TSG RAN Meeting #24 **RP-040228**
Seoul, Korea, 2 - 4 June 2004

Title **CRs (Rel-6) for WI "Technical Enhancements and Improvements"**
Source **TSG RAN WG4**
Agenda Item **8.10**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-040358	25.104	224	2	F	Rel-6	6.5.0	Redrafting of blocking tables for co-location & Requirements for Medium Range BS and Local Area BS in case of co-location	TEI6
R4-040356	25.104	223	2	D	Rel-6	6.5.0	Redrafting of spurious emission tables for co-existence	TEI6
R4-040359	25.141	344	2	F	Rel-6	6.5.0	Redrafting of blocking tables for co-location & Requirements for Medium Range BS and Local Area BS in case of co-location	TEI6
R4-040357	25.141	343	2	D	Rel-6	6.5.0	Redrafting of spurious emission tables for co-existence	TEI6
R4-040342	25.104	225	1	B	Rel-6	6.5.0	DCH/RACH/CPCH performance requirement for BS without Rx diversity	TEI6
R4-040343	25.141	347	1	B	Rel-6	6.5.0	Introduction of DCH/RACH/CPCH performance test requirement for BS without Rx diversity	TEI6
R4-040281	25.104	226		F	Rel-6	6.5.0	Corrections on terminology	TEI6
R4-040283	25.141	349	1	F	Rel-6	6.5.0	Corrections on terminology	TEI6
R4-040239	25.123	343		F	Rel-6	6.1.0	Correction to GSM reselection in CELL_FACH for 3.84Mcps TDD	TEI6
R4-040354	25.133	659	1	F	Rel-6	6.5.0	Removal of the 5s limitation of the identification time in interfrequency handovers	TEI6
R4-040366	25.133	668	1	F	Rel-6	6.5.0	Clarification to BSIC verification	TEI6
R4-040192	25.141	345		F	Rel-6	6.5.0	Spectrum mask test requirement for Band IV	TEI6
R4-040193	25.141	346		F	Rel-6	6.5.0	Correction of AWGN level for MR and LA BS classes receiver performance verification	TEI6
R4-040349	25.141	350		F	Rel-6	6.5.0	Correction of signal level for medium range and local are BS class verification of internal BLER calculation	TEI6

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040356**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.104** **CR** **223** ⌘ **rev** **2** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Redrafting of spurious emission tables for co-existence
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**D**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	In clause 6.6 (Spurious emissions), there are a range of requirements for co-existence with FDD and other systems in other bands. Each system and band has its own clause and set of tables, making the specification complicated to read and update with new bands and requirements.
Summary of change:	⌘	The co-existence requirements are merged into a single set of tables, with one table for co-existence in the same area and three separate tables for each BS class in case of co-location.
Consequences if not approved:	⌘	The specification will remain difficult to interpet and very complicated when updating with new bands and requirements.

Clauses affected:	⌘	4.3, 6.6, 7.7

		Y	N			
Other specs affected:	⌘		X	Other core specifications	⌘	25.141
		X		Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

4.3 Regional requirements

Some requirements in TS 25.104 may only apply in certain regions. Table 4.1 lists all requirements that may be applied differently in different regions.

Table 4.1: List of regional requirements

Clause number	Requirement	Comments
5.2	Frequency bands	Some bands may be applied regionally.
5.2 6.6.3.2 7.7	Frequency bands Protection of the BS receiver of own or different BS Spurious emissions	Band VI specifications are developed for use in Japan. The Band VI frequency ranges specified in clause 5.2 are subject to coming regulatory decisions.
5.3	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
5.4	Channel arrangement	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
6.2.1	Base station maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the range of conditions defined as normal.
6.6.2.1	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.6.3.1.1	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329 [1], are applied.
6.6.3.1.2	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329 [1], are applied.
6.6.3.3	Co-existence with other systems in the same geographical area	These requirements may apply in geographic areas in which both UTRA FDD and GSM900, DCS1800, PCS1900, GSM850 and/or UTRA FDD operating in another frequency band are deployed.
6.6.3.4	Co-existence with co-located and co-sited base stations	These requirements may be applied for the protection of other BS receivers when GSM900, DCS1800, PCS1900, GSM850 and/or FDD BS operating in another frequency band are co-located with a UTRA FDD BS.
~~6.6.3.3.1~~	~~Co-existence with GSM900 -Operation in the same geographic area~~	~~This requirement may be applied for the protection of GSM 900 MS and GSM 900 BTS in geographic areas in which both GSM 900 and UTRA FDD are deployed.~~
~~6.6.3.3.2~~	~~Co-existence with GSM900 - Co-located base stations~~	~~This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA FDD BS are co-located.~~
~~6.6.3.4.1~~	~~Co-existence with DCS1800 -Operation in the same geographic area~~	~~This requirement may be applied for the protection of DCS 1800 MS and DCS 1800 BTS in geographic areas in which both DCS 1800 and UTRA FDD are deployed.~~
~~6.6.3.4.2~~	~~Co-existence with DCS1800 - Co-located base stations~~	~~This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA FDD BS are co-located.~~
6.6.3.5	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA FDD are deployed.
6.6.3.6	Co-existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to the downlink bands as defined in clause 5.2in geographic areas in which both an adjacent band service and UTRA FDD are deployed.

6.6.3.7.1	Co-existence with UTRA TDD - Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.7.2	Co-existence with UTRA TDD - Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
~~6.6.3.8.1~~	~~Co-existence with UTRA FDD in frequency band I - Operation in the same geographic area~~	~~This requirement may be applied for the protection of UTRA FDD UE in frequency band I in geographic areas in which both UTRA FDD in frequency band I and III are deployed.~~
~~6.6.3.8.2~~	~~Co-existence with UTRA FDDin frequency band I - Co-located base stations~~	~~This requirement may be applied for the protection of UTRA FDD BTS receivers in frequency band I when UTRA FDD BS in frequency band I and III are co-located.~~
~~6.6.3.9.1~~	~~Co-existence with UTRA FDD in frequency band III - Operation in the same geographic area~~	~~This requirement may be applied for the protection of UTRA FDD UE in frequency band I in geographic areas in which both UTRA FDD in frequency band I and III are deployed.~~
~~6.6.3.9.2~~	~~Co-existence with UTRA FDD in frequency band III - Co-located base stations~~	~~This requirement may be applied for the protection of UTRA FDD BTS receivers in frequency band I when UTRA FDD BS in frequency band I and III are co-located.~~
~~6.6.3.10.1~~	~~Co-existence with PCS1900 - Operation in the same geographic area~~	~~This requirement may be applied for the protection of PCS 1900 BTS receivers in geographic areas in which both PCS 1900 and UTRA FDD are deployed.~~
~~6.6.3.10.2~~	~~Co-existence with PCS1900 - Co-located base stations~~	~~This requirement may be applied for the protection of PCS 1900 BTS receivers when PCS 1900 BTS and UTRA FDD BS are co-located.~~
~~6.6.3.11.1~~	~~Co-existence with GSM850 - Operation in the same geographic area~~	~~This requirement may be applied for the protection of GSM 850 MS and GSM 850 BTS receivers in geographic areas in which both GSM 850 and UTRA FDD are deployed.~~
~~6.6.3.11.2~~	~~Co-existence with GSM850 - Co-located base stations~~	~~This requirement may be applied for the protection of GSM 850 BTS receivers when GSM 850 BTS and UTRA FDD BS are co-located.~~
~~6.6.3.12.1~~	~~Co-existence with UTRA FDD in frequency band II - Operation in the same geographic area~~	~~This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band II in geographic areas in which both UTRA FDD in frequency band II and UTRA FDD in other frequency bands are deployed.~~
~~6.6.3.12.2~~	~~Co-existence with UTRA FDD in frequency band II - Co-located base stations~~	~~This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band II when UTRA FDD BS operating in frequency band II and UTRA FDD BS operating in other frequency bands are co-located.~~
~~6.6.3.13.1~~	~~Co-existence with UTRA FDD in frequency band V - Operation in the same geographic area~~	~~This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band V in geographic areas in which both UTRA FDD in frequency band V and UTRA FDD in other frequency bands are deployed.~~
~~6.6.3.13.2~~	~~Co-existence with UTRA FDD in frequency band V - Co-located base stations~~	~~This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band V when UTRA FDD BS operating in frequency band V and UTRA FDD BS operating in other frequency bands are co-located.~~
~~6.6.3.14.1~~	~~Co-existence with UTRA FDD in frequency band IV - Operation in the same geographic area~~	~~This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band IV in geographic areas in which both UTRA FDD in frequency band IV and UTRA FDD in other frequency bands are deployed.~~
~~6.6.3.14.2~~	~~Co-existence with UTRA FDD in frequency band IV - Co-located base stations~~	~~This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band IV when UTRA FDD BS operating in frequency band IV and UTRA FDD BS operating in other frequency bands are co-located.~~

~~6.6.3.15.1~~	~~Co-existence with UTRA FDD in frequency band VI Operation in the same geographic area~~	~~This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band VI in geographic areas in which both UTRA FDD in frequency band VI and UTRA FDD in other frequency bands are deployed.~~
~~6.6.3.15.2~~	~~Co-existence with UTRA FDD in frequency band VI Co-located base stations~~	~~This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band VI when UTRA FDD BS operating in frequency band VI and UTRA FDD BS operating in other frequency bands are co-located.~~
7.4.2	Adjacent Channel Selectivity Co-location with UTRA-TDD	This requirement may be applied for the protection of UTRA-FDD BS receivers when UTRA-FDD BS and UTRA-TDD BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
7.5.2	Blocking characteristics Co-location with GSM900, DCS 1800, PCS1900 and/or UTRA	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900, DCS1800, PCS1900, GSM850 and/or UTRA BS (operating in different frequency bands) are co-located.
7.5.3	Blocking characteristics Co-location with UTRA TDD	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and UTRA TDD BS are co-located.
7.6	Intermodulation characteristics	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
7.7	Spurious emissions	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
	Base station classes*	Only requirements for Wide Area (General Purpose) Base Stations shall be applied as regional requirements in Japan.
	HSDPA*	The portion of HSDPA(High Speed Downlink Packet Access) is not applicable to ARIB standards by the time when ARIB is prepared to transpose.

Note *: Base station classes, HSDPA: These regional requirements should be reviewed to check its necessity every TSG RAN meeting.

6.6.3.3 Co-existence with other systems in the same geographical area

These requirements may be applied for the protection of UE, MS and/or BS operating in other frequency bands in the same geographical area. The requirements may apply in geographic areas in which both UTRA FDD operating in frequency bands I to VI and a system operating in another frequency band than the FDD operating band are deployed. The system operating in the other frequency band may be GSM900, DCS1800, PCS1900, GSM850 and/or FDD operating in bands I to VI.

6.6.3.3.1 Minimum Requirements

The power of any spurious emission shall not exceed the limits of Table 6.11 for a BS where requirements for co-existence with the system listed in the first column apply.

Table 6.11: BS Spurious emissions limits for UTRA FDD BS in geographic coverage area of systems operating in other frequency bands

System type operating in the same geographical area	Band for co-existence requirement	Maximum Level	Measurement Bandwidth	Note
GSM900	876 – 915 MHz	-61 dBm	100 kHz	
	921 - 960 MHz	-57 dBm	100 kHz	
DCS1800	1805 - 1880 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in band III
	1710 – 1785 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in band III, since it is already covered by the requirement in sub-clause 6.6.3.2.
PCS1900	1930 - 1990 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band II
	1850 - 1910 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band II, since it is already covered by the requirement in sub-clause 6.6.3.2.
GSM850	824 - 849 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band V
	869 – 894 MHz	-57 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band V, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band I	2110 – 2170 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band I,
	1920 – 1980 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band I, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band II	1930 – 1990 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band II
	1850 – 1910 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band II, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band III	1805 – 1880 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band III
	1710 – 1785 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band III, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band IV	2110 – 2155 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band IV
	1710 – 1755 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band IV, since it is already covered by the requirement in sub-clause 6.6.3.2.
	869 – 894 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band V

FDD Band V	824 – 849 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band V, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band VI	875 – 885 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band VI
	830 – 840 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band VI, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.6.3.4 Co-existence with co-located and co-sited base stations

These requirements may be applied for the protection of other BS receivers when GSM900, DCS1800, PCS1900, GSM850 and/or FDD BS operating in Bands I to VI are co-located with a UTRA FDD BS.

The ~~values~~requirements in this chapter assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss ~~must~~should be increased by the ~~difference between the corresponding limits for the classes~~value as stated in TR 25.942 [4] chapter 10.3 in Table 10.1 and Table 10.2.

6.6.3.4.1 Minimum Requirements

The power of any spurious emission shall not exceed the limits of Table 6.12 for a Wide Area (WA) BS where requirements for co-location with a BS type listed in the first column apply.

Table 6.12: BS Spurious emissions limits for Wide Area BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Macro GSM900	876-915 MHz	-98 dBm	100 kHz	
Macro DCS1800	1710 - 1785 MHz	-98 dBm	100 kHz	
Macro PCS1900	1850 – 1910 MHz	-98 dBm	100 kHz	
Macro GSM850	824 - 849 MHz	-98 dBm	100 kHz	
WA UTRA FDD Band I	1920 - 1980 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band II	1850 – 1910 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band III	1710 – 1785 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band IV	1710 – 1755 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band V	824 – 849 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VI	830 – 840 MHz	-96 dBm	100 kHz	

The power of any spurious emission shall not exceed the limits of Table 6.13 for a Medium Range (MR) BS where requirements for co-location with a BS type listed in the first column apply.

Table 6.13: BS Spurious emissions limits for Medium Range BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Micro GSM900	876-915 MHz	-91 dBm	100 kHz	
Micro DCS1800	1710 - 1785 MHz	-96 dBm	100 kHz	
Micro PCS1900	1850 – 1910 MHz	-96 dBm	100 kHz	
Micro GSM850	824 - 849 MHz	-91 dBm	100 kHz	
MR UTRA FDD Band I	1920 - 1980 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band II	1850 – 1910 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band III	1710 – 1785 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band IV	1710 – 1755 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band V	824 – 849 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band VI	830 – 840 MHz	-9686 dBm	100 kHz	

The power of any spurious emission shall not exceed the limits of Table 6.14 for a Local Area (LA) BS where requirements for co-location with a BS type listed in the first column apply.

Table 6.14: BS Spurious emissions limits for Local Area BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Pico GSM900	876-915 MHz	-70 dBm	100 kHz	
Pico DCS1800	1710 - 1785 MHz	-80 dBm	100 kHz	
Pico PCS1900	1850 – 1910 MHz	-80 dBm	100 kHz	
Pico GSM850	824 - 849 MHz	-70 dBm	100 kHz	
LA UTRA FDD Band I	1920 - 1980 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band II	1850 – 1910 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band III	1710 – 1785 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band IV	1710 – 1755 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band V	824 – 849 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band VI	830 – 840 MHz	-9682 dBm	100 kHz	

~~6.6.3.3 Co-existence with GSM 900~~

~~6.6.3.3.1 Operation in the same geographic area~~

This requirement may be applied for the protection of GSM 900 MS and GSM 900 BTS receivers in geographic areas in which both GSM 900 and UTRA FDD are deployed.

6.6.3.3.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.11: BS Spurious emissions limits for BS in geographic coverage area of GSM 900 MS and GSM 900 BTS receivers

Band	Maximum Level	Measurement Bandwidth	Note
876 - 915 MHz	-61 dBm	100 kHz	
921 - 960 MHz	-57 dBm	100 kHz	

6.6.3.3.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA FDD BS are co-located.

6.6.3.3.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.12: BS Spurious emissions limits for protection of the GSM 900 BTS receiver

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	876-915 MHz	-98 dBm	100 kHz	
Medium Range BS	876-915 MHz	-91 dBm	100 kHz	
Local Area BS	876-915 MHz	-70 dBm	100 kHz	

These values assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss must be increased by the difference between the corresponding values from the table above.

6.6.3.4 Co-existence with DCS 1800

6.6.3.4.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS and DCS 1800 BTS receivers in geographic areas in which both DCS 1800 and UTRA FDD are deployed.

6.6.3.4.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.13: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800 MS and DCS 1800 BTS receivers

Band	Maximum Level	Measurement Bandwidth	Note
1805 - 1880 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA-FDD operating in band III
1710 - 1785 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA-FDD operating in band III, since it is already covered by the requirement in sub-clause 6.6.3.2.

~~6.6.3.4.2 Co-located base stations~~

~~This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.~~

~~6.6.3.4.2.1 Minimum Requirement~~

~~The power of any spurious emission shall not exceed:~~

~~Table 6.14: BS Spurious emissions limits for BS co-located with DCS 1800 BTS~~

~~BS class~~	~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~Wide Area BS~~	~~1710 - 1785 MHz~~	~~-98 dBm~~	~~100 kHz~~	
~~Medium Range BS~~	~~1710 - 1785 MHz~~	~~-96 dBm~~	~~100 kHz~~	
~~Local Area BS~~	~~1710 - 1785 MHz~~	~~-80 dBm~~	~~100 kHz~~	

~~These values assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss must be increased by the difference between the corresponding values from the table above.~~

6.6.3.5 Co-existence with PHS

This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA FDD are deployed.

6.6.3.5.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.15: BS Spurious emissions limits for BS in geographic coverage area of PHS

Band	Maximum Level	Measurement Bandwidth	Note
1893.5 - 1919.6 MHz	-41 dBm	300 kHz	

6.6.3.6 Co-existence with services in adjacent frequency bands

This requirement may be applied for the protection in bands adjacent to bands I, II or III, as defined in clause 5.2 in geographic areas in which both an adjacent band service and UTRA FDD are deployed.

6.6.3.6.1 Minimum requirement

The power of any spurious emission shall not exceed:

Table 6.16: BS spurious emissions limits for protection of adjacent band services

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	2100-2105 MHz	-30 + 3.4 · (f - 2100 MHz) dBm	1 MHz	
	2175-2180 MHz	-30 + 3.4 · (2180 MHz - f) dBm	1 MHz	
II	1920-1925 MHz	-30 + 3.4 · (f - 1920 MHz) dBm	1 MHz	
	1995-2000 MHz	-30 +3.4 · (2000 MHz - f) dBm	1 MHz	
III	1795-1800 MHz	-30 + 3.4 · (f - 1795 MHz) dBm	1MHz	
	1885-1890 MHz	-30 +3.4 · (1890 MHz - f) dBm	1MHz	

6.6.3.7 Co-existence with UTRA-TDD

6.6.3.7.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.

6.6.3.7.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.17: BS Spurious emissions limits for BS in geographic coverage area of UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1900 - 1920 MHz	-52 dBm	1 MHz	
2010 - 2025 MHz	-52 dBm	1 MHz	

6.6.3.7.2 Co-located base stations

This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.

6.6.3.7.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.18: BS Spurious emissions limits for BS co-located with UTRA-TDD

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	1900 - 1920 MHz	-86 dBm	1 MHz	
Local Area BS	1900 - 1920 MHz	-55 dBm	1 MHz	
Wide Area BS	2010 - 2025 MHz	-86 dBm	1 MHz	
Local Area BS	2010 - 2025 MHz	-55 dBm	1 MHz	

These values assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss must be increased by the difference between the corresponding values from the table above.

~~6.6.3.8 Co-existence with UTRA FDD in frequency band I~~

~~6.6.3.8.1 Operation in the same geographic area~~

~~This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band I in geographic areas in which both UTRA FDD in frequency band I and UTRA FDD in other frequency bands are deployed.~~

6.6.3.8.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.19: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band I

Band	Maximum Level	Measurement Bandwidth	Note
2110 – 2170 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band I,
1920 – 1980 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band I, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.6.3.8.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band I when UTRA FDD BS operating in frequency band I and UTRA FDD BS operating in other frequency bands are co-located.

6.6.3.8.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.20: BS Spurious emissions limits for BS co-located with UTRA FDD BS operating in frequency band I

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-96 dBm	100 kHz	

6.6.3.9 Co-existence with UTRA FDD in frequency band III

6.6.3.9.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band III in geographic areas in which both UTRA FDD in frequency band III and UTRA FDD in other frequency bands are deployed.

6.6.3.9.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.21: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band III

Band	Maximum Level	Measurement Bandwidth	Note
1805 – 1880 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band III
1710 – 1785 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band III, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.6.3.9.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band III when UTRA FDD BS operating in frequency band III and UTRA FDD BS operating in other frequency bands are co-located.

6.6.3.9.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.22: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band III

Band	Maximum Level	Measurement Bandwidth	Note
1710 – 1785 MHz	-96 dBm	100 kHz	

6.6.3.10 Co-existence with PCS1900

6.6.3.10.1 Operation in the same geographic area

This requirement may be applied for the protection of PCS 1900 BS receiver in geographic areas in which both PCS 1900 and UTRA FDD are deployed.

6.6.3.10.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.22A: BS Spurious emissions limits for BS in geographic coverage area of PCS 1900 BS

Band	Maximum Level	Measurement Bandwidth	Note
1850 - 1910 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band II, since it is already covered by the requirement in sub-clause 6.6.3.2.
1930 - 1990 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band II

6.6.3.10.2 Co-located base stations

This requirement may be applied for the protection of PCS1900 BS receivers when UTRA FDD BS and PCS1900 BS are co-located.

6.6.3.10.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.23: BS Spurious emissions limits for BS co-located with PCS1900 BS

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	1850 – 1910 MHz	-98 dBm	100 kHz	
Medium Range BS	1850 – 1910 MHz	-96 dBm	100 kHz	
Local Area BS	1850 – 1910 MHz	-80 dBm	100 kHz	

These values assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss must be increased by the difference between the corresponding values from the table above.

6.6.3.11 Co-existence with GSM850

6.6.3.11.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 850 MS and GSM 850 BS receiver in geographic areas in which both GSM 850 and UTRA FDD BS are deployed.

6.6.3.11.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.23A: BS Spurious emissions limits for BS in geographic coverage area of GSM 850

Band	Maximum Level	Measurement Bandwidth	Note
824 - 849 MHz	-61 dBm	100 kHz	
869 – 894 MHz	-57 dBm	100 kHz	

6.6.3.11.2 Co-located base stations

This requirement may be applied for the protection of GSM850 BS receivers when UTRA FDD BS and GSM850 BS are co-located.

6.6.3.11.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.24: BS Spurious emissions limits for BS co-located with GSM850 BS

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	824 - 849 MHz	-98 dBm	100 kHz	
Medium Range BS	824 - 849 MHz	-91 dBm	100 kHz	
Local Area BS	824 - 849 MHz	-70 dBm	100 kHz	

These values assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss must be increased by the difference between the corresponding values from the table above.

6.6.3.12 Co-existence with UTRA FDD in frequency band II

6.6.3.12.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band II in geographic areas in which both UTRA FDD in frequency band II and UTRA FDD in other frequency bands are deployed.

6.6.3.12.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.25: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band II

Band	Maximum Level	Measurement Bandwidth	Note
1930 – 1990 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band II
1850 – 1910 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band II, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.6.3.12.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band II when UTRA FDD BS operating in frequency band II and UTRA FDD BS operating in other frequency bands are co-located.

6.6.3.12.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.26: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band II

Band	Maximum Level	Measurement Bandwidth	Note
1850 – 1910 MHz	-96 dBm	100 kHz	

6.6.3.13 Co-existence with UTRA FDD in frequency band V

6.6.3.13.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band V in geographic areas in which both UTRA FDD in frequency band V and UTRA FDD in other frequency bands are deployed.

6.6.3.13.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.27: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band V

Band	Maximum Level	Measurement Bandwidth	Note
869 – 894 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band V
824 – 849 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band V, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.6.3.13.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band V when UTRA FDD BS operating in frequency band V and UTRA FDD BS operating in other frequency bands are co-located.

6.6.3.13.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.28: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band V

Band	Maximum Level	Measurement Bandwidth	Note
824 – 849 MHz	-96 dBm	100 kHz	

6.6.3.14 Co-existence with UTRA FDD in frequency band IV

6.6.3.14.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band IV in geographic areas in which both UTRA FDD in frequency band IV and UTRA FDD in other frequency bands are deployed.

6.6.3.14.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.29: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band IV

Band	Maximum Level	Measurement Bandwidth	Note
2110 – 2155 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band IV
1710 – 1755 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band IV, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.6.3.14.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band IV when UTRA FDD BS operating in frequency band IV and UTRA FDD BS operating in other frequency bands are co-located.

6.6.3.14.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.30: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band IV

Band	Maximum Level	Measurement Bandwidth	Note
1710 – 1755 MHz	-96 dBm	100 kHz	

6.6.3.15 Co-existence with UTRA FDD in frequency band VI

6.6.3.15.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band VI in geographic areas in which both UTRA FDD in frequency band VI and UTRA FDD in other frequency bands are deployed.

6.6.3.15.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.31: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band VI

Band	Maximum Level	Measurement Bandwidth	Note
875 – 885 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band VI
830 – 840 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band VI, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.6.3.15.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band VI when UTRA FDD BS operating in frequency band VI and UTRA FDD BS operating in other frequency bands are co-located.

~~6.6.3.15.2.1 Minimum Requirement~~

~~The power of any spurious emission shall not exceed:~~

~~Table 6.32: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band VI~~

~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~830 – 840 MHz~~	~~-96 dBm~~	~~100 kHz~~	

7.7 Spurious emissions

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS receiver antenna connector. The requirements apply to all BS with separate RX and TX antenna port. The test shall be performed when both TX and RX are on with the TX port terminated.

For all BS with common RX and TX antenna port the transmitter spurious emission as specified in section 6.6.3 is valid.

7.7.1 Minimum requirement

The power of any spurious emission shall not exceed:

Table 7.7: General spurious emission minimum requirement

Band	Maximum level	Measurement Bandwidth	Note
30MHz - 1 GHz	-57 dBm	100 kHz	
1 GHz - 12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS.

Table 7.7A: Additional spurious emission requirements

Operating Band	Band	Maximum level	Measurement Bandwidth	Note
I	1900 – 1980 MHz 2010 – 2025 MHz	-78 dBm	3.84 MHz	
II	1850 – 1910 MHz	-78 dBm	3.84 MHz	
III	1710 – 1785 MHz	-78 dBm	3.84 MHz	
IV	1710 – 1755 MHz	-78 dBm	3.84 MHz	
V	824 – 849 MHz	-78 dBm	3.84 MHz	
VI	830 – 840 MHz	-78 dBm	3.84 MHz	

In addition to the requirements in tables 7.7 and 7.7A, the co-existence requirements for co-located base stations specified in subclause 6.6.3.4 ~~6.6.3.3.2, 6.6.3.4.2 , 6.6.3.7.2, 6.6.3.8.2, 6.6.3.9.2, 6.6.3.10.1, 6.6.3.11.1, 6.6.3.12.2, 6.6.3.13.2, 6.6.3.14.2 and 6.6.3.15.2~~ may also be applied.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040358**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.104** **CR** **224** ⌘ **rev** **2** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Redrafting of blocking tables for co-location & Requirements for Medium Range BS and Local Area BS in case of co-location
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change:	⌘	- In clause 7.5 (Blocking) there are a range of requirements for co-location with FDD and other systems in other bands. Each system and band has its own clause and tables, making the specification difficult to read and very complicated when updating with new bands and requirements. - In Release 6 new FDD base station classes have been introduced taken into account specific requirements for micro-cell and pico-cell deployment scenarios. In current specification these scenarios haven't been considered and therefore blocking requirements are derived from WA BS only. For MR and LA BS classes blocking requirements in case of co-location are therefore unnecessarily tight.
Summary of change:	⌘	- The co-location requirements are merged into a single set of three tables, with one table for each BS class in case of co-location. - Co-location requirements for different BS classes added based on idea presented in document R4-040175. A mention added that co-location values assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss must be increased by the difference between the corresponding blocking requirements for different classes.
Consequences if not approved:	⌘	- The specification will remain difficult to interpet and very complicated when updating with new bands and requirements. - Blocking requirements in case of co-location are unnecessarily tight for MR and LA BSs.

