			(Cell 2			
Timeslot Number			0		DwPTS		5	
		T1	T2 T3	T1	T2 T3	T1	T2	T3
UTRA RF Channel Number				Cł	nannel 2			
PCCPCH_Ec/lor	dB		-3				n.a.	
DwPCH_Ec/lor					0			
DPCH_Ec/lor	dB		n.a.		n.a.	n	ı.a.	Not e1
OCNS_Ec/lor	dB	-3 Note2						
\hat{I}_{or}/I_{oc}	dB	-Inf. 9 -Inf. 9		9	-1	Inf.	9	
I_{oc}	dBm/ 1.28 MHz	-70						
PCCPCH_RSCP	dBm	-Inf.	-64		n.a.		n.a.	
Propagation Condition		AWGN						
	ic contro	rolled by the nower control loop						

The DPCH level is controlled by the power control loop Note 1:

The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 2:

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 T3.

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

Parar	Parameter Unit		Value	Comment
DCH par	DCH parameters		DL and UL Reference	As specified in TS 25.102 section annex
			Measurement Channel 12.2 kbps	A.2.2 and TS 25.101 annex A
Power			On	
	ity value on	BLER	0.01	
	CH			
Initial	Active cell		Cell 1	TDD cell
conditions	Neighbour cell		Cell 2	FDD cell
Final	Active cell		Cell 2	FDD cell
condition				
HC	CS		Not used	
()	dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hyste	eresis	dB	3	Hysteresis parameter for event 2B
Time to	Trigger	ms	0	
Absolute thr	eshold used	dBm	-71	Applicable for Event 2B
frequ				
Threshold frequ		dBm	-80	Applicable for Event 2B
	d frequency		1	Applicable for Event 2B
Filter co	efficient		0	
Monitored	Monitored cell list size		6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
Т	SI	S	1.28	The value shall be used for all cells in the test.
Т	1	S	5	
Т	2	S	15	
Т	3	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				Chan	ool 1			
Number				Chan	ilei i			
PCCPCH_Ec/lor	dB		-3			n.a.		
SCH_Ec/lor	dB		-9			n.a.		
SCH_t _{offset}	dB	0 r		n.a.				
DPCH_Ec/lor	dB	n.a. Note 1		te 1	n.a.			
OCNS_Ec/lor	dB		-3,12		No	te 2	n.a.	
\hat{I}_{or}/I_{oc}	dB	5		1	5	-	1	
PCCPCH RSCP	dBm	-68	-7	'4	n.a.			
	dBm/							
I_{oc}	3,84	-70						
	MHz							
Propagation Condition				AW	GN			
Note 1: The DPCH level	is control	led by the i	oower conti	rol loop	•	•	•	

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor

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

Parameter	Unit	Cel	12			
		T1, T2	Т3			
CPICH_Ec/lor	dB	-10)			
PCCPCH_Ec/lor	dB	-1:	2			
SCH_Ec/lor	dB	-1:	2			
PICH_Ec/lor	dB	-1:	5			
DPCH_Ec/lor	dB	n.a.	Note 1			
OCNS_Ec/lor	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 DDCH level is	c controllor	hy the power central	loon			

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 140100 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

A.5.2.2.1 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 5.2.2.2.

The test parameters are given in Table A.5.2.4, A.5.2.5 and A.5.2.6 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 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.5.2.4: General test parameters for TDD/FDD handover

Para	Parameter Ur		Value	Comment
DCH pa	DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A
Power	Power Control		On	
Initial	Active cell		Cell 1	TDD cell
conditions	Neighbour cell		Cell 2	FDD cell
Final condition	Active cell		Cell 2	FDD cell
(0	dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hyste	Hysteresis		3	Hysteresis parameter for event 2B
Time to	Trigger	ms	0	
	reshold used Jency	dBm	-71	Applicable for Event 2B
Threshold	I non-used Jency	dBm	-80	Applicable for Event 2B
	d frequency		1	Applicable for Event 2B
Filter co	efficient		0	
Monitored	Monitored cell list size		6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
Т	T _{SI}		1.28	The value shall be used for all cells in the test.
Т	1	S	5	
Т	2	S	15	
Т	- 3	S	5	

