TSG RAN Meeting #23 **RP-040039**
Phoenix, US, 10 - 12 March 2004

Title **CRs (Rel-6) to TS25.101, TS25.104, TS25.133, TS25.141 for the introduction of UMTS 1.7/2.1 GHz requirements**
Source **TSG RAN WG4**
Agenda Item **8.1.2**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-040027	25.101	324		B	Rel-6	6.3.0	Introduction of UMTS 1.7/2.1 GHz requirements	RInImp-UMTS1721
R4-040119	25.104	216	1	B	Rel-6	6.4.0	Introduction of UMTS 1.7/2.1 GHz requirements	RInImp-UMTS1721
R4-040148	25.133	650	1	F	Rel-6	6.4.0	Introduction of band IV, V and VI requirements	RInImp-UMTS850; UMTS800; UMTS1721
R4-040120	25.141	336	1	B	Rel-6	6.4.0	Introduction of UMTS 1.7/2.1 GHz requirements	RInImp-UMTS1721

3GPP TSG RAN WG4 (Radio) Meeting #30 **R4-040027**

Munich, Germany 9 - 13 February 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.101** **CR** **324** ⌘ **rev** ⌘ Current version: **6.3.0** ⌘

*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 UMTS 1.7/2.1 GHz requirements
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-UMTS1721
Date:	⌘	23/02/2004
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:	⌘	Introduction of UMTS 1.7/2.1 GHz requirements
Summary of change:	⌘	Re-structure of relevant sections: Output power, Spectrum emission mask, Spurious emissions, Blocking characteristics, Intermodulation characteristics, Receiver spurious emissions and Multi-path fading propagation conditions. In multipath propagation conditions, which are used for verifying demodulation performance and RRM test case "Correct reporting of neighbours in fading propagation conditions", all the UE speeds of Band IV are scaled to the speeds, which correspond to the same Doppler frequencies as used in Band I.
Consequences if not approved:	⌘	No requirements for UMTS 1.7/2.1 GHz band specified.

Clauses affected:	⌘	6.2.1, 6.6.2, 6.6.3, 7.3.1, 7.6.1, 7.6.2, 7.6.3, 7.8.2, 7.9.1, B.2.2

	Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘ TS25.307
		X		Test specifications	TS34.121
			X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:
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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.

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

6 Transmitter characteristics

6.1 General

Unless detailed the transmitter characteristic are specified at the antenna connector of the UE. For UE with integral antenna only, a reference antenna with a gain of 0 dBi is assumed. Transmitter characteristics for UE(s) with multiple antennas/antenna connectors are FFS.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 6 are defined using the UL reference measurement channel (12.2 kbps) specified in subclause A.2.1 and unless stated with the UL power control ON

6.2 Transmit power

6.2.1 UE maximum output power

The following Power Classes define the nominal maximum output power. The nominal power defined is the broadband transmit power of the UE, i.e. the power in a bandwidth of at least (1+α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

Table 6.1: UE Power Classes

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+1/-3	+27	+1/-3	+24	+1/-3	+21	+2/-2
Band II	-	-	-	-	+24	+1/-3	+21	+2/-2
Band III	-	-	-	-	+24	+1/-3	+21	+2/-2
Band IV	-	-	-	-	+24	+1/-3	+21	+2/-2
Band V	-	-	-	-	+24	+1/-3	+21	+2/-2
Band VI	-	-	-	-	+24	+1/-3	+21	+2/-2

NOTE: The tolerance allowed for the nominal maximum output power applies even for the multi-code transmission mode.

---NEXT MODIFIED SECTION---

6.6 Output RF spectrum emissions

6.6.1 Occupied bandwidth

Occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power of the transmitted spectrum, centered on the assigned channel frequency. The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3.84 Mcps.

6.6.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the nominal channel resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission limit is specified in terms of a spectrum emission mask and Adjacent Channel Leakage power Ratio.

6.6.2.1 Spectrum emission mask

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

6.6.2.1.1 Minimum requirement

The power of any UE emission shall not exceed the levels specified in Table 6.10. The absolute requirement is based on a –50 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as –55.8 dBm/1 MHz and –71.1 dBm/30 kHz.