Clauses affected:	⌘	7.5.2

		Y	N			
Other specs affected:	⌘		X	Other core specifications	⌘	
		X		Test specifications		25.141
			X	O&M Specifications		
Other comments:	⌘					

7.5.2 Minimum Requirement – Co-location with GSM900, DCS 1800, PCS1900, GSM850 and/or UTRA FDD

~~This additional blocking requirement may be applied for the protection of FDD BS receivers when GSM900, PCS1900, GSM850 and/or BS operating in DCS1800 band (UTRA FDD or GSM) are co-located with UTRA FDD BS.~~

~~The static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.~~

This additional blocking requirement may be applied for the protection of FDD BS receivers when GSM900, DCS1800, PCS1900, GSM850 and/or FDD BS operating in Bands I to VI are co-located with a UTRA FDD BS.

The ~~values~~requirements in this chapter assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss ~~must~~should be increased by the ~~difference between the corresponding limits for the classes~~value as stated in TR 25.942 [4] chapter 10.3 in Table 10.1 and Table 10.2.

For a Wide Area (WA) FDD BS, the static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the parameters in Table 7.5C.

Table 7.5C: Blocking performance requirement for Wide Area BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Macro GSM900	921 – 960 MHz	+16 dBm	-115 dBm	CW carrier
Macro DCS1800	1805 – 1880 MHz	+16 dBm	-115 dBm	CW carrier
Macro PCS1900	1930 – 1990 MHz	+16 dBm	-115 dBm	CW carrier
Macro GSM850	869 – 894 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band I	2110 – 2170 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band II	1930 – 1990 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band III	1805 – 1880 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band IV	2110 – 2155 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band V	869 – 894 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band VI	875 – 885 MHz	+16 dBm	-115 dBm	CW carrier

For a Medium Range (MR) FDD BS, the static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the parameters in Table 7.5D.

Table 7.5D: Blocking performance requirement for Medium Range BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Micro GSM900	921 – 960 MHz	-3 dBm	-105 dBm	CW carrier
Micro DCS1800	1805 – 1880 MHz	+5 dBm	-105 dBm	CW carrier
Micro PCS1900	1930 – 1990 MHz	+5 dBm	-105 dBm	CW carrier
Micro GSM850	869 – 894 MHz	-3 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band I	2110 – 2170 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band II	1930 – 1990 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band III	1805 – 1880 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band IV	2110 – 2155 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band V	869 – 894 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band VI	875 – 885 MHz	+8 dBm	-105 dBm	CW carrier

For a Local Area (LA) FDD BS, the static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the parameters in Table 7.5E.

Table 7.5E: Blocking performance requirement for Local Area BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Pico GSM900	921 – 960 MHz	-7 dBm	-101 dBm	CW carrier
Pico DCS1800	1805 – 1880 MHz	-4 dBm	-101 dBm	CW carrier
Pico PCS1900	1930 – 1990 MHz	-4 dBm	-101 dBm	CW carrier
Pico GSM850	869 – 894 MHz	-7dBm	-101 dBm	CW carrier
LA UTRA-FDD Band I	2110 – 2170 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band II	1930 – 1990 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band III	1805 – 1880 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band IV	2110 – 2155 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band V	869 – 894 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band VI	875 – 885 MHz	-6 dBm	-101 dBm	CW carrier

~~**Table 7.5C: Blocking performance requirement when co-located with GSM900**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~921 – 960 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.5D: Blocking performance requirement when co-located with BTS operating in DCS1800 band (GSM or UTRA)**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~1805 – 1880 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

Table 7.5E: Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band I

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
2110 – 2170 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.5F: Blocking performance requirement for operation when co-located with PCS1900 BTS

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
1930 – 1990 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.5G: Blocking performance requirement for operation when co-located with GSM850 BTS

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
869 – 894 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.5H: Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band II

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
1930 – 1990 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.5I: Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band V

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
869 – 894 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.5J: Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band IV

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
2110 – 2155 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.5K: Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band VI

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
875 – 885 MHz	+16 dBm	-115 dBm	—	CW carrier

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040342**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.104** **CR** **225** ⌘**rev** **1** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	DCH/RACH/CPCH performance requirement for BS without Rx diversity
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**B**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The UTRA-FDD BS DCH demodulation performance requirements without Rx diversity have been introduced in the core spec TS25.104, but the DCH demodulation performance for the birth/death propagation profile and RACH/CPCH performance requirements for BS without Rx diversity are still not yet introduced. Isolated Impact : This is an addition of performance requorements for BS without Rx diversity, it gives the performance requirements for FDD BS without Rx diversity, but will not impact on BS receiver with dual antenna Rx diversity.
Summary of change:	⌘	Addition of missed DCHRACH/CPCH demodulation performance for UTRAN-FDD BS without UL Rx diversity : • DCH demodulation performance requirement in Birth/Death propagation profile • RCH/CPCH preamble detection & message reception demodulation performance requirements in static and case 3 profiles • Correction of errors
Consequences if not approved:	⌘	Part of the demodulation performance requirements for BS without UL Rx diversity are not specified.

Clauses affected:	⌘	8 (8.1 ~ 8.8)

Other specs affected:	⌘	Y	N		⌘	
			X	Other core specifications		TS25.141
		X		Test specifications		
			X	O&M Specifications		

Other comments: ⌘

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

8 Performance requirement

8.1 General

Performance requirements for the BS are specified for the measurement channels defined in Annex A and the propagation conditions in Annex B. The requirements only apply to those measurement channels that are supported by the base station.

~~The BS performance requirements without UL Rx diversity should be applied only to BS which has not the dual receiver antenna diversity.~~

For BS with dual receiver antenna diversity, only the BS performance requirements with Rx diversity apply, the required E_b/N_0 shall be applied separately at each antenna port.

For BS without receiver antenna diversity, only the BS performance requirements without Rx diversity apply, the required E_b/N_0 shall be applied at the BS Rx antenna port.

For BS with dual receiver antenna diversity, the required E_b/N_0 shall be applied separately at each antenna port.

The Eb/No used in this section is defined as:

$$E_b / N_o = \frac{E_c}{N_o} \cdot \frac{L_{chip}}{L_{\inf}}$$

Where:

E_c is the received total energy of DPDCH, DPCCH and HS-DPCCH per PN chip per antenna from all paths.

N_o is the total one-sided noise power spectral density due to all noise sources

L_{chip} is the number of chips per frame

$L_{\inf}$ is the number of information bits in DTCH excluding CRC bits per frame

Table 8.1: Summary of Base Station performance targets

Physical channel	Measurement channel	Static	Multi-path Case 1	Multi-path Case 2	Multi-path Case 3	Moving	Birth / Death
		Performance metric					
DCH	12.2 kbps	BLER<10^{-2}	BLER<10^{-2}	BLER<10^{-2}	BLER<10^{-2}	BLER<	BLER<
	64 kbps	BLER< 10^{-1},10^{-2}	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1}, 10^{-2},10^{-3}	BLER<	BLER<
	144 kbps	BLER< 10^{-1},10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1}, 10^{-2},10^{-3}	-	-
	384 kbps	BLER< 10^{-1},10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1}, 10^{-2},10^{-3}	-	-

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.2.1.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.2.

Table 8.2: Performance requirements in AWGN channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.1 dB	8.3 dB	$< 10^{-2}$
64 kbps	1.5 dB	4.7 dB	$< 10^{-1}$
	1.7 dB	4.8 dB	$< 10^{-2}$
144 kbps	0.8 dB	3.8 dB	$< 10^{-1}$
	0.9 dB	4 dB	$< 10^{-2}$
384 kbps	0.9 dB	4 dB	$< 10^{-1}$
	1.0 dB	4.1 dB	$< 10^{-2}$

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.1.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.~~14 dB~~	$< 10^{-1}$
	11.9 dB	19.1 dB	$< 10^{-2}$
64 kbps	6.2 dB	11.6 dB	$< 10^{-1}$
	9.2 dB	15.9 dB	$< 10^{-2}$
144 kbps	5.4 dB	10.8 dB	$< 10^{-1}$
	8.4 dB	15 dB	$< 10^{-2}$
384 kbps	5.8 dB	11.2 dB	$< 10^{-1}$
	8.8 dB	15.5 dB	$< 10^{-2}$

8.3.2 Multipath fading Case 2

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.2.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.4.

Table 8.4: Performance requirements in multipath Case 2 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~11 dB~~	$< 10^{-1}$
	9.0 dB	15 dB	$< 10^{-2}$
64 kbps	4.3 dB	9.2 dB	$< 10^{-1}$
	6.4 dB	12.3 dB	$< 10^{-2}$
144 kbps	3.7 dB	8.2 dB	$< 10^{-1}$
	5.6 dB	11.5 dB	$< 10^{-2}$
384 kbps	4.1 dB	8.7 dB	$< 10^{-1}$
	6.1 dB	12.1 dB	$< 10^{-2}$

8.3.3 Multipath fading Case 3

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.3.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.5.

Table 8.5: Performance requirements in multipath Case 3 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~9.1 dB~~	$< 10^{-1}$
	7.2 dB	10.8 dB	$< 10^{-2}$
	8.0 dB	11.7 dB	$< 10^{-3}$
64 kbps	3.4 dB	7.1 dB	$< 10^{-1}$
	3.8 dB	7.7 dB	$< 10^{-2}$
	4.1 dB	8.5 dB	$< 10^{-3}$
144 kbps	2.8 dB	6 dB	$< 10^{-1}$
	3.2 dB	6.7 dB	$< 10^{-2}$
	3.6 dB	7.2 dB	$< 10^{-3}$
384 kbps	3.2 dB	6.5 dB	$< 10^{-1}$
	3.6 dB	7.2 dB	$< 10^{-2}$
	4.2 dB	7.9 dB	$< 10^{-3}$

8.3.4 Multipath fading Case 4

The performance requirement of DCH in multipath fading Case 4 in case of a Wide Area BS is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.4.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.5A.

Table 8.5A: Performance requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~12.1 dB~~	< 10^{-1}
	10.2 dB	13.8 dB	< 10-2
	11.0 dB	14.7 dB	< 10-3
64 kbps	6.4 dB	10.1 dB	< 10-1
	6.8 dB	10.7 dB	< 10-2
	7.1 dB	11.5 dB	< 10-3
144 kbps	5.8 dB	9 dB	< 10-1
	6.2 dB	9.7 dB	< 10-2
	6.6 dB	10.2 dB	< 10-3
384 kbps	6.2 dB	9.5 dB	< 10-1
	6.6 dB	10.2 dB	< 10-2
	7.2 dB	10.9 dB	< 10-3

8.4 Demodulation of DCH in moving propagation conditions

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.4.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.6.

Table 8.6: Performance requirements in moving channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	< 10^{-1}
	5.7 dB	8.7 dB	< 10^{-2}
64 kbps	2.1 dB	5.3 dB	< 10^{-1}
	2.2 dB	5.5 dB	< 10^{-2}

8.5 Demodulation of DCH in birth/death propagation conditions

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.5.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.7.

Table 8.7: Performance requirements in birth/death channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	7.7 dB	10.8 dB	$< 10^{-2}$
64 kbps	4.1 dB	7.4 dB	$< 10^{-1}$
	4.2 dB	7.5 dB	$< 10^{-2}$

~~Measurement channel~~	~~Received E_b/N_0~~	~~Required BLER~~
~~12.2 kbps~~	~~n.a.~~	~~$< 10^{-1}$~~
	~~7.7 dB~~	~~$< 10^{-2}$~~
~~64 kbps~~	~~4.1 dB~~	~~$< 10^{-1}$~~
	~~4.2 dB~~	~~$< 10^{-2}$~~

8.6 Void

8.7 Performance requirement for RACH

Performance requirements for RACH consists of two parts: preamble detection and message demodulation. Requirements for these are in sections 8.7.1 and 8.7.2, respectively. Requirements are defined for two propagation conditions: static and fading case 3. The propagation conditions are defined in annexes B.1 and B.2.

8.7.1 Performance requirement for RACH preamble detection

Probability of false alarm, Pfa (=false detection of the preamble) when the preamble was not sent, shall be 10^{-3} or less. The performance measure Required Ec/N0 at probability of detection, Pd of 0.99 and 0.999. Only 1 signature is used and it is known by the receiver. The requirement for preamble detection, when the preamble was sent is in table 8.9 and 8.10 for static and case 3 fading.

Table 8.9: Requirements for Ec/N0 of Pd in static propagation condition

	E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
BS with Rx Diversity	-20.5 dB	-20.1 dB
BS without Rx Diversity	-17.6 dB	-16.8 dB

~~E_c/N_0 for required Pd ≥ 0.99~~	~~E_c/N_0 for required Pd ≥ 0.999~~
~~-20.5 dB~~	~~-20.1 dB~~

Table 8.10: Requirements of Ec/N0 of Pd in case 3 fading

	E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
BS with Rx Diversity	-15.5 dB	-13.4 dB
BS without Rx Diversity	-9.4 dB	-6.4 dB

~~E_c/N_0 for required Pd ≥ 0.99~~	~~E_c/N_0 for required Pd ≥ 0.999~~
~~-15.5 dB~~	~~-13.4 dB~~

8.7.2 Demodulation of RACH message

The performance measure is required Eb/N0 for block error rate (BLER) of 10^{-1} and 10^{-2}. Both measurement channels have TTI=20 ms. Payloads are 168 and 360 bits. Channel coding is rate ½ convolutional coding.

8.7.2.1 Minimum requirements for Static Propagation Condition

Table 8.11: Required Eb/N0 for static propagation

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
BS with Rx Diversity	4.1 dB	5.0 dB	3.9 dB	4.8 dB
BS without Rx Diversity	7.2 dB	8.1 dB	6.9 dB	7.8 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~4.1 dB~~	~~5.0 dB~~
~~360 bits, TTI = 20 ms~~	~~3.9 dB~~	~~4.8 dB~~

8.7.2.2 Minimum requirements for Multipath Fading Case 3

Table 8.12: Required Eb/N0 for case 3 fading

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
BS with Rx Diversity	7.4 dB	8.5 dB	7.3 dB	8.3 dB
BS without Rx Diversity	11.1 dB	12.4 dB	11.0 dB	12.1 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~7.4 dB~~	~~8.5 dB~~
~~360 bits, TTI = 20 ms~~	~~7.3 dB~~	~~8.3 dB~~

8.8 Performance requirement for CPCH

Performance requirements for CPCH consists of two parts: preamble detection and message demodulation. Requirements for these are in sections 8.8.1 and 8.8.2, respectively. Requirements are defined for two propagation conditions: static and fading case 3. The propagation conditions are defined in annexes B.1 and B.2.

8.8.1 Performance requirement for CPCH preamble detection

8.8.1.1 Detection of CPCH Access Preamble (AP)

The requirement for detection of the AP for CPCH is the same as the requirement for detection of the RACH preamble which is described in section 8.7.1 of this specification.

8.8.1.2 Detection of CPCH Collision Detection Preamble (CD)

The requirement for detection of the CD for CPCH is the same as the requirement for detection of the RACH preamble which is described in section 8.7.1 of this specification.

8.8.2 Demodulation of CPCH message part

The performance measure is required Eb/N0 for block error rate (BLER) of 10^{-1} and 10^{-2}. Both measurement channels have TTI=20 ms. Payloads are 168 and 360 bits. Channel coding is rate ½ convolutional coding.

8.8.2.1 Minimum requirements for Static Propagation Condition

Table 8.13: Required Eb/N0 for static propagation

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	**E_b/N_0 for required BLER < 10^{-2}**	**E_b/N_0 for required BLER < 10^{-1}**	**E_b/N_0 for required BLER < 10^{-2}**
BS with Rx Diversity	4.1 dB	5.0 dB	3.9 dB	4.8 dB
BS without Rx Diversity	7.1 dB	8.0 dB	6.9 dB	7.8 dB

	~~TB size = 168 bits~~		~~TB size = 360 bits~~	
	~~BLER=10^{-1}~~	~~BLER=10^{-2}~~	~~BLER=10^{-1}~~	~~BLER=10^{-2}~~
~~Required Eb/N0~~	~~4.1 dB~~	~~5.0 dB~~	~~3.9 dB~~	~~4.8 dB~~

8.8.2.2 Minimum requirements for Multipath Fading Case 3

Table 8.14: Required Eb/N0 for case 3 fading

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	**E_b/N_0 for required BLER < 10^{-2}**	**E_b/N_0 for required BLER < 10^{-1}**	**E_b/N_0 for required BLER < 10^{-2}**

BS with Rx Diversity	7.5 dB	8.5 dB	7.3 dB	8.1 dB
BS without Rx Diversity	10.8 dB	12.0 dB	10.7 dB	11.7 dB

	~~TB size = 168 bits~~		~~TB size = 360 bits~~	
	~~BLER=10^{-1}~~	~~BLER=10^{-2}~~	~~BLER=10^{-1}~~	~~BLER=10^{-2}~~
~~Required Eb/N0~~	~~7.5 dB~~	~~8.5 dB~~	~~7.3 dB~~	~~8.1 dB~~

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040281**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.104** **CR** **226** ⌘ **rev** ⌘ Current version **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Corrections on terminology
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The performance requirements in section 8 are expressed with a term "should", which infringe 3GPP specification drafting rules in TS21.801.
Summary of change:	⌘	The term “should” used in a context of “requirements” in general is replaced by “shall”.
Consequences if not approved:	⌘	Incorrect expressions remain as requirements in section 8.

Clauses affected:	⌘	8.2.1.1, 8.3.1.1, 8.3.2.1, 8.3.3.1, 8.3.4.1, 8.4.1, 8.5.1, 8.5.1, 8.10.1, 8.10.2,

		Y	N			
Other specs Affected:	⌘		X	Other core specifications	⌘	
		X		Test specifications		25.141
			X	O&M Specifications		

Other comments:	⌘	

8 Performance requirement

8.1 General

Performance requirements for the BS are specified for the measurement channels defined in Annex A and the propagation conditions in Annex B. The requirements only apply to those measurement channels that are supported by the base station.

The BS performance requirements without UL Rx diversity should be applied only to BS which has not the dual receiver antenna diversity.

For BS with dual receiver antenna diversity, the required E_b/N_0 shall be applied separately at each antenna port.

The Eb/No used in this section is defined as:

$$E_b / N_o = \frac{E_c}{N_o} \cdot \frac{L_{chip}}{L_{\inf}}$$

Where:

E_c is the received total energy of DPDCH, DPCCH and HS-DPCCH per PN chip per antenna from all paths.

N_o is the total one-sided noise power spectral density due to all noise sources

L_{chip} is the number of chips per frame

$L_{\inf}$ is the number of information bits in DTCH excluding CRC bits per frame

Table 8.1: Summary of Base Station performance targets

Physical channel	Measurement channel	Static	Multi-path Case 1	Multi-path Case 2	Multi-path Case 3	Moving	Birth / Death
		Performance metric					
DCH	12.2 kbps	BLER<10^{-2}	BLER<10^{-2}	BLER<10^{-2}	BLER<10^{-2}	BLER<	BLER<
	64 kbps	BLER< 10^{-1},10^{-2}	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1}, 10^{-2},10^{-3}	BLER<	BLER<
	144 kbps	BLER< 10^{-1},10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1}, 10^{-2},10^{-3}	-	-
	384 kbps	BLER< 10^{-1},10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1},10^{-2}	BLER< 10^{-1}, 10^{-2},10^{-3}	-	-

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.2.1.1 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in Table 8.2.

Table 8.2: Performance requirements in AWGN channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.1 dB	8.3 dB	$< 10^{-2}$
64 kbps	1.5 dB	4.7 dB	$< 10^{-1}$
	1.7 dB	4.8 dB	$< 10^{-2}$
144 kbps	0.8 dB	3.8 dB	$< 10^{-1}$
	0.9 dB	4 dB	$< 10^{-2}$
384 kbps	0.9 dB	4 dB	$< 10^{-1}$
	1.0 dB	4.1 dB	$< 10^{-2}$

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.1.1 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in Table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	14 dB	$< 10^{-1}$
	11.9 dB	19.1 dB	$< 10^{-2}$
64 kbps	6.2 dB	11.6 dB	$< 10^{-1}$
	9.2 dB	15.9 dB	$< 10^{-2}$
144 kbps	5.4 dB	10.8 dB	$< 10^{-1}$
	8.4 dB	15 dB	$< 10^{-2}$
384 kbps	5.8 dB	11.2 dB	$< 10^{-1}$
	8.8 dB	15.5 dB	$< 10^{-2}$

8.3.2 Multipath fading Case 2

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.2.1 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in Table 8.4.

Table 8.4: Performance requirements in multipath Case 2 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	11 dB	$< 10^{-1}$
	9.0 dB	15 dB	$< 10^{-2}$
64 kbps	4.3 dB	9.2 dB	$< 10^{-1}$
	6.4 dB	12.3 dB	$< 10^{-2}$
144 kbps	3.7 dB	8.2 dB	$< 10^{-1}$
	5.6 dB	11.5 dB	$< 10^{-2}$
384 kbps	4.1 dB	8.7 dB	$< 10^{-1}$
	6.1 dB	12.1 dB	$< 10^{-2}$

8.3.3 Multipath fading Case 3

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.3.1 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in Table 8.5.

Table 8.5: Performance requirements in multipath Case 3 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	9.1 dB	$< 10^{-1}$
	7.2 dB	10.8 dB	$< 10^{-2}$
	8.0 dB	11.7 dB	$< 10^{-3}$
64 kbps	3.4 dB	7.1 dB	$< 10^{-1}$
	3.8 dB	7.7 dB	$< 10^{-2}$
	4.1 dB	8.5 dB	$< 10^{-3}$
144 kbps	2.8 dB	6 dB	$< 10^{-1}$
	3.2 dB	6.7 dB	$< 10^{-2}$
	3.6 dB	7.2 dB	$< 10^{-3}$
384 kbps	3.2 dB	6.5 dB	$< 10^{-1}$
	3.6 dB	7.2 dB	$< 10^{-2}$
	4.2 dB	7.9 dB	$< 10^{-3}$

8.3.4 Multipath fading Case 4

The performance requirement of DCH in multipath fading Case 4 in case of a Wide Area BS is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.4.1 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in Table 8.5A.

Table 8.5A: Performance requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	12.1 dB	< 10^{-1}
	10.2 dB	13.8 dB	< 10-2
	11.0 dB	14.7 dB	< 10-3
64 kbps	6.4 dB	10.1 dB	< 10-1
	6.8 dB	10.7 dB	< 10-2
	7.1 dB	11.5 dB	< 10-3
144 kbps	5.8 dB	9 dB	< 10-1
	6.2 dB	9.7 dB	< 10-2
	6.6 dB	10.2 dB	< 10-3
384 kbps	6.2 dB	9.5 dB	< 10-1
	6.6 dB	10.2 dB	< 10-2
	7.2 dB	10.9 dB	< 10-3

8.4 Demodulation of DCH in moving propagation conditions

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.4.1 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in Table 8.6.

Table 8.6: Performance requirements in moving channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	< 10^{-1}
	5.7 dB	8.7 dB	< 10^{-2}
64 kbps	2.1 dB	5.3 dB	< 10^{-1}
	2.2 dB	5.5 dB	< 10^{-2}

8.5 Demodulation of DCH in birth/death propagation conditions

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.5.1 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in Table 8.7.

Table 8.7: Performance requirements in birth/death channel

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	7.7 dB	$< 10^{-2}$
64 kbps	4.1 dB	$< 10^{-1}$
	4.2 dB	$< 10^{-2}$

8.6 Void

8.7 Performance requirement for RACH

Performance requirements for RACH consists of two parts: preamble detection and message demodulation. Requirements for these are in sections 8.7.1 and 8.7.2, respectively. Requirements are defined for two propagation conditions: static and fading case 3. The propagation conditions are defined in annexes B.1 and B.2.

8.7.1 Performance requirement for RACH preamble detection

Probability of false alarm, Pfa (=false detection of the preamble) when the preamble was not sent, shall be 10^{-3} or less. The performance measure Required Ec/N0 at probability of detection, Pd of 0.99 and 0.999. Only 1 signature is used and it is known by the receiver. The requirement for preamble detection, when the preamble was sent is in table 8.9 and 8.10 for static and case 3 fading.

Table 8.9: Requirements for Ec/N0 of Pd in static propagation condition

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-20.5 dB	-20.1 dB

Table 8.10: Requirements of Ec/N0 of Pd in case 3 fading

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-15.5 dB	-13.4 dB

8.7.2 Demodulation of RACH message

The performance measure is required Eb/N0 for block error rate (BLER) of 10^{-1} and 10^{-2}. Both measurement channels have TTI=20 ms. Payloads are 168 and 360 bits. Channel coding is rate ½ convolutional coding.

8.7.2.1 Minimum requirements for Static Propagation Condition

Table 8.11: Required Eb/N0 for static propagation

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER $< 10^{-1}$	E_b/N_0 for required BLER $< 10^{-2}$
168 bits, TTI = 20 ms	4.1 dB	5.0 dB
360 bits, TTI = 20 ms	3.9 dB	4.8 dB

8.7.2.2 Minimum requirements for Multipath Fading Case 3

Table 8.12: Required Eb/N0 for case 3 fading

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	7.4 dB	8.5 dB
360 bits, TTI = 20 ms	7.3 dB	8.3 dB

8.8 Performance requirement for CPCH

Performance requirements for CPCH consists of two parts: preamble detection and message demodulation. Requirements for these are in sections 8.8.1 and 8.8.2, respectively. Requirements are defined for two propagation conditions: static and fading case 3. The propagation conditions are defined in annexes B.1 and B.2.

8.8.1 Performance requirement for CPCH preamble detection

8.8.1.1 Detection of CPCH Access Preamble (AP)

The requirement for detection of the AP for CPCH is the same as the requirement for detection of the RACH preamble which is described in section 8.7.1 of this specification.

8.8.1.2 Detection of CPCH Collision Detection Preamble (CD)

The requirement for detection of the CD for CPCH is the same as the requirement for detection of the RACH preamble which is described in section 8.7.1 of this specification.

8.8.2 Demodulation of CPCH message part

The performance measure is required Eb/N0 for block error rate (BLER) of 10^{-1} and 10^{-2}. Both measurement channels have TTI=20 ms. Payloads are 168 and 360 bits. Channel coding is rate ½ convolutional coding.

8.8.2.1 Minimum requirements for Static Propagation Condition

Table 8.13: Required Eb/N0 for static propagation

	TB size = 168 bits		TB size = 360 bits	
	BLER=10^{-1}	BLER=10^{-2}	BLER=10^{-1}	BLER=10^{-2}
Required Eb/N0	4.1 dB	5.0 dB	3.9 dB	4.8 dB

8.8.2.2 Minimum requirements for Multipath Fading Case 3

Table 8.14: Required Eb/N0 for case 3 fading

	TB size = 168 bits		TB size = 360 bits	
	BLER=10^{-1}	BLER=10^{-2}	BLER=10^{-1}	BLER=10^{-2}
Required Eb/N0	7.5 dB	8.5 dB	7.3 dB	8.1 dB

8.9 BS Functionality in Site Selection Diversity Transmission (SSDT) Mode

Site Selection Diversity Transmission (SSDT) is an optional feature of BS. This requirement for SSDT mode ensures that BS correctly reacts to Layer 1 feedback signalling messages from UE.

8.9.1 Minimum requirements

For the conditions specified, the BS shall transmit or not transmit the downlink DPDCH channel.

Table 8.15: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set for radio link under test	dB	-3			
Target SIR, $SIR_{target,}$ set for radio link under test	dB	3			
Uplink SIR	dB	SIR_{target} + Q_{th} + 7.5	SIR_{target} + Q_{th} + 7.5	SIR_{target} + Q_{th} –7.5	SIR_{target} + Q_{th} – 7.5
Cell ID transmitted by UE	-	A	B	A	B
Transmission of downlink DPCCH	-	Yes	Yes	Yes	Yes
Transmission of downlink DPDCH	-	Yes	No	Yes	Yes

The above test ~~should~~shall be for repeated for each of the three code sets "long", "medium" and "short" Cell ID code sets.

8.10 Performance of ACK/NACK detection for HS-DPCCH

Performance requirements of HS-DPCCH signaling detection consist of two parts; ACK false alarm and ACK mis-detection. Requirements for these are 8.10.1 and 8.10.2, respectively. Performance requirements are specified for the reference measurement channel of HS-DPCCH and four propagation conditions: static, multi-path fading case 1, case2 and case3. The reference measurement channel for HS-DPCCH is defined in Annex A.8. The propagation conditions are defined in Annex B.1 and B.2.