Table A.5.2.5: Cell 1 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 1							
Timeslot number		0				5			
		T1	T2	T3	T1	T2	T3		
UTRA RF Channel Number		Channel 1							
PCCPCH_Ec/lor	dB	-3 n.a.							
DPCH_Ec/lor	dB	n.a.			Not	Note 1			
OCNS_Ec/lor	dB		-3		-3		Not	e 2	n.a.
\hat{I}_{or}/I_{oc}	dB	5	-1	1	5		-1		
PCCPCH RSCP	dBm	-68	-74			n.a.			
I_{oc}	dBm/ 1.28 MHz	-70							
Propagation Condition		AWGN							
Note 1: The DPCH le Note 2: The power of		•	•	•	the total p	ower from	the cell		

to be equal to lor.

Table A.5.2.6: Cell 2 specific test parameters for TDD/FDD handover

Parameter	Unit		Cell 2		
		T1	T2	T3	
CPICH_Ec/lor	dB		-10		
PCCPCH_Ec/lor	dB		-12		
SCH_Ec/lor	dB		-12		
PICH_Ec/lor	dB		-15		
DPCH_Ec/lor	dB	n.a. Note 1			
OCNS_Ec/lor	dB	-0.9	941	Note 2	
CPICH_RSCP	dBm	-Inf	1	75	
\hat{I}_{or}/I_{oc}	dB	-Inf		5	
I_{oc}	dBm/ 3.84 MHz	-70			
Propagation Condition		AWGN			
Note 1: The DPCH lev	al is controllad	hy the nower	control loop		

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 $I_{\rm or}$.

A.5.2.2.2 Test Requirements

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

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

R4-030049

Madrid, Spain 17 - 22 February, 2003

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

9.2.2.2 Transmitted code power

The measurement period shall be 100 ms.

9.2.2.2.1 Absolute accuracy requirements

Table 9.47: Transmitted code power absolute accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Transmitted code	dB	<u></u> ± 3]	Over the full range
power			

9.2.2.2.2 Relative accuracy requirements

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

Table 9.48: Transmitted code power relative accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Transmitted code	dB	± 2	Over the full range
power			

9.2.2.2.3 Range/mapping

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

In table 9.49 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.49

Reported value	Measured quantity value	Unit
UTRAN_CODE_POWER _010	-10,0 ≤ Transmitted code power < -9,5	dBm
UTRAN_CODE_POWER _011	-9,5 ≤ Transmitted code power < -9,0	dBm
UTRAN_CODE_POWER _012	-9,0 ≤ Transmitted code power < -8,5	dBm
	•••	•••
UTRAN_CODE_POWER _120	45,0 ≤ Transmitted code power < 45,5	dBm
UTRAN_CODE_POWER _121	45,5 ≤ Transmitted code power < 46,0	dBm
UTRAN_CODE_POWER _122	46,0 ≤ Transmitted code power < 46,5	dBm

R4-030050

Madrid, Spain 17 - 22 February, 2003

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

9.2.2.2 Transmitted code power

The measurement period shall be 100 ms.

9.2.2.2.1 Absolute accuracy requirements

Table 9.47: Transmitted code power absolute accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Transmitted code	dB	<u></u> ± 3]	Over the full range
power			

9.2.2.2.2 Relative accuracy requirements

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

Table 9.48: Transmitted code power relative accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Transmitted code	dB	± 2	Over the full range
power			

