TSG RAN Meeting #14

RP-010791

Kyoto, Japan, 11 - 14 December 2001

Title:CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.133 (2)Source:TSG RAN WG4Agenda Item:8.4.3

RAN4 Tdoc	Spec	CR	Title	Cat	Phase	Curr Ver	New Ver
R4-011519	25.133	205	Test conditions for UE Tx power measurement	F	Rel99	3.7.0	3.8.0
R4-011520	25.133	206	Test conditions for UE Tx power measurement	Α	Rel-4	4.2.0	4.3.0
R4-011521	25.133	207	Test conditions for UE Tx power measurement	А	Rel-5	5.0.0	5.1.0
R4-011627	25.133	208	Correction to general requirements for support of compressed mode	F	Rel99	3.7.0	3.8.0
R4-011628	25.133	209	Correction to general requirements for support of compressed mode	Α	Rel-4	4.2.0	4.3.0
R4-011629	25.133	210	Correction to general requirements for support of compressed mode	Α	Rel-5	5.0.0	5.1.0
R4-011631	25.133	211	UE Tx Timing rate	F	Rel99	3.7.0	3.8.0
R4-011632	25.133	212	UE Tx Timing rate	Α	Rel-4	4.2.0	4.3.0
R4-011633	25.133	213	UE Tx Timing rate	Α	Rel-5	5.0.0	5.1.0
R4-011637	25.133	214	Requirements and test parameters for UE measurements	F	Rel99	3.7.0	3.8.0
R4-011638	25.133	215	Requirements and test parameters for UE measurements	Α	Rel-4	4.2.0	4.3.0
R4-011639	25.133	216	Requirements and test parameters for UE measurements	Α	Rel-5	5.0.0	5.1.0
R4-011640	25.133	217	Clarifications on requirements for reporting criteria per measurement category	F	Rel99	3.7.0	3.8.0
R4-011641	25.133	218	Clarifications on requirements for reporting criteria per measurement category	A	Rel-4	4.2.0	4.3.0
R4-011642	25.133	219	Clarifications on requirements for reporting criteria per measurement category	A	Rel-5	5.0.0	5.1.0
R4-011643	25.133	220	Inconsistent use of "sets of cells" with respect to definition of RRC specs.	F	Rel99	3.7.0	3.8.0
R4-011644	25.133	221	Inconsistent use of "sets of cells" with respect to definition of RRC specs.	A	Rel-4	4.2.0	4.3.0
R4-011645	25.133	222	Inconsistent use of "sets of cells" with respect to definition of RRC specs.	A	Rel-5	5.0.0	5.1.0

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	CR-Form-v4
¥	25.133 CR 205 # ev _ # Current version: 3.7.0 #
For <u>HELP</u> on u	sing this form, see bottom of this page or look at the pop-up text over the $#$ symbols.
Proposed change	affects: # (U)SIM ME/UE X Radio Access Network Core Network
<i>Title:</i> ೫	Test conditions for UE Tx power measurement
Source: ೫	RAN WG4
Work item code: %	Date:
Category: ¥	F Release: # Rel99 Use one of the following categories: Use one 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 categories can be found in 3GPP TR 21.900. REL-4 (Release 5) E: # Currently there is no test setup defined for the UE Tx power measurement in the annex of 25.133. The UE Tx power measurement is used for different purposes, e.g in the UE TFC selection algorithm. Therefore it is belived important that the requirement is also tested and as TSG T WG1 shall follow the annex in 25.133 when defining the tests the test set-up needs to be defined in the annex. Ife: # A test set-up and procedure is defined for the UE Tx power measurement. Also an empty place holder section is created for the BLER measurement to follow the structure in section 9. Isolated Impact Analysis: Addition of a test case. Change in the test cases does not affect the function or the requirement.
Consequences if not approved:	
Clauses affected:	₭ A.9.1.3B (new), A.9.1.3C (new)
Other specs affected:	# Other core specifications # X Test specifications 34.121 O&M Specifications 0
Other comments:	Revised version of Tdoc R4-011379.
How to create CRs	using this form:

Comprehensive information and tips about how to create CRs can be found at: <u>http://www.3gpp.org/3G_Specs/CRs.htm</u>. 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.
- 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 <u>ftp://ftp.3gpp.org/specs/</u> 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.

A.9.1.3A GSM Carrier RSSI

A.9.1.3A.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.4.

In the test in Cell_DCH state compressed mode with purpose "GSM Carrier RSSI Measurement" is applied to measure on GSM. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Table A.9.5A defines the limits of signal strengths and code powers on the UMTS FDD cell, where the requirement is applicable. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement.

The limits of the GSM test parameters are defined in [21].

Parameter Unit		Value	Comment	
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.7	
Power Control		On		
Target quality value on DTCH	BLER	0.01		
Compressed mode patterns - GSM carrier RSSI measurement		Compressed mode reference pattern 2 Set 2	As specified in table A.22 TS 25.101 section A.5	
Inter-RAT measurement quantity		GSM Carrier RSSI		
BSIC verification required		Not required		
Monitored cell list size		6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.	

Table A.9.5A: General GSM Carrier RSSI test parameters

Table A.9.5B: Cell specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
Propagation condition	-	AWGN

A.9.1.3A.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.4.

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

A.9.1.3B Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.5 exists.

A.9.1.3B.1 Test Purpose and Environment

A.9.1.3B.2 Test Requirements

A.9.1.3C UE transmitted power

A.9.1.3C.1 Test Purpose and Environment

The purpose of this test is to verify that the UE transmitted power measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.6.

<u>The test parameters are given in Table x and y below. In the measurement control information it shall be indicated to the UE that periodic reporting of the UE transmitted power measurement shall be used.</u>

Table x: General test parameters for UE transmitted power

Parameter	<u>Unit</u>	Value	Comment
DCH parameters		DL Reference Measurement	As specified in TS 25.101 section A.3.
		Channel 12.2 kbps	
Power Control		<u>On</u>	
Target quality value on	BLER	<u>0.01</u>	
DTCH			

Table y: Cell Specific parameters for UE transmitted power

Parameter	<u>Unit</u>	<u>Cell 1</u>		
CPICH_Ec/lor	<u>dB</u>	<u>-10</u>		
PCCPCH_Ec/lor	<u>dB</u>	<u>-12</u>		
SCH_Ec/lor	dB	<u>-12</u>		
PICH_Ec/lor	<u>dB</u>	<u>-15</u>		
DPCH_Ec/lor	<u>dB</u>	Note1		
<u>OCNS</u>		Note 2		
\hat{I}_{or}/I_{oc}	<u>dB</u>	<u>0</u>		
I _{oc}	<u>dBm/3.84</u> <u>MHz</u>	<u>-70</u>		
CPICH_Ec/lo	dB	<u>-13</u>		
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				

Test procedure

- 1) Set the UE power and Maximum allowed UL TX power to the maximum power for that UE power class.
- 2) Send continuously during the entire test Up power control commands to the UE.
- 3) Measure the output power of the UE. The output power shall be averaged over the transmit one timeslot.
- 4) Check that the reported UE transmitted power is within the specified range.
- 5) Decrease the Maximum allowed UL TX power with 1 dB and signal the new value to the UE.

6) Repeat from step 3) until the entire specified range for the UE transmitted power measurement has been tested, i.e. the accuracy requirement for the UE transmitted power measurement is specified 10dB below the maximum power for the UE power class.

A.9.1.3C.2 Test Requirements

The UE transmitted power measurement accuracy shall meet the requirements in section 9.1.6.

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

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	CR-Form-v4
¥	25.133 CR 206 # ev _ # Current version: 4.2.0 #
For <u>HELP</u> on us	sing this form, see bottom of this page or look at the pop-up text over the X symbols.
Proposed change a	affects: \$\$ (U)SIM ME/UE X Radio Access Network Core Network
Title: ೫	Test conditions for UE Tx power measurement
Source: ೫	RAN WG4
Work item code: #	Date: <mark>፡፡ 2001-11-08</mark>
Category: %	A Release: % Rel-4 Use one of the following categories: Use one of the following releases: 2 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 categories can be found in 3GPP TR 21.900. REL-4 (Release 4) : % Currently there is no test setup defined for the UE Tx power measurement in the annex of 25.133. The UE Tx power measurement is used for different purposes,
Summary of chang	e.g in the UE TFC selection algorithm. Therefore it is belived important that the requirement is also tested and as TSG T WG1 shall follow the annex in 25.133 when defining the tests the test set-up needs to be defined in the annex. e: # A test set-up and procedure is defined for the UE Tx power measurement. Also an empty place holder section is created for the BLER measurement to follow the structure in section 9. Isolated Impact Analysis: Addition of a test case. Change in the test cases does not affect the function or the requirement.
Consequences if not approved:	# The requirements on the UE Tx power measurement will not be tested.
Clauses affected:	೫ A.9.1.3B (new), A.9.1.3C (new)
Other specs affected:	Image: Second system Image: Second system Image: Second
Other comments:	光 Corresponding R99 CR in Tdoc R4-011519.
How to create CRs	using this form:

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- 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 <u>ftp://ftp.3gpp.org/specs/</u> 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.

A.9.1.3A GSM Carrier RSSI

A.9.1.3A.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.4.

In the test in Cell_DCH state compressed mode with purpose "GSM Carrier RSSI Measurement" is applied to measure on GSM. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Table A.9.5A defines the limits of signal strengths and code powers on the UMTS FDD cell, where the requirement is applicable. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement.

The limits of the GSM test parameters are defined in [21].

Parameter Unit		Value	Comment	
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.	
Power Control		On		
Target quality value on DTCH	BLER	0.01		
Compressed mode patterns - GSM carrier RSSI measurement		Compressed mode reference pattern 2 Set 2	As specified in table A.22 TS 25.101 section A.5	
Inter-RAT measurement quantity		GSM Carrier RSSI		
BSIC verification required		Not required		
Monitored cell list size		6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.	

Table A.9.5A: General GSM Carrier RSSI test parameters

Table A.9.5B: Cell specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
Propagation condition	-	AWGN

A.9.1.3A.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.4.

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

A.9.1.3B Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.5 exists.

A.9.1.3B.1 Test Purpose and Environment

A.9.1.3B.2 Test Requirements

A.9.1.3C UE transmitted power

A.9.1.3C.1 Test Purpose and Environment

The purpose of this test is to verify that the UE transmitted power measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.6.

The test parameters are given in Table x and y below. In the measurement control information it shall be indicated to the UE that periodic reporting of the UE transmitted power measurement shall be used.

Table x: General test parameters for UE transmitted power

Parameter	<u>Unit</u>	Value	Comment
DCH parameters		DL Reference Measurement	As specified in TS 25.101 section A.3.
		Channel 12.2 kbps	
Power Control		<u>On</u>	
Target quality value on	BLER	<u>0.01</u>	
DTCH			

Table y: Cell Specific parameters for UE transmitted power

Parameter	<u>Unit</u>	<u>Cell 1</u>		
CPICH_Ec/lor	<u>dB</u>	<u>-10</u>		
PCCPCH_Ec/lor	<u>dB</u>	<u>-12</u>		
SCH_Ec/lor	<u>dB</u>	<u>-12</u>		
PICH_Ec/lor	<u>dB</u>	<u>-15</u>		
DPCH_Ec/lor	<u>dB</u>	Note1		
<u>OCNS</u>		Note 2		
\hat{I}_{or}/I_{oc}	<u>dB</u>	<u>0</u>		
I _{oc}	<u>dBm/3.84</u> <u>MHz</u>	<u>-70</u>		
CPICH_Ec/lo	dB	<u>-13</u>		
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				

Test procedure

- 1) Set the UE power and Maximum allowed UL TX power to the maximum power for that UE power class.
- 2) Send continuously during the entire test Up power control commands to the UE.
- 3) Measure the output power of the UE. The output power shall be averaged over the transmit one timeslot.
- 4) Check that the reported UE transmitted power is within the specified range.
- 5) Decrease the Maximum allowed UL TX power with 1 dB and signal the new value to the UE.

6) Repeat from step 3) until the entire specified range for the UE transmitted power measurement has been tested, i.e. the accuracy requirement for the UE transmitted power measurement is specified 10dB below the maximum power for the UE power class.

A.9.1.3C.2 Test Requirements

The UE transmitted power measurement accuracy shall meet the requirements in section 9.1.6.

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

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	CR-Form-v4
ж	25.133 CR 207 # ev _ # Current version: 5.0.0 #
For <u>HELP</u> on us	ing this form, see bottom of this page or look at the pop-up text over the $#$ symbols.
Proposed change a	ffects: # (U)SIM ME/UE X Radio Access Network Core Network
Title: ¥	Test conditions for UE Tx power measurement
Source: ೫	RAN WG4
Work item code: ℜ	Date: # 2001-11-08
Category: # Reason for change: Summary of change	 A Release: # Rel-5 Use one of the following categories: <i>F</i> (correction) <i>A</i> (corresponds to a correction in an earlier release) <i>B</i> (addition of feature), <i>C</i> (functional modification of feature) <i>R</i>96 (Release 1996) <i>B</i> (addition of feature), <i>R</i>97 (Release 1997) <i>C</i> (functional modification) <i>R</i>99 (Release 1998) <i>D</i> (editorial modification) <i>R</i>99 (Release 1999) Detailed explanations of the above categories can REL-4 (Release 4) be found in 3GPP TR 21.900. * Currently there is no test setup defined for the UE Tx power measurement in the annex of 25.133. The UE Tx power measurement is used for different purposes, e.g in the UE TFC selection algorithm. Therefore it is belived important that the requirement is also tested and as TSG T WG1 shall follow the annex in 25.133 when defining the tests the test set-up needs to be defined in the annex.
	empty place holder section is created for the BLER measurement to follow the structure in section 9. <u>Isolated Impact Analysis:</u> Addition of a test case. Change in the test cases does not affect the function or the requirement.
Consequences if not approved:	* The requirements on the UE Tx power measurement will not be tested.
Clauses affected:	発 A.9.1.3B (new), A.9.1.3C (new)
Other specs affected:	Image: Second system Image: Second system <td< th=""></td<>
Other comments:	Corresponding R99 CR in Tdoc R4-011519.
How to create CRs u	ising this form:

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- 1) Fill out the above form. The symbols above marked # contain pop-up help information about the field that they are closest to.
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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.

A.9.1.3A GSM Carrier RSSI

A.9.1.3A.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.4.

In the test in Cell_DCH state compressed mode with purpose "GSM Carrier RSSI Measurement" is applied to measure on GSM. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Table A.9.5A defines the limits of signal strengths and code powers on the UMTS FDD cell, where the requirement is applicable. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement.

The limits of the GSM test parameters are defined in [21].

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.7
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement		Compressed mode reference pattern 2 Set 2	As specified in table A.22 TS 25.101 section A.5
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Not required	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.

Table A.9.5A: General GSM Carrier RSSI test parameters

Table A.9.5B: Cell specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
Propagation condition	-	AWGN

A.9.1.3A.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.4.

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

A.9.1.3B Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.5 exists.

A.9.1.3B.1 Test Purpose and Environment

A.9.1.3B.2 Test Requirements

A.9.1.3C UE transmitted power

A.9.1.3C.1 Test Purpose and Environment

The purpose of this test is to verify that the UE transmitted power measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.6.

The test parameters are given in Table x and y below. In the measurement control information it shall be indicated to the UE that periodic reporting of the UE transmitted power measurement shall be used.

Table x: General test parameters for UE transmitted power

Parameter	<u>Unit</u>	Value	Comment
DCH parameters		DL Reference Measurement	As specified in TS 25.101 section A.3.
		Channel 12.2 kbps	
Power Control		<u>On</u>	
Target quality value on	BLER	<u>0.01</u>	
DTCH			

Table y: Cell Specific parameters for UE transmitted power

Parameter	<u>Unit</u>	<u>Cell 1</u>	
CPICH_Ec/lor	<u>dB</u>	<u>-10</u>	
PCCPCH_Ec/lor	<u>dB</u>	<u>-12</u>	
SCH_Ec/lor	<u>dB</u>	<u>-12</u>	
PICH_Ec/lor	<u>dB</u>	<u>-15</u>	
DPCH_Ec/lor	<u>dB</u>	Note1	
<u>OCNS</u>		Note 2	
\hat{I}_{or}/I_{oc}	<u>dB</u>	<u>0</u>	
I _{oc}	<u>dBm/3.84</u> <u>MHz</u>	<u>-70</u>	
CPICH_Ec/lo	dB	<u>-13</u>	
Propagation		AWCN	
<u>Condition</u>		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 t	power from the cell to be equal to I or		

Test procedure

- 1) Set the UE power and Maximum allowed UL TX power to the maximum power for that UE power class.
- 2) Send continuously during the entire test Up power control commands to the UE.
- 3) Measure the output power of the UE. The output power shall be averaged over the transmit one timeslot.
- 4) Check that the reported UE transmitted power is within the specified range.
- 5) Decrease the Maximum allowed UL TX power with 1 dB and signal the new value to the UE.

6) Repeat from step 3) until the entire specified range for the UE transmitted power measurement has been tested, i.e. the accuracy requirement for the UE transmitted power measurement is specified 10dB below the maximum power for the UE power class.

A.9.1.3C.2 Test Requirements

The UE transmitted power measurement accuracy shall meet the requirements in section 9.1.6.

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

R4-011627

East Brunswick, NJ, USA 12th - 16th November 2001

	CR-Form-v4
	CHANGE REQUEST
^ж 25	5.133 CR 208 [#] ev _ [#] Current version: 3.7.0 [#]
For <u>HELP</u> on using	, this form, see bottom of this page or look at the pop-up text over the $#$ symbols.
Proposed change affect	<i>cts:</i> ೫ (U)SIM ME/UE Ⅹ Radio Access Network Ⅹ Core Network
Title: ೫ Co	orrection to general requirements for support of compressed mode
Source: ^{# RA}	AN WG4
Work item code: ℜ	Date: 第 15 November 2001
Category: % F Use Deta be f	Release: % Rel99e one of the following categories:Use one 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)tailed explanations of the above categories canREL-4(Release 4)found in 3GPP TR 21.900.REL-5(Release 5)
Reason for change: #	The current text surrounding the requirement for support of compressed mode is ambiguous. In particular, the phrase "ensure that the activation of several transmission gap pattern sequences in parallel does not result in every frame being compressed" could be interpreted as indicating that only 1 out of every N frames (N>>1) need not contain a transmission gap. This could lead to very long sequences where every frame contains a transmission gap that would limit the ability of the power control loop to recover and would also negatively affect intra- frequency measurements.
Summary of change: ₩	The text is corrected to ensure that there is at least one frame that does not contain a compressed mode gap within any window of three frames.
Consequences if # not approved:	 The text will remain ambiguous and may be interpreted as supporting very long sequences of compressed frames that would create problems for the power control and intra-frequency measurements. Isolated Impact Analysis: Correction to a function where the specification was : ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
	 The corrected functionality is compressed mode support in the UE. If the network implements the change but not the UE, the UE might reject the set of compressed mode parameters provided by the network. If the UE implements the change but not the network, the UE might reject the set of compressed mode parameters provided by the network.