8.10.1 ACK false alarm

The probability of ACK false alarm, P(DTX->ACK) (= false ACK detection when DTX is transmitted) ~~should~~shall not exceed the required error ratio for the E_c/N_0 specified in Table 8.16.

Table 8.16: Performance requirements for ACK false alarm

Propagation condition	Received E_c/N_0 (Test condition) For BS with Rx Diversity	Required error ratio
Static	-19.9 dB	$< 10^{-2}$
Case 1	-13.1 dB	$< 10^{-2}$
Case 2	-16.0 dB	$< 10^{-2}$
Case 3	-17.8 dB	$< 10^{-2}$

8.10.2 ACK mis-detection

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) ~~should~~shall not exceed the required error ratio for the E_c/N_0 specified in Table 8.17.

Table 8.17: Performance requirements for ACK mis-detection

Propagation condition	Received E_c/N_0 For BS with Rx Diversity	Required error ratio
Static	-17.3 dB	$< 10^{-2}$
Case 1	-10.7 dB	$< 10^{-2}$
Case 2	-13.6 dB	$< 10^{-2}$
Case 3	-12.1 dB	$< 10^{-2}$

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040239**
Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.123** **CR** **343** ⌘ **rev** ⌘ Current version: **6.1.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction to GSM reselection in CELL_FACH for 3.84Mcps TDD
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The existing reference for the some of the parameters listed in the Inter-RAT cell re-selection measurement for 3.84Mcps TDD are incorrect. Therefore the meaning of the parameters is undefined and the associated measurement requirement is also not defined.
Summary of change:	⌘	The references and definitions of the undefined parameters are corrected so that the parameters are defined.
Consequences if not approved:	⌘	The measurement requirement will not be properly defined.

Clauses affected:	⌘	5.4.2.1.4			
Other specs affected:	⌘	**Y**	**N**		
				Other core specifications	⌘
		X		Test specifications	34.122
				O&M Specifications	
Other comments:	⌘	This CR is similar to the changes made at meeting #30 to 1.28Mcps TDD. (R4-040141)			

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

5.4.2.1.4 Inter-RAT cell re-selection

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

The cell re-selection delay in CELL_FACH state for inter-RAT cells shall be less than:

$$T_{\text{reselection GSM}} = T_{\text{identify GSM}} + T_{\text{measurement GSM}} + 40 + T_{\text{BCCH}} + T_{\text{RA}} \text{ ms}$$

where

T_{BCCH} is the maximum time allowed to read the BCCH data from a GSM cell [21].

T_{RA} is the additional delay caused by the random access procedure.

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

$T_{identify, GSM}$ is equal to $T_{identify about}$ as specified in 8.4.2.5.2.1.

$$T_{\text{measurement, GSM}} = Max\left\{8 \cdot \frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}} \cdot T_{meas}, 4 * T_{meas}, 480ms\right\}$$

where

$N_{carriers}$ is the number of GSM carriers in the Inter-RAT cell info list

$N_{GSM\ carrier\ RSSI}$ shall be derived from the values in table 8.7 section 8.4.2.5.1.

T_{meas} is specified in section 8.4.2.1.

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

$T_{identify\ GSM}$ = 150 ms

$T_{measurement\ GSM}$ = 480 ms

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040354**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **659** ⌘ **rev** **1** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Inter-frequency delay requirements
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Here is a limitation on the minimum identification time of 5 s in Cell_DCH and in Cell_FACH. At the time when the requirements in 25.133 were generalised this was because the former test case was based on 5s. And the requirements should not be tighter when they were generalised. However, there is not any technical reason to limit the identification time to 5 s. A UE searching for cells during the compressed mode gap should not search less just because the compressed mode pattern is dense.
Summary of change:	⌘	Remove the limitation that the identification time is never lower than 5s in Cell_DCH and Cell_FACH.
Consequences if not approved:	⌘	The network will not gain from having a very dense CM pattern in areas where the identification time is very critical.

Clauses affected:	⌘	8.1.2.3.1 and 8.4.2.3.1.

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

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 identified 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, TGD and Max TGPL:

Table 8.1

TGL1 [slots]	TGL2 [slots]	TGD [slots]	Max TGPL [frames]
7	-	undefined	18
14	-	undefined	36
10	-	undefined	24
7	7	15…269	18 + ceil(TGD/15)
14	14	45…269	36 + ceil(TGD/15)

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

$$T_{identify,\ inter} = T_{basic\ identify\ FDD,inter} \cdot \frac{T_{Measurement\ \ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq} \quad ms$$

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

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap 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.

8.1.2.3.2 UE CPICH measurement capability

When transmission gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.1 and 9.1.2 with measurement period given by

$$T_{measurement\ \ inter} = Max\left\{T_{Measurement\_Period\ Inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{Measurement\_Period\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

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

The UE shall be capable of performing CPICH measurements for $X_{basic\ measurement\ FDD\ inter}$ inter-frequency cells per FDD frequency of the monitored set or the virtual active set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_\ Inter.}$

$X_{basic\ measurement\ FDDinter} = 6$

$T_{Measurement\_Period\ Inter}$ = 480 ms. The period used for calculating the measurement period $T_{measurement\_inter}$ for inter frequency CPICH measurements.

$T_{Inter::}$ This is the minimum time that is available for inter frequency measurements , during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time per transmission gap is calculated by using the actual idle length within the transmission gap as given in the table 11 of Annex B in TS 25.212 and by assuming 2*0.5 ms for implementation margin and after that taking only full slots into account in the calculation.

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

$T_{basic\_measurement\_FDD\ inter}$ = 50 ms. This is the time period used in the equation for defining the measurement period for inter frequency CPICH measurements.

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

**********NEW SECTION **********

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 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

$$T_{identify,\ inter} = Ceil\left\{\frac{T_{basic\ identify\ FDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,FDD} \quad ms$$

~~$$T_{identify,\ inter} = Max\left\{5000, Ceil\left\{\frac{T_{basic\ identify\ FDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,FDD}\right\} \quad ms$$~~

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.

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

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040366**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **668** ⌘ **rev** **1** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correcion of inconsistency between 25.133 and 25.331.		
Source:	⌘	RAN WG4		
Work item code:	⌘	TEI6	***Date:*** ⌘	26/05/2004
Category:	⌘	**F**	***Release:*** ⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	There is an inconsistency between 25.133 and 25.331. In 25.331, paragraph 8.6.7.5, there are partially other requirements on what shall be sent in the reports depending on the release. In 25.331, rel 99, paragraph 8.6.7.5 the following is specified "UE may report non-BSIC-verified GSM cells, in case "BSIC verification is required" for the Inter-RAT measurement." In 25. 331, rel 4-, paragraph 8.6.7.5 the following is specified "only BSIC-verified GSM cells shall be included in the measurement report, in case "BSIC verification is required" But in 25.133, paragraph 8.1.2.5.2 it is stated that "non-BSIC-verified GSM cells shall be included in the measurement report."
Summary of change:	⌘	The inconsistency between 25.331 and 25.133 is removed in 25.133 and changed to reference 25.331.
Consequences if not approved:	⌘	Inconsistencies of requirements between 25.133 and 25.331 are kept. Thereby it is not clear what shall be reported.

Clauses affected:	⌘	8.1.2.5.2			
		Y	**N**		
Other specs Affected:	⌘		**X**	Other core specifications	⌘
		X		Test specifications	34.121

	X	O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification

8.1.2.5.1 GSM carrier RSSI

1) For a UE requiring compressed mode

A UE supporting GSM measurements using compressed mode shall meet the minimum number of GSM RSSI carrier measurements specified in table 8.4. This measurement shall be based on a transmission gap pattern sequence with purpose "GSM carrier RSSI measurements"

In order for the requirements in this subsection to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose GSM carrier RSSI measurements using the following combinations for TGL1, TGL2 and TGD:

Table 8.3

TGL1 [slots]	TGL2 [slots]	TGD [slots]
3	-	undefined
4	-	undefined
5	-	undefined
7	-	undefined
10	-	undefined
14	-	undefined
3	3	15…269
4	4	15…269
5	5	15…269
7	7	15…269
10	10	41…269
14	14	45…269

In the CELL_DCH state the measurement period, $T_{\text{Measurement Period, GSM}}$, for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS45.008, when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.4

TGL	Number of GSM carrier RSSI samples in each gap.
3	1
4	2
5	3
7	6
10	10
14	15

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

2) For a UE not requiring compressed mode

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per RSSI value. The measurement period is 480 ms.

8.1.2.5.2 BSIC verification

1) For a UE requiring compressed mode

In order for the requirements in the following subsections to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose GSM Initial BSIC identification or with measurement purpose GSM BSIC re-confirmation, using the following combinations for TGL1, TGL2 and TGD:

Table 8.5

TGL1 [slots]	TGL2 [slots]	TGD [slots]
5	-	undefined
7	-	undefined
10	-	undefined
14	-	undefined
5	5	15…269
7	7	15…269
10	10	41…269
14	14	45…269

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

Initial BSIC identification

Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the FDD and GSM cell. The UE shall trigger the initial BSIC identification within the available transmission gap pattern sequence with purpose "GSM Initial BSIC identification". The requirements for Initial BSIC identification can be found in 8.1.2.5.2.1.

BSIC re-confirmation

Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available transmission gap pattern sequence with purpose "GSM BSIC re-confirmation". The requirements for BSIC re-confirmation can be found in 8.1.2.5.2.2.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

If the network requests measurements on a GSM cell with BSIC verified, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to Section 8.1.2.5.1 when ever a transmission gap pattern sequence with the purposes “GSM carrier RSSI measurements” is provided and the UE shall perform measurement reporting as defined in Section 8.6.7.6 of [16].
- The UE shall perform BSIC identification according to Section 8.1.2.5.2.1 when a “GSM Initial BSIC identification” transmission gap pattern sequence is activated. The UE shall use the last available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation according to Section 8.1.2.5.2.2 when a “GSM BSIC re-confirmation” transmission gap pattern sequence is activated.
    - If a “GSM BSIC re-confirmation” transmission gap pattern sequence is not activated in parallel to a “GSM Initial BSIC identification” transmission gap pattern sequence or within one frame from the deactivation of a “GSM Initial BSIC identification” transmission gap pattern sequence, the BSIC shall be considered to be non-verified after the UE has performed one event evaluation or periodic reporting evaluation with verified BSIC and the corresponding reporting if reporting is required after the evaluation.

The UE shall perform event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the last available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting. Periodic reports shall be triggered according to ~~the given reporting period even if the BSIC of a GSM cell has not been verified as defined in~~ Sections 8.6.7.5 and 8.6.7.6 of [16]. ~~Non verified BSIC shall be indicated in the measurement report.~~

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every $T_{re\text{-}confirm\_abort}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a transmission gap pattern sequence with a purpose “GSM BSIC re-confirmation ” is not activated by the network after BSIC identified or the “GSM BSIC re-confirmation ” transmission gap pattern sequence is deactivated, the UE shall behave as described previously in this section.

The parameters $N_{identify\_abort}$ and $T_{re\text{-}confirm\_abort}$ are defined by higher layers and are signalled to the UE together with the transmission gap pattern sequence. $N_{identify\_abort}$ indicates the maximum number of patterns that the UE shall use to attempt to decode the unknown BSIC of the GSM cell in the initial BSIC identification procedure. $T_{re\text{-}confirm\_abort}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a transmission gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective transmission gap is within the limits specified in table 8.6.

The effective transmission gap is calculated by assuming both UL and DL compressed mode and applying the worst-case values for UL/DL timing offset and pilot field length of last DL gap slot.

Table 8.6: The gap length and maximum time difference for BSIC verification

Gap length [slots]	Maximum time difference [µs]
5	± 500
7	± 1200
10	± 2200
14	± 3500

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005.

2) For a UE not requiring compressed mode

If a BSIC is decoded and matches the expected value, it is considered as “verified”, else it is considered as “non verified”.

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040357**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.141** **CR** **343** ⌘ **rev** **2** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Redrafting of spurious emission tables for co-existence
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**D**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	In clause 6.5 (Spurious emissions), there are a range of requirements for co-existence with FDD and other systems in other bands. Each system and band has its own clause and set of tables, making the specification complicated to read and update with new bands and requirements
Summary of change:	⌘	The co-existence requirements are merged into a single set of tables, with one table for co-existence in the same area and three separate tables for each BS class in case of co-location.
Consequences if not approved:	⌘	The specification will remain difficult to interpet and very complicated when updating with new bands and requirements.

Clauses affected:	⌘	4.7, 6.5.3.4, 6.5.3.7, 7.7

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	25.104
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	

4.7 Regional requirements

Some requirements in TS 25.141 may only apply in certain regions. Table 4.4 lists all requirements that may be applied differently in different regions.

Table 4.4: List of regional requirements

Subclause number	Requirement	Comments
3.4.1	Frequency bands	Some bands may be applied regionally.
3.4.1 6.5.3.4.3 6.5.3.7.3 7.7	Frequency bands Protection of the BS receiver of own or different BS Protection of the BS receiver of own or different BS Spurious Emissions	Band VI specifications are developed for use in Japan. The Band VI frequency ranges specified in clause 3.4.1 are subject to coming regulatory decisions.
3.4.2	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
3.5	Channel arrangement	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
6.2.1.2	Base station output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 4.4.1.
6.5.2.1	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.5.3.4.1	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329 [4], are applied.
6.5.3.4.2	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329 [4], are applied.
6.5.3.4.4	Co-existence with other systems in the same geographical area	These requirements may apply in geographic areas in which both UTRA FDD and GSM900, DCS1800, PCS1900, GSM850 and/or UTRA FDD operating in another frequency band are deployed.
6.5.3.4.5	Co-existence with co-located and co-sited base stations	These requirements may be applied for the protection of other BS receivers when GSM900, DCS1800, PCS1900, GSM850 and/or FDD BS operating in another frequency band are co-located with a UTRA FDD BS.
~~6.5.3.4.4.1~~	~~Co-existence with GSM900 – Operation in the same geographic area~~	~~This requirement may be applied for the protection of GSM 900 MS and GSM 900 BTS in geographic areas in which both GSM 900 and UTRA FDD are deployed.~~
~~6.5.3.4.4.2~~	~~Co-existence with GSM900 – Co-located base stations~~	~~This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA FDD BS are co-located.~~
~~6.5.3.4.5.1~~	~~Co-existence with DCS1800 – Operation in the same geographic area~~	~~This requirement may be applied for the protection of DCS 1800 MS and DCS 1800 BTS in geographic areas in which both DCS 1800 and UTRA FDD are deployed.~~
~~6.5.3.4.5.2~~	~~Co-existence with DCS1800 – Co-located base stations~~	~~This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA FDD BS are co-located.~~
6.5.3.4.6	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA FDD are deployed.
6.5.3.4.7	Co-.existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to the downlink band as defined in clause 3.4.1 in geographic areas in which both an adjacent band service and UTRA FDD are deployed.
6.5.3.4.8.1	Co-existence with UTRA TDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.5.3.4.8.2	Co-existence with UTRA TDD – Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.

6.5.3.4.9.1	Co-existence with UTRA FDD in frequency band I -Operation in the same geographic area	This requirement may be applied for the protection of UTRA FDD UE in frequency band I in geographic areas in which both UTRA FDD in frequency band I and III are deployed.
6.5.3.4.9.2	Co-existence with UTRA FDD in frequency band I – Co-located base stations	This requirement may be applied for the protection of UTRA FDD BTS receivers in frequency band I when UTRA FDD BS in frequency band I and III are co-located.
6.5.3.4.10.1	Co-existence with UTRA FDD in frequency band III -Operation in the same geographic area	This requirement may be applied for the protection of UTRA FDD UE in frequency band III in geographic areas in which both UTRA FDD in frequency band I and III are deployed.
6.5.3.4.10.2	Co-existence with UTRA FDD in frequency band III – Co-located base stations	This requirement may be applied for the protection of UTRA FDD BTS receivers in frequency band III when UTRA FDD BS in frequency band I and III are co-located.
6.5.3.4.11.1	Co-existence with PCS1900 – Operation in the same geographic area	This requirement may be applied for the protection of PCS 1900 BTS receivers in geographic areas in which both PCS 1900 and UTRA FDD are deployed.
6.5.3.4.11.2	Co-existence with PCS1900 - Co-located base stations	This requirement may be applied for the protection of PCS 1900 BTS receivers when PCS 1900 BTS and UTRA FDD BS are co-located.
6.5.3.4.12.1	Co-existence with GSM850 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 850 MS and GSM 850 BTS receivers in geographic areas in which both GSM 850 and UTRA FDD are deployed.
6.5.3.4.12.2	Co-existence with GSM 850 - Co-located base stations	This requirement may be applied for the protection of GSM 850 BTS receivers when GSM 850 BTS and UTRA FDD BS are co-located.
6.5.3.4.13.1	Co-existence with UTRA FDD in frequency band II Operation in the same geographic area	This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band II in geographic areas in which both UTRA FDD in frequency band II and UTRA FDD in other frequency bands are deployed.
6.5.3.4.13.2	Co-existence with UTRA FDD in frequency band II Co-located base stations	This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band II when UTRA FDD BS operating in frequency band II and UTRA FDD BS operating in other frequency bands are co-located.
6.5.3.4.14.1	Co-existence with UTRA FDD in frequency band V Operation in the same geographic area	This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band V in geographic areas in which both UTRA FDD in frequency band V and UTRA FDD in other frequency bands are deployed.
6.5.3.4.14.2	Co-existence with UTRA FDD in frequency band V Co-located base stations	This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band V when UTRA FDD BS operating in frequency band V and UTRA FDD BS operating in other frequency bands are co-located.
6.5.3.4.15.1	Co-existence with UTRA FDD in frequency band IV Operation in the same geographic area	This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band IV in geographic areas in which both UTRA FDD in frequency band IV and UTRA FDD in other frequency bands are deployed.
6.5.3.4.15.2	Co-existence with UTRA FDD in frequency band IV Co-located base stations	This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band IV when UTRA FDD BS operating in frequency band IV and UTRA FDD BS operating in other frequency bands are co-located.
6.5.3.4.16.1	Co-existence with UTRA FDD in frequency band VI Operation in the same geographic area	This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band VI in geographic areas in which both UTRA FDD in frequency band VI and UTRA FDD in other frequency bands are deployed.

~~6.5.3.4.16.2~~	~~Co-existence with UTRA FDD in frequency band VI Co-located base stations~~	~~This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band VI when UTRA FDD BS operating in frequency band VI and UTRA FDD BS operating in other frequency bands are co-located.~~
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
7.5	Blocking characteristics	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900, GSM850, PCS 1900 and BS operating in the /DCS1800 band (GSM or UTRA) are co-located.
7.6	Intermodulation characteristics	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
7.7	Spurious emissions	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
	Base station classes*	Only requirements for Wide Area (General Purpose) Base Stations shall be applied as regional requirements in Japan.
	HSDPA*	The portion of HSDPA(High Speed Downlink Packet Access) is not applicable to ARIB standards by the time when ARIB is prepared to transpose.

Note*: Base Station Classes, HSDPA: These regional requirements should be reviewed to check its necessity every TSG RAN meeting.

6.5.3.4.4 Co-existence with other systems in the same geographical area

These requirements may be applied for the protection of UE, MS and/or BS operating in other frequency bands in the same geographical area. The requirements may apply in geographic areas in which both UTRA FDD operating in frequency bands I to VI and a system operating in another frequency band than the FDD operating band are deployed. The system operating in the other frequency band may be GSM900, DCS1800, PCS1900, GSM850 and/or FDD operating in bands I to VI.

6.5.3.4.4.1 Minimum Requirements

The power of any spurious emission shall not exceed the limits of Table 6.27 for a BS where requirements for co-existence with the system listed in the first column apply.

Table 6.27: BS Spurious emissions limits for UTRA FDD BS in geographic coverage area of systems operating in other frequency bands

System type operating in the same geographical area	Band for co-existence requirement	Maximum Level	Measurement Bandwidth	Note
GSM900	876 – 915 MHz	-61 dBm	100 kHz	
	921 - 960 MHz	-57 dBm	100 kHz	
DCS1800	1805 - 1880 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in band III
	1710 – 1785 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in band III, since it is already covered by the requirement in sub-clause 6.6.3.2.
PCS1900	1930 - 1990 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band II
	1850 - 1910 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band II, since it is already covered by the requirement in sub-clause 6.6.3.2.
GSM850	824 - 849 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band V
	869 – 894 MHz	-57 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band V, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band I	2110 – 2170 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band I,
	1920 – 1980 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band I, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band II	1930 – 1990 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band II
	1850 – 1910 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band II, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band III	1805 – 1880 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band III
	1710 – 1785 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band III, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band IV	2110 – 2155 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band IV
	1710 – 1755 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band IV, since it is already covered by the requirement in sub-clause 6.6.3.2.
	869 – 894 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band V

FDD Band V	824 – 849 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band V, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band VI	875 – 885 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band VI
	830 – 840 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band VI, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.5.3.4.5 Co-existence with co-located and co-sited base stations

These requirements may be applied for the protection of other BS receivers when GSM900, DCS1800, PCS1900, GSM850 and/or FDD BS operating in Bands I to VI are co-located with a UTRA FDD BS.

~~The values assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss must be increased by the difference between the corresponding limits for the classes.~~

6.5.3.4.5.1 Minimum Requirements

The power of any spurious emission shall not exceed the limits of Table 6.28 for a Wide Area (WA) BS where requirements for co-location with a BS type listed in the first column apply.

Table 6.28: BS Spurious emissions limits for Wide Area BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Macro GSM900	876-915 MHz	-98 dBm	100 kHz	
Macro DCS1800	1710 - 1785 MHz	-98 dBm	100 kHz	
Macro PCS1900	1850 – 1910 MHz	-98 dBm	100 kHz	
Macro GSM850	824 - 849 MHz	-98 dBm	100 kHz	
WA UTRA FDD Band I	1920 - 1980 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band II	1850 – 1910 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band III	1710 – 1785 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band IV	1710 – 1755 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band V	824 – 849 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VI	830 – 840 MHz	-96 dBm	100 kHz	

The power of any spurious emission shall not exceed the limits of Table 6.29 for a Medium Range (MR) BS where requirements for co-location with a BS type listed in the first column apply.

Table 6.29: BS Spurious emissions limits for Medium Range BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Micro GSM900	876-915 MHz	-91 dBm	100 kHz	
Micro DCS1800	1710 - 1785 MHz	-96 dBm	100 kHz	
Micro PCS1900	1850 – 1910 MHz	-96 dBm	100 kHz	
Micro GSM850	824 - 849 MHz	-91 dBm	100 kHz	
MR UTRA FDD Band I	1920 - 1980 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band II	1850 – 1910 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band III	1710 – 1785 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band IV	1710 – 1755 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band V	824 – 849 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band VI	830 – 840 MHz	-9686 dBm	100 kHz	

The power of any spurious emission shall not exceed the limits of Table 6.30 for a Local Area (LA) BS where requirements for co-location with a BS type listed in the first column apply.

Table 6.30: BS Spurious emissions limits for Local Area BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Pico GSM900	876-915 MHz	-70 dBm	100 kHz	
Pico DCS1800	1710 - 1785 MHz	-80 dBm	100 kHz	
Pico PCS1900	1850 – 1910 MHz	-80 dBm	100 kHz	
Pico GSM850	824 - 849 MHz	-70 dBm	100 kHz	
LA UTRA FDD Band I	1920 - 1980 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band II	1850 – 1910 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band III	1710 – 1785 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band IV	1710 – 1755 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band V	824 – 849 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band VI	830 – 840 MHz	-9682 dBm	100 kHz	

6.5.3.4.4 Co-existence with GSM 900

6.5.3.4.4.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 900 MS and GSM 900 BTS receivers in geographic areas in which both GSM 900 and UTRA FDD are deployed.

This requirement assumes the scenario described in [2]. For different scenarios, the manufacturer may declare a different requirement.

6.5.3.4.4.1.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.27: BS Spurious emissions limits for BS in geographic coverage area of GSM 900

Band	Maximum Level	Measurement Bandwidth	Note
876 MHz to 915 MHz	-61 dBm	100 kHz	
921 MHz to 960 MHz	-57 dBm	100 kHz	

6.5.3.4.4.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA FDD BS are co-located.

6.5.3.4.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.28: BS Spurious emissions limits for protection of the BTS receiver

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	876 - 915 MHz	-98 dBm	100 kHz	
Medium Range BS	876 - 915 MHz	-91 dBm	100 kHz	
Local Area BS	876 - 915 MHz	-70 dBm	100 kHz	

6.5.3.4.5 Co-existence with DCS 1800

6.5.3.4.5.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS and DCS 1800 BTS receivers in geographic areas in which both DCS 1800 and UTRA FDD are deployed.

6.5.3.4.5.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.29: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800

Band	Maximum Level	Measurement Bandwidth	Note
1 805 MHz to 1 880 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in band III
1 710 MHz to 1 785 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in band III, since it is already covered by the requirement in sub-clause 6.5.3.4.3.

~~6.5.3.4.5.2 Co-located basestations~~

~~This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.~~

~~6.5.3.4.5.2.1 Minimum Requirement~~

~~The power of any spurious emission shall not exceed.~~

~~Table 6.30: BS Spurious emissions limits for BS co-located with DCS 1800 BTS~~

~~BS class~~	~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~Wide Area BS~~	~~1710 - 1785 MHz~~	~~-98 dBm~~	~~100 kHz~~	
~~Medium Range BS~~	~~1710 - 1785 MHz~~	~~-96 dBm~~	~~100 kHz~~	
~~Local Area BS~~	~~1710 - 1785 MHz~~	~~-80 dBm~~	~~100 kHz~~	

6.5.3.4.6 Co-existence with PHS

This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA FDD are deployed.

6.5.3.4.6.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.31: BS Spurious emissions limits for BS in geographic coverage area of PHS

Band	Maximum Level	Measurement Bandwidth	Note
1 893,5 MHz to 1 919,60 MHz	-41 dBm	300 kHz	

6.5.3.4.7 Co-existence with services in adjacent frequency bands

This requirement may be applied for the protection in bands adjacent to bands I, II or III, as defined in clause 3.4.1 in geographic areas in which both an adjacent band service and UTRA FDD are deployed.

6.5.3.4.7.1 Minimum requirement

The power of any spurious emission shall not exceed.

Table 6.32: BS spurious emissions limits for protection of adjacent band services

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	2100-2105 MHz	-30 + 3.4 · (f - 2100 MHz) dBm	1 MHz	
	2175-2180 MHz	-30 + 3.4 · (2180 MHz - f) dBm	1 MHz	
II	1920-1925 MHz	-30 + 3.4 · (f - 1920 MHz) dBm	1 MHz	
	1995-2000 MHz	-30 +3.4 · (2000 MHz - f) dBm	1 MHz	
III	1795-1800 MHz	-30 + 3.4 · (f - 1795 MHz) dBm	1MHz	
	1885-1890 MHz	-30 +3.4 · (1890 MHz - f) dBm	1MHz	

6.5.3.4.8 Co-existence with UTRA-TDD

6.5.3.4.8.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.

6.5.3.4.8.1.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.33: BS Spurious emissions limits for BS in geographic coverage area of UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1 900 MHz to 1 920 MHz	-52 dBm	1 MHz	
2 010 MHz to 2 025 MHz	-52 dBm	1 MHz	

6.5.3.4.8.2 Co-located base stations

This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.

6.5.3.4.8.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.34: BS Spurious emissions limits for BS co-located with UTRA-TDD

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	1 900 - 1 920 MHz	–86 dBm	1 MHz	
Local Area BS	1900 - 1920 MHz	-55 dBm	1 MHz	
Wide Area BS	2 010 - 2025 MHz	–86 dBm	1 MHz	
Local Area BS	2010 - 2025 MHz	-55 dBm	1 MHz	

~~6.5.3.4.9 Co-existence with UTRA FDD in frequency band I~~

~~6.5.3.4.9.1 Operation in the same geographic area~~

~~This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band I in geographic areas in which both UTRA FDD in frequency band I and UTRA FDD in other frequency bands are deployed.~~

~~6.5.3.4.9.1.1 Minimum Requirement~~

~~The power of any spurious emission shall not exceed:~~

~~Table 6.34A: BS Spurious emissions limits for BS in geographic coverage area of UTRA UE receiver and BS receiver operating in frequency band I~~

~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~2110 – 2170 MHz~~	~~-52 dBm~~	~~1 MHz~~	~~This requirement does not apply to UTRA FDD BS operating in band I~~
~~1920 – 1980 MHz~~	~~-49 dBm~~	~~1 MHz~~	~~This requirement does not apply to UTRA FDD BS operating in band I, since it is already covered by the requirement in sub-clause 6.5.3.4.3.~~

~~6.5.3.4.9.2 Co-located base stations~~

~~This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band I when UTRA FDD BS operating in frequency band I and UTRA FDD operating in other frequency bands are co-located.~~

6.5.3.4.9.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34B: BS Spurious emissions limits for BS co-located with UTRA FDD BS operating in frequency band I

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-96 dBm	100 kHz	

6.5.3.4.10 Co-existence with UTRA FDD in frequency band III

6.5.3.4.10.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE operating in frequency band III in geographic areas in which both UTRA in frequency band III and I are deployed.