9.2.2.2.3 Range/mapping

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

In table 9.49 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.49

Reported value	Measured quantity value	Unit
UTRAN_CODE_POWER _010	-10,0 ≤ Transmitted code power < -9,5	dBm
UTRAN_CODE_POWER _011	-9,5 ≤ Transmitted code power < -9,0	dBm
UTRAN_CODE_POWER _012	-9,0 ≤ Transmitted code power < -8,5	dBm
UTRAN_CODE_POWER _120	45,0 ≤ Transmitted code power < 45,5	dBm
UTRAN_CODE_POWER _121	45,5 ≤ Transmitted code power < 46,0	dBm
UTRAN_CODE_POWER _122	46.0 ≤ Transmitted code power < 46.5	dBm

R4-030051

Madrid, Spain 17 - 22 February, 2003

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Clauses affected:	\mathfrak{H}	9.2.2	2.2.1										
Other specs affected:		Y N X X	Other	r core spe specificat Specifica	ions	ons	æ						
Other comments:	\mathfrak{H}		valent 5.123 v		ther Rel	leases:	CR2	93 ca	at. F to 2	5.123	3 v3.1	1.0, CR2	294 cat. A

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

- 1) Fill out the above form. The symbols above marked \(\mathcal{H} \) contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
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9.2.2.2 Transmitted code power

The measurement period shall be 100 ms.

9.2.2.2.1 Absolute accuracy requirements

Table 9.47: Transmitted code power absolute accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Transmitted code	dB	<u></u> ± 3]	Over the full range
power			

9.2.2.2.2 Relative accuracy requirements

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

Table 9.48: Transmitted code power relative accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Transmitted code	dB	± 2	Over the full range
power			

9.2.2.2.3 Range/mapping

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

In table 9.49 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.49

Reported value	Measured quantity value	Unit
UTRAN_CODE_POWER _010	-10,0 ≤ Transmitted code power < -9,5	dBm
UTRAN_CODE_POWER _011	-9,5 ≤ Transmitted code power < -9,0	dBm
UTRAN_CODE_POWER _012	-9,0 ≤ Transmitted code power < -8,5	dBm
UTRAN_CODE_POWER _120	45,0 ≤ Transmitted code power < 45,5	dBm
UTRAN_CODE_POWER _121	45,5 ≤ Transmitted code power < 46,0	dBm
UTRAN_CODE_POWER _122	46.0 ≤ Transmitted code power < 46.5	dBm

R4-030052

Madrid, Spain 17 - 22 February, 2003

			(CHANGE	RE	QUE	ST			CR-Form-v7
*	2	25.123	CR	296	жre	ev	\mathfrak{H}	Current vers	ion: 3.11	.0 #
For <u>HELP</u> on	n usii									symbols.
Proposed chang	e af	fects: l	JICC a	pps#	ME	X Rad	lio Ad	ccess Networ	k Core	Network
Title:	\mathfrak{H}	UE timer	accura	cy for TDD						
Source:	¥	RAN WG	4							
Work item code:	æ	TEI						Date: ₩	04/03/200	3
Category:	L	F (corr A (corr B (add C (fund D (edit	rection) respond lition of ctional l torial m blanatio	ds to a correction feature), modification of foodification) ns of the above	on in an)	lease	2 R96 R97 R98 R99 Rel-4 Rel-5	R99 the following (GSM Phase (Release 199 (Release 199 (Release 199 (Release 4) (Release 5) (Release 6)	: 2) 96) 97) 98)

Reason for change: # UE timers are used in different protocol entities to control the UE behaviour. Some examples are (TS 25.331):

- T305: Sets the time for UE periodic transmission of CELL UPDATE and URA UPDATE messages.
 Value range: 5, 10, 30, 60, 120, 360, 720, infinity [minutes]
- T314 and T315: Sets the time for how long UE shall attempt to reestablish the RRC Connection, in case of radio link failure.
 Value range T314: 0, 2, 4, 6, 8, 12, 16, 20 [seconds]
 Value range T315: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]
- T316 and T317: Sets the time for how long UE can be out-of-service in states Cell_PCH/URA_PCH and Cell_FACH.
 Value range T316: 0, 10, 20, 30, 40, 50, infinity [seconds]
 Value range T317: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]

It is assumed that in a typical UE implementation, the time measurement function is quite accurate, since most UE implementations are expected to provide e.g. a time of day clock feature. However, requirements on UE timer accuracy would facilitate the UTRAN setting of the corresponding timers on the network side. For this purpose, we expect that not so tight accuracy requirements are needed.