Table 6.10: Spectrum Emission Mask Requirement

Δf in MHz (Note 1)	**Minimum requirement (Note 2) Band I, II, III, IV, V, VI**		**Additional requirements Band II, Band IV and Band V (Note 3)**	**Measurement bandwidth (Note 6)**
	Relative requirement	**Absolute requirement**		
2.5 - 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-71.1 dBm	-15 dBm	30 kHz (Note 4)
3.5 - 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-55.8 dBm	-13 dBm	1 MHz (Note 5)
7.5 - 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-55.8 dBm	-13 dBm	1 MHz (Note 5)
8.5 - 12.5 MHz	-49 dBc	-55.8 dBm	-13 dBm	1 MHz (Note 5)

Note 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.
Note 2: The minimum requirement for bands I, II, III, IV, V & VI is calculated from the relative requirement or the absolute requirement, whichever is the higher power.
Note 3: For operation in Band II, Band IV and Band V only, the minimum requirement is calculated from the minimum requirement calculated in Note 2 or the additional requirement for band II, whichever is the lower power.
Note 4: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz.
Note 5: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.
Note 6: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the RRC filtered mean power centered on the assigned channel frequency to the RRC filtered mean power centered on an adjacent channel frequency.

6.6.2.2.1 Minimum requirement

If the adjacent channel power is greater than –50dBm then the ACLR shall be higher than the value specified in Table 6.11.

Table 6.11: UE ACLR

Power Class	Adjacent channel frequency relative to assigned channel frequency	ACLR limit
3	+ 5 MHz or – 5 MHz	33 dB
3	+ 10 MHz or – 10 MHz	43 dB
4	+ 5 MHz or – 5 MHz	33 dB
4	+ 10 MHz or –10 MHz	43 dB

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

6.6.3 Spurious emissions

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329 [2].

6.6.3.1 Minimum requirement

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

Table 6.12: General spurious emissions requirements

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	-30 dBm

Table 6.13: Additional spurious emissions requirements

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
I	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm *
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm *
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm *
	1893.5 MHz <f<1919.6 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
II	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
III	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm *
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm *
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
IV	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
	2110 MHz ≤ f ≤ 2155 MHz	3.84 MHz	-60 dBm
V	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	-60 dBm
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm
VI	875 MHz ≤ f ≤ 885 MHz	3.84 MHz	-60dBm
	1893.5 MHz ≤ f ≤1919.6 MHz	300 kHz	-41 dBm
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm
Note * The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 6.12 are permitted for each UARFCN used in the measurement			

---NEXT MODIFIED SECTION---

7 Receiver characteristics

---NEXT MODIFIED SECTION---

7.3 Reference sensitivity level

The reference sensitivity level <REFSENS> is the minimum mean power received at the UEantenna port at which the Bit Error Ratio (BER) shall not exceed a specific value.

7.3.1 Minimum requirement

The BER shall not exceed 0.001 for the parameters specified in Table 7.2.

Table 7.2: Test parameters for reference sensitivity

Operating Band	Unit	DPCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I, VI	dBm/3.84 MHz	-117	-106.7
II	dBm/3.84 MHz	-115	-104.7
III	dBm/3.84 MHz	-114	-103.7
IV	dBm/3.84 MHz	-117	-106.7
V	dBm/3.84 MHz	-115	-104.7
NOTE 1. For Power class 3 this shall be at the maximum output power NOTE 2. For Power class 4 this shall be at the maximum output power			

---NEXT MODIFIED SECTION---

7.6 Blocking characteristics

The blocking characteristic is a measure of the receiver's 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 spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

7.6.1 Minimum requirement (In-band blocking)

The BER shall not exceed 0.001 for the parameters specified in Table 7.6. In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band.

Table 7.6: In-band blocking

Parameter	Unit	Level	
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56	-44
F_{uw} offset		=±10 MHz	≤-15 MHz & ≥15 MHz
F_{uw} (Band I operation)	MHz	2102.4≤ f ≤2177.6 (Note 2)	2095≤ f ≤2185
F_{uw} (Band II operation)	MHz	1922.4≤ f ≤1997.6 (Note 2)	1915≤ f ≤2005
F_{uw} (Band III operation)	MHz	1797.4≤ f ≤1887.6 (Note 2)	1790≤ f ≤1895
F_{uw} (Band IV operation)	MHz	2102.4≤ f ≤2162.6 (Note 2)	2095≤ f ≤2170
F_{uw} (Band V operation)	MHz	861.4≤ f ≤901.6 (Note 2)	854≤ f ≤909
F_{uw} (Band VI operation)	MHz	867.4≤ f ≤892.6 (Note 2 and 3)	860≤ f ≤900 (Note 3)
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	

Note 1: $I_{blocking}$ (modulated) consists of the common channels needed for tests as specified in Table C.7 and 16 dedicated data channels as specified in Table C.6.