6.5.3.4.10.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34C: BS Spurious emissions limits for BS in geographic coverage area of UTRA UE receiver and BS receiver operating in frequency band III

Band	Maximum Level	Measurement Bandwidth	Note
1805 – 1880 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band III
1710 – 1785 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band III, since it is already covered by the requirement in sub-clause 6.5.3.4.3.

6.5.3.4.10.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band III when UTRA FDD BS operating in frequency band III and UTRA FDD BS operating in other frequency bands are co-located.

6.5.3.4.10.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34D: BS Spurious emissions limits for BS co-located with UTRA FDD BS operating in frequency band III

Band	Maximum Level	Measurement Bandwidth	Note
1710 – 1785 MHz	-96 dBm	100 kHz	

6.5.3.4.11 Co-existence with PCS1900

6.5.3.4.11.1 Operation in the same geographic area

This requirement may be applied for the protection of PCS 1900 BS receiver in geographic areas in which both PCS 1900 and UTRA FDD BS are deployed.

6.5.3.4.11.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34Da: BS Spurious emissions limits for BS in geographic coverage area of PCS 1900 BS

Band	Maximum Level	Measurement Bandwidth	Note
1850 - 1910 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA-FDD BS operating in frequency band II, since it is already covered by the requirement in sub-clause 6.5.3.4.3.
1930 - 1990 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA-FDD BS operating in frequency band II

6.5.3.4.11.2 Co-located base stations

This requirement may be applied for the protection of PCS1900 BS receivers when UTRA FDD BS and PCS1900 BS are co-located.

6.5.3.4.11.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34E: BS Spurious emissions limits for BS co-located with PCS1900 BS

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	1850 – 1910 MHz	-98 dBm	100 kHz	
Medium Range BS	1850 – 1910 MHz	-96 dBm	100 kHz	
Local Area BS	1850 – 1910 MHz	-80 dBm	100 kHz	

6.5.3.4.12 Co-existence with GSM850

6.5.3.4.12.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 850 MS and GSM 850 BS receiver in geographic areas in which both GSM 850 and UTRA FDD BS are deployed.

6.5.3.4.12.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34Ea: BS Spurious emissions limits for BS in geographic coverage area of GSM 850

Band	Maximum Level	Measurement Bandwidth	Note
824 - 849 MHz	-61 dBm	100 kHz	
869 – 894 MHz	-57 dBm	100 kHz	

6.5.3.4.12.2 Co-located base stations

This requirement may be applied for the protection of GSM850 BS receivers when UTRA FDD BS and GSM850 BS are co-located.

6.5.3.4.12.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34F: BS Spurious emissions limits for BS co-located with GSM850 BS

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	824 – 849 MHz	-98 dBm	100 kHz	
Medium Range BS	824 – 849 MHz	-91 dBm	100 kHz	
Local Area BS	824 – 849 MHz	-70 dBm	100 kHz	

6.5.3.4.13 Co-existence with UTRA FDD in frequency band II

6.5.3.4.13.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band II in geographic areas in which both UTRA FDD in frequency band II and UTRA FDD in other frequency bands are deployed.

6.5.3.4.13.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34G: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band II

Band	Maximum Level	Measurement Bandwidth	Note
1930 – 1990 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band II
1850 – 1910 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band II, since it is already covered by the requirement in sub-clause 6.5.3.4.3

6.5.3.4.13.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band II when UTRA FDD BS operating in frequency band II and UTRA FDD BS operating in other frequency bands are co-located.

6.5.3.4.13.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34H: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band II

Band	Maximum Level	Measurement Bandwidth	Note
1850 – 1910 MHz	-96 dBm	100 kHz	

6.5.3.4.14 Co-existence with UTRA FDD in frequency band V

6.5.3.4.14.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band V in geographic areas in which both UTRA FDD in frequency band V and UTRA FDD in other frequency bands are deployed.

6.5.3.4.14.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34I: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band V

Band	Maximum Level	Measurement Bandwidth	Note
869 – 894 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band V
824 – 849 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band V, since it is already covered by the requirement in sub-clause 6.5.3.4.3

6.5.3.4.14.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band V when UTRA FDD BS operating in frequency band V and UTRA FDD BS operating in other frequency bands are co-located.

6.5.3.4.14.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34J: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band V

Band	Maximum Level	Measurement Bandwidth	Note
824 – 849 MHz	-96 dBm	100 kHz	

6.5.3.4.15 Co-existence with UTRA FDD in frequency band IV

6.5.3.4.15.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band IV in geographic areas in which both UTRA FDD in frequency band IV and UTRA FDD in other frequency bands are deployed.

6.5.3.4.15.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34K: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band IV

Band	Maximum Level	Measurement Bandwidth	Note
2110 – 2155 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band IV
1710 – 1755 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band IV, since it is already covered by the requirement in sub-clause 6.5.3.4.3.

6.5.3.4.15.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band IV when UTRA FDD BS operating in frequency band IV and UTRA FDD BS operating in other frequency bands are co-located.

6.5.3.4.15.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34L: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band IV

Band	Maximum Level	Measurement Bandwidth	Note
1710 – 1755 MHz	-96 dBm	100 kHz	

6.5.3.4.16 Co-existence with UTRA FDD in frequency band VI

6.5.3.4.16.1 Operation in the same geographic area

This requirement may be applied for the protection of UTRA FDD UE and BS operating in frequency band VI in geographic areas in which both UTRA FDD in frequency band VI and UTRA FDD in other frequency bands are deployed.

6.5.3.4.16.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34M: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band VI

Band	Maximum Level	Measurement Bandwidth	Note
875 – 885 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band VI
830 – 840 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band VI, since it is already covered by the requirement in sub-clause 6.5.3.4.3.

6.5.3.4.16.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers operating in frequency band VI when UTRA FDD BS operating in frequency band VI and UTRA FDD BS operating in other frequency bands are co-located.

6.5.3.4.16.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.34N: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band VI

Band	Maximum Level	Measurement Bandwidth	Note
830 – 840 MHz	-96 dBm	100 kHz	

6.5.3.7 Test requirements

The measurement result in step 2 of 6.5.3.6.2 shall not exceed the maximum level specified in tables 6.35 to 6.456.51 if applicable for the BS under test.

NOTE: If a Test Requirement in this section differs from the corresponding Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

6.5.3.7.4 Co-existence with other systems in the same geographical area

Table 6.38: BS Spurious emissions limits for UTRA FDD BS in geographic coverage area of systems operating in other frequency bands

System type operating in the same geographical area	Band for co-existence requirement	Maximum Level	Measurement Bandwidth	Note
GSM900	876 – 915 MHz	-61 dBm	100 kHz	
	921 - 960 MHz	-57 dBm	100 kHz	
DCS1800	1805 - 1880 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in band III
	1710 – 1785 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in band III, since it is already covered by the requirement in sub-clause 6.6.3.2.
PCS1900	1930 - 1990 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band II
	1850 - 1910 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band II, since it is already covered by the requirement in sub-clause 6.6.3.2.
GSM850	824 - 849 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band V
	869 – 894 MHz	-57 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency band V, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band I	2110 – 2170 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band I,
	1920 – 1980 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band I, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band II	1930 – 1990 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band II
	1850 – 1910 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band II, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band III	1805 – 1880 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band III
	1710 – 1785 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band III, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band IV	2110 – 2155 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band IV
	1710 – 1755 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band IV, since it is already covered by the requirement in sub-clause 6.6.3.2.
	869 – 894 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band V

FDD Band V	824 – 849 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band V, since it is already covered by the requirement in sub-clause 6.6.3.2.
FDD Band VI	875 – 885 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band VI
	830 – 840 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band VI, since it is already covered by the requirement in sub-clause 6.6.3.2.

6.5.3.7.5 Co-existence with co-located and co-sited base stations

Table 6.39: BS Spurious emissions limits for Wide Area BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Macro GSM900	876-915 MHz	-98 dBm	100 kHz	
Macro DCS1800	1710 - 1785 MHz	-98 dBm	100 kHz	
Macro PCS1900	1850 – 1910 MHz	-98 dBm	100 kHz	
Macro GSM850	824 - 849 MHz	-98 dBm	100 kHz	
WA UTRA FDD Band I	1920 - 1980 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band II	1850 – 1910 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band III	1710 – 1785 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band IV	1710 – 1755 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band V	824 – 849 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VI	830 – 840 MHz	-96 dBm	100 kHz	

Table 6.40: BS Spurious emissions limits for Medium Range BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Micro GSM900	876-915 MHz	-91 dBm	100 kHz	
Micro DCS1800	1710 - 1785 MHz	-96 dBm	100 kHz	
Micro PCS1900	1850 – 1910 MHz	-96 dBm	100 kHz	
Micro GSM850	824 - 849 MHz	-91 dBm	100 kHz	
MR UTRA FDD Band I	1920 - 1980 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band II	1850 – 1910 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band III	1710 – 1785 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band IV	1710 – 1755 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band V	824 – 849 MHz	-9686 dBm	100 kHz	
MR UTRA FDD Band VI	830 – 840 MHz	-9686 dBm	100 kHz	

Table 6.41: BS Spurious emissions limits for Local Area BS co-located with another BS

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Pico GSM900	876-915 MHz	-70 dBm	100 kHz	
Pico DCS1800	1710 - 1785 MHz	-80 dBm	100 kHz	
Pico PCS1900	1850 – 1910 MHz	-80 dBm	100 kHz	
Pico GSM850	824 - 849 MHz	-70 dBm	100 kHz	
LA UTRA FDD Band I	1920 - 1980 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band II	1850 – 1910 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band III	1710 – 1785 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band IV	1710 – 1755 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band V	824 – 849 MHz	-9682 dBm	100 kHz	
LA UTRA FDD Band VI	830 – 840 MHz	-9682 dBm	100 kHz	

~~6.5.3.7.4 Co-existence with GSM 900~~

~~6.5.3.7.4.1 Operation in the same geographic area~~

~~Table 6.38: BS Spurious emissions limits for BS in geographic coverage area of GSM 900~~

~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~876 MHz to 915 MHz~~	~~-61 dBm~~	~~100 kHz~~	
~~921 MHz to 960 MHz~~	~~-57 dBm~~	~~100 kHz~~	

~~6.5.3.7.4.2 Co-located base stations~~

~~Table 6.39: BS Spurious emissions limits for protection of the BTS receiver~~

~~BS class~~	~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~Wide Area BS~~	~~876-915 MHz~~	~~-98 dBm~~	~~100 kHz~~	
~~Medium Range BS~~	~~876-915 MHz~~	~~-91 dBm~~	~~100 kHz~~	
~~Local Area BS~~	~~876-915 MHz~~	~~-70 dBm~~	~~100 kHz~~	

~~6.5.3.7.5 Co-existence with DCS 1800~~

~~6.5.3.7.5.1 Operation in the same geographic area~~

~~Table 6.40: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800~~

~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~1 805 MHz to 1 880 MHz~~	~~-47 dBm~~	~~100 kHz~~	~~This requirement does not apply to UTRA-FDD BS operating in band III~~
~~1 710 MHz to 1 785 MHz~~	~~-61 dBm~~	~~100 kHz~~	~~This requirement does not apply to UTRA-FDD BS operating in band III, since it is already covered by the requirement in sub-clause 6.5.3.4.3.~~

~~6.5.3.7.5.2 Co-located base stations~~

~~Table 6.41: BS Spurious emissions limits for BS co-located with DCS 1800 BTS~~

~~BS class~~	~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~Wide Area BS~~	~~1710 - 1785 MHz~~	~~-98 dBm~~	~~100 kHz~~	
~~Medium Range BS~~	~~1710 - 1785 MHz~~	~~-96 dBm~~	~~100 kHz~~	
~~Local Area BS~~	~~1710 - 1785 MHz~~	~~-80 dBm~~	~~100 kHz~~	

6.5.3.7.6 Co-existence with PHS

Table 6.42: BS Spurious emissions limits for BS in geographic coverage area of PHS

Band	Maximum Level	Measurement Bandwidth	Note
1 893,5 MHz to 1 919,60 MHz	-41 dBm	300 kHz	

6.5.3.7.7 Co-existence with services in adjacent frequency bands

Table 6.43: BS spurious emissions limits for protection of adjacent band services

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	2100-2105 MHz	-30 + 3.4 · (f - 2100 MHz) dBm	1 MHz	
	2175-2180 MHz	-30 + 3.4 · (2180 MHz - f) dBm	1 MHz	
II	1920-1925 MHz	-30 + 3.4 · (f - 1920 MHz) dBm	1 MHz	
	1995-2000 MHz	-30 +3.4 · (2000 MHz - f) dBm	1 MHz	
III	1795-1800 MHz	-30 + 3.4 · (f - 1795 MHz) dBm	1MHz	
	1885-1890 MHz	-30 +3.4 · (1890 MHz - f) dBm	1MHz	

6.5.3.7.8 Co-existence with UTRA-TDD

6.5.3.7.8.1 Operation in the same geographic area

Table 6.44: BS Spurious emissions limits for BS in geographic coverage area of UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1 900 MHz to 1 920 MHz	-52 dBm	1 MHz	
2 010 MHz to 2 025 MHz	-52 dBm	1 MHz	

6.5.3.7.8.2 Co-located base stations

Table 6.45: BS Spurious emissions limits for BS co-located with UTRA-TDD

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	1900 - 1920 MHz	-86 dBm	1 MHz	
Local Area BS	1900 - 1920 MHz	-55 dBm	1 MHz	
Wide Area BS	2010 - 2025 MHz	-86 dBm	1 MHz	
Local Area BS	2010 - 2025 MHz	-55 dBm	1 MHz	

~~6.5.3.7.9 Co-existence with UTRA FDD in frequency band I~~

~~6.5.3.7.9.1 Operation in the same geographic area~~

~~**Table 6.46: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band I**~~

~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~2110 – 2170 MHz~~	~~-52 dBm~~	~~1 MHz~~	~~This requirement does not apply to UTRA-FDD BS operating in band I~~
~~1920 – 1980 MHz~~	~~-49 dBm~~	~~1 MHz~~	~~This requirement does not apply to UTRA-FDD BS operating in band I, since it is already covered by the requirement in sub-clause 6.5.3.4.3.~~

6.5.3.7.9.2 Co-located base stations

Table 6.47: BS Spurious emissions limits for BS co-located with UTRA FDD BS operating in frequency band I

Band	Maximum Level	Measurement Bandwidth	Note
1920 - 1980 MHz	-96 dBm	100 kHz	

6.5.3.7.10 Co-existence with UTRA FDD in frequency band III

6.5.3.7.10.1 Operation in the same geographic area

Table 6.48: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band III

Band	Maximum Level	Measurement Bandwidth	Note
1805 – 1880 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band III
1710 – 1785 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band III, since it is already covered by the requirement in sub-clause 6.5.3.4.3.

6.5.3.7.10.2 Co-located base stations

Table 6.49: BS Spurious emissions limits for BS co-located with UTRA FDD BS operating in frequency band III

Band	Maximum Level	Measurement Bandwidth	Note
1710 – 1785 MHz	-96 dBm	100 kHz	

6.5.3.7.11 Co-existence with PCS1900

6.5.3.7.11.1 Operation in the same geographic area

Table 6.49A: BS Spurious emissions limits for BS in geographic coverage area of PCS 1900

Band	Maximum Level	Measurement Bandwidth	Note
1850 - 1910 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA-FDD BS operating in frequency band II, since it is already covered by the requirement in sub-clause 6.5.3.4.3.
1930 - 1990 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA-FDD BS operating in frequency band II

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

6.5.3.7.11.2 Co-located base stations

Table 6.50: BS Spurious emissions limits for BS co-located with PCS1900 BS

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	1850 – 1910 MHz	-98 dBm	100 kHz	
Medium Range BS	1850 – 1910 MHz	-96 dBm	100 kHz	
Local Area BS	1850 – 1910 MHz	-80 dBm	100 kHz	

6.5.3.7.12 Co-existence with GSM850

6.5.3.7.12.1 Operation in the same geographic area

Table 6.50A: BS Spurious emissions limits for BS in geographic coverage area of GSM 850

Band	Maximum Level	Measurement Bandwidth	Note
824 - 849 MHz	-61 dBm	100 kHz	
869 – 894 MHz	-57 dBm	100 kHz	

6.5.3.7.12.2 Co-located base stations

Table 6.51: BS Spurious emissions limits for BS co-located with GSM850 BS

BS class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	824 - 849 MHz	-98 dBm	100 kHz	
Medium Range BS	824 - 849 MHz	-91 dBm	100 kHz	
Local Area BS	824 - 849 MHz	-70 dBm	100 kHz	

6.5.3.7.13 Co-existence with UTRA FDD in frequency band II

6.5.3.7.13.1 Operation in the same geographic area

Table 6.52: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band II

Band	Maximum Level	Measurement Bandwidth	Note
1930 – 1990 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band II
1850 – 1910 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band II, since it is already covered by the requirement in sub-clause 6.5.3.4.3.

6.5.3.7.13.2 Co-located base stations

Table 6.53: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band II

Band	Maximum Level	Measurement Bandwidth	Note
1850 – 1910 MHz	-96 dBm	100 kHz	

6.5.3.7.14 Co-existence with UTRA FDD in frequency band V

6.5.3.7.14.1 Operation in the same geographic area

Table 6.54: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band V

Band	Maximum Level	Measurement Bandwidth	Note
869 – 894 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band V
824 – 849 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band V, since it is already covered by the requirement in sub-clause 6.5.3.4.3.

6.5.3.7.14.2 Co-located base stations

Table 6.55: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band V

Band	Maximum Level	Measurement Bandwidth	Note
824 – 849 MHz	-96 dBm	100 kHz	

6.5.3.7.15 Co-existence with UTRA FDD in frequency band IV

6.4.3.7.15.1 Operation in the same geographic area

Table 6.56: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band IV

Band	Maximum Level	Measurement Bandwidth	Note
2110 – 2155 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band IV
1710 – 1755 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA-FDD BS operating in band IV, since it is already covered by the requirement in sub-clause 6.5.3.4.3.

6.4.3.7.15.2 Co-located base stations

Table 6.57: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band IV

Band	Maximum Level	Measurement Bandwidth	Note
1710 – 1755 MHz	-96 dBm	100 kHz	

~~6.5.3.7.16 Co-existence with UTRA FDD in frequency band VI~~

~~6.5.3.7.16.1 Operation in the same geographic area~~

~~Table 6.58: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD UE receiver and BS receiver operating in frequency band VI~~

~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~875 – 885 MHz~~	~~-52 dBm~~	~~1 MHz~~	~~This requirement does not apply to UTRA-FDD BS operating in band VI.~~
~~830 – 840 MHz~~	~~-49 dBm~~	~~1 MHz~~	~~This requirement does not apply to UTRA-FDD BS operating in band VI, since it is already covered by the requirement in sub-clause 6.5.3.4.3.~~

~~6.5.3.7.16.2 Co-located base stations~~

~~Table 6.59: BS Spurious emissions limits for BS co-located with UTRA BS operating in frequency band VI~~

~~Band~~	~~Maximum Level~~	~~Measurement Bandwidth~~	~~Note~~
~~830 – 840 MHz~~	~~-96 dBm~~	~~100 kHz~~	

7.7 Spurious Emissions

7.7.1 Definition and applicability

The spurious emission power is the power of the emissions generated or amplified in a receiver that appears at the BS antenna connector. The requirements apply to all BS with separate RX and TX antenna port. The test shall be performed when both TX and RX are on with the TX port terminated.

For all BS with common RX and TX antenna port the transmitter spurious emission as specified in subclause 6.5.3 is valid.

7.7.2 Minimum Requirements

The power of any spurious emission shall not exceed:

Table 7.6(a): General spurious emission minimum requirement

Band	Maximum level	Measurement Bandwidth	Note
30 MHz - 1 GHz	-57 dBm	100 kHz	
1 GHz - 12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS.

Table 7.6(b): Additional spurious emission requirements

Operating Band	Band	Maximum level	Measurement Bandwidth	Note
I	1900 – 1980 MHz 2010 – 2025 MHz	-78 dBm	3.84 MHz	
II	1850 – 1910 MHz	-78 dBm	3.84 MHz	
III	1710 – 1785 MHz	-78 dBm	3.84 MHz	
IV	1710 – 1755 MHz	-78 dBm	3.84 MHz	
V	824 – 849 MHz	-78 dBm	3.84 MHz	
VI	830 – 840 MHz	-78 dBm	3.84 MHz	

In addition to the requirements in tables 7.6, the co-existence requirements for co-located base stations in subclause~~s~~ 6.5.3.4.5 ~~6.5.3.4.4.2, 6.5.3.4.5.2, 6.5.3.4.8.2, 6.5.3.4.9.2, 6.5.3.4.10.2, 6.5.3.4.11, 6.5.3.4.12, 6.5.3.4.13 , 6.5.3.4.14, 6.5.3.4.15 and 6.5.3.4.16~~ may also be applied. The normative reference for this requirement is in TS 25.104[1] subclause 7.7

7.7.3 Test purpose

The test purpose is to verify the ability of the BS to limit the interference caused by receiver spurious emissions to other systems.

7.7.4 Method of test

7.7.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: M with multi-carrier if supported, see subclause 4.8

1) Connect a measurement receiver to the BS antenna connector as shown in annex B.

2) Enable the BS receiver.

3) Start BS transmission with channel configuration as specified in the table 6.1 and 6.2 (Test model 1) at Pmax.

7.7.4.2 Procedure

1) Terminate the BS Tx antenna connector as shown in annex B.

2) Set measurement equipment parameters as specified in table 7.7.

3) Measure the spurious emissions over each frequency range described in subclause 7.7.2.

4) Repeat the test using diversity antenna connector if available.

Table 7.7

Measurement Band width	3.84 MHz (Root raised cosine,0.22) / 100 kHz/ 1MHz (note)
Sweep frequency range	30 MHz to 12.75GHz
Detection	True RMS
NOTE: As defined in subclause 7.7.2.	

7.7.5 Test requirements

The all measured spurious emissions, derived in step (3) and (4), shall be within requirement limits as specified in Tables 7.7A.

Table 7.7A(a): Spurious emission minimum requirement

Band	Maximum level	Measurement Bandwidth	Note
30 MHz - 1 GHz	-57 dBm	100 kHz	
1 GHz - 12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS.

Table 7.7A(b): Additional spurious emission requirements

Operating Band	Band	Maximum level	Measurement Bandwidth	Note
I	1900 – 1980 MHz 2010 – 2025 MHz	-78 dBm	3.84 MHz	
II	1850 – 1910 MHz	-78 dBm	3.84 MHz	
III	1710 – 1785 MHz	-78 dBm	3.84 MHz	
IV	1710 – 1755 MHz	-78 dBm	3.84 MHz	
V	824 – 849 MHz	-78 dBm	3.84 MHz	
VI	830 – 840 MHz	-78 dBm	3.84 MHz	

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

In addition to the requirements in tables 7.7A, the co-existence requirements for co-located base stations in subclause~~s~~ 6.5.3.7.5 ~~6.5.3.7.4.2, 6.5.3.7.5.2, 6.5.3.7.8.2, 6.5.3.7.9.2, 6.5.3.7.10.2, 6.5.3.7.11, 6.5.3.7.12, 6.5.3.7.13, 6.5.3.7.14, 6.5.3.7.15 and 6.5.3.7.16~~ may also be applied.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040359**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.141** **CR** **344** ⌘ **rev** **2** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Redrafting of blocking tables for co-location & Requirements for Medium Range BS and Local Area BS in case of co-location
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change:	⌘	- In clause 7.5 (Blocking) there are a range of requirements for co-location with FDD and other systems in other bands. Each system and band has its own clause and tables, making the specification difficult to read and very complicated when updating with new bands and requirements. - In Release 6 new FDD base station classes have been introduced taken into account specific requirements for micro-cell and pico-cell deployment scenarios. In current specification these scenarios haven't been considered and therefore blocking requirements are derived from WA BS only. For MR and LA BS classes blocking requirements in case of co-location are therefore unnecessarily tight.
Summary of change:	⌘	- The co-location requirements are merged into a single set of three tables, with one table for each BS class in case of co-location. - Co-location requirements for different BS classes added based on idea presented in document R4-040175. A mention added that co-location values assume a 30 dB coupling loss between transmitter and receiver. If BSs of different classes are co-sited, the coupling loss must be increased by the difference between the corresponding blocking requirements for different classes.
Consequences if not approved:	⌘	- The specification will remain difficult to interpet and very complicated when updating with new bands and requirements. - Blocking requirements in case of co-location are unnecessarily tight for MR and LA BSs.

Clauses affected:	⌘	7.5

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	25.104
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

.

7.5 Blocking characteristics

7.5.1 Definition and applicability

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance requirement applies as specified in tables 7.4A to 7.4J.~~7.4(a) to 7.4(g).~~

The requirements ~~in Tables 7.4(a1), 7.4(a2) and 7.4(a3)~~ shall apply to the indicated base station class, depending on which frequency band is used. The requirements in Tables 7.4D to 7.4J may be applied for the protection of FDD BS receivers when GSM900, DCS1800, PCS1900, GSM850 and/or FDD BS operating in Bands I to VI are co-located with a UTRA FDD BS. ~~The requirements in Tables 7.4 (b) to 7.4 (g) may be applied when the FDD BS is co-located with GSM900, (UTRA FDD or GSM) 850, (UTRA FDD or GSM) 1900 and/or BS operation in (UTRA FDD or GSM) 1800 band.~~

7.5.2 Minimum Requirements

The BER shall not exceed 0.001 for the parameters specified in table 7.4A to 7.4F if applicable for the BS under test.