Other specs affected:	 Conter core specifications Test specifications O&M Specifications 	¥
Other comments:	ж	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: <u>http://www.3gpp.org/3G_Specs/CRs.htm</u>. 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 <u>ftp://ftp.3gpp.org/specs/</u> 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.

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

The UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
- FDD mode cells distributed on up to 2 additional FDD carriers and
- Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers.

Depending on UE capability, the UE shall also in addition be able to support and process at least 32 GSM cells distributed on up to 32 GSM carriers.

- If the UE utilises compressed mode for inter-frequency and/or inter-RAT measurements, in order for the requirements in the following subsections to apply the UTRAN must: provide
- <u>provide</u> transmission gap pattern sequences with TGPL1 > 1-and ensure that the activation of several transmission gap pattern sequences in parallel does not result in every frame being compressed, and
- provide the patterns within a transmission gap pattern sequence that are identical (i.e., TGPL1 = TGPL2), and-
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- <u>ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames.</u>

Performance requirements for different types of transmission gap pattern sequences and different number of cells is defined in the following sections.

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

The received CPICH $E_{\rm c}/I_{\rm o}$ is defined as

$$\left(\frac{CPICH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. Cells, which are neither included in the active set nor in the monitored set, and are detected by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the-transmission gaps simultaneously for data reception from the active set cell/s.

R4-011628

East Brunswick, NJ, USA 12th - 16th November 2001

	CR-Form-v4
	CHANGE REQUEST
ж	25.133 CR 209 [#] ev _ [#] Current version: 4.2.0 [#]
For <u>HELP</u> on usi	ng this form, see bottom of this page or look at the pop-up text over the X symbols.
Proposed change af	fects: # (U)SIM ME/UE X Radio Access Network X Core Network
Title: ೫	Correction to general requirements for support of compressed mode
Source: ೫	RAN WG4
Work item code: ^ස	Date: # 15 November 2001
Category: ສູ	ARelease: %Rel-4Use one of the following categories:Use one of the following releases:F (correction)2A (corresponds to a correction in an earlier release)R96B (addition of feature),R97C (functional modification of feature)R98D (editorial modification)R99D (editorial modification)R99C (specific explanations of the above categories canREL-4REL-4(Release 4)e found in 3GPP TR 21.900.REL-5
Reason for change:	The current text surrounding the requirement for support of compressed mode is ambiguous. In particular, the phrase "ensure that the activation of several transmission gap pattern sequences in parallel does not result in every frame being compressed" could be interpreted as indicating that only 1 out of every N frames (N>>1) need not contain a transmission gap. This could lead to very long sequences where every frame contains a transmission gap that would limit the ability of the power control loop to recover and would also negatively affect intra- frequency measurements.
Summary of change	The text is corrected to ensure that there is at least one frame that does not contain a compressed mode gap within any window of three frames.
Consequences if not approved:	 The text will remain ambiguous and may be interpreted as supporting very long sequences of compressed frames that would create problems for the power control and intra-frequency measurements. Isolated Impact Analysis: Correction to a function where the specification was :
	• ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
	 The corrected functionality is compressed mode support in the UE. If the network implements the change but not the UE, the UE might reject the set of compressed mode parameters provided by the network. If the UE implements the change but not the network, the UE might reject the set of compressed mode parameters provided by the network.

Other specs affected:	 Conter core specifications Test specifications O&M Specifications 	¥
Other comments:	ж	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: <u>http://www.3gpp.org/3G_Specs/CRs.htm</u>. 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 <u>ftp://ftp.3gpp.org/specs/</u> 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.

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

In CELL_DCH state the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
 - FDD cells distributed on up to 2 additional FDD carriers and
 - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

If the UE utilises compressed mode for inter-frequency and/or inter-RAT measurements, in order for the requirements in the following subsections to apply the UTRAN must provide:

- <u>provide</u> transmission gap pattern sequences with TGPL1 > 1-and ensure that the activation of several transmission gap pattern sequences in parallel does not result in every frame being compressed, and
- <u>- provide</u> the patterns within a transmission gap pattern sequence <u>that</u> are identical (i.e., TGPL1 = TGPL2), and
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames.

Performance requirements for different types of transmission gap pattern sequences and different number of cells is defined in the following sections.

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

The received CPICH E_c/I_o is defined as

$$\left(\frac{CPICH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

and the received SCH $E_{c}/I_{\rm o}$ is defined as

$$\left(\frac{SCH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. Cells, which are neither included in the active set nor in the monitored set, and are detected by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the-transmission gaps simultaneously for data reception from the active set cell/s.

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R4-011629

East Brunswick, NJ, USA 12th - 16th November 2001

	CR-Form-v4
	CHANGE REQUEST
[#] 2	5.133 CR 210 [#] ev _ [#] Current version: 5.0.0 [#]
For <u>HELP</u> on using	this form, see bottom of this page or look at the pop-up text over the % symbols.
Proposed change affe	cts: # (U)SIM ME/UE X Radio Access Network X Core Network
T '	
лие: ж С	orrection to general requirements for support of compressed mode
Source: ೫ R	AN WG4
Work item code: 🕱	Date: ₩ 15 November 2001
Category: # A Use Det be	Release: # Rel-5e one of the following categories:Use one 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)ailed explanations of the above categories canREL-4(Release 4)found in 3GPP TR 21.900.REL-5(Release 5)
Reason for change: a	The current text surrounding the requirement for support of compressed mode is ambiguous. In particular, the phrase "ensure that the activation of several transmission gap pattern sequences in parallel does not result in every frame being compressed" could be interpreted as indicating that only 1 out of every N frames (N>>1) need not contain a transmission gap. This could lead to very long sequences where every frame contains a transmission gap that would limit the ability of the power control loop to recover and would also negatively affect intra- frequency measurements.
Summary of change: ३	The text is corrected to ensure that there is at least one frame that does not contain a compressed mode gap within any window of three frames.
Consequences if ३ not approved:	The text will remain ambiguous and may be interpreted as supporting very long sequences of compressed frames that would create problems for the power control and intra-frequency measurements.
	Isolated Impact Analysis: Correction to a function where the specification was : ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
	 The corrected functionality is compressed mode support in the UE. If the network implements the change but not the UE, the UE might reject the set of compressed mode parameters provided by the network. If the UE implements the change but not the network, the UE might reject the set of compressed mode parameters provided by the network.

Clauses affected: # 8.1.2.1

Other specs affected:	 Conter core specifications Test specifications O&M Specifications 	¥
Other comments:	ж	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: <u>http://www.3gpp.org/3G_Specs/CRs.htm</u>. 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 <u>ftp://ftp.3gpp.org/specs/</u> 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.

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

In CELL_DCH state the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
 - FDD cells distributed on up to 2 additional FDD carriers and
 - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

If the UE utilises compressed mode for inter-frequency and/or inter-RAT measurements, in order for the requirements in the following subsections to apply the UTRAN must provide:

- <u>provide</u> transmission gap pattern sequences with TGPL1 > 1-and ensure that the activation of several transmission gap pattern sequences in parallel does not result in every frame being compressed, and
- provide the patterns within a transmission gap pattern sequence are identical (i.e., TGPL1 = TGPL2). and
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames.

Performance requirements for different types of transmission gap pattern sequences and different number of cells is defined in the following sections.

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

The received CPICH E_c/I_o is defined as

$$\left(\frac{CPICH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

and the received SCH $E_{\rm c}/I_{\rm o}$ is defined as

$$\left(\frac{SCH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. Cells, which are neither included in the active set nor in the monitored set, and are detected by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the-transmission gaps simultaneously for data reception from the active set cell/s.

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R4-011631

East Brunswick, NJ, USA 12th - 16th November 2001

	CR-Form-v4		
CHANGE REQUEST			
¥	25.133 CR 211 * ev * Current version: 3.7.0 *		
For <u>HELP</u> on usi	ing this form, see bottom of this page or look at the pop-up text over the $#$ symbols.		
Proposed change at	ffects: \$\$ (U)SIM ME/UE X Radio Access Network Core Network		
Title: ೫	UE Tx Timing adjustment rate		
Source: ೫	RAN WG4		
Work item code: %	Date: 米 2001-11-15		
Category: #	F Release: % Rel99 Jse one of the following categories: Use one of the following releases: 2 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 categories can REL-4 (Release 4) be found in 3GPP TR 21.900. REL-5 (Release 5)		
Summary of change	 The requirement of UE transmit timing adjustment is corrected to allow optimum transmit timing adjustments with smaller steps than ¼ chip. Isolated Impact Analysis: The UE transmit timing adjustment correction allows more optimal implementation for UE transmit timing adjustments. The correction does not affect the network since the current text already allows more than one adjustment in 200 ms as long as the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 200 ms period. 		
Consequences if not approved:	* Optimal UE performance is not allowed in all environments for terminals using smaller than ¼ chip step for transmit timing adjustment.		
Clauses affected:	೫ <mark>7.1.2</mark>		
Other specs affected:	Conter core specifications # Test specifications # O&M Specifications •		
Other comments:	¥		

7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected Node B. The uplink DPCCH/DPDCH frame transmission takes place approximately T_0 chips after the reception of the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame. T_0 is defined in [2]. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements.

7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to ± 1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the time when the first significant path of the corresponding downlink DPCCH/DPDCH frame is received plus T₀ chips. T₀ is defined in [2].

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

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¹/₄ chip per 200ms. In particular, within any given $800*d_{200}$ ms period, the UE transmit timing shall not change in excess of +-<u>d</u>1/₄ chip from the timing at the beginning of this $800*d_{200}$ ms period, where $0 \le d \le 1/4$.

R4-011632

East Brunswick, NJ, USA 12th - 16th November 2001

	CR-Form-v4
	CHANGE REQUEST
[#] 2	5.133 CR 212 [#] ev [#] Current version: 4.2.0 [#]
For <u>HELP</u> on using	g this form, see bottom of this page or look at the pop-up text over the $#$ symbols.
Proposed change affe	ects: \$\$ (U)SIM ME/UE X Radio Access Network Core Network
Title: ೫ ∪	JE Tx Timing adjustment rate
Source: ೫ R	AN WG4
Work item code: 🕷 📃	Date: ₩ 2001-11-15
Category: # A Us De be	Release: # Rel-4 ie one of the following categories: Use one 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) etailed explanations of the above categories can found in 3GPP TR 21.900. REL-4 (Release 5) ** The current text of the UE transmit timing adjustment requirement unintentionally limits optimal transmit timing adjustments in all environments when the UE adjust its transmit timing with smaller steps than ¼ chip.
Summary of change: S	 [#] The requirement of UE transmit timing adjustment is corrected to allow optimum transmit timing adjustments with smaller steps than ¼ chip. Isolated Impact Analysis: The UE transmit timing adjustment correction allows more optimal implementation for UE transmit timing adjustments. The correction does not affect the network since the current text already allows more than one adjustment in 200 ms as long as the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 200 ms period.
Consequences if not approved:	* Optimal UE performance is not allowed in all environments for terminals using smaller than ¼ chip step for transmit timing adjustment.
Clauses affected:	第 7.1.2
Other specs	# Other core specifications # Test specifications O&M Specifications
Other comments:	ж

7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected Node B. The uplink DPCCH/DPDCH frame transmission takes place approximately T_0 chips after the reception of the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame. T_0 is defined in [2]. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements.

7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to ± 1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the time when the first significant path of the corresponding downlink DPCCH/DPDCH frame is received plus T₀ chips. T₀ is defined in [2].

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

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¹/₄ chip per 200ms. In particular, within any given $800*d_{200}$ ms period, the UE transmit timing shall not change in excess of +-<u>d</u>1/₄ chip from the timing at the beginning of this $800*d_{200}$ ms period, where $0 \le d \le 1/4$.

R4-011633

East Brunswick, NJ, USA 12th - 16th November 2001

CR-Form-v4						
CHANGE REQUEST						
ж	25.133 CR 213 [#] ev [#] Current version: 5.0.0 [#]					
For <u>HELP</u> on us	ing this form, see bottom of this page or look at the pop-up text over the $#$ symbols.					
Proposed change a	ffects: # (U)SIM ME/UE X Radio Access Network Core Network					
Title: ೫	UE Tx Timing adjustment rate					
Source: ೫	RAN WG4					
Work item code: ℜ	Date: # 2001-11-15					
Category: # A Release: # Rel-5 Use one of the following categories: Use one of the following releases: 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 categories can REL-4 (Release 4) be found in 3GPP TR 21.900. REL-5 (Release 5) Reason for change: # The current text of the UE transmit timing adjustment requirement unintentionally limits optimal transmit timing adjustments in all environments when the UE adjust its transmit timing with smaller steps than ¼ chip. Summary of change: # The requirement of UE transmit timing adjustment is corrected to allow optimum transmit timing adjustments with smaller steps than ¼ chip.						
Isolated Impact Analysis: The UE transmit timing adjustment correction allows more optimal implementation for UE transmit timing adjustments. The correction does not affect the network since the current text already allows more than one adjustment in 200 ms as lor as the UE transmit timing shall not change in excess of +-1/4 chip from the timin at the beginning of this 200 ms period.						
Consequences if not approved:	Image: Second					
Clauses affected:	¥ 7.1.2					
Other specs affected:	Image: Specification state Image: Specification state					
Other comments:	ж					

7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected Node B. The uplink DPCCH/DPDCH frame transmission takes place approximately T_0 chips after the reception of the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame. T_0 is defined in [2]. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements.

7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to ± 1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the time when the first significant path of the corresponding downlink DPCCH/DPDCH frame is received plus T₀ chips. T₀ is defined in [2].

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

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¹/₄ chip per 200ms. In particular, within any given $800*d_{200}$ ms period, the UE transmit timing shall not change in excess of +-<u>d</u>1/₄ chip from the timing at the beginning of this $800*d_{200}$ ms period, where $0 \le d \le 1/4$.

R4-011637

East Brunswick, NJ, USA 12th - 16th November 2001

CR-Form-v4					
CHANGE REQUEST					
ж	25.133 CR 214 [#] ev [#] Current version: 3.7.0 [#]				
For <u>HELP</u> on usi	ng this form, see bottom of this page or look at the pop-up text over the st symbols.				
Proposed change af	fects: ೫ (U)SIM ME/UE X Radio Access Network Core Network				
Title: ೫	Requirements and test parameters for UE measurements				
Source: ೫	RAN WG4				
Work item code: 🕷 🔤	Date: 業 2001-11-15				
Category: ¥	FRelease: %Rel99Ise one of the following categories:Use one of the following releases:F (correction)2A (corresponds to a correction in an earlier release)R96B (addition of feature),R97C (functional modification of feature)R98D (editorial modification)R99D (editorial modification)R99D (editorial modification)R99D (editorial modification)R14C (functional modification)R99D (editorial modification)R99D (editorial modification)R14C (functional modification)R14				
was agreed that Io conditions of accuracy requirements of some UE measurements e.g., CPICH RSCP measurement needs to be clarified to avo more misunderstandings. At the same meeting it was also agreed that RAN WG4 should define test conditions for some UE measurements e.g., CPICH RSCP and CPICH Ec/Ic measurements in more detail					
Summary of change	 ** 1) Io conditions have been clarified for the accuracy requirements of following measurements • CPICH RSCP intra frequency measurements 				
	 UTRA Carrier RSSI measurements 				
	• P-CCPCH RSCP measurements				
	Instead of having two ranges for Io conditions –94 dBm70dBm and –94 dbm50 dBm the new ranges are –94 dBm–70 dBm and –70 dBm50 dBm.				
	2) An obvious typo for Io conditions for UTRA Carrier RSSI relative measuremen has been corrected from –94 dBm70 dBm to –94 dBm50 dBm.				
	3) New test parameters for the CPICH RSCP, CPICH Ec/lo and UTRA Carrier RSSI measurements have been defined. Test parameters have been chosen using the following strategy:				
	 Tests are performed at both ends of specified lo conditions i.e. at -50 dBm and -94 dBm. Measurements are also performed at -69 dBm in tests where accuracy requirement changes at -70 dBm. 				
	 Side conditions of related measurements are always fulfilled. In many 				

	tests side conditions are just barely met. For example in some CPICH RSCP tests cases an absolute CPICH RSCP value have been –114 dBm, which is the lowest possible allowed by side conditions. Also CPICH_Ec/lo have been very close to –20 dBm in many measurements. The purpose of choosing tests parameters this way is to validate measurement capability in worst case conditions.			
	 The higher lo value is the higher Îor/loc value is specified 			
	 The UE is not in SHO during the tests 			
	 CPICH Ec/lo measurements tests are validating the accuracy for each specified accuracy category. 			
	• DPCH_Ec/lor level have been increased in some tests cases in order to have reasonable quality at DPCH in downlink.			
	• Test 1 of proposed CPICH RSCP and CPICH_Ec/lo tests fulfils also the side condition for SCH_Ec/lo which is defined for identification of a new intra or inter frequency cell.			
	 A note has been added to test tables that tests needs to be done sequentially and that tests parameters needs to be changed within 5 seconds. This is because in tests 2 and 3 SCH_Ec/lo for cell 2 may be below the specified identification limits. Thus when tests parameters are changed quickly UE will not loose the cell 2 during the time when tests parameters are being changed. 			
	4) It has been clarified that compressed mode pattern set 1of Table A.22 in TS 25.101 is being used for inter frequency CPICH RSCP and CPICH Ec/lo tests			
	5) Since in tests a test equipment does not know the effect of thermal noise and noise generated in the receiver, the required accuracy on Io levels of -9487 IBm is relaxed in some of the CPICH Ec/Io and UTRA carrier RSSI tests by the mpact of assumed thermal noise and noise generated in the receiver (–99 dBm). The modified tests are CPICH_Ec/Io Intra and Inter frequency absolute accuracy, CPICH_Ec/Io Inter frequency relative accuracy and UTRA Carrier RSSI absolute and relative accuracy tests.			
	Isolated Impact Analysis:			
	The proposed corrections are testing related and they do not change the behaviour of the UE. Hence, the changes do not affect the implementation.			
Consequences if not approved:	⁸ Misunderstandings of Io conditions exists. Test parameters for CPICH RSCP, CPICH Ec/Io and UTRA Carrier RSSI are inadequate. Testing of CPICH_Ec/Io Intra and Inter frequency absolute accuracy, CPICH_Ec/Io Inter frequency relative accuracy and UTRA Carrier RSSI absolute and relative accuracy is not possible since a test equipment does not know thermal noise and noise generated in the receiver.			
Clauses affected:	P 9131 9132 891111 891112 891211 891212 89122			
	A.9.1.3.1 and A.9.1.3.2			
Other specs affected:	Conter core specifications # X Test specifications O&M Specifications 34.121			
Other comments: ¥	It has been assumed that RAN WG1 will change the definition of UTRA Carrier RSSI and CPICH Ec/lo measurements so that thermal noise and noise generated in the receiver is included into UTRA Carrier RSSI and CPICH_Ec/lo measurements.			

9 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The physical layer measurement model and a complete list of measurements is specified in TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 "Physical layer - Measurements (FDD)". In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

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

9.1 Measurement Performance for UE

The requirements in this clause are applicable for a UE:

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

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

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

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

9.1.1 CPICH RSCP

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

9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.1.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.1 are valid under the following conditions:

CPICH_RSCP1|_{dBm} \geq -114 dBm.