Note 2: For each carrier frequency the requirement is valid for two frequencies, the carrier frequency +/- 10 MHz.

Note 3: For Band VI, the unwanted interfering signal does not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.

7.6.2 Minimum requirement (Out of-band blocking)

The BER shall not exceed 0.001 for the parameters specified in Table 7.7. Out-of-band band blocking is defined for an unwanted interfering signal falling more than 15 MHz below or above the UE receive band. For Table 7.7 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size. For these exceptions the requirements of clause 7.7 Spurious response are applicable.

Table 7.7: Out of band blocking

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+3 dB	<REFSENS>+3 dB	<REFSENS>+3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15
F_{uw} (Band I operation)	MHz	2050<f <2095 2185<f <2230	2025 <f <2050 2230 <f <2255	1< f <2025 2255<f<12750
F_{uw} (Band II operation)	MHz	1870<f <1915 2005<f <2050	1845 <f <1870 2050 <f <2075	1< f <1845 2075<f<12750
F_{uw} (Band III operation)	MHz	1745 <f <1790 1895<f <1940	1720 <f < 1745 1940<f < 1965	1< f <1720 1965<f<12750
F_{uw} (Band IV operation)	MHz	2050< f <2095 2170< f <2215	2025< f <2050 2215< f < 2240	1< f <784 2240<f<12750
F_{uw} (Band V operation)	MHz	809< f <854 909< f <954	784< f <809 954< f < 979	1< f <784 979<f<12750
F_{uw} (Band VI operation)	MHz	815 < f < 860 900 < f < 945	790 < f < 815 945 < f < 970	1 < f < 790 970 < f < 12750
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)		
Band I operation	For 2095<f<2110 MHz and 2170<f<2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied.			
Band II operation	For 1915<f<1930 MHz and 1990<f<2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied			
Band III operation	For 1790<f<1805 MHz and 1880<f<1895 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied.			
Band IV operation	For 2095<f<2110 MHz and 2155<f<2170 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied.			
Band V operation	For 854<f<869 MHz and 894<f<909 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied.			
Band VI operation	For 860<f<875 MHz and 885<f<900 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 7.5.1 and subclause 7.6.1 shall be applied.			

7.6.3 Minimum requirement (Narrow band blocking)

The BER shall not exceed 0.001 for the parameters specified in Table 7.7A. This requirement is measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an unwanted narrow band interferer at a frequency, which is less than the nominal channel spacing

Table 7.7A: Narrow band blocking characteristics

Parameter	Unit	Band II, Band IV and Band V	Band III
DPCH_Ec	dBm/3.84 MHz	<REFSENS> + 10 dB	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-57	-56
F_{uw} (offset)	MHz	2.7	2.8
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	

NOTE: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 45.004 [6]

7.7 Spurious response

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out of band blocking limit as specified in subclause 7.6.2 is not met.

7.7.1 Minimum requirement

The BER shall not exceed 0.001 for the parameters specified in Table 7.8.

Table 7.8: Spurious Response

Parameter	Unit	Level
DPCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> +3 dB
$I_{blocking}$ (CW)	dBm	-44
F_{uw}	MHz	Spurious response frequencies
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)

7.8 Intermodulation characteristics

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

7.8.1 Minimum requirement

The BER shall not exceed 0.001 for the parameters specified in Table 7.9.

Table 7.9: Receive intermodulation characteristics

Parameter	Unit	Level	
DPCH_Ec	dBm/3.84 MHz	<REFSENS> +3 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> +3 dB	
I_{ouw1} (CW)	dBm	-46	
I_{ouw2} mean power (modulated)	dBm	-46	
F_{uw1} (offset)	MHz	10	-10
F_{uw2} (offset)	MHz	20	-20
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	

NOTE: I_{ouw2} (modulated) consists of the common channels needed for tests as specified in Table C.7 and 16 dedicated data channels as specified in Table C.6.