Table 7.4A~~7.4(a1)~~: Blocking characteristics for Wide Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
II	1850 - 1910 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
III	1710 – 1785 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
IV	1710 – 1755 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1755 – 1775 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1775 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
V	824-849 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	804-824 MHz 849-869 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz – 804 MHz 869 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
VI	810 – 830 MHz 840 – 860 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz – 810 MHz 860 MHz – 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4B~~7.4(a2)~~: Blocking characteristics for Medium Range BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
II	1850 - 1910 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
III	1710 – 1785 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
IV	1710 – 1755 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1755 – 1775 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1775 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
V	824-849 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	804-824 MHz 849-869 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz – 804 MHz 869 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
VI	810 – 830 MHz 840 – 860 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz – 810 MHz 860 MHz – 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4C~~7.4(a3)~~: Blocking characteristics for Local Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
II	1850 - 1910 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
III	1710 – 1785 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
IV	1710 – 1755 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1755 – 1775 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1775 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
V	824-849 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	804-824 MHz 849-869 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz – 804 MHz 869 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
VI	810 – 830 MHz 840 – 860 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz – 810 MHz 860 MHz – 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4D: Blocking performance requirement for Wide Area BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Macro GSM900	921 – 960 MHz	+16 dBm	-115 dBm	CW carrier
Macro DCS1800	1805 – 1880 MHz	+16 dBm	-115 dBm	CW carrier
Macro PCS1900	1930 – 1990 MHz	+16 dBm	-115 dBm	CW carrier
Macro GSM850	869 – 894 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band I	2110 – 2170 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band II	1930 – 1990 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band III	1805 – 1880 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band IV	2110 – 2155 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band V	869 – 894 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band VI	875 – 885 MHz	+16 dBm	-115 dBm	CW carrier

Table 7.4E: Blocking performance requirement for Medium Range BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Micro GSM900	921 – 960 MHz	-3 dBm	-105 dBm	CW carrier
Micro DCS1800	1805 – 1880 MHz	+5 dBm	-105 dBm	CW carrier
Micro PCS1900	1930 – 1990 MHz	+5 dBm	-105 dBm	CW carrier
Micro GSM850	869 – 894 MHz	-3 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band I	2110 – 2170 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band II	1930 – 1990 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band III	1805 – 1880 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band IV	2110 – 2155 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band V	869 – 894 MHz	+8 dBm	-105 dBm	CW carrier
MR UTRA-FDD Band VI	875 – 885 MHz	+8 dBm	-105 dBm	CW carrier

Table 7.4F: Blocking performance requirement for Local Area BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Pico GSM900	921 – 960 MHz	-7 dBm	-101 dBm	CW carrier
Pico DCS1800	1805 – 1880 MHz	-4 dBm	-101 dBm	CW carrier
Pico PCS1900	1930 – 1990 MHz	-4 dBm	-101 dBm	CW carrier
Pico GSM850	869 – 894 MHz	-7 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band I	2110 – 2170 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band II	1930 – 1990 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band III	1805 – 1880 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band IV	2110 – 2155 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band V	869 – 894 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band VI	875 – 885 MHz	-6 dBm	-101 dBm	CW carrier

~~**Table 7.4(b): Blocking performance requirement when co-located with GSM900**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~921 -960 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4(c): Blocking performance requirement for operation when co-located with BTS operating inDCS1800 band (GSM or UTRA)**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~1805 – 1880 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~Table 7.4(d): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band I~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~2110 – 2170 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~Table 7.4(e): Blocking performance requirement for operation when co-located with PCS1900 BTS~~

~~Table 7.4(e): Blocking performance requirement for operation when co-located with PCS1900 BTS~~ ~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~1930 – 1990 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

Table 7.4G~~7.4(f1)~~: Blocking performance requirement (narrowband) for Wide Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 47 dBm	-115 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 47 dBm	-115 dBm	2.8 MHz	GMSK modulated*
IV	1710 – 1755 MHz	- 47 dBm	-115 dBm	2.7 MHz	GMSK modulated*
V	824 – 849 MHz	- 47 dBm	-115 dBm	2.7 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

Table 7.4H~~7.4(f2)~~: Blocking performance requirement (narrowband) for Medium range BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 42 dBm	-105 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 42 dBm	-105 dBm	2.8 MHz	GMSK modulated*
IV	1710 – 1755 MHz	- 42 dBm	-105 dBm	2.7 MHz	GMSK modulated*
V	824 – 849 MHz	- 42 dBm	-105 dBm	2.7 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

Table 7.4J~~7.4(f3)~~: Blocking performance requirement (narrowband) for Local Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 37 dBm	-101 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 37 dBm	-101 dBm	2.8 MHz	GMSK modulated*
IV	1710 – 1755 MHz	- 37 dBm	-101 dBm	2.7 MHz	GMSK modulated*
V	824 – 849 MHz	- 37 dBm	-101 dBm	2.7 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

~~**Table 7.4(g): Blocking performance requirement for operation when co-located with GSM850 BTS**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal Level~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~869 – 894 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4(h): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band II**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~1930 – 1990 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4(i): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band V**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~869 – 894 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4(j): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band IV**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~2110 – 2155 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4(k): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band VI**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~875 – 885 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

The normative reference for these requirements is in TS 25.104[1] subclause 7.5

7.5.3 Test purpose

The test stresses the ability of the BS receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity.

7.5.4 Method of test

7.5.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: M see subclause 4.8. The BS shall be configured to operate as close to the centre of the operating band as possible.

1) Connect WCDMA signal generator at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

2) Terminate any other Rx port not under test.

3) Transmit a signal from the WCDMA signal generator to the BS. The characteristics of the signal shall be set according to the UL reference measurement channel (12,2 kbit/s) specified in annex A subclause A.2.1. The level of the WCDMA signal measured at the BS antenna connector shall be set to the level specified in subclause 7.5.5.

7.5.4.2 Procedure

1) Adjust the signal generators to the type of interfering signals and the frequency offsets as specified in Tables 7.4K to 7.4T~~7.4A(a) to 7.4A(g)~~. Note that the GMSK modulated interfering signal shall have an ACLR of at least 72 dB in order to eliminate the impact of interference signal adjacent channel leakage power on the blocking characteristics measurement. For the tests defined in Tables 7.4K to 7.4M ~~Table 7.4A(a)~~, the interfering signal shall be at a frequency offset Fuw from the assigned channel frequency of the wanted signal which is given by:

$$Fuw = \pm (n \times 1\ MHz),$$

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz.

2) Measure the BER of the wanted signal at the BS receiver.

3) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (2).

7.5.5 Test Requirements

The BER shall not exceed 0.001 for the parameters specified in table 7.4K to 7.4T if applicable for the BS under test.~~7.4A.~~

Table 7.4K~~7.4A(a1)~~: Blocking characteristics for Wide Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
II	1850 - 1910 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
III	1710 – 1785 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
IV	1710 – 1755 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1755 – 1775 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1775 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
V	824-849 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	804-824 MHz 849-869 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz – 804 MHz 869 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
VI	810 – 830 MHz 840 – 860 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz – 810 MHz 860 MHz – 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4L~~7.4A(a2)~~: Blocking characteristics for Medium Range BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *

	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
II	1850 - 1910 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
III	1710 – 1785 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
IV	1710 – 1755 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1755 – 1775 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1775 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
V	824-849 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	804-824 MHz 849-869 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz – 804 MHz 869 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
VI	810 – 830 MHz 840 – 860 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz – 810 MHz 860 MHz – 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4M~~7.4A(a3)~~: Blocking characteristics for Local Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
II	1850 - 1910 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
III	1710 – 1785 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
IV	1710 – 1755 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1755 – 1775 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1775 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
V	824-849 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	804-824 MHz 849-869 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz – 804 MHz 869 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
VI	810 – 830 MHz 840 – 860 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz – 810 MHz 860 MHz – 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4N: Blocking performance requirement for Wide Area BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Macro GSM900	921 – 960 MHz	+16 dBm	-115 dBm	CW carrier
Macro DCS1800	1805 – 1880 MHz	+16 dBm	-115 dBm	CW carrier
Macro PCS1900	1930 – 1990 MHz	+16 dBm	-115 dBm	CW carrier
Macro GSM850	869 – 894 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band I	2110 – 2170 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band II	1930 – 1990 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band III	1805 – 1880 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band IV	2110 – 2155 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band V	869 – 894 MHz	+16 dBm	-115 dBm	CW carrier
WA UTRA-FDD Band VI	875 – 885 MHz	+16 dBm	-115 dBm	CW carrier

Table 7.4P: Blocking performance requirement for Medium Range BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Micro GSM900	921 – 960 MHz	-3 dBm	-101 dBm	CW carrier
Micro DCS1800	1805 – 1880 MHz	+5 dBm	-101 dBm	CW carrier
Micro PCS1900	1930 – 1990 MHz	+5 dBm	-101 dBm	CW carrier
Micro GSM850	869 – 894 MHz	-3 dBm	-101 dBm	CW carrier
MR UTRA-FDD Band I	2110 – 2170 MHz	+8 dBm	-101 dBm	CW carrier
MR UTRA-FDD Band II	1930 – 1990 MHz	+8 dBm	-101 dBm	CW carrier
MR UTRA-FDD Band III	1805 – 1880 MHz	+8 dBm	-101 dBm	CW carrier
MR UTRA-FDD Band IV	2110 – 2155 MHz	+8 dBm	-101 dBm	CW carrier
MR UTRA-FDD Band V	869 – 894 MHz	+8 dBm	-101 dBm	CW carrier
MR UTRA-FDD Band VI	875 – 885 MHz	+8 dBm	-101 dBm	CW carrier

Table 7.4Q: Blocking performance requirement for Local Area BS when co-located with BS in other bands.

Co-located BS type	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Type of Interfering Signal
Pico GSM900	921 – 960 MHz	-7 dBm	-101 dBm	CW carrier
Pico DCS1800	1805 – 1880 MHz	-4 dBm	-101 dBm	CW carrier
Pico PCS1900	1930 – 1990 MHz	-4 dBm	-101 dBm	CW carrier
Pico GSM850	869 – 894 MHz	-7 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band I	2110 – 2170 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band II	1930 – 1990 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band III	1805 – 1880 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band IV	2110 – 2155 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band V	869 – 894 MHz	-6 dBm	-101 dBm	CW carrier
LA UTRA-FDD Band VI	875 – 885 MHz	-6 dBm	-101 dBm	CW carrier

~~**Table 7.4A(b): Blocking performance requirement when co-located with GSM900**~~

~~Table 7.4A(b): Blocking performance requirement when co-located with GSM900~~ ~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~921 - 960 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4A(c): Blocking performance requirement when co-located with Base Station operating in DCS1800 band (GSM or UTRA FDD)**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~1805 – 1880 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4A(d): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band I**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~2110 – 2170 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4A(e): Blocking performance requirement for operation when co-located with PCS1900 BTS**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~1930 – 1990 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

Table 7.4R~~7.4A(f1)~~: Blocking performance requirement (narrowband) for Wide Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 47 dBm	-115 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 47 dBm	-115 dBm	2.8 MHz	GMSK modulated*
IV	1710 – 1755 MHz	- 47 dBm	-115 dBm	2.7 MHz	GMSK modulated*
V	824 – 849 MHz	- 47 dBm	-115 dBm	2.7 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

Table 7.4S~~7.4A(f2)~~: Blocking performance requirement (narrowband) for Medium range BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 42 dBm	-105 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 42 dBm	-105 dBm	2.8 MHz	GMSK modulated*
IV	1710 – 1755 MHz	- 42 dBm	-105 dBm	2.7 MHz	GMSK modulated*
V	824 – 849 MHz	- 42 dBm	-105 dBm	2.7 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

Table 7.4T~~7.4A(f3)~~: Blocking performance requirement (narrowband) for Local Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 37 dBm	-101 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 37 dBm	-101 dBm	2.8 MHz	GMSK modulated*
IV	1710 – 1755 MHz	- 37 dBm	-101 dBm	2.7 MHz	GMSK modulated*
V	824 – 849 MHz	- 37 dBm	-101 dBm	2.7 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

~~**Table 7.4A(g): Blocking performance requirement for operation when co-located with GSM850 BTS**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~869 – 894 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4A(h): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band II**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~1930 – 1990 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

~~**Table 7.4A(i): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band V**~~

~~Center Frequency of Interfering Signal~~	~~Interfering Signal mean power~~	~~Wanted Signal mean power~~	~~Minimum Offset of Interfering Signal~~	~~Type of Interfering Signal~~
~~869 – 894 MHz~~	~~+16 dBm~~	~~-115 dBm~~	~~—~~	~~CW carrier~~

Table 7.4A(j): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band IV

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
2110 – 2155 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.4A(k): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band VI

Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
875 – 885 MHz	+16 dBm	-115 dBm	—	CW carrier

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

NOTE: Annex C describes the procedure for BER tests taking into account the statistical consequence of frequent repetition of BER measurements within the blocking test . The consequence is: a DUT exactly on the limit may fail due to the statistical nature 2.55 times (mean value) in 12750 BER measurements using the predefined wrong decision probability of 0.02%. If the fail cases are ≤12, it is allowed to repeat the fail cases 1 time before the final verdict.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040192**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.141** **CR** **345** ⌘ **rev** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Spectrum mask test requirement for Band IV
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	There are Band IV spectrum mask minimum requirements for all maximum output power levels P, but the test requirements for P<31 dBm are missing.
Summary of change:	⌘	Table 6.21 for P< 31 dBm is changed to have Band IV included
Consequences if not approved:	⌘	There would be no spectrum mask test requirements for a Band IV BS with P<31 dBm.

Clauses affected:	⌘	

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

6.5.2.1.5 Test requirements

The measurement results in step 2 of 6.5.2.1.4.2 shall not exceed the test requirements specified in tables 6.18 to 6.21 for the appropriate BS maximum output power.

Table 6.18: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Test Requirement Band I, II, III, IV, V	Additional Requirements Band II, IV and V [1]	Measurement bandwidth
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-12.5dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	-13dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0 MHz ≤ f_offset < f_offset_{max}	-11.5 dBm		1 MHz
NOTE 1: The minimum requirement for operation in band I, II, III, IV, V is the lower power of the minimum requirement for band I, II, III, IV, V and the additional requirement for band II, IV and V.				

Table 6.19: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Test Requirement Band I, II, III, IV, V	Additional Requirements Band II, IV and V [1]	Measurement bandwidth
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-12.5dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	-13dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.5 dB	-13dBm	1 MHz
NOTE 1: The minimum requirement for operation in band I, II, III, IV, V is the lower power of the minimum requirement for band I, II, III, IV, V and the additional requirement for band II, IV and V.				

Table 6.20: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter – 3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Test Requirement Band I, II, III, IV, V	Additional RequirementsB and II, IV and V [1]	Measurement bandwidth
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P – 51.5 dB	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$P - 51.5dB - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 63.5 dB	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 50.5 dB	-13dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.5 dB	-13dBm	1 MHz
NOTE 1: The minimum requirement for operation in band I, II, III, IV, V is the lower power of the minimum requirement for band I, II, III, IV, V and the additional requirement for band II, IV and V.				

Table 6.21: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Test Requirement Band I, II, III, IV, V	Measurement bandwidth
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-20.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-20.5dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-32.5 dBm	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-19.5 dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	-23.5 dBm	1 MHz

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040193**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.141** **CR** **346** ⌘ **rev** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Correction of AWGN level for MR and LA BS classes receiver performance verification
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The AWGN level for conformance testing of MR and LA BS classes has not been adapted to the corresponding noise floor of these BS classes. The current AWGN level that is defined is based on WA BS class noise floor.
Summary of change:	⌘	AWGN level adapted to the MR and LA BS class noise floor.
Consequences if not approved:	⌘	If the level of AWGN is not adapted to corresponding BS class noise floor, the measurements will be affected by significant contribution of BS noise floor which result in inaccurate measurement results.

Clauses affected:	⌘	Chapter 8.

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments: ⌘

Performance requirement

8.1 General

All Bit Error Ratio (BER) and Block Error ratio (BLER) measurements shall be carried out according to the general rules for statistical testing defined in ITU-T Recommendation O.153 [5] and Annex C.

If external BLER measurement is not used then the internal BLER calculation shall be used instead. When internal BLER calculation is used, the requirements of the verification test according to 8.6 shall be met in advance.

Performance requirements are specified for a number of test environments and multi-path channel classes.

The requirements only apply to those measurement channels that are supported by the base station.

For BS with dual receiver antenna diversity, only the BS performance requirements with Rx diversity are to be tested, the required E_b/N_0 shall be applied separately at each antenna port.

For BS without receiver antenna diversity, only the BS performance requirements without Rx diversity are to be tested, the required E_b/N_0 shall be applied at the BS Rx antenna port.

In tests performed with signal generators a synchronization signal may be provided, from the base station to the signal generator, to enable correct timing of the wanted signal.

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

8.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.2.1.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.1.

Table 8.1: Performance requirements in AWGN channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.1 dB	8.3 dB	$< 10^{-2}$
64 kbps	1.5 dB	4.7 dB	$< 10^{-1}$
	1.7 dB	4.8 dB	$< 10^{-2}$
144 kbps	0.8 dB	3.8 dB	$< 10^{-1}$
	0.9 dB	4.0 dB	$< 10^{-2}$
384 kbps	0.9 dB	4.0 dB	$< 10^{-1}$
	1.0 dB	4.1 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.2.1.1.

8.2.1.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.2.1.4 Method of test

8.2.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.2.1.4.2 Procedure

1) ~~1)~~ Adjust the AWGN generator depending on the BS class under test ~~to -84 dBm/3.84 MHz~~ at the BS input as following:~~.~~

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.2 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

4) For each of the data rates in table 8.2 applicable for the base station, measure the BLER.

8.2.1.5 Test requirements

The BLER measured according to subclause 8.2.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.2.

Table 8.2: Test requirements in AWGN channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.5 dB	8.7 dB	$< 10^{-2}$
64 kbps	1.9 dB	5.1 dB	$< 10^{-1}$
	2.1 dB	5.2 dB	$< 10^{-2}$
144 kbps	1.2 dB	4.2 dB	$< 10^{-1}$
	1.3 dB	4.4 dB	$< 10^{-2}$
384 kbps	1.3 dB	4.4 dB	$< 10^{-1}$
	1.4 dB	4.5 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

8.3.1.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.1.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	14.0 dB	$< 10^{-1}$
	11.9 dB	19.1 dB	$< 10^{-2}$
64 kbps	6.2 dB	11.6 dB	$< 10^{-1}$
	9.2 dB	15.9 dB	$< 10^{-2}$
144 kbps	5.4 dB	10.8 dB	$< 10^{-1}$
	8.4 dB	15.0 dB	$< 10^{-2}$
384 kbps	5.8 dB	11.2 dB	$< 10^{-1}$
	8.8 dB	15.5 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.3.1.1

8.3.1.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal under slow multipath fading propagation conditions with a BLER not exceeding a specified limit.

8.3.1.4 Method of test

8.3.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.1.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.4 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.4 applicable for the base station, measure the BLER.

8.3.1.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.4.

Table 8.4: Test requirements in multipath Case 1 channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	14.6 dB	$< 10^{-1}$
	12.5 dB	19.7 dB	$< 10^{-2}$
64 kbps	6.8 dB	12.2 dB	$< 10^{-1}$
	9.8 dB	16.5 dB	$< 10^{-2}$
144 kbps	6.0 dB	11.4 dB	$< 10^{-1}$
	9.0 dB	15.6 dB	$< 10^{-2}$
384 kbps	6.4 dB	11.8 dB	$< 10^{-1}$
	9.4 dB	16.1 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.2 Multipath fading Case 2

8.3.2.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.2.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.5.

Table 8.5: Performance requirements in multipath Case 2 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	11.0 dB	$< 10^{-1}$
	9.0 dB	15.0 dB	$< 10^{-2}$
64 kbps	4.3 dB	9.2 dB	$< 10^{-1}$
	6.4 dB	12.3 dB	$< 10^{-2}$
144 kbps	3.7 dB	8.2 dB	$< 10^{-1}$
	5.6 dB	11.5 dB	$< 10^{-2}$
384 kbps	4.1 dB	8.7 dB	$< 10^{-1}$
	6.1 dB	12.1 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.3.2.1.

8.3.2.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal that has a large time dispersion with a BLER not exceeding a specified limit.

8.3.2.4 Method of test

8.3.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.2.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.6 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.6 applicable for the base station, measure the BLER.

8.3.2.5 Test requirements

The BLER measured according to subclause 8.3.2.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.5.

Table 8.6: Test requirements in multipath Case 2 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	11.6 dB	$< 10^{-1}$
	9.6 dB	15.6 dB	$< 10^{-2}$
64 kbps	4.9 dB	9.8 dB	$< 10^{-1}$
	7.0 dB	12.9 dB	$< 10^{-2}$
144 kbps	4.3 dB	8.8 dB	$< 10^{-1}$
	6.2 dB	12.1 dB	$< 10^{-2}$
384 kbps	4.7 dB	9.3 dB	$< 10^{-1}$
	6.7 dB	12.7dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.3 Multipath fading Case 3

8.3.3.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.3.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.7.

Table 8.7: Performance requirements in multipath Case 3 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	9.1 dB	$< 10^{-1}$
	7.2 dB	10.8 dB	$< 10^{-2}$
	8.0 dB	11.7 dB	$< 10^{-3}$
64 kbps	3.4 dB	7.1 dB	$< 10^{-1}$
	3.8 dB	7.7 dB	$< 10^{-2}$
	4.1 dB	8.5 dB	$< 10^{-3}$
144 kbps	2.8 dB	6.0 dB	$< 10^{-1}$
	3.2 dB	6.7 dB	$< 10^{-2}$
	3.6 dB	7.2 dB	$< 10^{-3}$
384 kbps	3.2 dB	6.5 dB	$< 10^{-1}$
	3.6 dB	7.2 dB	$< 10^{-2}$
	4.2 dB	7.9 dB	$< 10^{-3}$

The reference for this requirement is TS 25.104 subclause 8.3.3.1.

8.3.3.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.3.4 Method of test

8.3.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.3.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.8 applicable for the base station, measure the BLER

8.3.3.5 Test requirements

The BLER measured according to subclause 8.3.3.4.2 shall not exceed the BLER limits for E_b/N_0 levels specified in table 8.7.

Table 8.8: Test requirements in multipath Case 3 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	9.7 dB	$< 10^{-1}$
	7.8 dB	11.4 dB	$< 10^{-2}$
	8.6 dB	12.3 dB	$< 10^{-3}$
64 kbps	4.0 dB	7.7 dB	$< 10^{-1}$
	4.4 dB	8.3 dB	$< 10^{-2}$
	4.7 dB	9.1 dB	$< 10^{-3}$
144 kbps	3.4 dB	6.6 dB	$< 10^{-1}$
	3.8 dB	7.3 dB	$< 10^{-2}$
	4.2 dB	7.8 dB	$< 10^{-3}$
384 kbps	3.8 dB	7.1 dB	$< 10^{-1}$
	4.2 dB	7.8 dB	$< 10^{-2}$
	4.8 dB	8.5 dB	$< 10^{-3}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.4 Multipath fading Case 4

8.3.4.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 4 for Wide Area BS is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply Wide Area BS only.

8.3.4.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.8A.

Table 8.8A: Performance requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	12.1 dB	< 10^{-1}
	10.2 dB	13.8 dB	< 10-2
	11.0 dB	14.7 dB	< 10-3
64 kbps	6.4 dB	10.1 dB	< 10-1
	6.8 dB	10.7 dB	< 10-2
	7.1 dB	11.5 dB	< 10-3
144 kbps	5.8 dB	9.0 dB	< 10-1
	6.2 dB	9.7 dB	< 10-2
	6.6 dB	10.2 dB	< 10-3
384 kbps	6.2 dB	9.5 dB	< 10-1
	6.6 dB	10.2 dB	< 10-2
	7.2 dB	10.9 dB	< 10-3

The reference for this requirement is TS 25.104 subclause 8.3.4.1.

8.3.4.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.4.4 Method of test

8.3.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.4.4.2 Procedure

1) ~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8B is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.8B applicable for the base station, measure the BLER.

8.3.4.5 Test requirements

The BLER measured according to subclause 8.3.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.8B.

Table 8.8B: Test requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	12.7 dB	$< 10^{-1}$
	10.8 dB	14.4 dB	< 10-2
	11.6 dB	15.3 dB	< 10-3
64 kbps	7.0 dB	10.7 dB	< 10-1
	7.4 dB	11.3 dB	< 10-2
	7.7 dB	12.1 dB	< 10-3
144 kbps	6.4 dB	9.6 dB	< 10-1
	6.8 dB	10.3 dB	< 10-2
	7.2 dB	10.8 dB	< 10-3
384 kbps	6.8 dB	10.1 dB	< 10-1
	7.2 dB	10.8 dB	< 10-2
	7.8 dB	11.5 dB	< 10-3

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.4 Demodulation of DCH in moving propagation conditions

8.4.1 Definition and applicability

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.4.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.9.

Table 8.9: Performance requirements in moving channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.7 dB	8.7 dB	$< 10^{-2}$
64 kbps	2.1 dB	5.3 dB	$< 10^{-1}$
	2.2 dB	5.5 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.4.1.

8.4.3 Test purpose

The test shall verify the receiver's ability to receive and track the test signal with a BLER not exceeding the specified limit.

8.4.4 Method of test

8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.4.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.10 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.10 applicable for the base station, measure the BLER.

8.4.5 Test requirements

The BLER measured according to subclause 8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.10.

Table 8.10: Test requirements in moving channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	6.3 dB	9.3 dB	$< 10^{-2}$
64 kbps	2.7 dB	5.9 dB	$< 10^{-1}$
	2.8 dB	6.1 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.5 Demodulation of DCH in birth/death propagation conditions

8.5.1 Definition and applicability

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.5.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.11.

Table 8.11: Performance requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	7.7 dB
64 kbps	4.1 dB	4.2 dB

The reference for this requirement is TS 25.104 subclause 8.5.1.

8.5.3 Test purpose

The test shall verify the receiver's ability to receive the test signal to find new multi path components with a BLER not exceeding the specified limit.

8.5.4 Method of test

8.5.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.5.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.12 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.12 applicable for the base station, measure the BLER.

8.5.5 Test requirements

The BLER measured according to subclause 8.5.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.12.

Table 8.12: Test requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	8.3 dB
64 kbps	4.7 dB	4.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.6 Verification of the internal BLER calculation

8.6.1 Definition and applicability

Base Station System with internal BLER calculates block error rate from the CRC blocks of the received. This test is performed only if Base Station System has this kind of feature. All data rates which are used in clause 8 Performance requirement testing shall be used in verification testing. This test is performed by feeding measurement signal with known BLER to the input of the receiver. Locations of the erroneous blocks shall be randomly distributed within a frame. Erroneous blocks shall be inserted into the UL signal as shown in figure 8.1.

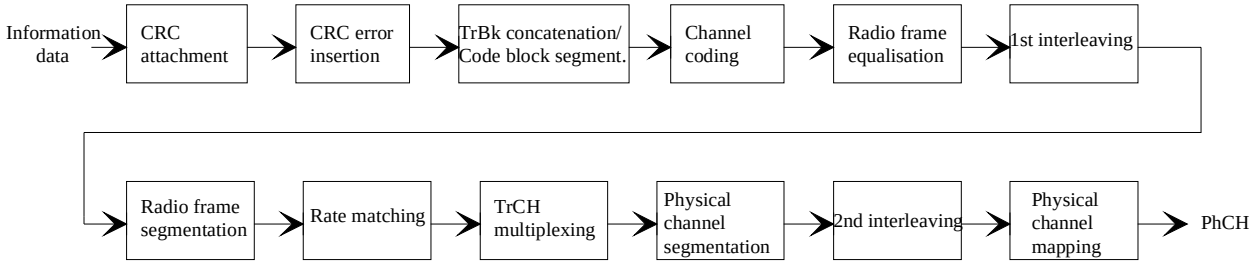

Figure 8.1: BLER insertion to the output data

8.6.2 Minimum requirement

BLER indicated by the Base Station System shall be within ±10% of the BLER generated by the RF signal source. Measurement shall be repeated for each data rate as specified in table 8.13.

Table 8.13

Transport channel combination	Data rate	BLER
DPCH	12,2 kbps	0.01
DPCH	64 kbps	0.01
DPCH	144 kbps	0.01
DPCH	384 kbps	0.01

8.6.3 Test purpose

To verify that the internal BLER calculation accuracy shall met requirements for conformance testing.

8.6.4 Method of test

8.6.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal to the BS antenna connector as shown in annex B.

3) Set correct signal source parameters as specified in table 8.14.

Table 8.14: UL Signal levels for different data rates

Data rate	Signal level	Unit
12,2 kbps	-111	dBm/3.84 MHz
64 kbps	-107	dBm/3.84 MHz
144 kbps	-104	dBm/3.84 MHz
384 kbps	-100	dBm/3.84 MHz

Note: PN9 can be used as data sequence for the test

8.6.4.2 Procedure

1) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

2) The BLER insertion to the wanted signal shall be configured according to the corresponding data rate in table 8.13.

3) Adjust the BS tester so that the required UL signal level specified in table 8.14 is achieved.

For each of the data rates in table 8.13 applicable for the base station, measure the BLER at least over 50 000 blocks.

8.6.5 Test requirement

BLER indicated by the Base Station System shall be within requirement as specified in subclause 8.6.2.

8.7 void

8.8 RACH performance

8.8.1 RACH preamble detection in static propagation conditions

8.8.1.1 Definition and applicability

The performance requirement of RACH for preamble detection in static propagation conditions is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The performance is measured by the required E_c/N_0 at probability of detection, Pd of 0.99 and 0.999. Pfa is defined as a conditional probability of erroneous detection of the preamble when input is only noise (+interference). Pd is defined as conditional probability of detection of the preamble when the signal is present. Pfa shall be 10^{-3} or less. Only one signature is used and it is known by the receiver.

8.8.1.2 Minimum requirement

The P_d shall be above or equal to the limits for the E_c/N_0 specified in table 8.16.

Table 8.16: Preamble detection requirements in AWGN channel

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-20.5 dB	-20.1 dB

The reference for this requirement is TS 25.104 subclause 8.7.1.