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

Baramotor	Unit	Accuracy [dB]		Conditions
Farameter	Onit	Normal condition	Extreme condition	lo [dBm]
	dBm	± 6	± 9	-9470
	dBm	± 8	± 11	- <u>70</u> 9450

Table 9.1: CPICH_RSCP Intra frequency absolute accuracy

9.1.1.1.2 Relative accuracy requirement

1

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

The accuracy requirements in table 9.2 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\begin{aligned} \left| CPICH _RSCP1 \right|_{in \, dBm} - CPICH _RSCP2 \right|_{in \, dBm} &| \le 20 dB \\ \frac{I_o}{(\hat{I}_{or})} \right|_{in \, dB} - \left(\frac{CPICH _E_c}{I_{or}} \right)_{in \, dB} \le 20 dB \end{aligned}$$

Table 9.2: CPICH_RSCP Intra frequency relative accuracy

Baramotor	Unit	Accuracy [dB]		Conditions
Farameter		Normal condition	Extreme condition	lo [dBm]
CPICH_RSCP	dBm	± 3	± 3	-9450

9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.1.2.1 Relative accuracy requirement

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

The accuracy requirements in table 9.3 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _ RSCP1 \right|_{in \, dBm} - CPICH _ RSCP2 \right|_{in \, dBm} \le 20 \, dB$$

| Channel 1_Io $|_{dBm}$ -Channel 2_Io $|_{dBm}| \le 20 \text{ dB}.$

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

Table 9.3: CPICH_RSCP Inter frequency relative accuracy

Baramotor	Unit	Accuracy [dB]		Conditions
Faranieter		Normal condition	Extreme condition	lo [dBm]
CPICH_RSCP	dBm	± 6	± 6	-9450

9.1.1.3 CPICH RSCP measurement report mapping

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

In table 9.4 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

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

Table 9.4

9.1.2 CPICH Ec/lo

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

9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.2.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.5 are valid under the following conditions:

 $CPICH_RSCP1|_{dBm} \ge -114 dBm.$

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

Table 9.5: CPICH_Ec/lo Intra frequency absolute accuracy

	Unit	Accuracy [dB]		Conditions
Parameter		Normal condition	Extreme condition	lo [dBm]
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo < -14 \pm 3 for -20 \leq CPICH Ec/lo < -16	± 3	-9450

9.1.2.1.2 Relative accuracy requirement

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

The accuracy requirements in table 9.6 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$|CPICH _RSCP1|_{in \, dBm} - CPICH _RSCP2|_{in \, dBm}| \le 20 \, dB$$
$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

Table 9.6: CPICH_Ec/lo Intra frequency relative accuracy

Baramotor	Unit	Accuracy [dB]		Conditions
Faranieter	Onit	Normal condition	Extreme condition	lo [dBm]
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo $<$ -14 \pm 3 for -20 \leq CPICH Ec/lo $<$ -16	± 3	-9450

9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.2.2.1 Absolute accuracy requirement

The accuracy requirements in table 9.7 are valid under the following conditions:

CPICH_RSCP1|_{dBm} \geq -114 dBm.

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

Table 9.7: CPICH_Ec/lo Inter frequency absolute accuracy

		Accuracy [dB]	Conditions	
Parameter	Unit	Normal condition	Extreme condition	lo [dBm]
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo < -14 \pm 3 for -20 \leq CPICH Ec/lo < -16	± 3	-9450

9.1.2.2.2 Relative accuracy requirement

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

The accuracy requirements in table 9.8 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left|CPICH _RSCP1\right|_{in \, dBm} - CPICH _RSCP2\right|_{in \, dBm} \le 20 dB$$

| Channel 1_Io|_{dBm} -Channel 2_Io|_{dBm}| ≤ 20 dB.

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

Table 9.8: CPICH_Ec/lo Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]	Conditions	
Farameter	Unit	Normal condition Extreme condition		lo [dBm]
		\pm 1.5 for -14 \leq CPICH Ec/lo		
CPICH_Ec/lo	dB	\pm 2 for -16 \leq CPICH Ec/lo < -14	± 3	-9450
		\pm 3 for -20 \leq CPICH Ec/lo < -16		

9.1.2.3 CPICH Ec/lo measurement report mapping

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

In table 9.9 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/lo < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/lo < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/lo < -23	dB
CPICH_Ec/No _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/lo < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/lo	dB

Table 9.9

9.1.3 UTRA Carrier RSSI

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSILe Inter frequency absolute accuracy

Paramotor	Unit	Accura	acy [dB]	Conditions
Falameter	Unit	Normal condition	Extreme condition	lo [dBm]
UTRA Carrier	dBm	± 4	± 7	-9470
<u>RSSI</u> lo	dBm	± 6	± 9	- <u>70</u> 9450

9.1.3.2 Relative accuracy requirement

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

The accuracy requirements in table 9.11 are valid under the following condition:

| Channel 1_Io $|_{dBm}$ -Channel 2_Io $|_{dBm}$ | < 20 dB.

Table 9.11: UTRA Carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accura	acy [dB]	Conditions	
Falailletei	Unit	Normal condition	Extreme condition	lo [dBm]	
UTRA Carrier RSSIle	dBm	± 7	± 11	-94 <u>5</u> 70	

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

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

Table 9.12

9.1.11 P-CCPCH RSCP

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

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.4. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.4.

9.1.11.1 Absolute accuracy requirements

The accuracy requirement in table 9.31 is valid under the following conditions:

P-CCPCH_RSCP ≥ -102 dBm.

$$\frac{I_o}{\left(\hat{I}_{or}\right)}\Big|_{in\ dB} - \left(\frac{P - CCPCH - E_c}{I_{or}}\right)\Big|_{in\ dB} \le 8dB$$

Table 9.31: P-CCPCH_RSCP Inter frequency absolute accuracy

Baramatar	Unit	Accura	Conditions	
Falameter	Unit	Normal conditions	Extreme conditions	lo [dBm]
	dBm	± 6	± 9	-9470
	dBm	± 8	± 11	- <u>70</u> 9450

9.1.11.2 P-CCPCH RSCP measurement report mapping

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

In table 9.32 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

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

Table 9.32

A.9 Measurement Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in TS 25.101 annex A, sub-clause A.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in TS 25.101 annex C.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

A.9.1 Measurement Performance for UE

A.9.1.1 CPICH RSCP

A.9.1.1.1 Test Purpose and Environment

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

A.9.1.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. Table A.9.1 defines the limits of signal strengths and code powers, when the requirements are applicable. Both CPICH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

When verifying the CPICH RSCP intra frequency absolute accuracy requirement only cell 1 in table A.9.1 shall be present. When verifying the CPICH RSCP intra frequency relative accuracy requirement both cell 1 and 2 in table A.9.1 shall be present.

Table A.9.1: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2		
UTRA RF Channel number		Channel 1	Channel 1		
CPICH_Ec/lor	d₿	-10	-10		
PCCPCH_Ec/lor	d₿	-12	-12		
SCH_Ec/lor	d₿	-12	-12		
PICH_Ec/lor	d₿	-15	-15		
DPCH_Ec/lor	d₿	-15	-15		
OCNS	dB	-1.11	-1.11		
Îor/loc	d₿	10.5	10.5		
loc	dBm/ 3.84 MHz	lo -13.7 dB = loc, Note 1	<i>lo -13.7 dB = loc</i> , Note 1		
Range 1:lo	dPm	-9470	-9470		
Range 2: lo	UDHI	-9450	-9450		
Propagation condition	-	AWGN			
NOTE 1: Ioc level shall be adjusted according the total signal power Io at receiver input and the geometry factor					
Îor/loc.					

Parameter	Unit	Tes	<u>st 1</u>	Tes	st 2	Tes	<u>st 3</u>
Farameter	<u>om</u>	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		<u>Char</u>	<u>inel 1</u>	Channel 1		Channel 1	
CPICH_Ec/lor	dB	-1	0	-1	0	-1	0
PCCPCH_Ec/lor	<u>dB</u>	-1	2	-12		-1	2
SCH_Ec/lor	dB	-1	2	-12		-1	2
PICH_Ec/lor	<u>dB</u>	-1	5	-1	5	-1	5
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	_	<u>-15</u>	_	<u>-15</u>	_
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-1.11</u>	<u>-0.94</u>
loc	<u>dBm/ 3.84 MHz</u>	<u>-75</u>	.54	<u>-59</u>	.98	<u>-97</u>	.52
<u>Îor/loc</u>	<u>dB</u>	4	0	9	<u>0</u>	0	-6.53
CPICH RSCP, Note 1	<u>dBm</u>	<u>-81.5</u>	-85.5	<u>-60.98</u>	-69.88	<u>-107.5</u>	-114.0
lo, Note 1	<u>dBm</u>	-6	<u>89</u>	-5	50	-9)4
Propagation condition	-	AWGN		AWGN		AW	'GN
NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes. They							
are not settable parar	meters themselves.						

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 [14 slots is FSS]. Table A.9.2 defines the limits of signal strengths and code powers, where the requirement is applicable. <u>CPICH RSCP inter frequency relative accuracy</u> requirements are tested by using test parameters in Table A.9.2.

When verifying the CPICH RSCP inter frequency relative accuracy requirement both cell 1 and 2 in table A.9.2 shall be present.

Table A.9.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2		
UTRA RF Channel number		Channel 1	Channel 2		
CPICH_Ec/lor	dB	-10	-10		
PCCPCH_Ec/lor	dB	-12	-12		
SCH_Ec/lor	dB	-12	-12		
PICH_Ec/lor	dB	-15	-15		
DPCH_Ec/lor	dB	-15	-15		
OCNS	dB	-1.11	-1.11		
Î or/loc	dB	10.1	10.1		
loc	dBm/ 3.84 MHz	Io -10.6 dB = Ioc, Note 1	lo -10.6 dB = loc, Note 1		
Range 1:lo	dBm	-9470	-9470		
Range 2: lo	ubm	-9450	-9450		
Propagation condition	-	AWGN			
NOTE 1: loc level shall be adjus	ted in each carrier fre	quency according the total signa	I power <i>to</i> at receiver input		

and the geometry factor for/loc.

		Ter	4.4	Te			
Parameter	Unit	<u>165</u>	<u>st 1</u>	<u>16</u>	<u>st 2</u>		
		Cell 1	<u>Cell 2</u>	<u>Cell 1</u>	Cell 2		
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2		
CPICH_Ec/lor	<u>dB</u>	-1	0	Υ.	<u>10</u>		
PCCPCH_Ec/lor	<u>dB</u>	-1	2	Υ.	12		
SCH_Ec/lor	dB	-1	2	Υ.	12		
PICH_Ec/lor	<u>dB</u>	-1	5	-15			
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	2	<u>-15</u>			
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-1.11</u>	<u>-0.94</u>		
loc	<u>dBm/ 3.84</u>	-60.00	-60.00	-84 00	-94 46		
<u></u>	MHz						
<u>Îor/loc</u>	<u>dB</u>	9.54	<u>9.54</u>	<u>0</u>	<u>-9.54</u>		
CPICH RSCP, Note 1	<u>dBm</u>	<u>-60.46</u>	<u>-60.46</u>	<u>-94.0</u>	<u>-114.0</u>		
lo, Note 1	<u>dBm</u>	-50.00	-50.00	<u>-81.0</u>	-94.0		
Propagation condition	-	AWGN AW			<u>/GN</u>		
NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information							
purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters							
for test 2 shall be set within 5 s	<u>econds so that l</u>	JE does not loos	e the Cell 2 in b	etween the test	<u>ts.</u>		

A.9.1.1.2 Test Requirements

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

A.9.1.2 CPICH Ec/lo

A.9.1.2.1 Test Purpose and Environment

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

A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Table A.9.3 defines the limits of signal strengths and code powers, where the requirements are applicable. Both CPICH Ec/Io absolute and relative accuracy requirements are tested by using test parameters in Table A.9.3

When verifying the CPICH Ec/Io intra frequency absolute accuracy requirement only cell 1 in table A.9.3 shall be present. When verifying the CPICH Ec/Io intra frequency relative accuracy requirement both cell 1 and 2 in table A.9.3 shall be present.

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/lor	dB	-10	-10
PCCPCH_Ec/lor	dB	-12	-12
SCH_Ec/lor	dB	-12	-12
PICH_Ec/lor	dB	-15	-15
DPCH_Ec/lor	dB	-15	-15
OCNS	dB	-1.11	-1.11
Î or/loc	dB	10.5	10.5
loc	dBm/ 3.84 MHz	/o -13.7 dB = loc, Note 1	lo -13.7 dB = loc, Note 1
Range 1:lo	dBm	-9470	-9170
Range 2: lo	ubiii	-9450	-9450
Propagation condition	-	AWGN	
NOTE 1: loc level shall be adjust	sted according the to	otal signal power <i>lo</i> at receive	r input and the geometry factor
Îor/loc.			

Deremeter	l In it	Tes	st 1	Tes	st <u>2</u>	Tes	st <u>3</u>
Parameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		<u>Char</u>	<u>inel 1</u>	<u>Char</u>	nel 1	<u>Char</u>	<u>inel 1</u>
CPICH_Ec/lor	<u>dB</u>	-1	0	-1	0	-1	0
PCCPCH_Ec/lor	<u>dB</u>	-1	2	-12		-1	2
SCH_Ec/lor	<u>dB</u>	-1	2	-12		<u>-12</u>	
PICH_Ec/lor	<u>dB</u>	-1	5	-1	5	-1	5
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	-	-15	-	-6	-
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-1.11</u>	-0.94	.2.56	<u>-0.94</u>
loc	<u>dBm/ 3.84 MHz</u>	<u>-56</u>	.98	-89	.07	<u>-94</u>	.98
<u>Îor/loc</u>	<u>dB</u>	<u>3.0</u>	3.0	<u>-2.9</u>	-2.9	<u>-9.0</u>	-9.0
CPICH Ec/lo, Note 1	<u>dBm</u>	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
lo, Note 1	<u>dBm</u>	-5	50	-8	<u>36</u>	4)4
Propagation condition	- <u>AWGN</u>		AWGN AWGN			'GN	
NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They							
are not settable parameters themselves.							

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.1.2.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Set 1 of Table A.22 [14 slots is FSS]. Table A.9.4 defines the limits of signal strengths and code powers, where the requirement is applicable. <u>CPICH Ec/Io inter frequency relative accuracy</u> requirements are tested by using test parameters in Table A.9.4.

When verifying the CPICH Ec/Io inter frequency relative accuracy requirement both cell 1 and 2 in table A.9.4 shall be present.

Table A.9.4: CPICH Ec/lo Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/lor	dB	-10	-10
PCCPCH_Ec/lor	d₿	-12	-12
SCH_Ec/lor	d₿	-12	-12
PICH_Ec/lor	dB	-15	-15
DPCH_Ec/lor	dB	-15	-15
OCNS	dB	-1.11	-1.11
Î or/loc	dB	10.1	10.1
loc	dBm/ 3.84 MHz	lo -10.6 dB = loc, Note 1	Io -10.6 dB = loc, Note 1
Range 1:lo	dBm	-9470	-9470
Range 2: lo	upin	-9450	-9450
Propagation condition	-	AW	GN
NOTE 1: loc level shall be adjus	ted in each carrier free	quency according the total signa	Loower lo at receiver input

and the geometry factor *Îor/loc.*

Parameter	Unit	<u>les</u>	<u>st 1</u>	<u>le</u> :	<u>st 2</u>	<u>le</u> :	<u>st 3</u>	
	<u>0111</u>	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
UTRA RF Channel		Channel 1	Channel 2	Chappel 1	Channel 2	Channel 1	Channel 2	
<u>number</u>								
CPICH_Ec/lor	<u>dB</u>	-1	0	-1	<u>10</u>	<u>-10</u>		
PCCPCH_Ec/lor	<u>dB</u>	-1	2	-1	12	-1	12	
<u>SCH_Ec/lor</u>	<u>dB</u>	-1	2	-1	12	-1	12	
PICH_Ec/lor	<u>dB</u>	<u>-15</u>		<u>-15</u>		-15		
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	<u> </u>	<u>-6</u>	=	<u>-6</u>	<u> </u>	
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	-0.94	<u>-2.56</u>	<u>-0.94</u>	<u>-2.56</u>	<u>-0.94</u>	
loc	<u>dBm/ 3.84</u>	-52 22	-52 22	-87 27	-87 27	-94 46	-94 46	
	<u>MHz</u>					<u> </u>	<u> </u>	
<u>Îor/loc</u>	<u>dB</u>	<u>-1.75</u>	<u>-1.75</u>	-4.7	<u>-4.7</u>	<u>-9.54</u>	<u>-9.54</u>	
CPICH Ec/lo, Note 1	<u>dBm</u>	<u>-14.0</u>	<u>-14.0</u>	<u>-16.0</u>	<u>-16.0</u>	<u>-20.0</u>	-20.0	
<u>lo, Note 1</u>	<u>dBm</u>	<u>-50</u>	<u>-50</u>	<u>-86</u>	<u>-86</u>	<u>-94</u>	<u>-94</u>	
Propagation condition	=	AWGN AWGN AWGN					<u>'GN</u>	
NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They								
are not settable parameters themselves.								
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests								
2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.								

A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2. <u>In case of the absolute</u> <u>CPICH_Ec/Io measurement accuracy and relative inter-frequency CPICH_Ec/Io measurement accuracy test cases the</u> <u>effect of assumed thermal noise and noise generated in the receiver (-99 dBm) shall be added into the required accuracy</u> <u>defined in Section 9.1.2 as shown in Table A.9.4A.</u>

Table A.9.4A: CPICH_Ec/lo Intra and Inter frequency absolute accuracy and CPICH_Ec/lo Inter frequency relative accuracy

		Accuracy [dB]		Conditions
Parameter Unit		Normal condition	Extreme condition	<u>lo [dBm]</u>
		<u>-2.71.5 for -14 \leq CPICH Ec/lo -3.22 for -16 \leq CPICH Ec/lo $<$ -14 -4.23 for -20 \leq CPICH Ec/lo $<$ -16</u>	<u>-4.23</u>	<u>-9487</u>
CPICH EC/10		$\frac{\pm 1.5 \text{ for } -14 \leq \text{CPICH Ec/lo}}{\pm 2 \text{ for } -16 \leq \text{CPICH Ec/lo} < -14}$ $\pm 3 \text{ for } -20 \leq \text{CPICH Ec/lo} < -16$	<u>± 3</u>	<u>-8750</u>

A.9.1.3 UTRA Carrier RSSI

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3. <u>UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.</u>

Table A.9.5 defines the limits of signal strengths, where the requirement is applicable.

When verifying the UTRA Carrier RSSI absolute accuracy requirement only cell 1 in table A.9.5 shall be present. When verifying the UTRA Carrier RSSI relative accuracy requirement both cell 1 and 2 in table A.9.5 shall be present.