7.8.2 Minimum requirement (Narrow band)

The BER shall not exceed 0.001 for the parameters specified in Table 7.9A.

Table 7.9A: Receive intermodulation characteristics

Parameter	Unit	Band II, Band IV and Band V		Band III	
DPCH_Ec	dBm/3.84 MHz	<REFSENS>+ 10 dB		<REFSENS>+ 10 dB	
$\hat{I}_{or}$	dBm/3.84 MHz	<REF$\hat{I}_{or}$> + 10 dB		[<REF$\hat{I}_{or}$> +10 dB	
I_{ouw1} (CW)	dBm	-44		-43	
I_{ouw2} (GMSK)	dBm	-44		-43	
F_{uw1} (offset)	MHz	3.5	-3.5	3.6	-3.6
F_{uw2} (offset)	MHz	5.9	-5.9	6.0	-6.0
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)			

NOTE: I_{ouw2} (GMSK) is an interfering signal as defined in TS 45.004 [6].

7.9 Spurious emissions

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector.

7.9.1 Minimum requirement

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in Table 7.10 and Table 7.11

Table 7.10: General receiver spurious emission requirements

Frequency Band	Measurement Bandwidth	Maximum level	Note
30MHz ≤ f < 1GHz	100 kHz	-57 dBm	
1GHz ≤ f ≤ 12.75 GHz	1 MHz	-47 dBm	

Table 7.11: Additional receiver spurious emission requirements

Band	Frequency Band	Measurement Bandwidth	Maximum level	Note
I	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm *	
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm *	
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm *	
	1805 MHz ≤ f ≤ 1880 MHz	100 kHz	-71 dBm *	
	1920 MHz ≤ f ≤ 1980 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	UE receive band
II	869 MHz ≤ f < 894 MHz	3.84 MHz	-60 dBm	
	1850 MHz ≤ f ≤ 1910 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	UE receive band
III	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm*	
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm*	
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm*	
	1710 MHz ≤ f ≤ 1785 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1805 MHz ≤ f ≤ 1880 MHz	3.84 MHz	-60 dBm	UE receive band
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
IV	869 MHz ≤ f < 894 MHz	3.84 MHz	-60 dBm	
	1710 MHz ≤ f < 1755 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
	2110 MHz≤ f ≤ 2155 MHz	3.84 MHz	-60 dBm	UE receive band
V	824 MHz ≤ f < 849 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	869 MHz ≤ f < 894 MHz	3.84 MHz	-60 dBm	UE receive band
	1930 MHz ≤ f ≤ 1990 MHz	3.84 MHz	-60 dBm	
VI	830 MHz ≤ f ≤ 840 MHz	3.84 MHz	-60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	875 MHz ≤ f ≤ 885 MHz	3.84 MHz	-60 dBm	UE receive band
	2110 MHz ≤ f ≤ 2170 MHz	3.84 MHz	-60 dBm	
Note *	The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 7.10 are permitted for each UARFCN used in the measurement			

---NEXT MODIFIED SECTION---

Annex B (normative): Propagation conditions

B.1 General

Void

B.2 Propagation Conditions

B.2.1 Static propagation condition

The propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading and multi-paths exist for this propagation model.

B.2.2 Multi-path fading propagation conditions

Table B1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

Table B.1: Propagation Conditions for Multi path Fading Environments (Cases 1 to 6)

Case 1		Case 2		Case 3		Case 4		Case 5 (Note 1)		Case 6	
Speed for Band I, II, III and IV 3 km/h		Speed for Band I, II, III and IV 3 km/h		Speed for Band I, II, III and IV 120 km/h		Speed for Band I, II, III and IV 3 km/h		Speed for Band I, II, III and IV 50 km/h		Speed for Band I, II, III and IV 250 km/h	
Speed for Band V 7 km/h		Speed for Band V 7 km/h		Speed for Band V 282 km/h (Note 2)		Speed for Band V 7 km/h		Speed for Band V 118 km/h		Speed for Band V 583 km/h (Note 2)	
Speed for Band VI 7 km/h		Speed for Band VI 7 km/h		Speed for Band VI 282 km/h (Note 2)		Speed for Band VI 7 km/h		Speed for Band VI 118 km/h		Speed for Band VI 583 km/h (Note 2)	
Relative Delay [ns]	Relative mean Power [dB]	Relative Delay [ns]	Relative mean Power [dB]	Relative Delay [ns]	Relative mean Power [dB]	Relative Delay [ns]	Relative mean Power [dB]	Relative Delay [ns]	Relative mean Power [dB]	Relative Delay [ns]	Relative mean Power [dB]
0	0	0	0	0	0	0	0	0	0	0	0
976	-10	976	0	260	-3	976	0	976	-10	260	-3
		20000	0	521	-6					521	-6
				781	-9					781	-9

NOTE 1: Case 5 is only used in TS25.133.