Furthermore, for UE conformance test cases in TS 34.123, reference to core specification requirements on UE timer accuracy would facilitate setting of test requirements. Otherwise, the requirements would be implicitly specified by the conformance test cases, which is not a desired situation.

Therefore if we do not add these requirements there will be:

		 Problems in setting of UTRAN timers for supervising UE procedures Problems when setting test requirements in UE conformance tests
		Problems when setting test requirements in OE conformance tests
Summary of change: ₩		Requirements on UE timer accuracy have been introduced.
Consequences if not approved:	¥	Requirements on UE timer accuracy would be missing.
Clauses offeeted:	90	7.4 (2004)

Clauses affected:	第 7.4 (new)
Other specs affected:	Y N X Other core specifications Test specifications O&M Specifications
Other comments:	# Equivalent CRs in other Releases: CR297 cat. A to 25.123 v4.7.0, CR298 cat. A to 25.123 v5.3.0

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

7 Timing characteristics

7.1 Timing Advance (TA) requirements

7.1.1 Introduction

The timing advance is initiated from UTRAN with an RRC message that implies an adjustement of the timing advance, see TS 25.331 section 8.6.6.26.

To update timing advance of a UE, the UTRAN measures RX Timing deviation. The measurements are defined in TS 25.225 and measurement accuracies are specified in section 9.

7.1.2 Requirements

7.1.2.1 Timing Advance adjustement accuracy

The UE shall adjust the timing of its transmissions with an accuracy better than or equal to ± 0.5 chip to the signalled timing advance value.

7.1.2.2 Timing Advance adjustement delay

The UE shall adjust the timing of its transmission at the designated activation time, when the indicated activation time is later than D_{TA} msec from the end of the last TTI containing the RRC message implying an adjustement of the timing advance.

 D_{TA} equals the RRC procedure delay of the RRC message implying an adjustement of the timing advance as defined in TS25.331 section 13.5.

7.2 Cell synchronization accuracy

7.2.1 Definition

Cell synchronization accuracy is defined as the maximum deviation in frame start times between any pair of cells on the same frequency that have overlapping coverage areas.

7.2.2 Minimum requirements

The cell synchronization accuracy shall be better than or equal to $3\mu s$.

7.3 UE Transmit Timing

7.3.1 Definition

UE transmit timing is defined as the frame start time of uplink transmissions relative to the downlink frame timing at zero propagation delay with timing advance turned off. The reference point for UE transmit timing shall be the antenna connector. This is applicable for the AWGN propagation condition. In the case of multi-path fading conditions, the reference point for UE transmit timing shall be the first significant path of the received PCCPCH.

7.3.2 Minimum Requirement

The UE transmit timing error shall be within 0 to +3 chips for the AWGN propagation condition.

7.4 UE timer accuracy

7.4.1 Introduction

<u>UE timers are used in different protocol entities to control the UE behaviour.</u>

7.4.2 Requirements

For UE timers T3xx, $T_{\underline{barred}}$, Treselection, Penalty_time, $T_{\underline{CRmax}}$, $T_{\underline{CrmaxHyst}}$ [16], UE shall comply with the timer accuracies according to Table 7.1.