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channei number	-	Channel 1	Channel 2
Î or/loc	dB	-4	-1
loc	dBm/3.84 MHz	lo -4.13 dB = loc,	lo -4.13 dB = loc,
	Unit Cell 1 - Channel 1 C dB -1 C dBm/3.84 MHz Io-4.13 dB = Ioc, Note 1 Io-4. dBm/3.84 MHz -9470 -4 off -94	Note 1	
Range 1: lo	dBm/2.84 MHz	-9470	-9470
Range 2: lo		-9150	-9450
Propagation condition	-	AW	'GN
NOTE 1: loc level shall be adjusted according	the total signal power I	lo at receiver input and	d the geometry
factor Îor/loc.	· · ·		- •

D escription		Test 1		Te	st 2	Te	st 3
Parameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
<u>number</u>							<u>Onamer 2</u>
CPICH_Ec/lor	<u>dB</u>	-1	0		<u>10</u>	-	0
PCCPCH_Ec/lor	<u>dB</u>	-1	2	1	<u>12</u>	-	12
SCH_Ec/lor	<u>dB</u>	-1	2	1	<u>12</u>	-	12
PICH_Ec/lor	<u>dB</u>	-1	<u> 5</u>	1	<u>15</u>	<u>-15</u>	
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	=	<u>-6</u>		<u>-6</u>	=
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-2.56</u>	<u>-0.94</u>	<u>-2.56</u>	<u>-0.94</u>
loc	<u>dBm/ 3.84</u> MHz	<u>-52.22</u>	<u>-52.22</u>	<u>-70.27</u>	<u>-70.27</u>	<u>-94.46</u>	<u>-94.46</u>
<u>Îor/loc</u>	dB	<u>-1.75</u>	<u>-1.75</u>	-4.7	-4.7	<u>-9.54</u>	<u>-9.54</u>
CPICH Ec/lo, Note 1	<u>dBm</u>	<u>-14.0</u>	<u>-14.0</u>	<u>-16.0</u>	<u>-16.0</u>	<u>-20.0</u>	<u>-20.0</u>
lo, Note 1	<u>dBm</u>	<u>-50</u>	-50	-69	<u>-69</u>	<u>-94</u>	-94
Propagation condition	_	AWGN AWGN AWGN				'GN	
NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They							
are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests							
2 and 3 shall be set with	nin 5 seconds :	<u>so that UE do</u>	es not loose	the Cell 2 in I	between the t	ests.	

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

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. <u>The effect of assumed</u> thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in <u>Section 9.1.2 as shown in Table A.9.5A.</u>

Boromotor Unit		Accur	Conditions	
Farameter	<u>om</u>	Normal condition	Extreme condition	lo [dBm]
	<u>dBm</u>	<u>-45.2</u>	<u>-78.2</u>	<u>-9487</u>
UTRA Carrier RSSI	<u>dBm</u>	<u>± 4</u>	<u>± 7</u>	<u>-8770</u>
	<u>dBm</u>	<u>± 6</u>	<u>± 9</u>	<u>-7050</u>

3GPP TSG RAN WG4 Meeting #20

R4-011638

East Brunswick, NJ, USA 12th - 16th November 2001

	CR-Fo	orm-v4
	CHANGE REQUEST	
[#] 2	5.133 CR 215 [#] ev [#] Current version: 4.2.0 [#]	
For <u>HELP</u> on using	this form, see bottom of this page or look at the pop-up text over the $#$ symbols	s.
Proposed change affe	<i>cts:</i> ೫ (U)SIM ME/UE X Radio Access Network Core Network	k 📃
Title: # R	equirements and test parameters for UE measurements	
Source: ೫ R	AN WG4	
Work item code: 🛱	Date: ೫ <mark>2001-11-15</mark>	
Category: X A Use Det be t	Release: % Rel-4 e one of the following categories: Use one 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) cailed explanations of the above categories can REL-4 (Release 4) found in 3GPP TR 21.900. REL-5 (Release 5)	:
	measurements e.g., CPICH RSCP measurement needs to be clarified to avoid more misunderstandings. At the same meeting it was also agreed that RAN WG4 should define test conditions for some UE measurements e.g., CPICH RSCP and CPICH Ec/lo measurements in more detail	
Summary of change: भ	 1) lo conditions have been clarified for the accuracy requirements of following measurements CPICH RSCP intra frequency measurements 	
	UTRA Carrier RSSI measurements	
	Instead of having two ranges for Io conditions –94 dBm70dBm and –94 dbm50 dBm the new ranges are –94 dBm–70 dBm and –70 dBm50 dB	sm.
	2) An obvious typo for Io conditions for UTRA Carrier RSSI relative measurements has been corrected from –94 dBm70 dBm to –94 dBm50 dBm.	ents
	3) New test parameters for the CPICH RSCP, CPICH Ec/lo and UTRA Carrier RSSI measurements have been defined. Test parameters have been chosen using the following strategy:	
	 Tests are performed at both ends of specified Io conditions i.e. at -50 dBm and -94 dBm. Measurements are also performed at -69 dBm in tests where accuracy requirement changes at -70 dBm. 	
	• Side conditions of related measurements are always fulfilled. In many	

	tests side conditions are just barely met. For example in some CPICH RSCP tests cases an absolute CPICH RSCP value have been –114 dBm, which is the lowest possible allowed by side conditions. Also CPICH_Ec/lo have been very close to –20 dBm in many measurements. The purpose of choosing tests parameters this way is to validate measurement capability in worst case conditions.
	 The higher lo value is the higher Îor/loc value is specified
	 The UE is not in SHO during the tests
	 CPICH Ec/lo measurements tests are validating the accuracy for each specified accuracy category.
	• DPCH_Ec/lor level have been increased in some tests cases in order to have reasonable quality at DPCH in downlink.
	• Test 1 of proposed CPICH RSCP and CPICH_Ec/lo tests fulfils also the side condition for SCH_Ec/lo which is defined for identification of a new intra or inter frequency cell.
	 A note has been added to test tables that tests needs to be done sequentially and that tests parameters needs to be changed within 5 seconds. This is because in tests 2 and 3 SCH_Ec/lo for cell 2 may be below the specified identification limits. Thus when tests parameters are changed quickly UE will not loose the cell 2 during the time when tests parameters are being changed.
	4) It has been clarified that compressed mode pattern set 1of Table A.22 in TS 25.101 is being used for inter frequency CPICH RSCP and CPICH Ec/lo tests
	5) Since in tests a test equipment does not know the effect of thermal noise and noise generated in the receiver, the required accuracy on Io levels of -9487 dBm is relaxed in some of the CPICH Ec/Io and UTRA carrier RSSI tests by the impact of assumed thermal noise and noise generated in the receiver (–99 dBm). The modified tests are CPICH_Ec/Io Intra and Inter frequency absolute accuracy, CPICH_Ec/Io Inter frequency relative accuracy and UTRA Carrier RSSI absolute and relative accuracy tests.
	Isolated Impact Analysis:
	The proposed corrections are testing related and they do not change the behaviour of the UE. Hence, the changes do not affect the implementation.
Consequences if not approved:	⁸ Misunderstandings of Io conditions exists. Test parameters for CPICH RSCP, CPICH Ec/Io and UTRA Carrier RSSI are inadequate. Testing of CPICH_Ec/Io Intra and Inter frequency absolute accuracy, CPICH_Ec/Io Inter frequency relative accuracy and UTRA Carrier RSSI absolute and relative accuracy is not possible since a test equipment does not know thermal noise and noise generated in the receiver.
Clauses affected:	P 9131 9132 891111 891112 891211 891212 89122
	A.9.1.3.1 and A.9.1.3.2
Other specs affected:	Conter core specifications # X Test specifications O&M Specifications 34.121
Other comments: ¥	It has been assumed that RAN WG1 will change the definition of UTRA Carrier RSSI and CPICH Ec/lo measurements so that thermal noise and noise generated in the receiver is included into UTRA Carrier RSSI and CPICH_Ec/lo measurements.

9 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The physical layer measurement model and a complete list of measurements is specified in TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 "Physical layer - Measurements (FDD)". In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

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

9.1 Measurement Performance for UE

The requirements in this clause are applicable for a UE:

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

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

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

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

9.1.1 CPICH RSCP

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

9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.1.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.1 are valid under the following conditions:

CPICH_RSCP1 $|_{dBm} \ge -114 \text{ dBm}.$

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

Table 9.1: CPICH_RSCP Intra frequency absolute accuracy

Paramotor	Unit	Accuracy [dB]		Conditions
Falameter	Unit	Normal condition	Extreme condition	lo [dBm]
	dBm	± 6	± 9	-9470
	dBm	± 8	± 11	- <u>70</u> 9450

9.1.1.1.2 Relative accuracy requirement

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

The accuracy requirements in table 9.2 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _RSCP1 \right|_{in \, dBm} - CPICH _RSCP2 \right|_{in \, dBm} \right| \le 20 \, dB$$

$$\frac{I_o}{\left(\hat{I}_{or}\right)}_{in \, dB} - \left(\frac{CPICH _E_c}{I_{or}}\right)_{in \, dB} \le 20 \, dB$$

Table 9.2: CPICH_RSCP Intra frequency relative accuracy

Baramotor	Unit	Accuracy [dB]		Conditions
Parameter	Unit	Normal condition	Extreme condition	lo [dBm]
CPICH_RSCP	dBm	± 3	± 3	-9450

9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.1.2.1 Relative accuracy requirement

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

The accuracy requirements in table 9.3 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _RSCP1 \right|_{in \, dBm} - CPICH _RSCP2 \right|_{in \, dBm} \le 20 \, dB$$

| Channel 1_Io $|_{dBm}$ -Channel 2_Io $|_{dBm}| \le 20 \text{ dB}.$

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

Table 9.3: CPICH_RSCP Inter frequency relative accuracy

Paramotor	Unit	Accur	Conditions	
Parameter	Unit	Normal condition	Extreme condition	lo [dBm]
CPICH_RSCP	dBm	± 6	±6	-9450

9.1.1.3 CPICH RSCP measurement report mapping

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

In table 9.4 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4

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

9.1.2 CPICH Ec/lo

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

9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.2.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.5 are valid under the following conditions:

CPICH_RSCP1|_{dBm} \geq -114 dBm.

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} \quad - \quad \left(\frac{CPICH - E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$$

Table 9.5: CPICH_Ec/lo Intra frequency absolute accuracy

		Accuracy [dB]		Conditions
Parameter	Unit	Normal condition	Extreme condition	lo [dBm]
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo < -14 \pm 3 for -20 \leq CPICH Ec/lo < -16	± 3	-9450

9.1.2.1.2 Relative accuracy requirement

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

The accuracy requirements in table 9.6 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _RSCP1 \right|_{in \ dBm} - CPICH _RSCP2 \right|_{in \ dBm} \left| \le 20 dB \right|_{in \ dBm} = - \left(\frac{CPICH _E_c}{I_{or}} \right)_{in \ dB} \le 20 dB$$

Table 9.6: CPICH	_Ec/lo Intra	frequency	relative	accuracy
------------------	--------------	-----------	----------	----------

Baramatar	Unit	Accuracy [dB]	Conditions	
Farameter	Unit	Normal condition	Extreme condition	lo [dBm]
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo < -14 \pm 3 for -20 \leq CPICH Ec/lo < -16	± 3	-9450

9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.2.2.1 Absolute accuracy requirement

The accuracy requirements in table 9.7 are valid under the following conditions:

 $CPICH_RSCP1|_{dBm} \ge -114 dBm.$

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

Table 9.7: CPICH_Ec/lo Inter frequency absolute accuracy

	Accuracy [dB]			Conditions
Parameter	Unit	Normal condition	Extreme condition	lo [dBm]
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo $<$ -14 \pm 3 for -20 \leq CPICH Ec/lo $<$ -16	±3	-9450

9.1.2.2.2 Relative accuracy requirement

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

The accuracy requirements in table 9.8 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _RSCP1 \right|_{in \, dBm} - CPICH _RSCP2 \right|_{in \, dBm} \le 20 \, dB$$

| Channel 1_Io $|_{dBm}$ -Channel 2_Io $|_{dBm}| \le 20 \text{ dB}.$

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

Table 9.8: CPICH_Ec/lo Inter frequency relative accuracy

Parameter	Accuracy [dB]			Conditions
Farameter	Unit	Normal condition	Extreme condition	lo [dBm]
		\pm 1.5 for -14 \leq CPICH Ec/lo		
CPICH_Ec/lo	dB	\pm 2 for -16 \leq CPICH Ec/lo < -14	± 3	-9450
		\pm 3 for -20 \leq CPICH Ec/lo < -16		

9.1.2.3 CPICH Ec/lo measurement report mapping

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

In table 9.9 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/lo < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/lo < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/lo < -23	dB
		•••
CPICH_Ec/No _47	-1 ≤ CPICH Ec/lo < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/lo < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/lo	dB

Table 9.9

9.1.3 UTRA Carrier RSSI

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSIIe Inter frequency absolute accuracy

Baramotor Unit		Accuracy [dB]		Conditions
raiametei	Onit	Normal condition	Extreme condition	lo [dBm]
UTRA Carrier	dBm	± 4	± 7	-9470
RSSII0	dBm	± 6	± 9	- <u>70</u> 9450

9.1.3.2 Relative accuracy requirement

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

The accuracy requirements in table 9.11 are valid under the following condition:

| Channel 1_Io $|_{dBm}$ -Channel 2_Io $|_{dBm}$ | < 20 dB.

Table 9.11: UTRA Carrier RSSI lo Inter frequency relative accuracy

Paramotor	Unit	Accuracy [dB] Conditio		Conditions
Falailletei	Unit	Normal condition	Extreme condition	lo [dBm]
UTRA Carrier RSSIIo	dBm	± 7	± 11	-9470

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.12

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

9.1.11 P-CCPCH RSCP

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

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.4. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.4.

9.1.11.1 Absolute accuracy requirements

The accuracy requirement in table 9.31is valid under the following conditions:

P-CCPCH_RSCP ≥ -102 dBm.

$$\frac{I_o}{\left(\hat{I}_{or}\right)}\Big|_{in\ dB} - \left(\frac{P - CCPCH - E_c}{I_{or}}\right)\Big|_{in\ dB} \le 8dB$$

Table 9.31: P-CCPCH_RSCP Inter frequency absolute accuracy

Baramatar	Unit	Accura	acy [dB]	Conditions
Farameter	Unit	Normal conditions	Extreme conditions	lo [dBm]
	DBm	± 6	± 9	-9470
	DBm	± 8	± 11	- <u>70</u> 9450

9.1.11.2 P-CCPCH RSCP measurement report mapping

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

In table 9.32 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

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

Table 9.32

A.9 Measurement Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in TS 25.101 annex A, sub-clause A.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in TS 25.101 annex C.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

A.9.1 Measurement Performance for UE

A.9.1.1 CPICH RSCP

A.9.1.1.1 Test Purpose and Environment

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

A.9.1.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. Table A.9.1 defines the limits of signal strengths and code powers, when the requirements are applicable. Both CPICH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

When verifying the CPICH RSCP intra frequency absolute accuracy requirement only cell 1 in table A.9.1 shall be present. When verifying the CPICH RSCP intra frequency relative accuracy requirement both cell 1 and 2 in table A.9.1 shall be present.

Table A.9.1: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Cell 1 Cell 2			
UTRA RF Channel number		Channel 1	Channel 1		
CPICH_Ec/lor	dB	-10	-10		
PCCPCH_Ec/lor	d₿	-12	-12		
SCH_Ec/lor	dB	-12	-12		
PICH_Ec/lor	dB	-15	-15		
DPCH_Ec/lor	dB	-15	-15		
OCNS	dB	-1.11	-1.11		
Îor/loc	dB	10.5	10.5		
loc	dBm/ 3.84 MHz	lo -13.7 dB = loc, Note 1	lo -13.7 dB = loc, Note 1		
Range 1:lo	dBm	-9470	-9470		
Range 2: lo	UDIII	-9450	-9450		
Propagation condition	- AWGN				
NOTE 1: /oc level shall be adjusted according the total signal power /o at receiver input and the geometry factor					
Îor/loc.					

Parameter	Unit	Tes	<u>st 1</u>	Tes	<u>st 2</u>	Tes	<u>st 3</u>				
Farameter	<u>onit</u>	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2				
UTRA RF Channel number		Channel 1		Channel 1 Channel 1		Channel 1		<u>Char</u>	nel 1		
CPICH_Ec/lor	dB	-1	0	-10		-1	0				
PCCPCH_Ec/lor	<u>dB</u>	<u>-12</u> <u>-12</u>		<u>-12</u>		-1	2				
SCH_Ec/lor	dB	-12		<u>-12</u>		-12 -12		-1	2		
PICH_Ec/lor	<u>dB</u>	<u>-15</u>		<u>-15</u>		<u>-15</u>		<u>-15</u>		-1	5
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	-	<u>-15</u>		<u>-15</u>	-				
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-1.11</u>	<u>-0.94</u>				
loc	<u>dBm/ 3.84 MHz</u>	-75.54		<u>-59.98</u>		<u>-97</u>	. <u>52</u>				
<u>Îor/loc</u>	<u>dB</u>	4	<u>0</u>	9	0	<u>0</u>	-6.53				
CPICH RSCP, Note 1	<u>dBm</u>	<u>-81.5</u>	-85.5	<u>-60.98</u>	<u>-69.88</u>	<u>-107.5</u>	<u>-114.0</u>				
lo, Note 1	<u>dBm</u>	<u>-69</u> <u>-50</u> <u>-94</u>		94							
Propagation condition	<u>- AWGN AWGN AWGN</u>										
NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves											
die not settable parameters themselves.											

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 [14 slots is FSS]. Table A.9.2 defines the limits of signal strengths and code powers, where the requirement is applicable.<u>CPICH RSCP inter frequency relative accuracy</u> requirements are tested by using test parameters in Table A.9.2.

When verifying the CPICH RSCP inter frequency relative accuracy requirement both cell 1 and 2 in table A.9.2 shall be present.

Table A.9.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2			
UTRA RF Channel number		Channel 1	Channel 2			
CPICH_Ec/lor	d₿	-10	-10			
PCCPCH_Ec/lor	d₿	-12 - 12				
SCH_Ec/lor	d₿	-12	-12			
PICH_Ec/lor	d₿	-15	-15			
DPCH_Ec/lor	d₿	-15	-15			
OCNS	dB	-1.11 -1.11				
Î or/loc	dB	10.1	10.1			
loc	dBm/ 3.84 MHz	lo -10.6 dB = loc, Note 1	lo -10.6 dB = loc, Note 1			
Range 1:lo	dRm	-9470	-9470			
Range 2: lo	UDIII	-9450	-9450			
Propagation condition	- AWGN					
NOTE 1: /oc level shall be adjusted in each carrier frequency according the total signal power /o at receiver input						
and the geometry factor <i>lor/loc</i> .						