NOTE 2: Speed above 250km/h is applicable to demodulation performance requirements only.

Table B.1A shows propagation conditions that are used for the performance measurements in multi-path environment when UE is informed by higher layer signalling that only DPCCH exists for channel estimation. All taps have classical Doppler spectrum. Taps are normalized to the strongest tap in the beam/sector. The actual power relation between the sector and the beam is determined by the test case.

Table B.1A: Propagation Conditions for Multi path Fading Environments (Case 7)

Case 7		
Speed for Band I, II, III and IV 50 km/h		
Speed for Band V, VI 118 km/h		
Relative Delay [ns]	**Average Power [dB]**	
	Sector	**Beam**
0	0.0	-
260	-4.3	-
1040	-6.6	-
4690	-2.0	0.0
7290	-7.0	-0.3
14580	-7.5	-0.9

Table B.1B shows propagation conditions that are used for HSDPA performance measurements in multi-path fading environment.

Table B.1B: Propagation Conditions for Multi-Path Fading Environments for HSDPA Performance Requirements

ITU Pedestrian A Speed 3km/h (PA3)		**ITU Pedestrian B Speed 3km/h (PB3)**		**ITU vehicular A Speed 30km/h (VA30)**		**ITU vehicular A Speed 120km/h (VA120)**	
Speed for Band I, II, III and IV 3 km/h		Speed for Band I, II, III and IV 3 km/h		Speed for Band I, II, III and IV 30 km/h		Speed for Band I, II, III and IV 120 km/h	
Speed for Band V, VI 7 km/h		Speed for Band V, VI 7 km/h		Speed for Band V, VI 71 km/h		Speed for Band V, VI 282 km/h (Note 1)	
Relative Delay [ns]	**Relative Mean Power [dB]**	**Relative Delay [ns]**	**Relative Mean Power [dB]**	**Relative Delay [ns]**	**Relative Mean Power [dB]**	**Relative Delay [ns]**	**Relative Mean Power [dB]**
0	0	0	0	0	0	0	0
110	-9.7	200	-0.9	310	-1.0	310	-1.0
190	-19.2	800	-4.9	710	-9.0	710	-9.0
410	-22.8	1200	-8.0	1090	-10.0	1090	-10.0
		2300	-7.8	1730	-15.0	1730	-15.0
		3700	-23.9	2510	-20.0	2510	-20.0

NOTE 1: Speed above 120km/h is applicable to demodulation performance requirements only.

NOTE: The propagation conditions used in simulations were based on the TR 25.890. The effect of re-mapping of channel rays to integer sample locations is FFS.

Table B.1C shows propagation conditions that are used for CQI test in multi-path fading

Table B.1C: Propagation Conditions for CQI test in multi-path fading

Case 8, speed 30km/h	
Relative Delay [ns]	Relative mean Power [dB]
0	0
976	-10

B.2.3 Moving propagation conditions

The dynamic propagation conditions for the test of the baseband performance are non fading channel models with two taps. The moving propagation condition has two tap, one static, Path0, and one moving, Path1. The time difference between the two paths is according Equation (B.1). The taps have equal strengths and equal phases.

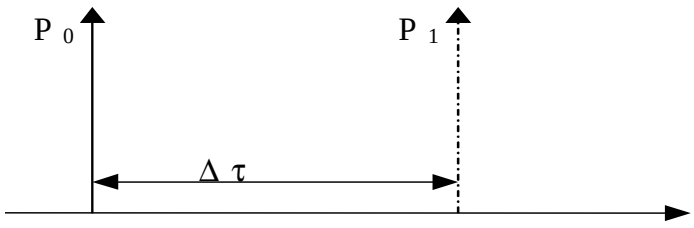


Figure B.1: The moving propagation conditions

$$\Delta\tau = B + \frac{A}{2}\left(1 + \sin(\Delta\omega \cdot t)\right) \quad \text{(B.1)}$$

The parameters in the equation are shown in the following table.