The requirements are only related to the actual timing measurements internally in the UE. They do not include the following:

- Inaccuracy in the start and stop conditions of a timer (e.g. UE reaction time to detect that start and stop conditions of a timer is fulfilled), or
- Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Timer value [s]	<u>Accuracy</u>
timer value <4	<u>± 0.1 s</u>
timer value ≥ 4	± 2.5 %

Table 7.1

R4-030053

Madrid,	Spain	17 -	- 22	February,	2003
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\mathfrak{H}	25.123 CR								
ж	23.123 CR	297	жrev	3	Ħ	Current versi	ion: 4.7	.0	*
	sing this form, see								
Proposed change a			ME <mark>X</mark>	Radi	o Ac	ccess Networ	k Cor	e Ne	etwork
Title: #	UE timer accura	cy for TDD							
Source: #	RAN WG4								
Work item code: ₩	TEI					<i>Date:</i> ♯	04/03/20	03	
Category:	B (addition of	ds to a correction feature), modification of fo odification) ns of the above	n in an earli eature)		ease	R96 R97 R98 R99 Rel-4 Rel-5		se 2) 996) 997) 998) 999))	ases:

Reason for change: # UE timers are used in different protocol entities to control the UE behaviour. Some examples are (TS 25.331):

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 Value range T314: 0, 2, 4, 6, 8, 12, 16, 20 [seconds]
 Value range T315: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]
- T316 and T317: Sets the time for how long UE can be out-of-service in states Cell_PCH/URA_PCH and Cell_FACH.
 Value range T316: 0, 10, 20, 30, 40, 50, infinity [seconds]
 Value range T317: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]

It is assumed that in a typical UE implementation, the time measurement function is quite accurate, since most UE implementations are expected to provide e.g. a time of day clock feature. However, requirements on UE timer accuracy would facilitate the UTRAN setting of the corresponding timers on the network side. For this purpose, we expect that not so tight accuracy requirements are needed.

Furthermore, for UE conformance test cases in TS 34.123, reference to core specification requirements on UE timer accuracy would facilitate setting of test requirements. Otherwise, the requirements would be implicitly specified by the conformance test cases, which is not a desired situation.

Therefore if we do not add these requirements there will be:

	■ Problems in setting of UTRAN timers for supervising UE procedures
	Problems when setting test requirements in UE conformance tests
Summary of change: ₩	Requirements on UE timer accuracy have been introduced.
	Requirements on UE timer accuracy would be missing.
Consequences if # not approved:	Requirements on UE timer accuracy would be missing.

Clauses affected:	策 7.4 (new)
Other specs affected:	Y N X Other core specifications Test specifications O&M Specifications
Other comments:	# Equivalent CRs in other Releases: CR296 cat. F to 25.123 v3.11.0, CR298 cat. A to 25.123 v5.3.0

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7 Timing characteristics

7.1 Timing Advance

7.1.1 3.84 Mcps TDD option

7.1.1.1 Introduction

The timing advance is initiated from UTRAN with an RRC message that implies an adjustement of the timing advance, see TS 25.331 section 8.6.6.26.

To update timing advance of a UE, the UTRAN measures RX Timing deviation. The measurements are defined in TS 25.225 and measurement accuracies are specified in section 9.

7.1.1.2 Requirements

7.1.1.2.1 Timing Advance adjustment accuracy

The UE shall adjust the timing of its transmissions with an accuracy better than or equal to ± 0.5 chip to the signalled timing advance value.

7.1.1.2.2 Timing Advance adjustment delay

The UE shall adjust the timing of its transmission at the designated activation time, when the indicated activation time is later than D_{TA} msec from the end of the last TTI containing the RRC message implying an adjustment of the timing advance.

 D_{TA} equals the RRC procedure delay of the RRC message implying an adjustment of the timing advance as defined in TS25.331 section 13.5.

7.1.2 1.28 Mcps TDD option

For 1.28 Mcps TDD the timing advance in the UE is adjusted by means of uplink synchronization. For the random access procedure the node B commands the UE to adjust its synchronisation shift by means of signalling the received position of the UpPTS in the FPACH. During the connection the node B measures the timing in the uplink and transmits a SS (Synchronization Shift) command to the UE at least once per sub-frame.

These SS commands determined whether the UE synchronization shift is either left unchanged, or adjusted 1 step up or 1 step down. The step size of the SS adjustment is (k/8)Tc where k (=1,2,...,8) is signalled by higher layer signalling.