8.8.1.3 Test purpose

The test shall verify the receiver's ability to detect RACH preambles under static propagation conditions.

8.8.1.4 Method of test

8.8.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.8.1.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_c/N_0 specified in table 8.17 is achieved. To achieve the specified E_c/N_O, the ratio of the wanted signal level (of the preamble part) relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

4) The test signal generator sends a preamble and the receiver tries to detect the preamble. This pattern is repeated. Preamble detection should be made only on those access slots a preamble has been sent in.

Figure 8.2: RACH test signal pattern

8.8.1.5 Test requirements

The P_d shall be above or equal to the Pd limits for the E_c/N_0 levels specified in table 8.17.

Table 8.17: Preamble detection test requirements in AWGN channel

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-20.1 dB	-19.7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.2 RACH preamble detection in multipath fading case 3

8.8.2.1 Definition and applicability

The performance requirement of RACH for preamble detection in in multipath fading case 3 is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The performance is measured by the required E_c/N_0 at probability of detection, Pd of 0.99 and 0.999. Pfa is defined as a conditional probability of erroneous detection of the preamble when input is only noise (+interference). Pd is defined as conditional probability of detection of the preamble when the signal is present. Pfa shall be 10^{-3} or less. Only one signature is used and it is known by the receiver.

8.8.2.2 Minimum requirement

The P_d shall be above or equal to the limits for the E_c/N_0 specified in table 8.18.

Table 8.18: Preamble detection requirements in fading case 3 channel

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-15.5 dB	-13.4 dB

The reference for this requirement is TS 25.104 subclause 8.7.1.

8.8.2.3 Test purpose

The test shall verify the receiver's ability to detect RACH preambles under multipath fading case 3 propagation conditions.

8.8.2.4 Method of test

8.8.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.8.2.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_c/N_0 specified in table 8.19 is achieved. To achieve the specified E_c/N_O, the ratio of the wanted signal level (of the preamble part) relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

5) The test signal generator sends a preamble and the receiver tries to detect the preamble. This pattern is repeated. Preamble detection should be made only on those access slots a preamble has been sent in.

Figure 8.3: RACH test signal pattern

8.8.2.5 Test requirements

The P_d shall be above or equal to the Pd limits for the E_c/N_0 levels specified in table 8.19.

Table 8.19: Preamble detection test requirements in fading case 3 channel

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-14.9 dB	-12.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.3 Demodulation of RACH message in static propagation conditions

8.8.3.1 Definition and applicability

The performance requirement of RACH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The preamble threshold factor is chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2. Only one signature is used and it is known by the receiver.

8.8.3.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.20.

Table 8.20: Performance requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.1 dB	5.0 dB
360 bits, TTI = 20 ms	3.9 dB	4.8 dB

The reference for this requirement is TS 25.104 subclause 8.7.2.

8.8.3.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.8.3.4 Method of test

8.8.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.8.3.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.21 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\text{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0\ [\text{dB}].$$

4) The test signal generator sends a preamble followed by the actual RACH message. This pattern is repeated (see figure 8.4). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

Figure 8.4: RACH test signal pattern

8.8.3.5 Test requirements

The BLER measured according the subclause 8.8.3.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.21.

Table 8.21: Test requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.5 dB	5.4 dB
360 bits, TTI = 20 ms	4.3 dB	5.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.4 Demodulation of RACH message in multipath fading case 3

8.8.4.1 Definition and applicability

The performance requirement of RACH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The preamble threshold factor is chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2. Only one signature is used and it is known by the receiver.

8.8.4.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.22.

Table 8.22: Performance requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	7.4 dB	8.5 dB
360 bits, TTI = 20 ms	7.3 dB	8.3 dB

The reference for this requirement is TS 25.104 subclause 8.7.2.

8.8.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading case 3 propagation conditions with a BLER not exceeding a specified limit.

8.8.4.4 Method of test

8.8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.8.4.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.23 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*Log10(TB/(TTI*3.84*10^6))+E_b/N_0\ [dB]$$

5) The test signal generator sends a preamble followed by the actual RACH message. This pattern is repeated (see figure 8.5). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

Figure 8.5: RACH test signal pattern

8.8.4.5 Test requirements

The BLER measured according to subclause 8.8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.23.

Table 8.23: Test requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	8.0 dB	9.1 dB
360 bits, TTI = 20 ms	7.9 dB	8.9 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.9 CPCH Performance

8.9.1 CPCH access preamble and collision detection preamble detection in static propagation conditions

8.9.1.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd).

8.9.1.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble in section 8.8.1 of this specification. No additional conformance test is needed.

8.9.2 CPCH access preamble and collision detection preamble detection in multipath fading case 3

8.9.2.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd).

8.9.2.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble in section 8.8.2 of this specification. No additional conformance test is needed.

8.9.3 Demodulation of CPCH message in static propagation conditions

8.9.3.1 Definition and applicability

The performance requirement of CPCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.

8.9.3.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.24.

Table 8.24: Performance requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.1 dB	5.0 dB
360 bits, TTI = 20 ms	3.9 dB	4.8 dB

The reference for this requirement is TS 25.104 subclause 8.8.2.

8.9.3.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.9.3.4 Method of test

Annex B functional setups for DCH shall also be used for CPCH tests.

8.9.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B for DCH.

8.9.3.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL CPCH reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.25 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\text{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0 \text{ [dBm]}.$$

4) The test signal generator sends an access preamble followed by a collision detection preamble then followed by the actual CPCH message. This pattern is repeated (see figure 8.6). The receiver tries to detect the AP and CD preambles and the CPCH message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

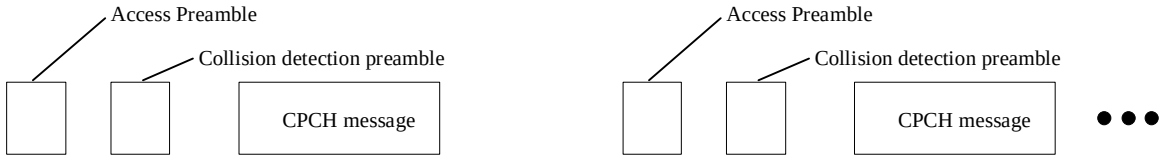

Figure 8.6: CPCH test signal pattern

8.9.3.5 Test requirements

The BLER measured according the subclause 8.9.3.4.2 shall not exceed the limits specified in table 8.25.

Table 8.25: Test requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.5 dB	5.4 dB
360 bits, TTI = 20 ms	4.3 dB	5.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.9.4 Demodulation of CPCH message in multipath fading case 3

8.9.4.1 Definition and applicability

The performance requirement of CPCH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.

8.9.4.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.26.

Table 8.26: Performance requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	7.5 dB	8.5 dB
360 bits, TTI = 20 ms	7.3 dB	8.1 dB

The reference for this requirement is TS 25.104 subclause 8.8.2.

8.9.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading case 3 propagation conditions with a BLER not exceeding a specified limit.

8.9.4.4 Method of test

Annex B functional setups for DCH shall also be used for CPCH tests.

8.9.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B for DCH.

8.9.4.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL CPCH reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.27 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\text{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0\ [\text{dBm}].$$

4) The test signal generator sends an access preamble followed by a collision detection preamble then followed by the actual CPCH message. This pattern is repeated (see figure 8.7). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

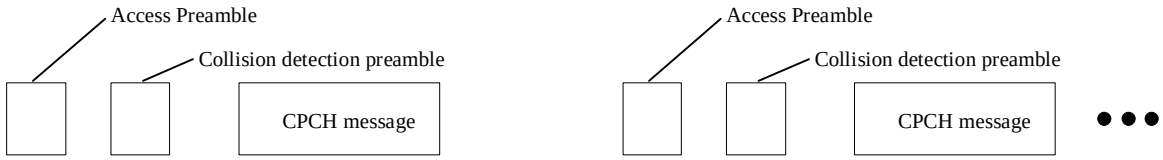

Figure 8.7: CPCH test signal pattern

8.9.4.5 Test requirements

The BLER measured according to subclause 8.9.4.4.2 shall not exceed the limits specified in table 8.27

Table 8.27: Test requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	8.1 dB	9.1 dB
360 bits, TTI = 20 ms	7.9 dB	8.7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.10 Site Selection Diversity Transmission (SSDT) Mode

8.10.1 Definition and applicability

Site Selection Diversity Transmission (SSDT) mode is an optional feature of BS and is a macro diversity method in soft handover mode. In SSDT mode, the UE selects one of the cells from its active set to be "primary", all other active cells are classed as "non-primary". The non-primary cells switch off the DCH transmission. The primary cell ID code is delivered to active cells using uplink FBI field of DPCCH.

The requirements and this test apply only to Base Station, which has a function of SSDT mode.

8.10.2 Minimum requirements

According to the conditions specified in Table 8.28, the downlink DPDCH and DPCCH are properly transmitted or stopped.

Table 8.28: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set for radio link under test	dB	-3			
Target SIR, $SIR_{target,}$ set for radio link under test	dB	3			
Uplink SIR	dB	SIR_{target} + Q_{th} +7.5	SIR_{target} + Q_{th} +7.5	SIR_{target} + Q_{th} -7.5	SIR_{target} + Q_{th} -7.5
Cell ID transmitted by UE	-	A	B	A	B
Transmission of downlink DPCCH	-	Yes	Yes	Yes	Yes
Transmission of downlink DPDCH	-	Yes	No	Yes	Yes

The reference for this requirement is in TS 25.104 clause 8.9.

8.10.3 Test purpose

To verify that downlink transmission reaction of BS to Layer 1 feedback signalling messages from UE.

8.10.4 Method of test

8.10.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect BS tester generating the wanted signal and an AWGN generator to the BS antenna connector as shown in Figure B. 13.

2) Disable inner loop power control.

3) Activate SSDT function using parameters specified in Table .8.28.

8.10.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured as a UL reference measurement channel for 12.2kbps defined in annex A.

3) Adjust the level of the wanted signal so that required Uplink SIR specified in table 8.29 is achieved. The wanted signal level at the BS input should be adjusted to: $-84-10*\text{Log}_{10}(SF)+10*\text{Log}_{10}$(Uplink SIR to set) [dBm], where SF = 256.

4) Check downlink DCH, properly transmitted on or off, according to Table 8.29 under conditions of Test1 through Test4 with 3 types of Cell ID sets, “long”, ”medium” and “short”, respectively.

8.10.5 Test Requirements

According to the conditions specified in Table 8.29, the downlink DPDCH and DPCCH are properly transmitted or stopped.

Table 8.29: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, Q_{th}, set for radio link under test	dB	-3			
Target SIR, SIR_{target}, set in BS	dB	3			
Uplink SIR	dB	$SIR_{target} + Q_{th} + 7.9$	$SIR_{target} + Q_{th} + 7.9$	$SIR_{target} + Q_{th} - 7.9$	$SIR_{target} + Q_{th} - 7.9$
Cell ID transmitted by UE	-	A	B	A	B
Transmission of downlink DPCCH	-	Yes	Yes	Yes	Yes
Transmission of downlink DPDCH	-	Yes	No	Yes	Yes

8.11 Performance of signaling detection for HS-DPCCH

The performance requirement of HS-DPCCH signaling detection is determined by the two parameters: the probability of false detection of ACK; P(DTX->ACK) and the probability of mis-detection of ACK; P(ACK->DTX or NACK).

8.11.1 ACK false alarm in static propagation conditions

8.11.1.1 Definition and applicability

ACK false alarm is defined as a conditional probability of erroneous detection of ACK when input is only DPCCH and DPDCH (+interference). The performance requirement of ACK false alarm in static propagation conditions is determined by the maximum error ratio allowed when the receiver input signal is at a specified E_c/N_0 limit. ACK false alarm: P(DTX->ACK) shall be 10^{-2} or less.

8.11.1.2 Minimum requirement

ACK false alarm, P(DTX->ACK) should not exceed the limits for the E_c/N_0 specified in Table 8.30.

Table 8.30: Performance requirements for ACK false alarm in AWGN channel

Received E_c/N_0	Required error ratio
-19.9 dB	< 10^{-2}

The reference for this requirement is TS 25.104 subclause 8.10.1.

8.11.1.3 Test purpose

The test shall verify the receiver's ability to detect HS-DPCCH signaling (ACK/NACK) under static propagation conditions.

8.11.1.4 Method of test

8.11.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.11.1.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_c/N_0 specified in table 8.31 is achieved. To achieve the specified E_c/N_0, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

4) The test signal generator sends only DPCCH and DPDCH and the receiver tries to detect HS-DPCCH signaling. This pattern is repeated. ACK false detection should be made only on those slots ACK/NACK should be observed.

8.11.1.5 Test requirements

ACK false alarm, P(DTX->ACK) should not exceed the limits for the E_c/N_0 specified in Table 8.31.

Table 8.31: Performance requirements for ACK false alarm in AWGN channel

Received E_c/N_0	Required error ratio
-19.5 dB	< 10^{-2}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.11.2 ACK false alarm in multipath fading conditions

8.11.2.1 Definition and applicability

ACK false alarm is defined as a conditional probability of erroneous detection of ACK when input is only DPCCH and DPDCH (+interference). The performance requirement of ACK false alarm in multipath fading conditions is determined by the maximum error ratio allowed when the receiver input signal is at a specified E_c/N_0 limit. ACK false alarm: P(DTX->ACK) shall be 10^{-2} or less.

8.11.2.2 Minimum requirement

ACK false alarm, P(DTX->ACK) should not exceed the limits for the E_c/N_0 specified in Table 8.32.

Table 8.32: Performance requirements for ACK false alarm in fading channels

Propagation conditions	Received E_c/N_0	Required error ratio
Case 1	-13.1 dB	< 10^{-2}
Case 2	-16.0 dB	< 10^{-2}
Case 3	-17.8 dB	< 10^{-2}

The reference for this requirement is TS 25.104 subclause 8.10.1.

8.11.2.3 Test purpose

The test shall verify the receiver's ability to detect HS-DPCCH signaling (ACK/NACK) under multipath fading case 3 propagation conditions.

8.11.2.4 Method of test

8.11.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.11.2.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_c/N_0 specified in table 8.33 is achieved. To achieve the specified E_c/N_0, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

5) The test signal generator sends only DPCCH and DPDCH and the receiver tries to detect HS-DPCCH signaling. This pattern is repeated. ACK false detection should be made only on those slots ACK/NACK should be observed.

8.11.2.5 Test requirements

ACK false alarm, P(DTX->ACK) should not exceed the limits for the E_c/N_0 specified in Table 8.33.

Table 8.33: Performance requirements for ACK false alarm in fading channels

Propagation conditions	Received E_c/N_0	Required error ratio
Case 1	-12.5 dB	$< 10^{-2}$
Case 2	-15.4 dB	$< 10^{-2}$
Case 3	-17.2 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.11.3 ACK mis-detection in static propagation conditions

8.11.3.1 Definition and applicability

The probability of ACK mis-detection is defined a probability of ACK mis-detected when ACK is transmitted. The performance requirement of ACK mis-detection in static propagation conditions is determined by the maximum error ratio allowed when the receiver input signal is at a specified E_c/N_0 limit.

8.11.3.2 Minimum requirement

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) should not exceed the required error ratio for the E_c/N_0 specified in Table 8.34.

Table 8.34: Performance requirements for ACK mis-detection in AWGN channel

Received E_c/N_0	Required error ratio
-17.3 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.10.2.

8.11.3.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with an error ratio not exceeding a specified limit.

8.11.3.4 Method of test

8.11.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.11.3.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_c/N_0 specified in table 8.35 is achieved. To achieve the specified E_c/N_0, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

4) The test signal generator sends the ACKs with DPCCH/DPDCH. The receiver tries to detect ACK. The error ratio is calculated for the ACKs that have been detected.

8.11.3.5 Test requirements

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) should not exceed the required error ratio for the E_c/N_0 specified in Table 8.35.

Table 8.35: Performance requirements for ACK mis-detection in AWGN channel

Received E_c/N_0	Required error ratio
-16.9 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.11.4 ACK mis-detection in multipath fading conditions

8.11.4.1 Definition and applicability

The probability of ACK mis-detection is defined a probability of ACK mis-detected when ACK is transmitted. The performance requirement of ACK mis-detection in multipath fading conditions is determined by the maximum error ratio allowed when the receiver input signal is at a specified E_c/N_0 limit.

8.11.4.2 Minimum requirement

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) should not exceed the required error ratio for the E_c/N_0 specified in Table 8.36.

Table 8.36: Performance requirements for ACK mis-detection in fading channels

Propagation conditions	Received E_c/N_0	Required error ratio
Case 1	-10.7 dB	$< 10^{-2}$
Case 2	-13.6 dB	$< 10^{-2}$
Case 3	-12.1 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.10.2.

8.11.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading propagation conditions with an error ratio not exceeding a specified limit.

8.11.4.4 Method of test

8.11.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.11.4.4.2 Procedure

~~1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.~~

1) Adjust the AWGN generator depending on the BS class under test at the BS input as following:

Wide Area: -84 dBm/3.84 MHz

Medium Range: -74 dBm/3.84 MHz

Local Area: -70 dBm/3.84 MHz

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_c/N_0 specified in table 8.37 is achieved. To achieve the specified E_c/N_0, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB]

5) The test signal generator sends the ACKs with DPCCH/DPDCH. The receiver tries to detect ACK. The error ratio is calculated for the ACKs that have been detected.

8.11.4.5 Test requirements

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) should not exceed the required error ratio for the E_c/N_0 specified in Table 8.37.

Table 8.37: Performance requirements for ACK mis-detection in fading channels

Propagation conditions	Received E_c/N_0	Required error ratio
Case 1	-10.1 dB	$< 10^{-2}$
Case 2	-13.0 dB	$< 10^{-2}$
Case 3	-11.5 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040343**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.141** **CR** **347** ⌘ **rev** **1** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Introduction of DCH/RACH/CPCH performance test requirement for BS without Rx diversity
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**B**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The UTRA-FDD BS DCH demodulation performance requirements without Rx diversity have been introduced in the core spec TS25.104 and TS25.141, but the DCH demodulation performance test requirement in the birth/death propagation profile and RACH/CPCH performance test requirements for BS without Rx diversity are still not yet introduced. Isolated Impact : This is an addition of performances test requirements for BS without Rx diversity, it gives the test requirements for FDD BS without Rx diversity, but will not impact on BS receiver with dual antenna Rx diversity.
Summary of change:	⌘	Addition of DCH/RACH/CPCH demodulation performance test requirements for UTRAN-FDD BS without UL Rx diversity by using the Ran_4 agreed test tolerances : • DCH demodulation performance test requirement in Birth/Death propagation profile • RCH/CPCH preamble detection & message reception demodulation performance test requirements in static and case 3 profiles • Correction of errors
Consequences if not approved:	⌘	There will not be any RACH/CPCH performance test requirements for Base Station which is not equipped with a dual receiver antenna diversity.

Clauses affected:	⌘	8 (8.1 ~ 8.9)

Y **N**

Other specs affected:	⌘	X		Other core specifications	⌘	TS25.104
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

8 Performance requirement

8.1 General

All Bit Error Ratio (BER) and Block Error ratio (BLER) measurements shall be carried out according to the general rules for statistical testing defined in ITU-T Recommendation O.153 [5] and Annex C.

If external BLER measurement is not used then the internal BLER calculation shall be used instead. When internal BLER calculation is used, the requirements of the verification test according to 8.6 shall be met in advance.

Performance requirements are specified for a number of test environments and multi-path channel classes.

The requirements only apply to those measurement channels that are supported by the base station.

For BS with dual receiver antenna diversity, only the BS performance requirements with Rx diversity are to be tested, the required E_b/N_0 shall be applied separately at each antenna port.

For BS without receiver antenna diversity, only the BS performance requirements without Rx diversity are to be tested, the required E_b/N_0 shall be applied at the BS Rx antenna port.

In tests performed with signal generators a synchronization signal may be provided, from the base station to the signal generator, to enable correct timing of the wanted signal.

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

8.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.2.1.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.1.

Table 8.1: Performance requirements in AWGN channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.1 dB	8.3 dB	$< 10^{-2}$
64 kbps	1.5 dB	4.7 dB	$< 10^{-1}$
	1.7 dB	4.8 dB	$< 10^{-2}$
144 kbps	0.8 dB	3.8 dB	$< 10^{-1}$
	0.9 dB	4.0 dB	$< 10^{-2}$
384 kbps	0.9 dB	4.0 dB	$< 10^{-1}$
	1.0 dB	4.1 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.2.1.1.

8.2.1.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.2.1.4 Method of test

8.2.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.2.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.2 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB].

4) For each of the data rates in table 8.2 applicable for the base station, measure the BLER.

8.2.1.5 Test requirements

The BLER measured according to subclause 8.2.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.2.

Table 8.2: Test requirements in AWGN channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.5 dB	8.7 dB	$< 10^{-2}$
64 kbps	1.9 dB	5.1 dB	$< 10^{-1}$
	2.1 dB	5.2 dB	$< 10^{-2}$
144 kbps	1.2 dB	4.2 dB	$< 10^{-1}$
	1.3 dB	4.4 dB	$< 10^{-2}$
384 kbps	1.3 dB	4.4 dB	$< 10^{-1}$
	1.4 dB	4.5 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

8.3.1.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.1.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.~~14.0 dB~~	$< 10^{-1}$
	11.9 dB	19.1 dB	$< 10^{-2}$
64 kbps	6.2 dB	11.6 dB	$< 10^{-1}$
	9.2 dB	15.9 dB	$< 10^{-2}$
144 kbps	5.4 dB	10.8 dB	$< 10^{-1}$
	8.4 dB	15.0 dB	$< 10^{-2}$
384 kbps	5.8 dB	11.2 dB	$< 10^{-1}$
	8.8 dB	15.5 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.3.1.1

8.3.1.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal under slow multipath fading propagation conditions with a BLER not exceeding a specified limit.

8.3.1.4 Method of test

8.3.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.4 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.4 applicable for the base station, measure the BLER.

8.3.1.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.4.

Table 8.4: Test requirements in multipath Case 1 channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.~~14.6 dB~~	$< 10^{-1}$
	12.5 dB	19.7 dB	$< 10^{-2}$
64 kbps	6.8 dB	12.2 dB	$< 10^{-1}$
	9.8 dB	16.5 dB	$< 10^{-2}$
144 kbps	6.0 dB	11.4 dB	$< 10^{-1}$
	9.0 dB	15.6 dB	$< 10^{-2}$
384 kbps	6.4 dB	11.8 dB	$< 10^{-1}$
	9.4 dB	16.1 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.2 Multipath fading Case 2

8.3.2.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.2.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.5.

Table 8.5: Performance requirements in multipath Case 2 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~11.0 dB~~	$< 10^{-1}$
	9.0 dB	15.0 dB	$< 10^{-2}$
64 kbps	4.3 dB	9.2 dB	$< 10^{-1}$
	6.4 dB	12.3 dB	$< 10^{-2}$
144 kbps	3.7 dB	8.2 dB	$< 10^{-1}$
	5.6 dB	11.5 dB	$< 10^{-2}$
384 kbps	4.1 dB	8.7 dB	$< 10^{-1}$
	6.1 dB	12.1 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.3.2.1.

8.3.2.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal that has a large time dispersion with a BLER not exceeding a specified limit.

8.3.2.4 Method of test

8.3.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.2.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.6 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.6 applicable for the base station, measure the BLER.

8.3.2.5 Test requirements

The BLER measured according to subclause 8.3.2.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.5.

Table 8.6: Test requirements in multipath Case 2 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~11.6 dB~~	$< 10^{-1}$
	9.6 dB	15.6 dB	$< 10^{-2}$
64 kbps	4.9 dB	9.8 dB	$< 10^{-1}$
	7.0 dB	12.9 dB	$< 10^{-2}$
144 kbps	4.3 dB	8.8 dB	$< 10^{-1}$
	6.2 dB	12.1 dB	$< 10^{-2}$
384 kbps	4.7 dB	9.3 dB	$< 10^{-1}$
	6.7 dB	12.7dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.3 Multipath fading Case 3

8.3.3.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.3.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.7.

Table 8.7: Performance requirements in multipath Case 3 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~9.1 dB~~	$< 10^{-1}$
	7.2 dB	10.8 dB	$< 10^{-2}$
	8.0 dB	11.7 dB	$< 10^{-3}$
64 kbps	3.4 dB	7.1 dB	$< 10^{-1}$
	3.8 dB	7.7 dB	$< 10^{-2}$
	4.1 dB	8.5 dB	$< 10^{-3}$
144 kbps	2.8 dB	6.0 dB	$< 10^{-1}$
	3.2 dB	6.7 dB	$< 10^{-2}$
	3.6 dB	7.2 dB	$< 10^{-3}$
384 kbps	3.2 dB	6.5 dB	$< 10^{-1}$
	3.6 dB	7.2 dB	$< 10^{-2}$
	4.2 dB	7.9 dB	$< 10^{-3}$

The reference for this requirement is TS 25.104 subclause 8.3.3.1.

8.3.3.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.3.4 Method of test

8.3.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.8 applicable for the base station, measure the BLER

8.3.3.5 Test requirements

The BLER measured according to subclause 8.3.3.4.2 shall not exceed the BLER limits for E_b/N_0 levels specified in table 8.7.

Table 8.8: Test requirements in multipath Case 3 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~9.7 dB~~	$< 10^{-1}$
	7.8 dB	11.4 dB	$< 10^{-2}$
	8.6 dB	12.3 dB	$< 10^{-3}$
64 kbps	4.0 dB	7.7 dB	$< 10^{-1}$
	4.4 dB	8.3 dB	$< 10^{-2}$
	4.7 dB	9.1 dB	$< 10^{-3}$
144 kbps	3.4 dB	6.6 dB	$< 10^{-1}$
	3.8 dB	7.3 dB	$< 10^{-2}$
	4.2 dB	7.8 dB	$< 10^{-3}$
384 kbps	3.8 dB	7.1 dB	$< 10^{-1}$
	4.2 dB	7.8 dB	$< 10^{-2}$
	4.8 dB	8.5 dB	$< 10^{-3}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.4 Multipath fading Case 4

8.3.4.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 4 for Wide Area BS is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply Wide Area BS only.

8.3.4.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.8A.

Table 8.8A: Performance requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~12.1 dB~~	$< 10^{-1}$
	10.2 dB	13.8 dB	< 10-2
	11.0 dB	14.7 dB	< 10-3
64 kbps	6.4 dB	10.1 dB	< 10-1
	6.8 dB	10.7 dB	< 10-2
	7.1 dB	11.5 dB	< 10-3
144 kbps	5.8 dB	9.0 dB	< 10-1
	6.2 dB	9.7 dB	< 10-2
	6.6 dB	10.2 dB	< 10-3
384 kbps	6.2 dB	9.5 dB	< 10-1
	6.6 dB	10.2 dB	< 10-2
	7.2 dB	10.9 dB	< 10-3

The reference for this requirement is TS 25.104 subclause 8.3.4.1.

8.3.4.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.4.4 Method of test

8.3.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8B is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.8B applicable for the base station, measure the BLER.

8.3.4.5 Test requirements

The BLER measured according to subclause 8.3.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.8B.

Table 8.8B: Test requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.~~12.7 dB~~	< 10^{-1}
	10.8 dB	14.4 dB	< 10-2
	11.6 dB	15.3 dB	< 10-3
64 kbps	7.0 dB	10.7 dB	< 10-1
	7.4 dB	11.3 dB	< 10-2
	7.7 dB	12.1 dB	< 10-3
144 kbps	6.4 dB	9.6 dB	< 10-1
	6.8 dB	10.3 dB	< 10-2
	7.2 dB	10.8 dB	< 10-3
384 kbps	6.8 dB	10.1 dB	< 10-1
	7.2 dB	10.8 dB	< 10-2
	7.8 dB	11.5 dB	< 10-3

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.4 Demodulation of DCH in moving propagation conditions

8.4.1 Definition and applicability

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.4.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.9.

Table 8.9: Performance requirements in moving channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.7 dB	8.7 dB	$< 10^{-2}$
64 kbps	2.1 dB	5.3 dB	$< 10^{-1}$
	2.2 dB	5.5 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.4.1.