Parameter	Unit	nit <u>Cell 1</u> <u>Cell 2</u>		Te	<u>st 2</u>		
Farameter	<u>onn</u>			Cell 1	Cell 2		
UTRA RF Channel number		Channel 1 Channel 2		Channel 1	Channel 2		
CPICH_Ec/lor	<u>dB</u>	-1	<u>10</u>	-	<u>10</u>		
PCCPCH_Ec/lor	<u>dB</u>	-1	12	-	12		
SCH_Ec/lor	dB	-1	12	-	12		
PICH_Ec/lor	dB	-15		-	<u>15</u>		
DPCH_Ec/lor	dB	<u>-15</u>		<u>-15</u>	-		
OCNS Ec/lor	<u>dB</u>	<u>-1.11</u> <u>-0.94</u>		<u>-1.11</u>	<u>-0.94</u>		
loc	<u>dBm/ 3.84</u> <u>MHz</u>	<u>-60.00</u> <u>-60.00</u>		<u>-84.00</u>	<u>-94.46</u>		
<u>Îor/loc</u>	dB	9.54 9.54		<u>0</u>	<u>-9.54</u>		
CPICH RSCP, Note 1	<u>dBm</u>	- <u>60.46</u> - <u>60.46</u>		<u>-94.0</u>	<u>-114.0</u>		
lo, Note 1	dBm	-50.00	-50.00 -50.00		-94.0		
Propagation condition	_	AWGN AWGN					
NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information							
purposes. They are not settable parameters themselves.							
Tests shall be done sequential	y. Test 1 shall b	e done first. Afte	er test 1 has bee	n executed test	<u>parameters</u>		
101 test 2 shall de set within 5 s	econas so that l	JE ques not loos	<u>se the Cell 2 in c</u>	between the tes	<u>IS.</u>		

A.9.1.1.2 Test Requirements

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

A.9.1.2 CPICH Ec/lo

A.9.1.2.1 Test Purpose and Environment

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

A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Table A.9.3 defines the limits of signal strengths and code powers, where the requirements are applicable. Both CPICH Ec/Io absolute and relative accuracy requirements are tested by using test parameters in Table A.9.3

When verifying the CPICH Ec/Io intra frequency absolute accuracy requirement only cell 1 in table A.9.3 shall be present. When verifying the CPICH Ec/Io intra frequency relative accuracy requirement both cell 1 and 2 in table A.9.3 shall be present.

Table A.9.3: CPICH Ec/lo Intra frequency test parameter

Parameter	Unit	Cell 1	Cell 2			
UTRA RF Channel number		Channel 1	Channel 1			
CPICH_Ec/lor	dB	-10	-10			
PCCPCH_Ec/lor	dB	-12	-12			
SCH_Ec/lor	d₿	-12	-12			
PICH_Ec/lor	d₿	-15	-15			
DPCH_Ec/lor	dB	-15	-15			
OCNS	dB	-1.11	-1.11			
Îor/loc	dB	10.5	10.5			
loc	dBm/ 3.84 MHz	/o -13.7 dB = loc, Note 1	lo -13.7 dB = loc, Note 1			
Range 1:lo	dBm	-9470	-9170			
Range 2: lo	ubiii	-9450	-9450			
Propagation condition - AWGN						
NOTE 1: /oc level shall be adjusted according the total signal power /o at receiver input and the geometry factor						
Îor/loc.						

Deremeter	l linit.	Tes	st 1	Tes	st <u>2</u>	Test 3			
Parameter	Onit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2		
UTRA RF Channel number		Channel 1		Channel 1 Channel 1		Channel 1		Char	inel 1
CPICH_Ec/lor	<u>dB</u>	-1	<u>-10</u> <u>-10</u>		<u>-10</u>		0		
PCCPCH_Ec/lor	<u>dB</u>	-1	<u>-12</u> <u>-12</u>		-12		2		
<u>SCH_Ec/lor</u>	<u>dB</u>	-12		<u>-12</u>		-12		-1	2
PICH_Ec/lor	<u>dB</u>	<u>-15</u>		<u>-15</u> <u>-15</u>		<u>-15</u>		-1	5
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	-	<u>-15</u>		-6	-		
OCNS_Ec/lor	dB	-1.11	-0.94	-1.11	-0.94	.2.56	-0.94		
loc	<u>dBm/ 3.84 MHz</u>	-56.98		<u>-89.07</u>		-94	.98		
<u>Îor/loc</u>	<u>dB</u>	<u>3.0</u>	<u>3.0</u>	-2.9	-2.9	-9.0	-9.0		
CPICH Ec/lo, Note 1	<u>dBm</u>	-14.0	-14.0	-16.0	<u>-16.0</u>	-20.0	-20.0		
lo, Note 1	<u>dBm</u>	dBm -50 -86 -94							
Propagation condition	<u>AWGN</u> AWGN AWGN								
NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They									
are not settable parameters themselves.									
Tests shall be done sequentially	Tasts shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests								

<u>I ests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests</u> 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.1.2.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Set 1 of Table A.22 [14 slots is FSS]. Table A.9.4 defines the limits of signal strengths and code powers, where the requirement is applicable. <u>CPICH Ec/Io inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.4</u>.

When verifying the CPICH Ec/Io inter frequency relative accuracy requirement both cell 1 and 2 in table A.9.4 shall be present.

Table A.9.4: CPICH Ec/lo Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2			
UTRA RF Channel number		Channel 1	Channel 2			
CPICH_Ec/lor	dB	-10	-10			
PCCPCH_Ec/lor	dB	-12	-12			
SCH_Ec/lor	dB	-12	-12			
PICH_Ec/lor	dB	-15	-15			
DPCH_Ec/lor	dB	-15	-15			
OCNS	dB	-1.11	-1.11			
Î or/loc	dB	10.1	10.1			
loc	dBm/ 3.84 MHz	Io -10.6 dB = Ioc, Note 1	Io -10.6 dB = loc, Note 1			
Range 1:10	dBm	-9470	-9470			
Range 2: lo	UDIII	-9450	-9450			
Propagation condition	-	AWGN				
NOTE 1: Joe level shall be adjusted in each carrier frequency according the total signal power. In at receiver input						

and the geometry factor for/loc.

Toot 1 Toot 2 Toot 2							
Parameter	Unit	<u>18</u>	<u>st 1</u>	<u>16</u>	<u>st 2</u>	<u>18</u>	<u>51 3</u>
	<u></u>	<u>Cell 1</u>	<u>Cell 2</u>	<u>Cell 1</u>	<u>Cell 2</u>	<u>Cell 1</u>	Cell 2
UTRA RF Channel							Observatio
number		Channel 1	<u>Channel 2</u>	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/lor	<u>dB</u>	-1	0	<u>-10</u>		-1	0
PCCPCH_Ec/lor	<u>dB</u>	-1	2	-	12	-1	2
<u>SCH_Ec/lor</u>	<u>dB</u>	-1	1 <u>2</u>	-1	12	-1	2
PICH_Ec/lor	<u>dB</u>	-1	<u> 5</u>	-1	<u>15</u>	-15	
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	=	<u>-6</u>	=	<u>-6</u>	=
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-2.56</u>	<u>-0.94</u>	<u>-2.56</u>	<u>-0.94</u>
	dBm/ 3.84	50.00	50.00	07.07	07.07	04.46	04.46
100	MHz	<u>-52.22</u>	-32.22	<u>-01.21</u>	<u>-01.21</u>	<u>-94.40</u>	<u>-94.40</u>
<u>Îor/loc</u>	<u>dB</u>	<u>-1.75</u>	<u>-1.75</u>	<u>-4.7</u>	<u>-4.7</u>	<u>-9.54</u>	<u>-9.54</u>
CPICH Ec/lo, Note 1	<u>dBm</u>	<u>-14.0</u>	<u>-14.0</u>	<u>-16.0</u>	<u>-16.0</u>	<u>-20.0</u>	<u>-20.0</u>
lo, Note 1	<u>dBm</u>	<u>-50</u>	<u>-50</u>	<u>-86</u>	<u>-86</u>	<u>-94</u>	<u>-94</u>
Propagation condition	-	AWGN AWGN AWGN					
NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They							
are not settable parameters themselves.							
Tests shall be done seq	uentially. Test	1 shall be do	ne first. After	test 1 has be	en executed	test paramet	ers for tests
2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2. In case of the absolute CPICH_Ec/Io measurement accuracy and relative inter-frequency CPICH_Ec/Io measurement accuracy test cases the effect of assumed thermal noise and noise generated in the receiver (-99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.4A.

Table A.9.4A: CPICH_Ec/lo Intra and Inter frequency absolute accuracy and CPICH_Ec/lo Inter frequency relative accuracy

	<u>Unit</u>	Accuracy [dB]	Conditions	
Parameter		Normal condition	Extreme condition	<u>lo [dBm]</u>
CDICH Follo	dp	$\frac{-2.71.5 \text{ for } -14 \le \text{CPICH Ec/lo}}{-3.22 \text{ for } -16 \le \text{CPICH Ec/lo} < -14}$ $-4.23 \text{ for } -20 \le \text{CPICH Ec/lo} < -16$	<u>-4.23</u>	<u>-9487</u>
CPICH EC/10		$\frac{\pm 1.5 \text{ for } -14 \leq \text{CPICH Ec/lo}}{\pm 2 \text{ for } -16 \leq \text{CPICH Ec/lo} < -14}$ $\pm 3 \text{ for } -20 \leq \text{CPICH Ec/lo} < -16$	<u>± 3</u>	<u>-8750</u>

A.9.1.3 UTRA Carrier RSSI

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3. <u>UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.</u>

Table A.9.5 defines the limits of signal strengths, where the requirement is applicable.

When verifying the UTRA Carrier RSSI absolute accuracy requirement only cell 1 in table A.9.5 shall be present. When verifying the UTRA Carrier RSSI relative accuracy requirement both cell 1 and 2 in table A.9.5 shall be present.

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channei number	-	Channel 1	Channel 2
Îor/loc	d₿	-1	-4
	dBm/ 3 84 MHz	lo -4.13 dB = loc,	lo -4.13 dB = loc,
		Note 1	Note 1
Range 1: lo	dBm/ 3.84 MHz	-9470	-9470
Range 2: lo		-9150	-9450
Propagation condition	•	AW	GN
NOTE 1: loc level shall be adjusted according th	e total signal power I	o at receiver input and	the geometry
factor Îor/loc.			

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

Parameter	Unit	Tes	<u>st 1</u>	Test 2		Test 3	
Farameter	Onit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
<u>number</u>		onumeri				<u>onamer r</u>	<u>onamer z</u>
CPICH_Ec/lor	<u>dB</u>	-1	<u>10</u>	-1	<u>10</u>	<u>-1</u>	0
PCCPCH_Ec/lor	<u>dB</u>	-1	12	-1	12	<u>-1</u>	2
SCH_Ec/lor	<u>dB</u>	-1	12	-1	12	<u>-1</u>	12
PICH_Ec/lor	<u>dB</u>	-1	<u>15</u>	-	<u>15</u>	<u>-15</u>	
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	<u> </u>	<u>-6</u>	<u> </u>	<u>-6</u>	<u> </u>
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	-0.94	-2.56	-0.94	<u>-2.56</u>	<u>-0.94</u>
loc	<u>dBm/ 3.84</u> MHz	<u>-52.22</u>	<u>-52.22</u>	<u>-70.27</u>	<u>-70.27</u>	<u>-94.46</u>	<u>-94.46</u>
<u>Îor/loc</u>	dB	<u>-1.75</u>	<u>-1.75</u>	-4.7	-4.7	<u>-9.54</u>	-9.54
CPICH Ec/lo, Note 1	<u>dBm</u>	<u>-14.0</u>	<u>-14.0</u>	<u>-16.0</u>	<u>-16.0</u>	<u>-20.0</u>	<u>-20.0</u>
lo, Note 1	<u>dBm</u>	<u>-50</u>	<u>-50</u>	<u>-69</u>	<u>-69</u>	<u>-94</u>	<u>-94</u>
Propagation condition		AWGN AWGN AWGN					
NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They							
are not settable parameters themselves.							
Tests shall be done seg	Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests						
2 and 3 shall be set with	nin 5 seconds :	so that UE do	es not loose	the Cell 2 in I	between the t	ests.	

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. <u>The effect of assumed</u> thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in <u>Section 9.1.2 as shown in Table A.9.5A.</u>

Parameter	<u>Unit</u>	Accur	Conditions	
Farameter		Normal condition	Extreme condition	lo [dBm]
	<u>dBm</u>	<u>-45.2</u>	<u>-78.2</u>	<u>-9487</u>
UTRA Carrier RSSI	<u>dBm</u>	<u>± 4</u>	<u>± 7</u>	<u>-8770</u>
	<u>dBm</u>	<u>± 6</u>	<u>± 9</u>	<u>-7050</u>

3GPP TSG RAN WG4 Meeting #20

R4-011639

East Brunswick, NJ, USA 12th - 16th November 2001

	CR-Form-v4						
CHANGE REQUEST							
¥	25.133 CR 216 [#] ev [#] Current version: 5.0.0 [#]						
For <u>HELP</u> on us	ing this form, see bottom of this page or look at the pop-up text over the $#$ symbols.						
Proposed change affects: # (U)SIM ME/UE X Radio Access Network Core Network							
Title: ೫	Requirements and test parameters for UE measurements						
Source: ೫	RAN WG4						
Work item code: ℜ	Date: 第 2001-11-15						
Category: #	A Release: % Rel-5 Use one of the following categories: Use one of the following releases: 2 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 categories can REL-4 (Release 4) De found in 3GPP TR 21.900. REL-5 (Release 5)						
	measurements e.g., CPICH RSCP measurement needs to be clarified to avoid more misunderstandings. At the same meeting it was also agreed that RAN WG4 should define test conditions for some UE measurements e.g., CPICH RSCP and CPICH Ec/lo measurements in more detail						
Summary of change	 1) Io conditions have been clarified for the accuracy requirements of following measurements CPICH RSCP intra frequency measurements 						
	UTRA Carrier RSSI measurements						
	• P-CCPCH RSCP measurements						
	Instead of having two ranges for Io conditions –94 dBm70dBm and –94 dbm50 dBm the new ranges are –94 dBm–70 dBm and –70 dBm50 dBm.						
	2) An obvious typo for Io conditions for UTRA Carrier RSSI relative measurements has been corrected from –94 dBm70 dBm to –94 dBm50 dBm.						
3) New test parameters for the CPICH RSCP, CPICH Ec/Io and UTRA Carrier RSSI measurements have been defined. Test parameters have been chosen using the following strategy:							
	 Tests are performed at both ends of specified Io conditions i.e. at -50 dBm and -94 dBm. Measurements are also performed at -69 dBm in tests where accuracy requirement changes at -70 dBm. 						
	 Side conditions of related measurements are always fulfilled. In many 						

	tests side conditions are just barely met. For example in some CPICH RSCP tests cases an absolute CPICH RSCP value have been –114 dBm, which is the lowest possible allowed by side conditions. Also CPICH_Ec/lo have been very close to –20 dBm in many measurements. The purpose of choosing tests parameters this way is to validate measurement capability in worst case conditions.
	 The higher lo value is the higher Îor/loc value is specified
	 The UE is not in SHO during the tests
	 CPICH Ec/lo measurements tests are validating the accuracy for each specified accuracy category.
	 DPCH_Ec/lor level have been increased in some tests cases in order to have reasonable quality at DPCH in downlink.
	 Test 1 of proposed CPICH RSCP and CPICH_Ec/lo tests fulfils also the side condition for SCH_Ec/lo which is defined for identification of a new intra or inter frequency cell.
	 A note has been added to test tables that tests needs to be done sequentially and that tests parameters needs to be changed within 5 seconds. This is because in tests 2 and 3 SCH_Ec/lo for cell 2 may be below the specified identification limits. Thus when tests parameters are changed quickly UE will not loose the cell 2 during the time when tests parameters are being changed.
	4) It has been clarified that compressed mode pattern set 1of Table A.22 in TS 25.101 is being used for inter frequency CPICH RSCP and CPICH Ec/lo tests
	5) Since in tests a test equipment does not know the effect of thermal noise and noise generated in the receiver, the required accuracy on Io levels of -9487 dBm is relaxed in some of the CPICH Ec/Io and UTRA carrier RSSI tests by the impact of assumed thermal noise and noise generated in the receiver (–99 dBm). The modified tests are CPICH_Ec/Io Intra and Inter frequency absolute accuracy, CPICH_Ec/Io Inter frequency relative accuracy and UTRA Carrier RSSI absolute and relative accuracy tests.
Consequences if a solution of approved:	# Misunderstandings of lo conditions exists. Test parameters for CPICH RSCP, CPICH Ec/lo and UTRA Carrier RSSI are inadequate. Testing of CPICH_Ec/lo Intra and Inter frequency absolute accuracy, CPICH_Ec/lo Inter frequency relative accuracy and UTRA Carrier RSSI absolute and relative accuracy is not possible since a test equipment does not know thermal noise and noise generated in the receiver.
Clauses affected:	₭ <u>9.1.3.1, 9.1.3.2, A.9.1.1.1.1, A.9.1.1.1.2, A.9.1.2.1.1, A.9.1.2.1.2, A.9.1.2.2,</u>
	A.9.1.3.1 and A.9.1.3.2
Other specs	# Other core specifications # X Test specifications 34.121 O&M Specifications O&M Specifications
Other comments:	It has been assumed that RAN WG1 will change the definition of UTRA Carrier RSSI and CPICH Ec/Io measurements so that thermal noise and noise generated in the receiver is included into UTRA Carrier RSSI and CPICH_Ec/Io measurements.

9 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The physical layer measurement model and a complete list of measurements is specified in TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 "Physical layer - Measurements (FDD)". In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

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

9.1 Measurement Performance for UE

The requirements in this clause are applicable for a UE:

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

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

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

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

9.1.1 CPICH RSCP

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

9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.1.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.1 are valid under the following conditions:

CPICH_RSCP1 $|_{dBm} \ge -114 \text{ dBm}.$

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

Table 9.1: CPICH_RSCP Intra frequency absolute accuracy

Baramotor	Unit	Accura	Conditions	
Falalletei	Unit	Normal condition	Extreme condition	lo [dBm]
	dBm	± 6	± 9	-9470
	dBm	± 8	± 11	- <u>70</u> 9450

9.1.1.1.2 Relative accuracy requirement

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

The accuracy requirements in table 9.2 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _RSCP1 \right|_{in \, dBm} - CPICH _RSCP2 \right|_{in \, dBm} \right| \le 20 \, dB$$

$$\frac{I_o}{\left(\hat{I}_{or}\right)}_{in \, dB} - \left(\frac{CPICH _E_c}{I_{or}}\right)_{in \, dB} \le 20 \, dB$$

Table 9.2: CPICH_RSCP Intra frequency relative accuracy

Baramotor	Unit	Accura	Conditions	
Parameter	Unit	Normal condition	Extreme condition	lo [dBm]
CPICH_RSCP	dBm	± 3	± 3	-9450

9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.1.2.1 Relative accuracy requirement

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

The accuracy requirements in table 9.3 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _RSCP1 \right|_{in \, dBm} - CPICH _RSCP2 \right|_{in \, dBm} \le 20 \, dB$$

| Channel 1_Io $|_{dBm}$ -Channel 2_Io $|_{dBm}| \le 20 \text{ dB}.$

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

Table 9.3: CPICH_RSCP Inter frequency relative accuracy

Paramotor	Unit	Accur	Conditions	
Farameter	Onit	Normal condition	Extreme condition	lo [dBm]
CPICH_RSCP	dBm	± 6	±6	-9450

9.1.1.3 CPICH RSCP measurement report mapping

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

In table 9.4 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4

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

9.1.2 CPICH Ec/lo

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

9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.2.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.5 are valid under the following conditions:

CPICH_RSCP1|_{dBm} \geq -114 dBm.