7.1.2.1 Uplink synchronization control requirements for UE for 1.28 Mcps TDD option

Uplink synchronization control is the ability of the UE transmitter to adjust its TX timing in accordance with one or more SS commands received in the downlink.

7.1.2.1.1 Uplink synchronization control steps

The SS step is the change in UE transmission timing in response to a single SS command, SS_cmd, received by the UE.

7.1.2.1.1.1 Minimum requirement

The UE transmitter shall have the capability of changing the transmission timing with a step size of 1/8, 2/8, 3/8, ..., 1 chip according to the value of Δ_{SS} , within n=(1,2,...,14) time slots excluding special timeslots (DwPTS, GP, UpPTS) after the SS_cmd arrived (closed loop). For the open loop any step being a multiple of 1/8 chip has to be allowed.

- a) The minimum transmission timing step $\Delta_{SS,min}$ due to closed loop uplink synchronization control shall be within the range shown in Table 7.1.
- b) In case uplink synchronization control implies larger adjustment than the minimum step the UE shall perform a multiple integer number of the minimum step. Within the implementation grid of the applicable timing steps of the UE the step being closest to the required step should be executed.

Table 7.1: Uplink synchronisation control range

	Uplink synchronisation control range for minimum step				
SS_cmd	1/8 chip step size				
	Lower	Upper			
Up	1/9 chip	1/7 chip			
Down	1/9 chip	1/7 chip			

7.2 Cell synchronization accuracy

7.2.1 Definition

Cell synchronization accuracy is defined as the maximum deviation in frame start times between any pair of cells on the same frequency that have overlapping coverage areas.

7.2.2 Minimum requirements

The cell synchronization accuracy shall be better than or equal to 3 us.

7.3 UE Transmit Timing for 3.84 Mcps TDD Option

7.3.1 Definition

UE transmit timing is defined as the frame start time of uplink transmissions relative to the downlink frame timing at zero propagation delay with timing advance turned off. The reference point for UE transmit timing shall be the antenna connector. This is applicable for the AWGN propagation condition. In the case of multi-path fading conditions, the reference point for UE transmit timing shall be the first significant path of the received PCCPCH.

7.3.2 Minimum Requirement

The UE transmit timing error shall be within 0 to +3 chips for the AWGN propagation condition.

7.4 UE timer accuracy

7.4.1 Introduction

UE timers are used in different protocol entities to control the UE behaviour.

7.4.2 Requirements

For UE timers T3xx, T_{barred} , Treselection, Penalty time, T_{CRmax} , $T_{\text{CrmaxHyst}}$ [16], UE shall comply with the timer accuracies according to Table 7.1.

The requirements are only related to the actual timing measurements internally in the UE. They do not include the following:

Inaccuracy in the start and stop conditions of a timer (e.g. UE reaction time to detect that start and stop conditions of a timer is fulfilled), or

Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Timer value [s]	<u>Accuracy</u>
timer value <4	<u>± 0.1 s</u>
timer value ≥ 4	± 2.5 %

Table 7.1

R4-030054

Madrid, Spain 17 - 22 February, 2003

			(CHANGE	REQ	UE	ST				CR-Form-v7
*		25.123	CR	298	жrev		\mathbb{H}	Current versi	on:	5.3.0	ж
For <u>HELP</u> or	า us	ing this forn	n, see	e bottom of this	s page or	look a	at the	e pop-up text	over	the ℋ syn	mbols.
Proposed chang	je a	ffects: U	ICC a	apps器 <mark> </mark>	ME X	Rad	lio Ad	ccess Networ	k	Core Ne	etwork
Title:	¥	UE timer a	ccura	acy for TDD							
Source:	Ħ	RAN WG4									
Work item code:	**	TEI						Date: ℜ	04/0	03/2003	
Category:		F (corre A (corre B (addi C (func D (edito	ection) espone tion of tional orial m anatic	ds to a correction f feature), modification of the modification) ons of the above	n in an ea feature)		lease	R96 R97 R98 R99 Rel-4 Rel-5	the folicities (Releader) (Releader) (Releader) (Releader) (Releader) (Releader)	•	eases:

Reason for change: # UE timers are used in different protocol entities to control the UE behaviour. Some examples are (TS 25.331):

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 Value range T316: 0, 10, 20, 30, 40, 50, infinity [seconds]
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It is assumed that in a typical UE implementation, the time measurement function is quite accurate, since most UE implementations are expected to provide e.g. a time of day clock feature. However, requirements on UE timer accuracy would facilitate the UTRAN setting of the corresponding timers on the network side. For this purpose, we expect that not so tight accuracy requirements are needed.

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	 Problems in setting of UTRAN timers for supervising UE procedures 						
	Problems when setting test requirements in UE conformance tests						
Summary of change: \$	Requirements on UE timer accuracy have been introduced.						
Consequences if anot approved:	Requirements on UE timer accuracy would be missing.						
Clauses affected: 3	f 7.4 (new)						
	YN						
Other specs affected:	Other core specifications # Test specifications O&M Specifications						
Other comments: 3	Equivalent CRs in other Releases: CR296 cat. F to 25.123 v3.11.0, CR297 cat. A to 25.123 v4.7.0						

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7 Timing characteristics

7.1 Timing Advance

7.1.1 3.84 Mcps TDD option

7.1.1.1 Introduction

The timing advance is initiated from UTRAN with an RRC message that implies an adjustement of the timing advance, see TS 25.331 section 8.6.6.26.

To update timing advance of a UE, the UTRAN measures RX Timing deviation. The measurements are defined in TS 25.225 and measurement accuracies are specified in section 9.

7.1.1.2 Requirements

7.1.1.2.1 Timing Advance adjustment accuracy

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7.1.1.2.2 Timing Advance adjustment delay

The UE shall adjust the timing of its transmission at the designated activation time, when the indicated activation time is later than D_{TA} msec from the end of the last TTI containing the RRC message implying an adjustment of the timing advance.

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7.1.2.1.1 Uplink synchronization control steps

The SS step is the change in UE transmission timing in response to a single SS command, SS_cmd, received by the UE.

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- a) The minimum transmission timing step $\Delta_{SS,min}$ due to closed loop uplink synchronization control shall be within the range shown in Table 7.1.
- b) In case uplink synchronization control implies larger adjustment than the minimum step the UE shall perform a multiple integer number of the minimum step. Within the implementation grid of the applicable timing steps of the UE the step being closest to the required step should be executed.

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7.2 Cell synchronization accuracy

7.2.1 Definition

Cell synchronization accuracy is defined as the maximum deviation in frame start times between any pair of cells on the same frequency that have overlapping coverage areas.

7.2.2 Minimum requirements

The cell synchronization accuracy shall be better than or equal to 3 us.

7.3 UE Transmit Timing for 3.84 Mcps TDD Option

7.3.1 Definition

UE transmit timing is defined as the frame start time of uplink transmissions relative to the downlink frame timing at zero propagation delay with timing advance turned off. The reference point for UE transmit timing shall be the antenna connector. This is applicable for the AWGN propagation condition. In the case of multi-path fading conditions, the reference point for UE transmit timing shall be the first significant path of the received PCCPCH.

7.3.2 Minimum Requirement

The UE transmit timing error shall be within 0 to +3 chips for the AWGN propagation condition.

7.4 UE timer accuracy

7.4.1 Introduction

UE timers are used in different protocol entities to control the UE behaviour.

7.4.2 Requirements

For UE timers T3xx, T_{barred} , Treselection, Penalty time, T_{CRmax} , $T_{\text{CrmaxHyst}}$ [16], UE shall comply with the timer accuracies according to Table 7.1.

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Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Timer value [s]	<u>Accuracy</u>
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Table 7.1