8.4.3 Test purpose

The test shall verify the receiver's ability to receive and track the test signal with a BLER not exceeding the specified limit.

8.4.4 Method of test

8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.10 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.10 applicable for the base station, measure the BLER.

8.4.5 Test requirements

The BLER measured according to subclause 8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.10.

Table 8.10: Test requirements in moving channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	6.3 dB	9.3 dB	$< 10^{-2}$
64 kbps	2.7 dB	5.9 dB	$< 10^{-1}$
	2.8 dB	6.1 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.5 Demodulation of DCH in birth/death propagation conditions

8.5.1 Definition and applicability

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.5.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.11.

Table 8.11: Performance requirements in birth/death channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	7.7 dB	10.8 dB	$< 10^{-2}$
64 kbps	4.1 dB	7.4 dB	$< 10^{-1}$
	4.2 dB	7.5 dB	$< 10^{-2}$

~~Measurement channel data rate (R_b)~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~7.7 dB~~
~~64 kbps~~	~~4.1 dB~~	~~4.2 dB~~

The reference for this requirement is TS 25.104 subclause 8.5.1.

8.5.3 Test purpose

The test shall verify the receiver's ability to receive the test signal to find new multi path components with a BLER not exceeding the specified limit.

8.5.4 Method of test

8.5.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity , ~~C~~connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.5.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.12 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.12 applicable for the base station, measure the BLER.

8.5.5 Test requirements

The BLER measured according to subclause 8.5.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.12.

Table 8.12: Test requirements in birth/death channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	8.3 dB	11.4 dB	$< 10^{-2}$
64 kbps	4.7 dB	8.0 dB	$< 10^{-1}$
	4.8 dB	8.1 dB	$< 10^{-2}$

~~Measurement channel data rate (R_b)~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~8.3 dB~~
~~64 kbps~~	~~4.7 dB~~	~~4.8 dB~~

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.6 Verification of the internal BLER calculation

8.6.1 Definition and applicability

Base Station System with internal BLER calculates block error rate from the CRC blocks of the received. This test is performed only if Base Station System has this kind of feature. All data rates which are used in clause 8 Performance requirement testing shall be used in verification testing. This test is performed by feeding measurement signal with known BLER to the input of the receiver. Locations of the erroneous blocks shall be randomly distributed within a frame. Erroneous blocks shall be inserted into the UL signal as shown in figure 8.1.

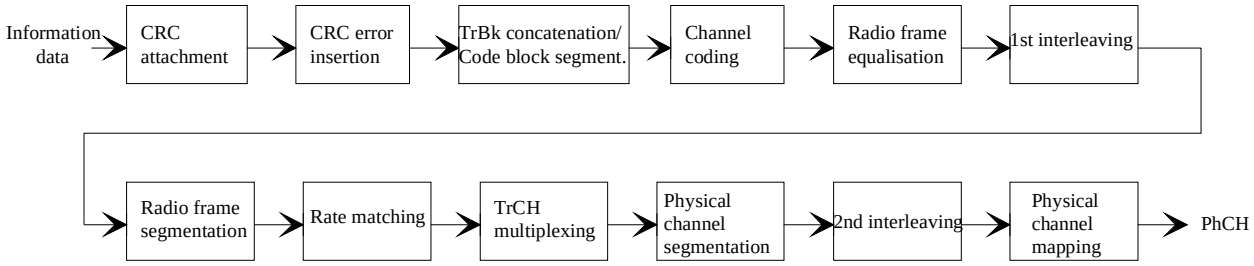

Figure 8.1: BLER insertion to the output data

8.6.2 Minimum requirement

BLER indicated by the Base Station System shall be within ±10% of the BLER generated by the RF signal source. Measurement shall be repeated for each data rate as specified in table 8.13.

Table 8.13

Transport channel combination	Data rate	BLER
DPCH	12,2 kbps	0.01
DPCH	64 kbps	0.01
DPCH	144 kbps	0.01
DPCH	384 kbps	0.01

8.6.3 Test purpose

To verify that the internal BLER calculation accuracy shall met requirements for conformance testing.

8.6.4 Method of test

8.6.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal to the BS antenna connector as shown in annex B.

3) Set correct signal source parameters as specified in table 8.14.

Table 8.14: UL Signal levels for different data rates

Data rate	Signal level	Unit
12,2 kbps	-111	dBm/3.84 MHz
64 kbps	-107	dBm/3.84 MHz
144 kbps	-104	dBm/3.84 MHz
384 kbps	-100	dBm/3.84 MHz

Note: PN9 can be used as data sequence for the test

8.6.4.2 Procedure

1) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

2) The BLER insertion to the wanted signal shall be configured according to the corresponding data rate in table 8.13.

3) Adjust the BS tester so that the required UL signal level specified in table 8.14 is achieved.

For each of the data rates in table 8.13 applicable for the base station, measure the BLER at least over 50 000 blocks.

8.6.5 Test requirement

BLER indicated by the Base Station System shall be within requirement as specified in subclause 8.6.2.

8.7 void

8.8 RACH performance

8.8.1 RACH preamble detection in static propagation conditions

8.8.1.1 Definition and applicability

The performance requirement of RACH for preamble detection in static propagation conditions is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The performance is measured by the required E_c/N_0 at probability of detection, Pd of 0.99 and 0.999. Pfa is defined as a conditional probability of erroneous detection of the preamble when input is only noise (+interference). Pd is defined as conditional probability of detection of the preamble when the signal is present. Pfa shall be 10^{-3} or less. Only one signature is used and it is known by the receiver.

8.8.1.2 Minimum requirement

The P_d shall be above or equal to the limits for the E_c/N_0 specified in table 8.16.

Table 8.16: Preamble detection requirements in AWGN channel

	E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
BS with Rx Diversity	-20.5 dB	-20.1 dB
BS without Rx Diversity	-17.6 dB	-16.8 dB

~~E_c/N_0 for required Pd ≥ 0.99~~	~~E_c/N_0 for required Pd ≥ 0.999~~
~~-20.5 dB~~	~~-20.1 dB~~

The reference for this requirement is TS 25.104 subclause 8.7.1.

8.8.1.3 Test purpose

The test shall verify the receiver's ability to detect RACH preambles under static propagation conditions.

8.8.1.4 Method of test

8.8.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, c~~C~~onnect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.8.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_c/N_0 specified in table 8.17 is achieved. To achieve the specified E_c/N_O, the ratio of the wanted signal level (of the preamble part) relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

4) The test signal generator sends a preamble and the receiver tries to detect the preamble. This pattern is repeated. Preamble detection should be made only on those access slots a preamble has been sent in.

Figure 8.2: RACH test signal pattern

8.8.1.5 Test requirements

The P_d shall be above or equal to the Pd limits for the E_c/N_0 levels specified in table 8.17.

Table 8.17: Preamble detection test requirements in AWGN channel

	E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
BS with Rx Diversity	-20.1 dB	-19.7 dB
BS without Rx Diversity	-17.2 dB	-16.4 dB

~~E_c/N_0 for required Pd ≥ 0.99~~	~~E_c/N_0 for required Pd ≥ 0.999~~
~~-20.1 dB~~	~~-19.7 dB~~

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.2 RACH preamble detection in multipath fading case 3

8.8.2.1 Definition and applicability

The performance requirement of RACH for preamble detection in in multipath fading case 3 is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The performance is measured by the required E_c/N_0 at probability of detection, Pd of 0.99 and 0.999. Pfa is defined as a conditional probability of erroneous detection of the preamble when input is only noise (+interference). Pd is defined as conditional probability of detection of the preamble when the signal is present. Pfa shall be 10^{-3} or less. Only one signature is used and it is known by the receiver.

8.8.2.2 Minimum requirement

The P_d shall be above or equal to the limits for the E_c/N_0 specified in table 8.18.

Table 8.18: Preamble detection requirements in fading case 3 channel

	E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
BS with Rx Diversity	-15.5 dB	-13.4 dB
BS without Rx Diversity	-9.4 dB	-6.4 dB

~~E_c/N_0 for required Pd ≥ 0.99~~	~~E_c/N_0 for required Pd ≥ 0.999~~
~~-15.5 dB~~	~~-13.4 dB~~

The reference for this requirement is TS 25.104 subclause 8.7.1.

8.8.2.3 Test purpose

The test shall verify the receiver's ability to detect RACH preambles under multipath fading case 3 propagation conditions.

8.8.2.4 Method of test

8.8.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, ~~C~~connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.8.2.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_c/N_0 specified in table 8.19 is achieved. To achieve the specified E_c/N_O, the ratio of the wanted signal level (of the preamble part) relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

5) The test signal generator sends a preamble and the receiver tries to detect the preamble. This pattern is repeated. Preamble detection should be made only on those access slots a preamble has been sent in.

Figure 8.3: RACH test signal pattern

8.8.2.5 Test requirements

The P_d shall be above or equal to the Pd limits for the E_c/N_0 levels specified in table 8.19.

Table 8.19: Preamble detection test requirements in fading case 3 channel

	E_c/N_0 for required Pd ≥ 0.99	**E_c/N_0 for required Pd ≥ 0.999**
BS with Rx Diversity	-14.9 dB	-12.8 dB
BS without Rx Diversity	-8.8 dB	-5.8 dB

~~**E_c/N_0 for required Pd ≥ 0.99**~~	~~**E_c/N_0 for required Pd ≥ 0.999**~~
~~-14.9 dB~~	~~-12.8 dB~~

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.3 Demodulation of RACH message in static propagation conditions

8.8.3.1 Definition and applicability

The performance requirement of RACH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The preamble threshold factor is chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2. Only one signature is used and it is known by the receiver.

8.8.3.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.20.

Table 8.20: Performance requirements in AWGN channel

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
BS with Rx Diversity	4.1 dB	5.0 dB	3.9 dB	4.8 dB
BS without Rx Diversity	7.2 dB	8.1 dB	6.9 dB	7.8 dB

~~| Transport Block size TB and TTI in frames | E_b/N_0 for required BLER < 10^{-1} | E_b/N_0 for required BLER < 10^{-2} |~~
~~| 168 bits, TTI = 20 ms | 4.1 dB | 5.0 dB |~~
~~| 360 bits, TTI = 20 ms | 3.9 dB | 4.8 dB |~~

The reference for this requirement is TS 25.104 subclause 8.7.2.

8.8.3.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.8.3.4 Method of test

8.8.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2

1) For BS with Rx diversity, ~~C~~connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.8.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.21 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$10*Log10(TB/(TTI*3.84*10^6))+E_b/N_0$ [dB].

4) The test signal generator sends a preamble followed by the actual RACH message. This pattern is repeated (see figure 8.4). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

Figure 8.4: RACH test signal pattern

8.8.3.5 Test requirements

The BLER measured according the subclause 8.8.3.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.21.

Table 8.21: Test requirements in AWGN channel

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	**E_b/N_0 for required BLER < 10^{-2}**	**E_b/N_0 for required BLER < 10^{-1}**	**E_b/N_0 for required BLER < 10^{-2}**
BS with Rx Diversity	4.5 dB	5.4 dB	4.3 dB	5.2 dB
BS without Rx Diversity	7.6 dB	8.5 dB	7.3 dB	8.2 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~4.5 dB~~	~~5.4 dB~~
~~360 bits, TTI = 20 ms~~	~~4.3 dB~~	~~5.2 dB~~

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.4 Demodulation of RACH message in multipath fading case 3

8.8.4.1 Definition and applicability

The performance requirement of RACH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The preamble threshold factor is chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2. Only one signature is used and it is known by the receiver.

8.8.4.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.22.

Table 8.22: Performance requirements in fading case 3 channel

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
BS with Rx Diversity	7.4 dB	8.5 dB	7.3 dB	8.3 dB
BS without Rx Diversity	11.1 dB	12.4 dB	11.0 dB	12.1 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~7.4 dB~~	~~8.5 dB~~
~~360 bits, TTI = 20 ms~~	~~7.3 dB~~	~~8.3 dB~~

The reference for this requirement is TS 25.104 subclause 8.7.2.

8.8.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading case 3 propagation conditions with a BLER not exceeding a specified limit.

8.8.4.4 Method of test

8.8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2

1) For BS with Rx diversity, ~~C~~connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.8.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.23 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\mathrm{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0\ [\mathrm{dB}]$$

5) The test signal generator sends a preamble followed by the actual RACH message. This pattern is repeated (see figure 8.5). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

Figure 8.5: RACH test signal pattern

8.8.4.5 Test requirements

The BLER measured according to subclause 8.8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.23.

Table 8.23: Test requirements in fading case 3 channel

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	**E_b/N_0 for required BLER < 10^{-2}**	**E_b/N_0 for required BLER < 10^{-1}**	**E_b/N_0 for required BLER < 10^{-2}**
BS with Rx Diversity	8.0 dB	9.1 dB	7.9 dB	8.9 dB
BS without Rx Diversity	11.7 dB	13.0 dB	11.6 dB	12.7 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~8.0 dB~~	~~9.1 dB~~
~~360 bits, TTI = 20 ms~~	~~7.9 dB~~	~~8.9 dB~~

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.9 CPCH Performance

8.9.1 CPCH access preamble and collision detection preamble detection in static propagation conditions

8.9.1.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd).

8.9.1.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble in section 8.8.1 of this specification. No additional conformance test is needed.

8.9.2 CPCH access preamble and collision detection preamble detection in multipath fading case 3

8.9.2.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd).

8.9.2.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble in section 8.8.2 of this specification. No additional conformance test is needed.

8.9.3 Demodulation of CPCH message in static propagation conditions

8.9.3.1 Definition and applicability

The performance requirement of CPCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.

8.9.3.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.24.

Table 8.24: Performance requirements in AWGN channel

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
BS with Rx Diversity	4.1 dB	5.0 dB	3.9 dB	4.8 dB
BS without Rx Diversity	7.1 dB	8.0 dB	6.9 dB	7.8 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~4.1 dB~~	~~5.0 dB~~
~~360 bits, TTI = 20 ms~~	~~3.9 dB~~	~~4.8 dB~~

The reference for this requirement is TS 25.104 subclause 8.8.2.

8.9.3.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.9.3.4 Method of test

Annex B functional setups for DCH shall also be used for CPCH tests.

8.9.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2

1) For BS with Rx diversity, ~~C~~connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B ~~for DCH~~.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.9.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL CPCH reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.25 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\text{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0 \text{ [dBm]}.$$

4) The test signal generator sends an access preamble followed by a collision detection preamble then followed by the actual CPCH message. This pattern is repeated (see figure 8.6). The receiver tries to detect the AP and CD preambles and the CPCH message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

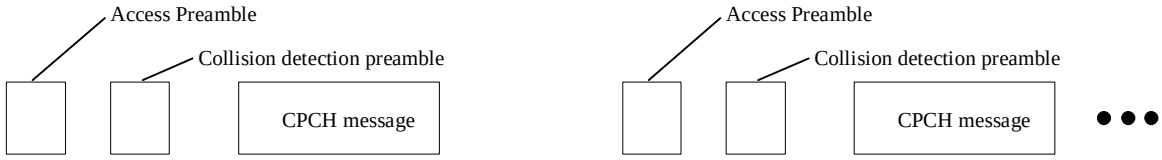

Figure 8.6: CPCH test signal pattern

8.9.3.5 Test requirements

The BLER measured according the subclause 8.9.3.4.2 shall not exceed the limits specified in table 8.25.

Table 8.25: Test requirements in AWGN channel

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	**E_b/N_0 for required BLER < 10^{-2}**	**E_b/N_0 for required BLER < 10^{-1}**	**E_b/N_0 for required BLER < 10^{-2}**

BS with Rx Diversity	4.5 dB	5.4 dB	4.3 dB	5.2 dB
BS without Rx Diversity	7.5 dB	8.4 dB	7.3 dB	8.2 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~4.5 dB~~	~~5.4 dB~~
~~360 bits, TTI = 20 ms~~	~~4.3 dB~~	~~5.2 dB~~

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.9.4 Demodulation of CPCH message in multipath fading case 3

8.9.4.1 Definition and applicability

The performance requirement of CPCH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.

8.9.4.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.26.

Table 8.26: Performance requirements in fading case 3 channel

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
BS with Rx Diversity	7.5 dB	8.5 dB	7.3 dB	8.1 dB
BS without Rx Diversity	10.8 dB	12.0 dB	10.7 dB	11.7 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~7.5 dB~~	~~8.5 dB~~
~~360 bits, TTI = 20 ms~~	~~7.3 dB~~	~~8.1 dB~~

The reference for this requirement is TS 25.104 subclause 8.8.2.

8.9.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading case 3 propagation conditions with a BLER not exceeding a specified limit.

8.9.4.4 Method of test

Annex B functional setups for DCH shall also be used for CPCH tests.

8.9.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2

1) For BS with Rx diversity, ~~C~~connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B ~~for DCH~~.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.9.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL CPCH reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.27 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\text{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0\ [\text{dBm}].$$

4) The test signal generator sends an access preamble followed by a collision detection preamble then followed by the actual CPCH message. This pattern is repeated (see figure 8.7). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

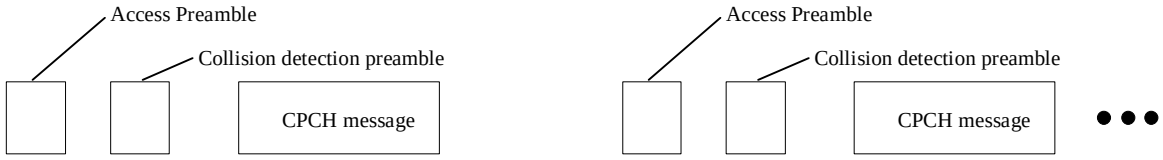

Figure 8.7: CPCH test signal pattern

8.9.4.5 Test requirements

The BLER measured according to subclause 8.9.4.4.2 shall not exceed the limits specified in table 8.27

Table 8.27: Test requirements in fading case 3 channel

Transport Block size TB and TTI in frames	168 bits, TTI = 20 ms		360 bits, TTI = 20 ms	
	E_b/N_0 for required BLER < 10^{-1}	**E_b/N_0 for required BLER < 10^{-2}**	**E_b/N_0 for required BLER < 10^{-1}**	**E_b/N_0 for required BLER < 10^{-2}**

BS with Rx Diversity	8.1 dB	9.1 dB	7.9 dB	8.7 dB
BS without Rx Diversity	11.4 dB	12.6 dB	11.3 dB	12.3 dB

~~Transport Block size TB and TTI in frames~~	~~E_b/N_0 for required BLER < 10^{-1}~~	~~E_b/N_0 for required BLER < 10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~8.1 dB~~	~~9.1 dB~~
~~360 bits, TTI = 20 ms~~	~~7.9 dB~~	~~8.7 dB~~

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040283**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.141** **CR** **349** ⌘ **rev** **1** ⌘ Current version **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Corrections on terminology
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The performance requirements in section 8 are expressed with a term "should", which infringe 3GPP specification drafting rules in TS21.801.
Summary of change:	⌘	The term “should” used in a context of “requirements” in general is replaced by “shall”.
Consequences if not approved:	⌘	Incorrect expressions remain as requirements in section 8.

Clauses affected:	⌘	8.2.1.2, 8.3.1.2, 8.3.2.2, 8.3.3.2, 8.3.4.2, 8.4.2, 8.5.2, 8.11.1.2, 8.11.1.5, 8.11.2.2, 8.11.2.5, 8.11.3.2, 8.11.3.5, 8.11.4.2, 8.11.4.5

		Y	N			
Other specs Affected:	⌘	X		Other core specifications	⌘	25.104
			X	Test specifications		
			X	O&M Specifications		

Other comments: ⌘

8 Performance requirement

8.1 General

All Bit Error Ratio (BER) and Block Error ratio (BLER) measurements shall be carried out according to the general rules for statistical testing defined in ITU-T Recommendation O.153 [5] and Annex C.

If external BLER measurement is not used then the internal BLER calculation shall be used instead. When internal BLER calculation is used, the requirements of the verification test according to 8.6 shall be met in advance.

Performance requirements are specified for a number of test environments and multi-path channel classes.

The requirements only apply to those measurement channels that are supported by the base station.

For BS with dual receiver antenna diversity, only the BS performance requirements with Rx diversity are to be tested, the required E_b/N_0 shall be applied separately at each antenna port.

For BS without receiver antenna diversity, only the BS performance requirements without Rx diversity are to be tested, the required E_b/N_0 shall be applied at the BS Rx antenna port.

In tests performed with signal generators a synchronization signal may be provided, from the base station to the signal generator, to enable correct timing of the wanted signal.

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

8.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.2.1.2 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in table 8.1.

Table 8.1: Performance requirements in AWGN channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.1 dB	8.3 dB	$< 10^{-2}$
64 kbps	1.5 dB	4.7 dB	$< 10^{-1}$
	1.7 dB	4.8 dB	$< 10^{-2}$
144 kbps	0.8 dB	3.8 dB	$< 10^{-1}$
	0.9 dB	4.0 dB	$< 10^{-2}$
384 kbps	0.9 dB	4.0 dB	$< 10^{-1}$
	1.0 dB	4.1 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.2.1.1.

8.2.1.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.2.1.4 Method of test

8.2.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.2.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.2 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB].

4) For each of the data rates in table 8.2 applicable for the base station, measure the BLER.

8.2.1.5 Test requirements

The BLER measured according to subclause 8.2.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.2.

Table 8.2: Test requirements in AWGN channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.5 dB	8.7 dB	$< 10^{-2}$
64 kbps	1.9 dB	5.1 dB	$< 10^{-1}$
	2.1 dB	5.2 dB	$< 10^{-2}$
144 kbps	1.2 dB	4.2 dB	$< 10^{-1}$
	1.3 dB	4.4 dB	$< 10^{-2}$
384 kbps	1.3 dB	4.4 dB	$< 10^{-1}$
	1.4 dB	4.5 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

8.3.1.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.1.2 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	14.0 dB	$< 10^{-1}$
	11.9 dB	19.1 dB	$< 10^{-2}$
64 kbps	6.2 dB	11.6 dB	$< 10^{-1}$
	9.2 dB	15.9 dB	$< 10^{-2}$
144 kbps	5.4 dB	10.8 dB	$< 10^{-1}$
	8.4 dB	15.0 dB	$< 10^{-2}$
384 kbps	5.8 dB	11.2 dB	$< 10^{-1}$
	8.8 dB	15.5 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.3.1.1

8.3.1.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal under slow multipath fading propagation conditions with a BLER not exceeding a specified limit.

8.3.1.4 Method of test

8.3.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.4 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.4 applicable for the base station, measure the BLER.

8.3.1.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.4.

Table 8.4: Test requirements in multipath Case 1 channel

Measurement channel	Received E_b/N_0 For BS with Rx diversity	Received E_b/N_0 For BS without Rx diversity	Required BLER
12.2 kbps	n.a.	14.6 dB	$< 10^{-1}$
	12.5 dB	19.7 dB	$< 10^{-2}$
64 kbps	6.8 dB	12.2 dB	$< 10^{-1}$
	9.8 dB	16.5 dB	$< 10^{-2}$
144 kbps	6.0 dB	11.4 dB	$< 10^{-1}$
	9.0 dB	15.6 dB	$< 10^{-2}$
384 kbps	6.4 dB	11.8 dB	$< 10^{-1}$
	9.4 dB	16.1 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.2 Multipath fading Case 2

8.3.2.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.2.2 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in table 8.5.

Table 8.5: Performance requirements in multipath Case 2 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	11.0 dB	$< 10^{-1}$
	9.0 dB	15.0 dB	$< 10^{-2}$
64 kbps	4.3 dB	9.2 dB	$< 10^{-1}$
	6.4 dB	12.3 dB	$< 10^{-2}$
144 kbps	3.7 dB	8.2 dB	$< 10^{-1}$
	5.6 dB	11.5 dB	$< 10^{-2}$
384 kbps	4.1 dB	8.7 dB	$< 10^{-1}$
	6.1 dB	12.1 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.3.2.1.

8.3.2.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal that has a large time dispersion with a BLER not exceeding a specified limit.

8.3.2.4 Method of test

8.3.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.2.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.6 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.6 applicable for the base station, measure the BLER.

8.3.2.5 Test requirements

The BLER measured according to subclause 8.3.2.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.5.

Table 8.6: Test requirements in multipath Case 2 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	11.6 dB	$< 10^{-1}$
	9.6 dB	15.6 dB	$< 10^{-2}$
64 kbps	4.9 dB	9.8 dB	$< 10^{-1}$
	7.0 dB	12.9 dB	$< 10^{-2}$
144 kbps	4.3 dB	8.8 dB	$< 10^{-1}$
	6.2 dB	12.1 dB	$< 10^{-2}$
384 kbps	4.7 dB	9.3 dB	$< 10^{-1}$
	6.7 dB	12.7dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.3 Multipath fading Case 3

8.3.3.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.3.2 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in table 8.7.

Table 8.7: Performance requirements in multipath Case 3 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	9.1 dB	$< 10^{-1}$
	7.2 dB	10.8 dB	$< 10^{-2}$
	8.0 dB	11.7 dB	$< 10^{-3}$
64 kbps	3.4 dB	7.1 dB	$< 10^{-1}$
	3.8 dB	7.7 dB	$< 10^{-2}$
	4.1 dB	8.5 dB	$< 10^{-3}$
144 kbps	2.8 dB	6.0 dB	$< 10^{-1}$
	3.2 dB	6.7 dB	$< 10^{-2}$
	3.6 dB	7.2 dB	$< 10^{-3}$
384 kbps	3.2 dB	6.5 dB	$< 10^{-1}$
	3.6 dB	7.2 dB	$< 10^{-2}$
	4.2 dB	7.9 dB	$< 10^{-3}$

The reference for this requirement is TS 25.104 subclause 8.3.3.1.

8.3.3.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.3.4 Method of test

8.3.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.8 applicable for the base station, measure the BLER

8.3.3.5 Test requirements

The BLER measured according to subclause 8.3.3.4.2 shall not exceed the BLER limits for E_b/N_0 levels specified in table 8.7.

Table 8.8: Test requirements in multipath Case 3 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	9.7 dB	$< 10^{-1}$
	7.8 dB	11.4 dB	$< 10^{-2}$
	8.6 dB	12.3 dB	$< 10^{-3}$
64 kbps	4.0 dB	7.7 dB	$< 10^{-1}$
	4.4 dB	8.3 dB	$< 10^{-2}$
	4.7 dB	9.1 dB	$< 10^{-3}$
144 kbps	3.4 dB	6.6 dB	$< 10^{-1}$
	3.8 dB	7.3 dB	$< 10^{-2}$
	4.2 dB	7.8 dB	$< 10^{-3}$
384 kbps	3.8 dB	7.1 dB	$< 10^{-1}$
	4.2 dB	7.8 dB	$< 10^{-2}$
	4.8 dB	8.5 dB	$< 10^{-3}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.3.4 Multipath fading Case 4

8.3.4.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 4 for Wide Area BS is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply Wide Area BS only.

8.3.4.2 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in table 8.8A.

Table 8.8A: Performance requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	12.1 dB	$< 10^{-1}$
	10.2 dB	13.8 dB	< 10-2
	11.0 dB	14.7 dB	< 10-3
64 kbps	6.4 dB	10.1 dB	< 10-1
	6.8 dB	10.7 dB	< 10-2
	7.1 dB	11.5 dB	< 10-3
144 kbps	5.8 dB	9.0 dB	< 10-1
	6.2 dB	9.7 dB	< 10-2
	6.6 dB	10.2 dB	< 10-3
384 kbps	6.2 dB	9.5 dB	< 10-1
	6.6 dB	10.2 dB	< 10-2
	7.2 dB	10.9 dB	< 10-3

The reference for this requirement is TS 25.104 subclause 8.3.4.1.

8.3.4.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.4.4 Method of test

8.3.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.3.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8B is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.8B applicable for the base station, measure the BLER.

8.3.4.5 Test requirements

The BLER measured according to subclause 8.3.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.8B.