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} \quad - \quad \left(\frac{CPICH - E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$$

Table 9.5: CPICH_Ec/lo Intra frequency absolute accuracy

		Accuracy [dB]	dB] Conditio		
Parameter	Unit	Normal condition	Extreme condition	lo [dBm]	
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo < -14 \pm 3 for -20 \leq CPICH Ec/lo < -16	± 3	-9450	

9.1.2.1.2 Relative accuracy requirement

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

The accuracy requirements in table 9.6 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _RSCP1 \right|_{in \ dBm} - CPICH _RSCP2 \right|_{in \ dBm} \left| \le 20 dB \right|_{in \ dBm} = - \left(\frac{CPICH _E_c}{I_{or}} \right)_{in \ dB} \le 20 dB$$

Table 9.6: CPICH	_Ec/lo Intra	frequency	relative	accuracy
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Baramatar	Unit	Accuracy [dB]		Conditions
Parameter Unit		Normal condition	Extreme condition	lo [dBm]
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo < -14 \pm 3 for -20 \leq CPICH Ec/lo < -16	± 3	-9450

9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.2.2.1 Absolute accuracy requirement

The accuracy requirements in table 9.7 are valid under the following conditions:

 $CPICH_RSCP1|_{dBm} \ge -114 dBm.$

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

Table 9.7: CPICH_Ec/lo Inter frequency absolute accuracy

		Accuracy [dB]	Conditions	
Parameter Unit		Normal condition	Extreme condition	lo [dBm]
CPICH_Ec/lo	dB	\pm 1.5 for -14 \leq CPICH Ec/lo \pm 2 for -16 \leq CPICH Ec/lo $<$ -14 \pm 3 for -20 \leq CPICH Ec/lo $<$ -16	±3	-9450

9.1.2.2.2 Relative accuracy requirement

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

The accuracy requirements in table 9.8 are valid under the following conditions:

CPICH_RSCP1,2 $|_{dBm} \ge -114 \text{ dBm}.$

$$\left| CPICH _RSCP1 \right|_{in \, dBm} - CPICH _RSCP2 \right|_{in \, dBm} \le 20 \, dB$$

| Channel 1_Io $|_{dBm}$ -Channel 2_Io $|_{dBm}| \le 20 \text{ dB}.$

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

Table 9.8: CPICH_Ec/lo Inter frequency relative accuracy

Parameter Unit -		Accuracy [dB]	Conditions	
		Normal condition Extreme condition		lo [dBm]
		\pm 1.5 for -14 \leq CPICH Ec/lo		
CPICH_Ec/lo	dB	\pm 2 for -16 \leq CPICH Ec/lo < -14	± 3	-9450
		\pm 3 for -20 \leq CPICH Ec/lo < -16		

9.1.2.3 CPICH Ec/lo measurement report mapping

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

In table 9.9 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/lo < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/lo < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/lo < -23	dB
		•••
CPICH_Ec/No _47	-1 ≤ CPICH Ec/lo < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/lo < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/lo	dB

Table 9.9

9.1.3 UTRA Carrier RSSI

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSIIe Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
Farameter	Onit	Normal condition	Extreme condition	lo [dBm]
la	dBm	± 4	± 7	-9470
10	dBm	± 6	± 9	- <u>70</u> 94 50

9.1.3.2 Relative accuracy requirement

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

The accuracy requirements in table 9.11 are valid under the following condition:

| Channel 1_Io $|_{dBm}$ -Channel 2_Io $|_{dBm}$ | < 20 dB.

Table 9.11: UTRA Carrier RSSI lo Inter frequency relative accuracy

Paramotor	Unit	Accuracy [dB]		Conditions
Falameter	Unit	Normal condition	Extreme condition	Conditions lo [dBm] -9470
UTRA Carrier RSSIIo	dBm	± 7	± 11	-9470

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.12

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

9.1.11 P-CCPCH RSCP

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

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.4. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.4.

9.1.11.1 Absolute accuracy requirements

The accuracy requirement in table 9.31is valid under the following conditions:

P-CCPCH_RSCP ≥ -102 dBm.

$$\frac{I_o}{\left(\hat{I}_{or}\right)}\Big|_{in\ dB} - \left(\frac{P - CCPCH - E_c}{I_{or}}\right)\Big|_{in\ dB} \le 8dB$$

Table 9.31: P-CCPCH_RSCP Inter frequency absolute accuracy

Baramatar	Unit	Accuracy [dB]		Conditions
Farameter	Unit	Normal conditions	Extreme conditions	lo [dBm]
	dBm	± 6	± 9	-9470
	dBm	± 8	± 11	- <u>70</u> 9450

9.1.11.2 P-CCPCH RSCP measurement report mapping

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

In table 9.32 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

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

Table 9.32

A.9 Measurement Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in TS 25.101 annex A, sub-clause A.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in TS 25.101 annex C.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

A.9.1 Measurement Performance for UE

A.9.1.1 CPICH RSCP

A.9.1.1.1 Test Purpose and Environment

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

A.9.1.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. Table A.9.1 defines the limits of signal strengths and code powers, when the requirements are applicable. Both CPICH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

When verifying the CPICH RSCP intra frequency absolute accuracy requirement only cell 1 in table A.9.1 shall be present. When verifying the CPICH RSCP intra frequency relative accuracy requirement both cell 1 and 2 in table A.9.1 shall be present.

Table A.9.1: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2	
UTRA RF Channel number		Channel 1	Channel 1	
CPICH_Ec/lor	dB	-10	-10	
PCCPCH_Ec/lor	dB	-12	-12	
SCH_Ec/lor	dB	-12	-12	
PICH_Ec/lor	dB	-15	-15	
DPCH_Ec/lor	dB	-15	-15	
OCNS	dB	-1.11	-1.11	
Îor/loc	dB	10.5	10.5	
loc	dBm/ 3.84 MHz	lo -13.7 dB = loc, Note 1	lo -13.7 dB = loc, Note 1	
Range 1:lo	dDm	-9470	-9470	
Range 2: lo	UDIII	-9450	-9450	
Propagation condition	- AWGN			
NOTE 1: <i>loc</i> level shall be adjusted according the total signal power <i>lo</i> at receiver input and the geometry factor				

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/lor	dB	<u>-10</u>		-10		-10	
PCCPCH_Ec/lor	<u>dB</u>	<u>-12</u>		<u>-12</u>		<u>-12</u>	
SCH_Ec/lor	dB	<u>-12</u>		-12		-12	
PICH_Ec/lor	<u>dB</u>	<u>-15</u>		<u>-15</u>		<u>-15</u>	
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	-	<u>-15</u>	-	<u>-15</u>	-
OCNS_Ec/lor	<u>dB</u>	-1.11	-0.94	<u>-1.11</u>	-0.94	<u>-1.11</u>	-0.94
loc	<u>dBm/ 3.84 MHz</u>	<u>-75.54</u>		-59.98		-97.52	
<u>Îor/loc</u>	dB	4	<u>0</u>	9	<u>0</u>	<u>0</u>	-6.53
CPICH RSCP, Note 1	<u>dBm</u>	<u>-81.5</u>	-85.5	-60.98	-69.88	<u>-107.5</u>	-114.0
lo, Note 1	<u>dBm</u>	-69		-50		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes. They							
are not settable parameters themselves.							

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, <u>Set 1 of Table A.22</u> [14 slots is FSS]. <u>Table A.9.2 defines the limits of signal strengths and code powers</u>, where the requirement is applicable. <u>CPICH RSCP inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.2</u>.

When verifying the CPICH RSCP inter frequency relative accuracy requirement both cell 1 and 2 in table A.9.2 shall be present.
Table A.9.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2				
UTRA RF Channel number		Channel 1	Channel 2				
CPICH_Ec/lor	dB	-10	-10				
PCCPCH_Ec/lor	dB	-12	-12				
SCH_Ec/lor	dB	-12	-12				
PICH_Ec/lor	dB	-15	-15				
DPCH_Ec/lor	dB	-15	-15				
OCNS	dB	-1.11	-1.11				
Î or/loc	dB	10.1	10.1				
loc	dBm/ 3.84 MHz	lo -10.6 dB = loc, Note 1	lo -10.6 dB = loc, Note 1				
Range 1:lo	dBm	-9470	-9470				
Range 2: lo	upm	-9450	-9450				
Propagation condition	-	AWGN					
NOTE 1: loc level shall be adjus	ted in each carrier fre	quency according the total signa	l power lo at receiver input				

and the geometry factor for/loc.

Paramotor	Unit	Tes	<u>st 1</u>	Test 2		
Falalleter	0111	Cell 1	<u>Cell 2</u>	<u>Te:</u> <u>Cell 1</u> <u>Channel 1</u> <u>-</u> <u>-</u> <u>-15</u> <u>-15</u> <u>-1.11</u> <u>-84.00</u> <u>0</u> <u>-94.0</u> <u>-94.0</u> <u>-81.0</u> <u>AW</u> ers for informa	<u>Cell 2</u>	
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	
CPICH_Ec/lor	dB	-1	0	1	0	
PCCPCH_Ec/lor	dB	-1	2	1	2	
SCH_Ec/lor	dB	-1	2	-1	2	
PICH_Ec/lor	dB	-1	5	-1	5	
DPCH_Ec/lor	dB	<u>-15</u>		-15	-	
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	<u>-0.94</u>	<u>-1.11</u>	<u>-0.94</u>	
loc	<u>dBm/ 3.84</u> <u>MHz</u>	<u>-60.00</u>	<u>-60.00</u>	<u>-84.00</u>	<u>-94.46</u>	
<u>Îor/loc</u>	<u>dB</u>	<u>9.54</u>	<u>9.54</u>	<u>0</u>	-9.54	
CPICH RSCP, Note 1	<u>dBm</u>	<u>-60.46</u>	<u>-60.46</u>	<u>-94.0</u>	<u>-114.0</u>	
lo, Note 1	<u>dBm</u>	-50.00	-50.00	<u>-81.0</u>	-94.0	
Propagation condition	- 1	AW	GN	AW	<u>'GN</u>	
NOTE 1: CPICH RSCP and Ic	levels have bee	en calculated fro	m other parame	ters for informa	<u>tion</u>	
purposes. They are	not settable para	ameters themsel	ves.			
Tests shall be done sequentiall	y. Test 1 shall b	e done first. Afte	er test 1 has bee	n executed test	parameters	
for test 2 shall be set within 5 s	<u>econds so that l</u>	JE does not loos	se the Cell 2 in b	etween the test	<u>s.</u>	

A.9.1.1.2 Test Requirements

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

A.9.1.2 CPICH Ec/lo

A.9.1.2.1 Test Purpose and Environment

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

A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Table A.9.3 defines the limits of signal strengths and code powers, where the requirements are applicable. Both CPICH Ec/Io absolute and relative accuracy requirements are tested by using test parameters in Table A.9.3

When verifying the CPICH Ec/Io intra frequency absolute accuracy requirement only cell 1 in table A.9.3 shall be present. When verifying the CPICH Ec/Io intra frequency relative accuracy requirement both cell 1 and 2 in table A.9.3 shall be present.

Parameter	Unit		Cell 1			Cell 2				
UTRA RF Channel number		Channel								
CPICH_Ec/lor	dB	-10								
PCCPCH_Ec/lor	dB	-12			-12					
SCH_Ec/lor	dB	-12			-12					
PICH_Ec/lor	dB	-15			-15					
DPCH_Ec/lor	dB	-15			-15					
OCNS	dB	-1.11			-1.11					
Îor/loc	dB	10.5			10.5					
loc	dBm/ 3.84 MHz	lo -13.7 (dB = loc, N	lote 1	lo -13.7 d	B = loc, No	ste 1			
Range 1:lo	dBm	-9470			-9470					
Range 2: lo	upm	-9450			-9450					
Propagation condition - AWGN										
NOTE 1: loc level shall be adjusted according the total signal power lo at receiver input and the geometry factor										
Î or/loc.										
Parameter	Unit	Tes	<u>st 1</u>	Test 2		Tes	st 3			
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2			
	alD	Char		Unar						
		<u>-1</u>		-	10	-10				
		-	2	-	12	<u>-12</u>				
		-1	2	<u>-</u>	<u>-12</u>					
		-1	5		15	-	15			
		<u>-15</u>	-	-15	<u>-</u>	- <u>6</u>	<u>-</u>			
UCINS_EC/IOF		<u>-1.11</u>	<u>-0.94</u>	<u>-1.11</u>	<u>-0.94</u>	.2.56	<u>-0.94</u>			
	<u>dBm/ 3.84 MHz</u>	<u>-56</u>	.98	<u>-85</u>	<u>9.07</u>	<u>-94</u>	.98			
	dB	<u>3.0</u>	<u>3.0</u>	<u>-2.9</u>	<u>-2.9</u>	<u>-9.0</u>	<u>-9.0</u>			
CPICH Ec/lo, Note 1	dBm	<u>-14.0</u>	<u>-14.0</u>	<u>-16.0</u>	<u>-16.0</u>	<u>-20.0</u>	<u>-20.0</u>			
lo, Note 1	<u>dBm</u>	-5	<u>50</u>	-	<u>36</u>	-9	<u>94</u>			
Propagation condition		AW	GN	AV	<u>GN</u>	AW				
NOTE 1: CPICH Ec/lo and lo lev	veis nave been calcu	llated from	otner para	imeters for	Informatio	n purpose	s. They			
are not settable param	eters themselves.	Carl AG	1 1 4 h	hara a			to a to at			
1 ests shall be done sequentially.	1 est 1 shall be done	TIRST. After	test 1 has	Deen exe	cuted test p	barameters	s tor tests			
2 and 3 chall be cet within 5 ceco	nds so that LIE does	not loose t	me Cell 2 i	n netweer	i the tests					

A.9.1.2.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Set 1 of Table A.22 [14 slots is FSS]. Table A.9.4 defines the limits of signal strengths and code powers, where the requirement is applicable. <u>CPICH Ec/Io inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.4</u>.

When verifying the CPICH Ec/Io inter frequency relative accuracy requirement both cell 1 and 2 in table A.9.4 shall be present.

Parameter	Unit	Cell 1	Cell 2						
UTRA RF Channel number		Channel 1	Channel 2						
CPICH_Ec/lor	dB	-10	-10						
PCCPCH_Ec/lor	dB	-12	-12						
SCH_Ec/lor	dB	-12	-12						
PICH_Ec/lor	dB	-15	-15						
DPCH_Ec/lor	dB	-15	-15						
OCNS	dB	-1.11	-1.11						
Îor/loc	dB	10.1	10.1						
loc	dBm/ 3.84 MHz	lo -10.6 dB = loc, Note 1	lo -10.6 dB = loc, Note 1						
Range 1:lo	dDm	-9470	-9470						
Range 2: lo	UDIII	-9450	-9450						
Propagation condition	-	AWGN							
NOTE 1: Icc level shall be adjusted in each carrier frequency according the total signal power Ic at receiver input									
and the geometry facto	or Îor/loc.								

Paramotor	Unit	Tes	<u>st 1</u>	Te	<u>st 2</u>	Test 3			
Farameter	Onit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	<u>Cell 2</u>		
UTRA RF Channel		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2		
<u>number</u>						<u>Onamier r</u>	Onamie 2		
CPICH_Ec/lor	<u>dB</u>	-1	0	-1	10	<u>-1</u>	0		
PCCPCH_Ec/lor	<u>dB</u>	-1	2	-1	12	<u>-1</u>	2		
SCH_Ec/lor	<u>dB</u>	-1	2	-1	12	-1	2		
PICH_Ec/lor	<u>dB</u>	<u>-15</u>		<u>-15</u>		<u>-15</u>			
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	=	<u>-6</u>	<u>_</u>	<u>-6</u>	-		
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	-0.94	-2.56	-0.94	-2.56	-0.94		
loc	<u>dBm/ 3.84</u>	-52.22	-52.22	-87.27	-87.27	-94.46	-94.46		
100	MHz	-52.22	-52.22	-01.21	-01.21	<u>-34.40</u>	-34.40		
<u>Îor/loc</u>	<u>dB</u>	<u>-1.75</u>	<u>-1.75</u>	-4.7	-4.7	<u>-9.54</u>	<u>-9.54</u>		
CPICH Ec/lo, Note 1	<u>dBm</u>	<u>-14.0</u>	-14.0	<u>-16.0</u>	<u>-16.0</u>	-20.0	<u>-20.0</u>		
lo, Note 1	<u>dBm</u>	-50	-50	-86	-86	-94	-94		
Propagation condition	-	AW	'GN	AW	<u>'GN</u>	AW	<u>GN</u>		
NOTE 1: CPICH Ec/lo	and lo levels	have been ca	Iculated from	other parame	eters for infor	mation purpo	ses. They		
are not settal	are not settable parameters themselves.								
Tests shall be done see	uentially. Test	1 shall be do	ne first. After	test 1 has be	en executed	test paramet	ers for tests		
2 and 3 shall be set with	nin 5 seconds :	so that UE do	es not loose	the Cell 2 in I	between the t	ests.			

A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2. <u>In case of the absolute</u> <u>CPICH_Ec/Io measurement accuracy and relative inter-frequency CPICH_Ec/Io measurement accuracy test cases the effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.4A.</u>

Table A.9.4A: CPICH Ec/lo Intra and Inter frequency absolute accuracy and CPICH Ec/lo Inter frequency relative accuracy

		Accuracy [dB]	Conditions	
Parameter	<u>Unit</u>	Normal condition	Extreme condition	<u>lo [dBm]</u>
	dp	$\frac{-2.71.5 \text{ for } -14 \le \text{CPICH Ec/lo}}{-3.22 \text{ for } -16 \le \text{CPICH Ec/lo} < -14}$ $-4.23 \text{ for } -20 \le \text{CPICH Ec/lo} < -16$	-4.23	<u>-9487</u>
CPICH_EC/10	<u>ar</u>	$\frac{\pm 1.5 \text{ for } -14 \leq \text{CPICH Ec/lo}}{\pm 2 \text{ for } -16 \leq \text{CPICH Ec/lo} < -14}$ $\pm 3 \text{ for } -20 \leq \text{CPICH Ec/lo} < -16$	<u>± 3</u>	<u>-8750</u>

A.9.1.3 UTRA Carrier RSSI

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3. <u>UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.</u>

Table A.9.5 defines the limits of signal strengths, where the requirement is applicable.

When verifying the UTRA Carrier RSSI absolute accuracy requirement only cell 1 in table A.9.5 shall be present. When verifying the UTRA Carrier RSSI relative accuracy requirement both cell 1 and 2 in table A.9.5 shall be present.

Parameter	Unit	Cell 1	Cell 2		
UTRA RF Channei number	-	Channel 1	Channel 2		
Îor/loc	dB	-4	-4		
	dBm/2.94 MHz	lo -4.13 dB = loc,	lo -4.13 dB = loc		
ee dBm/3.		Note 1	Note 1		
Range 1: Io	dBm/ 2.84 MHz	-9470	-9470		
Range 2: Io		-9450	-9450		
Propagation condition	-	AWGN			
NOTE 1: loc level shall be adjusted according the	ne total signal power <i>l</i>	lo at receiver input and	d the geometry		
factor Îor/loc.		-			

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

Parameter	Unit	Tes	st 1	Те	st 2	Tes Cell 1 Channel 1 -2.56 -9.54 -20.0 -94 AW mation purport test parametetests. <th>st 3</th>	st 3
Parameter	<u>onn</u>	Cell 1	Cell 2	Cell 1	Cell 2		Cell 2
UTRA RF Channel		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
number							
CPICH_Ec/lor	<u>dB</u>	-1	0		<u>10</u>	-	10
PCCPCH_Ec/lor	dB	-1	2	-	12	-	12
SCH_Ec/lor	<u>dB</u>	<u>-12</u> <u>-12</u>		<u>-12</u>		-1	12
PICH_Ec/lor	<u>dB</u>	-15			<u>15</u>	<u>-15</u>	
DPCH_Ec/lor	<u>dB</u>	<u>-15</u>	_	<u>-6</u>	_	<u>-6</u>	<u> </u>
OCNS_Ec/lor	<u>dB</u>	<u>-1.11</u>	-0.94	-2.56	-0.94	-2.56	-0.94
loc	<u>dBm/ 3.84</u>	52.22	52.22	70.27	70.27	04.46	04.46
100	MHz	-52.22	-52.22	<u>-70.27</u>	-10.21	<u>-94.40</u>	-94.40
<u>Îor/loc</u>	<u>dB</u>	<u>-1.75</u>	<u>-1.75</u>	-4.7	-4.7	<u>-9.54</u>	<u>-9.54</u>
CPICH Ec/lo, Note 1	<u>dBm</u>	-14.0	-14.0	<u>-16.0</u>	<u>-16.0</u>	-20.0	-20.0
lo, Note 1	<u>dBm</u>	<u>-50</u>	<u>-50</u>	<u>-69</u>	<u>-69</u>	<u>-94</u>	<u>-94</u>
Propagation condition	_	AW	'GN	AW	/GN	AW	<u>'GN</u>
NOTE 1: CPICH Ec/lo	and lo levels	have been ca	Iculated from	other param	eters for infor	mation purpo	<u>ses. They</u>
are not settal	ble parameters	s themselves.					
Tests shall be done see	uentially. Test	1 shall be do	ne first. After	test 1 has be	een executed	test paramet	ers for tests
2 and 3 shall be set with	nin 5 seconds :	so that UE do	es not loose	the Cell 2 in I	between the t	ests.	

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. <u>The effect of assumed</u> thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in <u>Section 9.1.2 as shown in Table A.9.5A.</u>

Table A.9.5A: UTRA Carrier RSSI absolute and relative accuracy

Parameter	Unit	Accur	Conditions	
Farameter	<u>onn</u>	Normal condition	Extreme condition	lo [dBm]
	<u>dBm</u>	-45.2	<u>-78.2</u>	-9487
UTRA Carrier RSSI	<u>dBm</u>	<u>± 4</u>	<u>± 7</u>	<u>-8770</u>
	<u>dBm</u>	<u>± 6</u>	<u>± 9</u>	<u>-7050</u>

3GPP TSG RAN WG4 Meeting #20

R4-011640

East Brunswick, NJ, USA 12th - 16th November 2001

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The corrected functionality is the support of the number of event triggering and reporting criteria in the UE. If the network does not implement this change, the UE might not be able to track all events requested by the network.

Consequences if #	Network might request too many parallel events to be tracked by UE, which would
not approved:	cause interoperation problems between the UE and the network.

Clauses affected:	¥ 8.3.2
Other specs affected:	# Other core specifications # Test specifications 0&M Specifications
Other comments:	ж

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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.

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8.2 Measurements in CELL_DCH State with special requirements

8.2.1 Introduction

This section contains specific requirements for certain measurements beyond those specified in section 8.1. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331. Compressed mode is specified in TS 25.215.

8.2.2 Requirements

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

The UE shall be able to perform measurements according to table 8.9.

In addition to the requirements in table 8.9 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to section 8.1.

Measurement quantity	Number of parallel measurements possible to request from the UE
Transport channel BLER	1 per Transport Channel
UE transmitted power	1
UE Rx-Tx time difference	1 including timing to all radio links in active set
SFN-SFN observed time difference type 2	
UE GPS Timing of Cell Frames for LCS	[]

Table 8.9: Parallel measurement requirements

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

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

8.3.1 Introduction

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

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

8.3.2 Requirements

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

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.10. The same type of events (e.g. events 1A) are counted as different events if either any of the parameters related to the events or their neighbour cell lists differ from each other. For the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 18 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

Measurement category	Ecat	Note
Intra-frequency	8	Applicable for periodic reporting or FDD events (1A-1F).
Inter-frequency	6	Applicable for periodic reporting or Event 2A-2F
Inter-frequency, virtual active set	4	Applicable for periodic reporting or Event 1A-1C
Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
UP measurements	2	Only applicable for UE with this capability.

Table 8.10: Requirements for reporting criteria per measurement category

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R4-011641

East Brunswick, NJ, USA 12th - 16th November 2001

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Isolated Impact Analysis:

Clarification to a function where the specification was not sufficiently explicit. The clarification would not affect implementations behaving like indicated in the CR but it would affect implementations supporting the corrected functionality.

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Consequences if #	Network might request too many parallel events to be tracked by UE, which would
not approved:	cause interoperation problems between the UE and the network.

Clauses affected:	¥ 8.3.2
Other specs affected:	% Other core specifications % Test specifications O&M Specifications
Other comments:	ж

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3

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8.2.2 Requirements

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SFN-SFN observed time difference type 2	
UE GPS Timing of Cell Frames for LCS	[]

Table 8.9: Parallel measurement requirements

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

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8.3.1 Introduction

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

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

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.10. The same type of events (e.g. events 1A) are counted as different events if either any of the parameters related to the events or their neighbour cell lists differ from each other. For the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 18 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

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Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
UP measurements	2	Only applicable for UE with this capability.

Table 8.10: Requirements for reporting criteria per measurement category

3GPP TSG RAN WG4 Meeting #20

R4-011642

East Brunswick, NJ, USA 12th - 16th November 2001

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Title: ೫	Clarifications on requirements for reporting criteria per measurement category
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Category: ⊮	ARelease: %Rel-5Use one of the following categories:Use one 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 categories can be found in 3GPP TR 21.900.REL-4(Release 5)
Reason for change	: X The number of allowed parallel events might be interpreted wrongly.
Summary of chang	It is clarified that the same events are counted as different events if either any of their paramenters related to the event or their neighbour cell lists differ from each other.
	Isolated Impact Analysis:
	Clarification to a function where the specification was not sufficiently explicit. The clarification would not affect implementations behaving like indicated in the CR but it would affect implementations supporting the corrected functionality.

The corrected functionality is the support of the number of event triggering and reporting criteria in the UE. If the network does not implement this change, the UE might not be able to track all events requested by the network.

Consequences if #	Network might request too many parallel events to be tracked by UE, which would
not approved:	cause interoperation problems between the UE and the network.

Clauses affected:	¥ 8.3.2
Other specs affected:	Conter core specifications # Test specifications # O&M Specifications #
Other comments:	ж

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8.2.2 Requirements

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

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In addition to the requirements in table 8.9 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to section 8.1.

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UE Rx-Tx time difference	1 including timing to all radio links in active set
SFN-SFN observed time difference type 2	
UE GPS Timing of Cell Frames for LCS	[]

Table 8.9: Parallel measurement requirements

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

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

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8.3.2 Requirements

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The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.10. The same type of events (e.g. events 1A) are counted as different events if either any of the parameters related to the events or their neighbour cell lists differ from each other. For the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 18 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

Measurement category	Ecat	Note
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Inter-frequency	6	Applicable for periodic reporting or Event 2A-2F
Inter-frequency, virtual active set	4	Applicable for periodic reporting or Event 1A-1C
Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
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Table 8.10: Requirements for reporting criteria per measurement category

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Work item code	e: #			<i>Date:</i>	2001-11-15
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Reason for change: # The term "detected" used in TS25.133 is not in accordance with definition of sets of cells given in TS25.331, section 8.4 (RRC specification). Clarification of "detectable" cell.					
Summary of ch	ange: #	 Clarify the word "d 2. Align use of the word only for "detected 3. Align use of "set of 4. The sentence " The measured during a measurement perform meas CPICH measurem decreased." Isolated Impact Analysis was containing some of like indicated in the CF functionality otherwise 	letectable". ord "detected" wit set" and replaced f cells" with TS 25 the detectable cells that measuremen iods" is removed a as identified more surements of all i pents of cells from sis: Correction to a contradictions. Wo	h definitions of 25.3 d by "identified" oth 5.331. e, in the monitored of t period, shall be m and clarified by the than Ymeasureme dentified cells but t UE physical layer a function where th puld not affect imple plementations supp	331 : "detected" is used erwise. set, that were not beasured in the following following sentence in ent intra cells, the UE he reporting rate of to higher layers may be e specification ementations behaving porting the corrected
Consequences not approved:	if ¥	Inconsistencies betw cell.	een 25.133 and 2	5.331. Misinterpret	ation of "detectable"
Clauses affecte	d: ೫	4.2.2.2;4.2.2.3;8.1.2. 2.3.4;8.1.2.4.1;8.4.2.	<mark>2;8.1.2.2.1;8.1.2.2</mark> 2;8.4.2.2.1;8.4.2.2	2.2;8.1.2.2.5;8.1.2.3 2.2;8.4.2.3;8.4.2.3.	3;8.1.2.3.1;8.1.2.3.4;8.1. 1
Other specs affected:	ж	Other core specific Test specifications	cations #		

	O&M Specifications	
Other comments:	X	
Other comments:	ж	_

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- 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 <u>ftp://ftp.3gpp.org/specs/</u> 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.

4.2.2.2 Measurements of intra-frequency cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $T_{measureFDD}$ (see table 4.1) for intrafrequency cells that are <u>detected-identified</u> and measured according to the measurement rules. $T_{measureFDD}$ is defined in Table 4.1. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured intrafrequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateFDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 3 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and either CPICH Ec/Io or CPICH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurements of inter-frequency FDD cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $(N_{carrier}-1) * T_{measureFDD}$ (see table 4.1) for inter-frequency cells that are <u>detected-identified</u> and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for FDD cells. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

If CPICH Ec/Io is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already detected identified inter-frequency cell has become better ranked than the serving cell within ($N_{carrier}$ -1) * $T_{evaluateFDD}$ (see table 4.1) from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-detected identified inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If CPICH RSCP is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already detected-identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB

better than the current serving cell provided that Treselection timer is set to zero. For non-detected-<u>identified</u> inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure <u>detected identified</u> intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report <u>unlisted</u> <u>detected set</u> cells, the UE shall also search for intra frequency cells outside the monitored <u>and active</u> set. Cells, which are neither included in the active set nor in the monitored set, and are <u>detected identified</u> by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

8.1.2.2.1 Identification of a new cell

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

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

A cell shall be considered detectable when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -20 dB and SCH_Ec/Io is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.2.2 UE CPICH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no transmission gap pattern sequence is activated, the UE shall be capable of performing CPICH measurements for 8 detectedidentified-intra-frequency cells, in of the monitored set and/or the active set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one or more transmission gap pattern sequences are activated, the UE shall be capable of performing CPICH measurements for at least $Y_{measurement intra}$ cells , where $Y_{measurement intra}$ is defined in the following equation. The detectable cells, in the monitored set, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement intra}$ cells from UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement intra}} = Floor \left\{ X_{\text{basic measurement FDD}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement Period, Intra}}} \right\} \text{ cells}$$

where

 $X_{\text{basic measurement FDD}} = 8 \text{ (cells)}$

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

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

 $T_{\text{basic_identify}_FDD, intra} = 800 \text{ ms.}$ This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

8.1.2.2.5 Event Triggered Reporting

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

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

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

The event triggered measurement reporting delay, on cells belonging to monitored set, measured without L3 filtering, shall be less than the above defined T $_{identify intra}$. defined in Section 8.1.2.2.1

If a cell, belonging to monitored set, which the UE has detected identified and measured at least once over the measurement period, becomes undetectable for a period < 5 seconds and then the cell becomes detectable again and triggers an event, the measurement reporting delay shall be less than $T_{Measurement_Period Intra}$ ms provided the timing to that cell has not changed more than +/-32 chips, the UE CPICH measurement capabilities of section 8.1.2.2.2 are valid and L3 filtering has not been used. When L3 filtering is used an additional delay can be

expected.

If a cell belonging to monitored set has been detectable at least for the time period $T_{identify_intra}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period Intra}$ when the L3 filter has not been used and the UE CPICH measurement capabilities of Section 8.1.2.2.2 are valid.

8.1.2.3 FDD inter frequency measurements

In the CELL_DCH state when a transmission gap pattern sequence with the "FDD measurements" purpose is provided by the network the UE shall continuously measure <u>detected identified</u> inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose FDD measurement using the following combinations for TGL1, TGL2 and TGD:

TGL1 [slots]	TGL2 [slots]	TGD [slots]
7	-	undefined
14	-	undefined
10	-	undefined
7	7	15269
14	14	15269
10	5	15269

) 8.1

8.1.2.3.1 Identification of a new cell

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

$$T_{\text{identify inter}} = Max \left\{ 5000, T_{\text{basic identify FDD,inter}} \cdot \frac{T_{\text{Measurement Period, Inter}}}{T_{\text{Inter}}} \cdot N_{Freq} \right\} ms$$

A cell shall be considered detectable when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.3.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9. The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled. The measurement reporting delay is defined as the time between any event that will trigger a measurement report

until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{identify inter} defined in Section 8.1.2.3.1 When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period $T_{identify_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period Inter}$ provided the timing to that cell has not changed more than +/-32 chips while transmission gap has not been available and the L3 filter has not been used.

8.1.2.4.1 Identification of a new cell

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

$$T_{\text{identify TDD inter}} = Max \left\{ 5000, T_{\text{basic identify TDD inter}} \cdot \frac{T_{\text{Measurement Period TDD inter}}}{T_{\text{TDD inter}}} \cdot N_{Freq} \right\} ms$$

| <u>A cell shall be considered detectable</u> when P-CCPCH Ec/Io \geq -8 dB, SCH_Ec/Io \geq -13 dB and SCH_Ec/Io is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided. When L3 filtering is used an additional delay can be expected.

Where the received P-CCPCH E_c/I_o is defined as

$$\left(\frac{P - CCPCH _ E_c}{I_o}\right)_{in \ dB} = \left(\frac{P - CCPCH _ E_c}{I_{or}}\right)_{in \ dB} - \frac{I_o}{(\hat{I}_{or})}_{in \ dB}$$

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure detected identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

8.4.2.2.1 Identification of a new cell

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

$$T_{\text{identify, intra}} = Max \left\{ 800, \text{Ceil} \left\{ \frac{T_{\text{basic identify FDD, intra}}}{N_{\text{TTI}} \cdot (M_{\text{REP}} - 1) \cdot 10} \right\} \cdot N_{\text{TTI}} \cdot M_{\text{REP}} \cdot 10 \right\} \text{ ms}$$

where

T_{basic_identify_FDD, intra} is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable and when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

8.4.2.2.2 UE CPICH measurement capability

In the CELL_FACH state the measurement period for intra frequency measurements is 200 ms. When no measurement occasion sequence is activated, the UE shall be capable of performing CPICH measurements for 8 $\frac{detected}{identified}$ intra-frequency cells of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one measurement occasion sequence is activated, the UE shall be capable of performing CPICH measurements for the $Y_{measurement}$ intra strongest cells, where $Y_{measurement intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement intra}} = Floor \begin{cases} X_{\text{basic measurement FDD}} \cdot \frac{T_{\text{Measurement_Period Intra}} - Ceil \left\{ \frac{T_{\text{Measurement_Period Intra}}}{N_{TTI} \cdot M _ REP \cdot 10 \text{ ms}} \right\} \cdot N_{TTI} \cdot 10 \text{ ms}} \\ T_{\text{Measurement_Period Intra}} \end{cases}$$

cells

where

 $X_{\text{basic measurement FDD}}$ is specified in section 8.1.2.2.2,

 $T_{Measurement_Period Intra}$ is specified in section 8.1.2.2.2,

M_REP and N_{TTI} is specified in section 8.4.2.1.

8.4.2.3 FDD inter frequency measurements

In the CELL_FACH state when a measurement occasion cycle is provided by the network the UE shall continuously measure detected identified inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

8.4.2.3.1 Identification of a new cell

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

$$\mathbf{T}_{\text{identify, inter}} = Max \left\{ 5000, Ceil \left\{ \frac{\mathbf{T}_{\text{basic identify FDD inter}}}{\mathbf{T}_{\text{Inter FACH}}} \right\} \cdot \mathbf{T}_{\text{meas}} \cdot N_{Freq, FDD} \right\} \text{ ms}$$

where

T_{basic_identify_FDD,inter} is specified in 8.1.2.3.2.

N_{Freq,FDD}: Number of FDD frequencies in the Inter-frequency cell info list

T_{Meas} and M_REP are specified in 8.4.2.1.

 $T_{\text{Inter FACH}} = (N_{\text{TTI}} * 10 - 2 * 0.5) \text{ ms}$

A cell shall be considered detectable and when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

3GPP TSG RAN WG4 Meeting #20 East Brunswick, NJ, USA 12th - 16th November 2001

CR-Form-v4 CHANGE REQUEST			
¥	25	5.133 CR 221 [#] ev _ [#] Current version: 4.2.0	ж
For <u>HELP</u> or	n using	, this form, see bottom of this page or look at the pop-up text over the st sy	mbols.
Proposed chang	e affec	<i>cts:</i> 第 (U)SIM ME/UE X Radio Access Network Core N	letwork
Title:	ំ <mark>Inc</mark>	consistent use of "sets of cells" with respect to definition of RRC spe	ecs.
Source:	<mark>೫ R</mark> A	AN WG4	
Work item code:	ж	Date:	
Category:	策 A Use Deta be fo	Release: %Rel-4e one of the following categories:Use one of the following regores:F (correction)2A (corresponds to a correction in an earlier release)R96B (addition of feature),R97C (functional modification of feature)R98D (editorial modification)R99cailed explanations of the above categories canREL-4found in 3GPP TR 21.900.REL-5	leases:))))
Reason for change: # The term "detected" used in TS25.133 is not in accordance with definition of sets of cells given in TS25.331, section 8.4 (RRC specification). Clarification of "detectable" cell.			
 Summary of change: # 1. Clarify the word "detectable". 2. Align use of the word "detected" with definitions of 25.331 : "detected" is use only for "detected set" and replaced by "identified" otherwise. 3. Align use of "set of cells" with TS 25.331. 4. The sentence " The detectable cells, in the monitored set, that were not measured during that measurement period, shall be measured in the following measurement periods" is removed and clarified by the following sentence in stead "If the UE has identified more than Ymeasurement intra cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased." Isolated Impact Analysis: Correction to a function where the specification was containing some contradictions. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected 			d" is used not ence in the UE ate of rs may be having rected
Consequences in not approved:	f ¥	Inconsistencies between 25.133 and 25.331. Misinterpretation of "detec	table"
Clauses affected	l: ¥	4.2.2.2;4.2.2.3;8.1.2.2;8.1.2.2.1;8.1.2.2.2;8.1.2.2.5;8.1.2.3;8.1.2.3.1;8.1 2.3.4;8.1.2.4.1;8.4.2.2;8.4.2.2.1;8.4.2.2.2;8.4.2.3;8.4.2.3.1	.2.3.4;8.1.
Other specs affected:	ж	Conter core specifications # Test specifications	

	O&M Specifications	
Other comments:	X	
Other comments:	ж	_

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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.