Table 8.8B: Test requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	12.7 dB	$< 10^{-1}$
	10.8 dB	14.4 dB	< 10-2
	11.6 dB	15.3 dB	< 10-3
64 kbps	7.0 dB	10.7 dB	< 10-1
	7.4 dB	11.3 dB	< 10-2
	7.7 dB	12.1 dB	< 10-3
144 kbps	6.4 dB	9.6 dB	< 10-1
	6.8 dB	10.3 dB	< 10-2
	7.2 dB	10.8 dB	< 10-3
384 kbps	6.8 dB	10.1 dB	< 10-1
	7.2 dB	10.8 dB	< 10-2
	7.8 dB	11.5 dB	< 10-3

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.4 Demodulation of DCH in moving propagation conditions

8.4.1 Definition and applicability

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.4.2 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in table 8.9.

Table 8.9: Performance requirements in moving channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	5.7 dB	8.7 dB	$< 10^{-2}$
64 kbps	2.1 dB	5.3 dB	$< 10^{-1}$
	2.2 dB	5.5 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.4.1.

8.4.3 Test purpose

The test shall verify the receiver's ability to receive and track the test signal with a BLER not exceeding the specified limit.

8.4.4 Method of test

8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal, multipath fading simulator and AWGN generator to the BS antenna connector via a combining network as shown in annex B.

8.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.10 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.10 applicable for the base station, measure the BLER.

8.4.5 Test requirements

The BLER measured according to subclause 8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.10.

Table 8.10: Test requirements in moving channel

Measurement channel	Received E_b/N_0 For BS with Rx Diversity	Received E_b/N_0 For BS without Rx Diversity	Required BLER
12.2 kbps	n.a.	n.a.	$< 10^{-1}$
	6.3 dB	9.3 dB	$< 10^{-2}$
64 kbps	2.7 dB	5.9 dB	$< 10^{-1}$
	2.8 dB	6.1 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.5 Demodulation of DCH in birth/death propagation conditions

8.5.1 Definition and applicability

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.5.2 Minimum requirement

The BLER ~~should~~shall not exceed the limit for the E_b/N_0 specified in table 8.11.

Table 8.11: Performance requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER $< 10^{-1}$	E_b/N_0 for required BLER $< 10^{-2}$
12.2 kbps	n.a.	7.7 dB
64 kbps	4.1 dB	4.2 dB

The reference for this requirement is TS 25.104 subclause 8.5.1.

8.5.3 Test purpose

The test shall verify the receiver's ability to receive the test signal to find new multi path components with a BLER not exceeding the specified limit.

8.5.4 Method of test

8.5.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.5.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.12 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*Log10(R_b /3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.12 applicable for the base station, measure the BLER.

8.5.5 Test requirements

The BLER measured according to subclause 8.5.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.12.

Table 8.12: Test requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	8.3 dB
64 kbps	4.7 dB	4.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.6 Verification of the internal BLER calculation

8.6.1 Definition and applicability

Base Station System with internal BLER calculates block error rate from the CRC blocks of the received. This test is performed only if Base Station System has this kind of feature. All data rates which are used in clause 8 Performance requirement testing shall be used in verification testing. This test is performed by feeding measurement signal with known BLER to the input of the receiver. Locations of the erroneous blocks shall be randomly distributed within a frame. Erroneous blocks shall be inserted into the UL signal as shown in figure 8.1.

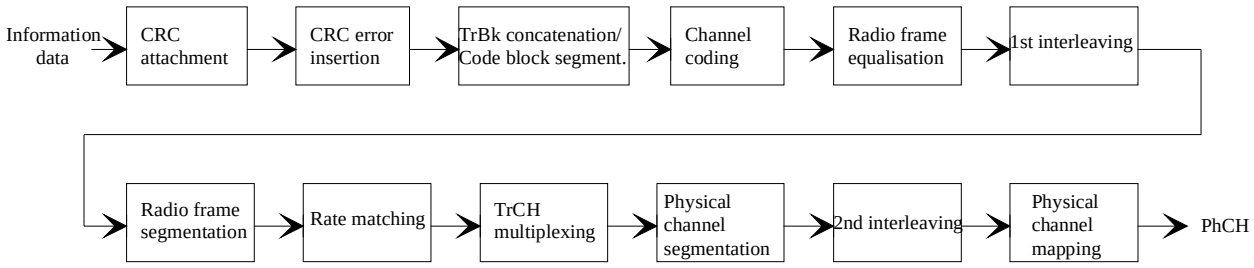

Figure 8.1: BLER insertion to the output data

8.6.2 Minimum requirement

BLER indicated by the Base Station System shall be within ±10% of the BLER generated by the RF signal source. Measurement shall be repeated for each data rate as specified in table 8.13.

Table 8.13

Transport channel combination	Data rate	BLER
DPCH	12,2 kbps	0.01
DPCH	64 kbps	0.01
DPCH	144 kbps	0.01
DPCH	384 kbps	0.01

8.6.3 Test purpose

To verify that the internal BLER calculation accuracy shall met requirements for conformance testing.

8.6.4 Method of test

8.6.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal to the BS antenna connector as shown in annex B.

3) Set correct signal source parameters as specified in table 8.14.

Table 8.14: UL Signal levels for different data rates

Data rate	Signal level	Unit
12,2 kbps	-111	dBm/3.84 MHz
64 kbps	-107	dBm/3.84 MHz
144 kbps	-104	dBm/3.84 MHz
384 kbps	-100	dBm/3.84 MHz

Note: PN9 can be used as data sequence for the test

8.6.4.2 Procedure

1) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

2) The BLER insertion to the wanted signal shall be configured according to the corresponding data rate in table 8.13.

3) Adjust the BS tester so that the required UL signal level specified in table 8.14 is achieved.

For each of the data rates in table 8.13 applicable for the base station, measure the BLER at least over 50 000 blocks.

8.6.5 Test requirement

BLER indicated by the Base Station System shall be within requirement as specified in subclause 8.6.2.

8.7 void

8.8 RACH performance

8.8.1 RACH preamble detection in static propagation conditions

8.8.1.1 Definition and applicability

The performance requirement of RACH for preamble detection in static propagation conditions is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The performance is measured by the required E_c/N_0 at probability of detection, Pd of 0.99 and 0.999. Pfa is defined as a conditional probability of erroneous detection of the preamble when input is only noise (+interference). Pd is defined as conditional probability of detection of the preamble when the signal is present. Pfa shall be 10^{-3} or less. Only one signature is used and it is known by the receiver.

8.8.1.2 Minimum requirement

The P_d shall be above or equal to the limits for the E_c/N_0 specified in table 8.16.

Table 8.16: Preamble detection requirements in AWGN channel

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-20.5 dB	-20.1 dB

The reference for this requirement is TS 25.104 subclause 8.7.1.

8.8.1.3 Test purpose

The test shall verify the receiver's ability to detect RACH preambles under static propagation conditions.

8.8.1.4 Method of test

8.8.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.8.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_c/N_0 specified in table 8.17 is achieved. To achieve the specified E_c/N_O, the ratio of the wanted signal level (of the preamble part) relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

4) The test signal generator sends a preamble and the receiver tries to detect the preamble. This pattern is repeated. Preamble detection should be made only on those access slots a preamble has been sent in.

Figure 8.2: RACH test signal pattern

8.8.1.5 Test requirements

The P_d shall be above or equal to the Pd limits for the E_c/N_0 levels specified in table 8.17.

Table 8.17: Preamble detection test requirements in AWGN channel

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-20.1 dB	-19.7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.2 RACH preamble detection in multipath fading case 3

8.8.2.1 Definition and applicability

The performance requirement of RACH for preamble detection in in multipath fading case 3 is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The performance is measured by the required E_c/N_0 at probability of detection, Pd of 0.99 and 0.999. Pfa is defined as a conditional probability of erroneous detection of the preamble when input is only noise (+interference). Pd is defined as conditional probability of detection of the preamble when the signal is present. Pfa shall be 10^{-3} or less. Only one signature is used and it is known by the receiver.

8.8.2.2 Minimum requirement

The P_d shall be above or equal to the limits for the E_c/N_0 specified in table 8.18.

Table 8.18: Preamble detection requirements in fading case 3 channel

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-15.5 dB	-13.4 dB

The reference for this requirement is TS 25.104 subclause 8.7.1.

8.8.2.3 Test purpose

The test shall verify the receiver's ability to detect RACH preambles under multipath fading case 3 propagation conditions.

8.8.2.4 Method of test

8.8.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.8.2.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_c/N_0 specified in table 8.19 is achieved. To achieve the specified E_c/N_O, the ratio of the wanted signal level (of the preamble part) relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

5) The test signal generator sends a preamble and the receiver tries to detect the preamble. This pattern is repeated. Preamble detection should be made only on those access slots a preamble has been sent in.

Figure 8.3: RACH test signal pattern

8.8.2.5 Test requirements

The P_d shall be above or equal to the Pd limits for the E_c/N_0 levels specified in table 8.19.

Table 8.19: Preamble detection test requirements in fading case 3 channel

E_c/N_0 for required Pd ≥ 0.99	E_c/N_0 for required Pd ≥ 0.999
-14.9 dB	-12.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.3 Demodulation of RACH message in static propagation conditions

8.8.3.1 Definition and applicability

The performance requirement of RACH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The preamble threshold factor is chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2. Only one signature is used and it is known by the receiver.

8.8.3.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.20.

Table 8.20: Performance requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.1 dB	5.0 dB
360 bits, TTI = 20 ms	3.9 dB	4.8 dB

The reference for this requirement is TS 25.104 subclause 8.7.2.

8.8.3.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.8.3.4 Method of test

8.8.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.8.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.21 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\text{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0\ [\text{dB}].$$

4) The test signal generator sends a preamble followed by the actual RACH message. This pattern is repeated (see figure 8.4). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

Figure 8.4: RACH test signal pattern

8.8.3.5 Test requirements

The BLER measured according the subclause 8.8.3.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.21.

Table 8.21: Test requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.5 dB	5.4 dB
360 bits, TTI = 20 ms	4.3 dB	5.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.8.4 Demodulation of RACH message in multipath fading case 3

8.8.4.1 Definition and applicability

The performance requirement of RACH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The preamble threshold factor is chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2. Only one signature is used and it is known by the receiver.

8.8.4.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.22.

Table 8.22: Performance requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	7.4 dB	8.5 dB
360 bits, TTI = 20 ms	7.3 dB	8.3 dB

The reference for this requirement is TS 25.104 subclause 8.7.2.

8.8.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading case 3 propagation conditions with a BLER not exceeding a specified limit.

8.8.4.4 Method of test

8.8.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.8.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.23 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*Log10(TB/(TTI*3.84*10^6))+E_b/N_0\ [dB]$$

5) The test signal generator sends a preamble followed by the actual RACH message. This pattern is repeated (see figure 8.5). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

Figure 8.5: RACH test signal pattern

8.8.4.5 Test requirements

The BLER measured according to subclause 8.8.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.23.

Table 8.23: Test requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	8.0 dB	9.1 dB
360 bits, TTI = 20 ms	7.9 dB	8.9 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.9 CPCH Performance

8.9.1 CPCH access preamble and collision detection preamble detection in static propagation conditions

8.9.1.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd).

8.9.1.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble in section 8.8.1 of this specification. No additional conformance test is needed.

8.9.2 CPCH access preamble and collision detection preamble detection in multipath fading case 3

8.9.2.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd).

8.9.2.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble in section 8.8.2 of this specification. No additional conformance test is needed.

8.9.3 Demodulation of CPCH message in static propagation conditions

8.9.3.1 Definition and applicability

The performance requirement of CPCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.

8.9.3.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.24.

Table 8.24: Performance requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.1 dB	5.0 dB
360 bits, TTI = 20 ms	3.9 dB	4.8 dB

The reference for this requirement is TS 25.104 subclause 8.8.2.

8.9.3.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.9.3.4 Method of test

Annex B functional setups for DCH shall also be used for CPCH tests.

8.9.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B for DCH.

8.9.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL CPCH reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.25 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\text{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0\ [\text{dBm}].$$

4) The test signal generator sends an access preamble followed by a collision detection preamble then followed by the actual CPCH message. This pattern is repeated (see figure 8.6). The receiver tries to detect the AP and CD preambles and the CPCH message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

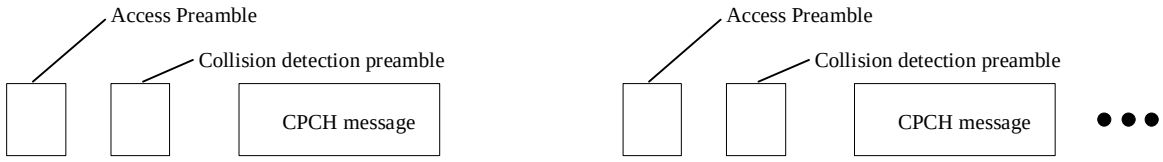

Figure 8.6: CPCH test signal pattern

8.9.3.5 Test requirements

The BLER measured according the subclause 8.9.3.4.2 shall not exceed the limits specified in table 8.25.

Table 8.25: Test requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.5 dB	5.4 dB
360 bits, TTI = 20 ms	4.3 dB	5.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.9.4 Demodulation of CPCH message in multipath fading case 3

8.9.4.1 Definition and applicability

The performance requirement of CPCH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.

8.9.4.2 Minimum requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.26.

Table 8.26: Performance requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	7.5 dB	8.5 dB
360 bits, TTI = 20 ms	7.3 dB	8.1 dB

The reference for this requirement is TS 25.104 subclause 8.8.2.

8.9.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading case 3 propagation conditions with a BLER not exceeding a specified limit.

8.9.4.4 Method of test

Annex B functional setups for DCH shall also be used for CPCH tests.

8.9.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

Preamble threshold factor: chosen to fulfil the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B for DCH.

8.9.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL CPCH reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_b/N_0 specified in table 8.27 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

$$10*\text{Log10}(TB/(TTI*3.84*10^6))+E_b/N_0 \text{ [dBm]}.$$

4) The test signal generator sends an access preamble followed by a collision detection preamble then followed by the actual CPCH message. This pattern is repeated (see figure 8.7). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

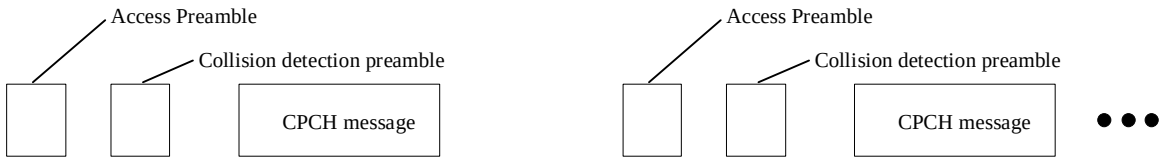

Figure 8.7: CPCH test signal pattern

8.9.4.5 Test requirements

The BLER measured according to subclause 8.9.4.4.2 shall not exceed the limits specified in table 8.27

Table 8.27: Test requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	8.1 dB	9.1 dB
360 bits, TTI = 20 ms	7.9 dB	8.7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.10 Site Selection Diversity Transmission (SSDT) Mode

8.10.1 Definition and applicability

Site Selection Diversity Transmission (SSDT) mode is an optional feature of BS and is a macro diversity method in soft handover mode. In SSDT mode, the UE selects one of the cells from its active set to be "primary", all other active cells are classed as "non-primary". The non-primary cells switch off the DCH transmission. The primary cell ID code is delivered to active cells using uplink FBI field of DPCCH.

The requirements and this test apply only to Base Station, which has a function of SSDT mode.

8.10.2 Minimum requirements

According to the conditions specified in Table 8.28, the downlink DPDCH and DPCCH are properly transmitted or stopped.

Table 8.28: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set for radio link under test	dB	-3			
Target SIR, $SIR_{target,}$ set for radio link under test	dB	3			
Uplink SIR	dB	SIR_{target} + Q_{th} +7.5	SIR_{target} + Q_{th} +7.5	SIR_{target} + Q_{th} -7.5	SIR_{target} + Q_{th} -7.5
Cell ID transmitted by UE	-	A	B	A	B
Transmission of downlink DPCCH	-	Yes	Yes	Yes	Yes
Transmission of downlink DPDCH	-	Yes	No	Yes	Yes

The reference for this requirement is in TS 25.104 clause 8.9.

8.10.3 Test purpose

To verify that downlink transmission reaction of BS to Layer 1 feedback signalling messages from UE.

8.10.4 Method of test

8.10.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect BS tester generating the wanted signal and an AWGN generator to the BS antenna connector as shown in Figure B. 13.

2) Disable inner loop power control.

3) Activate SSDT function using parameters specified in Table .8.28.

8.10.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured as a UL reference measurement channel for 12.2kbps defined in annex A.

3) Adjust the level of the wanted signal so that required Uplink SIR specified in table 8.29 is achieved. The wanted signal level at the BS input should be adjusted to: $-84-10*\text{Log}_{10}(SF)+10*\text{Log}_{10}$(Uplink SIR to set) [dBm], where SF = 256.

4) Check downlink DCH, properly transmitted on or off, according to Table 8.29 under conditions of Test1 through Test4 with 3 types of Cell ID sets, “long”, ”medium” and “short”, respectively.

8.10.5 Test Requirements

According to the conditions specified in Table 8.29, the downlink DPDCH and DPCCH are properly transmitted or stopped.

Table 8.29: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set for radio link under test	dB	-3			
Target SIR, $SIR_{target,}$ set in BS	dB	3			
Uplink SIR	dB	$SIR_{target} + Q_{th} + 7.9$	$SIR_{target} + Q_{th} + 7.9$	$SIR_{target} + Q_{th} - 7.9$	$SIR_{target} + Q_{th} - 7.9$
Cell ID transmitted by UE	-	A	B	A	B
Transmission of downlink DPCCH	-	Yes	Yes	Yes	Yes
Transmission of downlink DPDCH	-	Yes	No	Yes	Yes

8.11 Performance of signaling detection for HS-DPCCH

The performance requirement of HS-DPCCH signaling detection is determined by the two parameters: the probability of false detection of ACK; P(DTX->ACK) and the probability of mis-detection of ACK; P(ACK->DTX or NACK).

8.11.1 ACK false alarm in static propagation conditions

8.11.1.1 Definition and applicability

ACK false alarm is defined as a conditional probability of erroneous detection of ACK when input is only DPCCH and DPDCH (+interference). The performance requirement of ACK false alarm in static propagation conditions is determined by the maximum error ratio allowed when the receiver input signal is at a specified E_c/N_0 limit. ACK false alarm: P(DTX->ACK) shall be 10^{-2} or less.

8.11.1.2 Minimum requirement

ACK false alarm, P(DTX->ACK) ~~should~~shall not exceed the limits for the E_c/N_0 specified in Table 8.30.

Table 8.30: Performance requirements for ACK false alarm in AWGN channel

Received E_c/N_0	Required error ratio
-19.9 dB	< 10^{-2}

The reference for this requirement is TS 25.104 subclause 8.10.1.

8.11.1.3 Test purpose

The test shall verify the receiver's ability to detect HS-DPCCH signaling (ACK/NACK) under static propagation conditions.

8.11.1.4 Method of test

8.11.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.11.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_c/N_0 specified in table 8.31 is achieved. To achieve the specified E_c/N_0, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

4) The test signal generator sends only DPCCH and DPDCH and the receiver tries to detect HS-DPCCH signaling. This pattern is repeated. ACK false detection should be made only on those slots ACK/NACK should be observed.

8.11.1.5 Test requirements

ACK false alarm, P(DTX->ACK) ~~should~~shall not exceed the limits for the E_c/N_0 specified in Table 8.31.

Table 8.31: Performance requirements for ACK false alarm in AWGN channel

Received E_c/N_0	Required error ratio
-19.5 dB	< 10^{-2}

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.11.2 ACK false alarm in multipath fading conditions

8.11.2.1 Definition and applicability

ACK false alarm is defined as a conditional probability of erroneous detection of ACK when input is only DPCCH and DPDCH (+interference). The performance requirement of ACK false alarm in multipath fading conditions is determined by the maximum error ratio allowed when the receiver input signal is at a specified E_c/N_0 limit. ACK false alarm: P(DTX->ACK) shall be 10^{-2} or less.

8.11.2.2 Minimum requirement

ACK false alarm, P(DTX->ACK) ~~should~~shall not exceed the limits for the E_c/N_0 specified in Table 8.32.

Table 8.32: Performance requirements for ACK false alarm in fading channels

Propagation conditions	Received E_c/N_0	Required error ratio
Case 1	-13.1 dB	$< 10^{-2}$
Case 2	-16.0 dB	$< 10^{-2}$
Case 3	-17.8 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.10.1.

8.11.2.3 Test purpose

The test shall verify the receiver's ability to detect HS-DPCCH signaling (ACK/NACK) under multipath fading case 3 propagation conditions.

8.11.2.4 Method of test

8.11.2.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.11.2.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_c/N_0 specified in table 8.33 is achieved. To achieve the specified E_c/N_0, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

5) The test signal generator sends only DPCCH and DPDCH and the receiver tries to detect HS-DPCCH signaling. This pattern is repeated. ACK false detection should be made only on those slots ACK/NACK should be observed.

8.11.2.5 Test requirements

ACK false alarm, P(DTX->ACK) ~~should~~shall not exceed the limits for the E_c/N_0 specified in Table 8.33.

Table 8.33: Performance requirements for ACK false alarm in fading channels

Propagation conditions	Received E_c/N_0	Required error ratio
Case 1	-12.5 dB	$< 10^{-2}$
Case 2	-15.4 dB	$< 10^{-2}$
Case 3	-17.2 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.11.3 ACK mis-detection in static propagation conditions

8.11.3.1 Definition and applicability

The probability of ACK mis-detection is defined a probability of ACK mis-detected when ACK is transmitted. The performance requirement of ACK mis-detection in static propagation conditions is determined by the maximum error ratio allowed when the receiver input signal is at a specified E_c/N_0 limit.

8.11.3.2 Minimum requirement

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) ~~should~~shall not exceed the required error ratio for the E_c/N_0 specified in Table 8.34.

Table 8.34: Performance requirements for ACK mis-detection in AWGN channel

Received E_c/N_0	Required error ratio
-17.3 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.10.2.

8.11.3.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with an error ratio not exceeding a specified limit.

8.11.3.4 Method of test

8.11.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.11.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) Adjust the equipment so that required E_c/N_0 specified in table 8.35 is achieved. To achieve the specified E_c/N_0, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB].

4) The test signal generator sends the ACKs with DPCCH/DPDCH. The receiver tries to detect ACK. The error ratio is calculated for the ACKs that have been detected.

8.11.3.5 Test requirements

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) ~~should~~shall not exceed the required error ratio for the E_c/N_0 specified in Table 8.35.

Table 8.35: Performance requirements for ACK mis-detection in AWGN channel

Received E_c/N_0	Required error ratio
-16.9 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

8.11.4 ACK mis-detection in multipath fading conditions

8.11.4.1 Definition and applicability

The probability of ACK mis-detection is defined a probability of ACK mis-detected when ACK is transmitted. The performance requirement of ACK mis-detection in multipath fading conditions is determined by the maximum error ratio allowed when the receiver input signal is at a specified E_c/N_0 limit.

8.11.4.2 Minimum requirement

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) ~~should~~shall not exceed the required error ratio for the E_c/N_0 specified in Table 8.36.

Table 8.36: Performance requirements for ACK mis-detection in fading channels

Propagation conditions	Received E_c/N_0	Required error ratio
Case 1	-10.7 dB	$< 10^{-2}$
Case 2	-13.6 dB	$< 10^{-2}$
Case 3	-12.1 dB	$< 10^{-2}$

The reference for this requirement is TS 25.104 subclause 8.10.2.

8.11.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading propagation conditions with an error ratio not exceeding a specified limit.

8.11.4.4 Method of test

8.11.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.11.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_c/N_0 specified in table 8.37 is achieved. To achieve the specified E_c/N_0, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: E_c/N_0 [dB]

5) The test signal generator sends the ACKs with DPCCH/DPDCH. The receiver tries to detect ACK. The error ratio is calculated for the ACKs that have been detected.

8.11.4.5 Test requirements

The probability of ACK mis-detection, P(ACK->NACK or DTX) (= mis-detected when ACK is transmitted) ~~should~~shall not exceed the required error ratio for the E_c/N_0 specified in Table 8.37.

Table 8.37: Performance requirements for ACK mis-detection in fading channels

Propagation conditions	Received E_c/N_0	Required error ratio
Case 1	-10.1 dB	$< 10^{-2}$
Case 2	-13.0 dB	$< 10^{-2}$
Case 3	-11.5 dB	$< 10^{-2}$

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

3GPP TSG RAN WG4 (Radio) Meeting #31 **R4-040349**

Beijing, China 10 - 14 May 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.141** **CR** **350** ⌘ **rev** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Correction of signal level for MR and LA BS class verification of internal BLER calculation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	26/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The signal level for verification of internal BLER callculation of MR and LA BS classes has not been adapted to the corresponding sensitivity of these BS classes. The current defined signal level is based on WA BS class.
Summary of change:	⌘	Signal level for verification of internal BLER adapted to the MR and LA BS class sensitivity.
Consequences if not approved:	⌘	If the signal level is not adapted to corresponding BS class sensitivity, the measurement results for MR and LA will be inaccurate.

Clauses affected:	⌘	Chapter 8.6.

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

8.6 Verification of the internal BLER calculation

8.6.1 Definition and applicability

Base Station System with internal BLER calculates block error rate from the CRC blocks of the received. This test is performed only if Base Station System has this kind of feature. All data rates which are used in clause 8 Performance requirement testing shall be used in verification testing. This test is performed by feeding measurement signal with known BLER to the input of the receiver. Locations of the erroneous blocks shall be randomly distributed within a frame. Erroneous blocks shall be inserted into the UL signal as shown in figure 8.1.

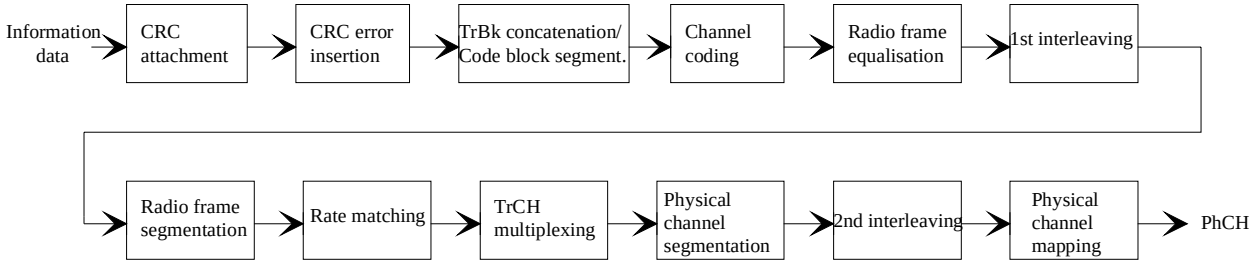

Figure 8.1: BLER insertion to the output data

8.6.2 Minimum requirement

BLER indicated by the Base Station System shall be within ±10% of the BLER generated by the RF signal source. Measurement shall be repeated for each data rate as specified in table 8.13.

Table 8.13

Transport channel combination	Data rate	BLER
DPCH	12,2 kbps	0.01
DPCH	64 kbps	0.01
DPCH	144 kbps	0.01
DPCH	384 kbps	0.01

8.6.3 Test purpose

To verify that the internal BLER calculation accuracy shall met requirements for conformance testing.

8.6.4 Method of test

8.6.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) For BS with Rx diversity, connect the BS tester generating the wanted signal to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

2) For BS without Rx diversity, connect the BS tester generating the wanted signal to the BS antenna connector as shown in annex B.

3) Set correct signal source parameters depending on the BS class under test as specified in table 8.14.

Table 8.14: UL Signal levels for different data rates

Data rate	Signal level for WA BS	Signal level for MR BS	Signal level for LA BS	Unit
12,2 kbps	-111	-101	-97	dBm/3.84 MHz
64 kbps	-107	-97	-93	dBm/3.84 MHz
144 kbps	-104	-94	-90	dBm/3.84 MHz
384 kbps	-100	-90	-86	dBm/3.84 MHz

Note: PN9 can be used as data sequence for the test

8.6.4.2 Procedure

1) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

2) The BLER insertion to the wanted signal shall be configured according to the corresponding data rate in table 8.13.

3) Adjust the BS tester so that the required UL signal level specified in table 8.14 is achieved.

For each of the data rates in table 8.13 applicable for the base station, measure the BLER at least over 50 000 blocks.

8.6.5 Test requirement

BLER indicated by the Base Station System shall be within requirement as specified in subclause 8.6.2.