4.2.2.2 Measurements of intra-frequency cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $T_{measureFDD}$ (see table 4.1) for intrafrequency cells that are <u>detected-identified</u> and measured according to the measurement rules. $T_{measureFDD}$ is defined in Table 4.1. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured intrafrequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateFDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 3 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and either CPICH Ec/Io or CPICH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurements of inter-frequency FDD cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $(N_{carrier}-1) * T_{measureFDD}$ (see table 4.1) for inter-frequency cells that are <u>detected-identified</u> and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for FDD cells. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

If CPICH Ec/Io is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already detected identified inter-frequency cell has become better ranked than the serving cell within ($N_{carrier}$ -1) * $T_{evaluateFDD}$ (see table 4.1) from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-detected identified inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If CPICH RSCP is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already detected-identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB

better than the current serving cell provided that Treselection timer is set to zero. For non-detected-<u>identified</u> inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure <u>detected identified</u> intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report <u>unlisted</u> <u>detected set</u> cells, the UE shall also search for intra frequency cells outside the monitored <u>and active</u> set. Cells, which are neither included in the active set nor in the monitored set, and are <u>detected identified</u> by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

8.1.2.2.1 Identification of a new cell

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

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

A cell shall be considered detectable when CPICH Ec/Io ≥ -20 dB, SCH_Ec/Io ≥ -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected

The UE shall be able to identify a new detectable cell not belonging to the monitored set within

$$T_{identify detected set} = 30s$$

when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.2.2 UE CPICH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no transmission gap pattern sequence is activated, the UE shall be capable of performing CPICH measurements for 8 detected identified-intra-frequency cells, in of the monitored set and/or the active set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one or more transmission gap pattern sequences are activated, the UE shall be capable of performing CPICH measurements for at least $Y_{measurement intra}$ cells , where $Y_{measurement intra}$ is defined in the following equation. The detectable cells, in the monitored set, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

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

where

 $X_{\text{basic measurement FDD}} = 8 \text{ (cells)}$

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

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

 $T_{\text{basic_identify}_FDD, intra} = 800 \text{ ms.}$ This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

The UE shall furthermore be capable of performing CPICH measurements for at least 1 detected intra-frequency cell, in the detected set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 10 s. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2.

8.1.2.2.5 Event Triggered Reporting

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

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

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

The event triggered measurement reporting delay, on cells belonging to monitored set, measured without L3 filtering, shall be less than the above defined T $_{identify intra}$. defined in Section 8.1.2.2.1

If a cell, belonging to monitored set, which the UE has detected identified and measured at least once over the measurement period, becomes undetectable for a period < 5 seconds and then the cell becomes detectable again and triggers an event, the measurement reporting delay shall be less than $T_{Measurement_Period Intra}$ ms provided the timing to that cell has not changed more than +/-32 chips, the UE CPICH measurement capabilities of section 8.1.2.2.2 are valid and L3 filtering has not been used. When L3 filtering is used an additional delay can be

expected.

If a cell belonging to monitored set has been detectable at least for the time period $T_{identify_intra}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period Intra}$ when the L3 filter has not been used and the UE CPICH measurement capabilities of Section 8.1.2.2.2 are valid.

The event triggered measurement reporting delay on cells not belonging to monitored set, measured without L3 filtering, shall be less than the above defined T $_{identify detected set}$ defined in Section 8.1.2.2.1.

8.1.2.3 FDD inter frequency measurements

In the CELL_DCH state when a transmission gap pattern sequence with the "FDD measurements" purpose is provided by the network the UE shall continuously measure <u>detected identified</u> inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose FDD measurement using the following combinations for TGL1, TGL2 and TGD:

TGL1 [slots]	TGL2 [slots]	TGD [slots]
7	-	undefined
14	-	undefined
10	-	undefined
7	7	15269
14	14	15269
10	5	15269

) 8.1

8.1.2.3.1 Identification of a new cell

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

$$T_{\text{identify inter}} = Max \left\{ 5000, T_{\text{basic identify FDD,inter}} \cdot \frac{T_{\text{Measurement Period, Inter}}}{T_{\text{Inter}}} \cdot N_{Freq} \right\} ms$$

A cell shall be considered detectable when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.3.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9. The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled. The measurement reporting delay is defined as the time between any event that will trigger a measurement report

until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{identify inter} defined in Section 8.1.2.3.1 When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period $T_{identify_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period Inter}$ provided the timing to that cell has not changed more than +/-32 chips while transmission gap has not been available and the L3 filter has not been used.
8.1.2.4.1 Identification of a new cell

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

$$T_{\text{identify TDD inter}} = Max \left\{ 5000, T_{\text{basic identify TDD inter}} \cdot \frac{T_{\text{Measurement Period TDD inter}}}{T_{\text{TDD inter}}} \cdot N_{Freq} \right\} ms$$

| <u>A cell shall be considered detectable</u> when P-CCPCH Ec/Io \geq -8 dB, SCH_Ec/Io \geq -13 dB and SCH_Ec/Io is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided. When L3 filtering is used an additional delay can be expected.

Where the received P-CCPCH E_c/I_o is defined as

$$\left(\frac{P - CCPCH _ E_c}{I_o}\right)_{in \ dB} = \left(\frac{P - CCPCH _ E_c}{I_{or}}\right)_{in \ dB} - \frac{I_o}{(\hat{I}_{or})}_{in \ dB}$$

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure detected identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

8.4.2.2.1 Identification of a new cell

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

$$T_{\text{identify, intra}} = Max \left\{ 800, \text{Ceil} \left\{ \frac{T_{\text{basic identify FDD, intra}}}{N_{\text{TTI}} \cdot (M_{\text{REP}} - 1) \cdot 10} \right\} \cdot N_{\text{TTI}} \cdot M_{\text{REP}} \cdot 10 \right\} \text{ ms}$$

where

T_{basic_identify_FDD, intra} is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable and when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

8.4.2.2.2 UE CPICH measurement capability

In the CELL_FACH state the measurement period for intra frequency measurements is 200 ms. When no measurement occasion sequence is activated, the UE shall be capable of performing CPICH measurements for 8 $\frac{detected}{identified}$ intra-frequency cells of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one measurement occasion sequence is activated, the UE shall be capable of performing CPICH measurements for the $Y_{measurement}$ intra strongest cells, where $Y_{measurement intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement intra}} = Floor \begin{cases} X_{\text{basic measurement FDD}} \cdot \frac{T_{\text{Measurement_Period Intra}} - Ceil \left\{ \frac{T_{\text{Measurement_Period Intra}}}{N_{TTI} \cdot M _ REP \cdot 10 \text{ ms}} \right\} \cdot N_{TTI} \cdot 10 \text{ ms}} \\ T_{\text{Measurement_Period Intra}} \end{cases}$$

cells

where

 $X_{\text{basic measurement FDD}}$ is specified in section 8.1.2.2.2,

 $T_{Measurement_Period Intra}$ is specified in section 8.1.2.2.2,

M_REP and N_{TTI} is specified in section 8.4.2.1.

8.4.2.3 FDD inter frequency measurements

In the CELL_FACH state when a measurement occasion cycle is provided by the network the UE shall continuously measure <u>detected identified</u> inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

8.4.2.3.1 Identification of a new cell

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

$$\mathbf{T}_{\text{identify, inter}} = Max \left\{ 5000, Ceil \left\{ \frac{\mathbf{T}_{\text{basic identify FDD inter}}}{\mathbf{T}_{\text{Inter FACH}}} \right\} \cdot \mathbf{T}_{\text{meas}} \cdot N_{Freq, FDD} \right\} \text{ ms}$$

where

T_{basic_identify_FDD,inter} is specified in 8.1.2.3.2.

N_{Freq,FDD}: Number of FDD frequencies in the Inter-frequency cell info list

T_{Meas} and M_REP are specified in 8.4.2.1.

 $T_{\text{Inter FACH}} = (N_{\text{TTI}} * 10 - 2 * 0.5) \text{ ms}$

A cell shall be considered detectable and when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

3GPP TSG RAN WG4 Meeting #20 East Brunswick, NJ, USA 12th - 16th November 2001

CHANGE REQUEST								
ж	25	.133 CR 222	ж ev	<mark>-</mark> * (Current versio	on: 5.0.0	ж	
For HELP on using this form, see bottom of this page or look at the pop-up text over the # symbols.								
Proposed change affects: # (U)SIM ME/UE X Radio Access Network Core Network								
Title:	ំ Ind	consistent use of "set	ts of cells" with	respect	to definition	of RRC spe	CS.	
Source:	<mark>೫ R</mark> A	N WG4						
Work item code.	: ¥				<i>Date:</i>	2001-11-15		
Category:	* A Use Deta be fo	<u>one</u> of the following cate F (correction) A (corresponds to a corresponds to a corresponds to a corresponds to a correspondence of the following of the correspondence of	gories: rection in an earli on of feature)) ubove categories	er release) can	Release: % Use <u>one</u> of ti 2 (R96 (R97 (R98 (R99 (REL-4 (REL-5 (Rel-5 he following rele (GSM Phase 2) (Release 1996) (Release 1997) (Release 1998) (Release 1999) (Release 4) (Release 5)	eases:	
Reason for change: # The term "detected" used in TS25.133 is not in accordance with definition of sets of cells given in TS25.331, section 8.4 (RRC specification). Clarification of "detectable" cell.								
Summary of cha	ange: #	 Clarify the word "of 2. Align use of the word "of 3. Align use of "set of 4. The sentence " The measured during measurement perform measurement shall perform measurement cPICH measurement decreased." Isolated Impact Analy was containing some like indicated in the C functionality otherwise 	detectable". yord "detected" y set" and replay of cells" with TS he detectable of that measurem riods" is remove as identified mo asurements of a ments of cells from sis: Correction for contradictions. R, would affect	with definit ced by "ide 25.331. ells, in the ent period d and clar ore than Y li identifie om UE phy to a functio Would not implemen	tions of 25.33 entified" othe monitored so shall be me ified by the for measurement d cells but the ysical layer to on where the taffect implet tations support	31 : "detected rwise. et, that were re easured in the ollowing sente to intra cells, the e reporting rate o higher layers e specification mentations be orting the corre	" is used following ence in the UE te of s may be	
Consequences not approved:	if ¥	Inconsistencies betw cell.	veen 25.133 and	1 25.331. I	Misinterpreta	tion of "detect	able"	
Clauses affected	d: ¥	4.2.2.2;4.2.2.3;8.1.2. 2.3.4;8.1.2.4.1;8.4.2.	<mark>2;8.1.2.2.1;8.1.</mark> 2;8.4.2.2.1;8.4.	<mark>2.2.2;8.1.2</mark> 2.2.2;8.4.2	2 <mark>.2.5;8.1.2.3;</mark> 2.3;8.4.2.3.1	8.1.2.3.1;8.1.2	2.3.4;8.1.	
Other specs affected:	ж	Other core specifi	cations ೫ s					

	O&M Specifications	
Other comments:	X	
Other comments:	ж	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: <u>http://www.3gpp.org/3G_Specs/CRs.htm</u>. 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 <u>ftp://ftp.3gpp.org/specs/</u> 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.

4.2.2.2 Measurements of intra-frequency cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $T_{measureFDD}$ (see table 4.1) for intrafrequency cells that are <u>detected-identified</u> and measured according to the measurement rules. $T_{measureFDD}$ is defined in Table 4.1. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured intrafrequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateFDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 3 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and either CPICH Ec/Io or CPICH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurements of inter-frequency FDD cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $(N_{carrier}-1) * T_{measureFDD}$ (see table 4.1) for inter-frequency cells that are <u>detected-identified</u> and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for FDD cells. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

If CPICH Ec/Io is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already detected identified inter-frequency cell has become better ranked than the serving cell within ($N_{carrier}$ -1) * $T_{evaluateFDD}$ (see table 4.1) from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-detected identified inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If CPICH RSCP is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already detected-identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB

better than the current serving cell provided that Treselection timer is set to zero. For non-detected-<u>identified</u> inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure <u>detected identified</u> intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report <u>unlisted</u> <u>detected set</u> cells, the UE shall also search for intra frequency cells outside the monitored <u>and active</u> set. Cells, which are neither included in the active set nor in the monitored set, and are <u>detected identified</u> by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

8.1.2.2.1 Identification of a new cell

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

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

A cell shall be considered detectable when CPICH Ec/Io ≥ -20 dB, SCH_Ec/Io ≥ -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected

The UE shall be able to identify a new detectable cell not belonging to the monitored set within

$$T_{identify detected set} = 30s$$

when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.2.2 UE CPICH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no transmission gap pattern sequence is activated, the UE shall be capable of performing CPICH measurements for 8 detected identified-intra-frequency cells, in of the monitored set and/or the active set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one or more transmission gap pattern sequences are activated, the UE shall be capable of performing CPICH measurements for at least $Y_{measurement intra}$ cells , where $Y_{measurement intra}$ is defined in the following equation. The detectable cells, in the monitored set, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

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

where

 $X_{\text{basic measurement FDD}} = 8 \text{ (cells)}$

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

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

 $T_{\text{basic_identify}_FDD, intra} = 800 \text{ ms.}$ This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

The UE shall furthermore be capable of performing CPICH measurements for at least 1 detected intra-frequency cell, in the detected set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 10 s. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2.

8.1.2.2.5 Event Triggered Reporting

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

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

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

The event triggered measurement reporting delay, on cells belonging to monitored set, measured without L3 filtering, shall be less than the above defined T $_{identify intra}$. defined in Section 8.1.2.2.1

If a cell, belonging to monitored set, which the UE has detected identified and measured at least once over the measurement period, becomes undetectable for a period < 5 seconds and then the cell becomes detectable again and triggers an event, the measurement reporting delay shall be less than $T_{Measurement_Period Intra}$ ms provided the timing to that cell has not changed more than +/-32 chips, the UE CPICH measurement capabilities of section 8.1.2.2.2 are valid and L3 filtering has not been used. When L3 filtering is used an additional delay can be

expected.

If a cell belonging to monitored set has been detectable at least for the time period $T_{identify_intra}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period Intra}$ when the L3 filter has not been used and the UE CPICH measurement capabilities of Section 8.1.2.2.2 are valid.

The event triggered measurement reporting delay on cells not belonging to monitored set, measured without L3 filtering, shall be less than the above defined T $_{identify detected set}$ defined in Section 8.1.2.2.1.

8.1.2.3 FDD inter frequency measurements

In the CELL_DCH state when a transmission gap pattern sequence with the "FDD measurements" purpose is provided by the network the UE shall continuously measure <u>detected identified</u> inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose FDD measurement using the following combinations for TGL1, TGL2 and TGD:

TGL1 [slots]	TGL2 [slots]	TGD [slots]
7	-	undefined
14	-	undefined
10	-	undefined
7	7	15269
14	14	15269
10	5	15269

) 8.1

8.1.2.3.1 Identification of a new cell

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

$$T_{\text{identify inter}} = Max \left\{ 5000, T_{\text{basic identify FDD,inter}} \cdot \frac{T_{\text{Measurement Period, Inter}}}{T_{\text{Inter}}} \cdot N_{Freq} \right\} ms$$

A cell shall be considered detectable when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.3.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9. The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled. The measurement reporting delay is defined as the time between any event that will trigger a measurement report

until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{identify inter} defined in Section 8.1.2.3.1 When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period $T_{identify_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period Inter}$ provided the timing to that cell has not changed more than +/-32 chips while transmission gap has not been available and the L3 filter has not been used.

8.1.2.4.1 Identification of a new cell

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

$$T_{\text{identify TDD inter}} = Max \left\{ 5000, T_{\text{basic identify TDD inter}} \cdot \frac{T_{\text{Measurement Period TDD inter}}}{T_{\text{TDD inter}}} \cdot N_{Freq} \right\} ms$$

| <u>A cell shall be considered detectable</u> when P-CCPCH Ec/Io \geq -8 dB, SCH_Ec/Io \geq -13 dB and SCH_Ec/Io is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided. When L3 filtering is used an additional delay can be expected.

Where the received P-CCPCH E_c/I_o is defined as

$$\left(\frac{P - CCPCH _ E_c}{I_o}\right)_{in \ dB} = \left(\frac{P - CCPCH _ E_c}{I_{or}}\right)_{in \ dB} - \frac{I_o}{(\hat{I}_{or})}_{in \ dB}$$

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{\left(\hat{I}_{or}\right)}_{in\ dB}$$

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure detected identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

8.4.2.2.1 Identification of a new cell

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

$$T_{\text{identify, intra}} = Max \left\{ 800, \text{Ceil} \left\{ \frac{T_{\text{basic identify FDD, intra}}}{N_{\text{TTI}} \cdot (M_{\text{REP}} - 1) \cdot 10} \right\} \cdot N_{\text{TTI}} \cdot M_{\text{REP}} \cdot 10 \right\} \text{ ms}$$

where

T_{basic_identify_FDD, intra} is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable and when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

8.4.2.2.2 UE CPICH measurement capability

In the CELL_FACH state the measurement period for intra frequency measurements is 200 ms. When no measurement occasion sequence is activated, the UE shall be capable of performing CPICH measurements for 8 $\frac{detected}{identified}$ intra-frequency cells of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one measurement occasion sequence is activated, the UE shall be capable of performing CPICH measurements for the $Y_{measurement}$ intra strongest cells, where $Y_{measurement intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement intra}} = Floor \begin{cases} X_{\text{basic measurement FDD}} \cdot \frac{T_{\text{Measurement_Period Intra}} - Ceil \left\{ \frac{T_{\text{Measurement_Period Intra}}}{N_{TTI} \cdot M _ REP \cdot 10 \text{ ms}} \right\} \cdot N_{TTI} \cdot 10 \text{ ms}} \\ T_{\text{Measurement_Period Intra}} \end{cases}$$

cells

where

 $X_{\text{basic measurement FDD}}$ is specified in section 8.1.2.2.2,

 $T_{Measurement_Period Intra}$ is specified in section 8.1.2.2.2,

M_REP and N_{TTI} is specified in section 8.4.2.1.

8.4.2.3 FDD inter frequency measurements

In the CELL_FACH state when a measurement occasion cycle is provided by the network the UE shall continuously measure <u>detected identified</u> inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

8.4.2.3.1 Identification of a new cell

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

$$\mathbf{T}_{\text{identify, inter}} = Max \left\{ 5000, Ceil \left\{ \frac{\mathbf{T}_{\text{basic identify FDD inter}}}{\mathbf{T}_{\text{Inter FACH}}} \right\} \cdot \mathbf{T}_{\text{meas}} \cdot N_{Freq, FDD} \right\} \text{ ms}$$

where

T_{basic_identify_FDD,inter} is specified in 8.1.2.3.2.

N_{Freq,FDD}: Number of FDD frequencies in the Inter-frequency cell info list

T_{Meas} and M_REP are specified in 8.4.2.1.

 $T_{\text{Inter FACH}} = (N_{\text{TTI}} * 10 - 2 * 0.5) \text{ ms}$

A cell shall be considered detectable and when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.