Table B.2

Parameter	Value
A	5 μs
B	1 μs
$\Delta\omega$	$40*10^{-3}$ s^{-1}

B.2.4 Birth-Death propagation conditions

The dynamic propagation conditions for the test of the base band performance is a non fading propagation channel with two taps. The moving propagation condition has two taps, Path1 and Path2 which alternate between 'birth' and 'death'. The positions the paths appear are randomly selected with an equal probability rate and is shown in Figure B.2.

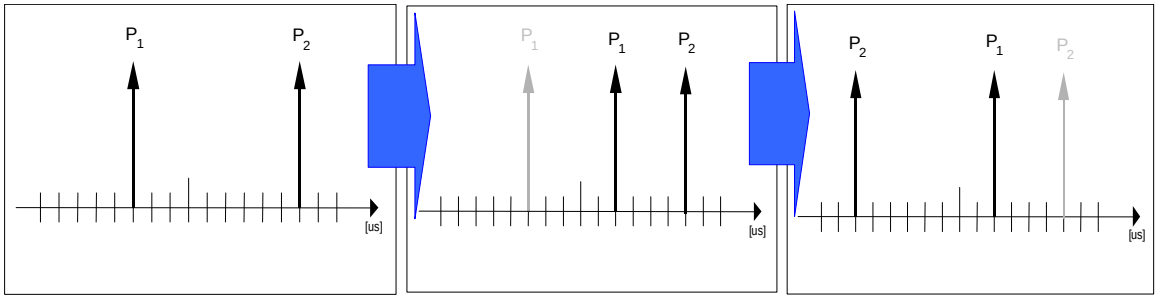


Figure B.2: Birth death propagation sequence

1. Two paths, Path1 and Path2 are randomly selected from the group[-5,-4,-3,-2,-1,0,1,2,3,4,5] μs. The paths have equal magnitudes and equal phases.

2. After 191 ms, Path1 vanishes and reappears immediately at a new location randomly selected from the group [-5,-4,-3,-2,-1,0,1,2,3,4,5] μs but excludes the point Path 2. The magnitudes and the phases of the tap coefficients of Path 1 and Path 2 shall remain unaltered.

3. After an additional 191 ms, Path2 vanishes and reappears immediately at a new location randomly selected from the group [-5,-4,-3,-2,-1,0,1,2,3,4,5] μs but excludes the point Path 1. The magnitudes and the phases of the tap coefficients of Path 1 and Path 2 shall remain unaltered.

The sequence in 2) and 3) is repeated.

3GPP TSG RAN WG4 (Radio) Meeting #30 **R4-040119**

Munich, Germany 9 - 13 February 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.104** **CR** **216** ⌘ **rev** **1** ⌘ Current version: **6.4.0** ⌘

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

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

Title:	⌘	Introduction of UMTS 1.7/2.1 GHz requirements
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-UMTS1721
Date:	⌘	23/02/2004
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:	⌘	Introduction of UMTS 1.7/2.1 GHz requirements
Summary of change:	⌘	Re-structure of relevant sections: Spectrum emission mask, Spurious emissions, Blocking characteristics, Intermodulation characteristics, Receiver spurious emissions and Multi-path fading propagation conditions.
Consequences if not approved:	⌘	No requirements for UMTS 1.7/2.1 GHz band specified.

Clauses affected:	⌘	6.6.2.1; 6.6.3.1.2; 6.6.3.2.1; 7.5.1; 7.6.1; 7.7.1; Annex B.2

Other specs affected:	Y	N			
⌘	X		Other core specifications	⌘	TS25.307
	X		Test specifications		TS25.141, CR 336
		X	O&M Specifications		

Other comments:	⌘	Co-existence requirements for other bands to protect band IV in CRs 217, 337

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 reques

6.6 Output RF spectrum emissions

6.6.1 Occupied bandwidth

Occupied bandwidth is a measure of the bandwidth containing 99% of the total integrated power for transmitted spectrum and is centered on the assigned channel frequency. The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3.84 Mcps.

6.6.2 Out of band emission

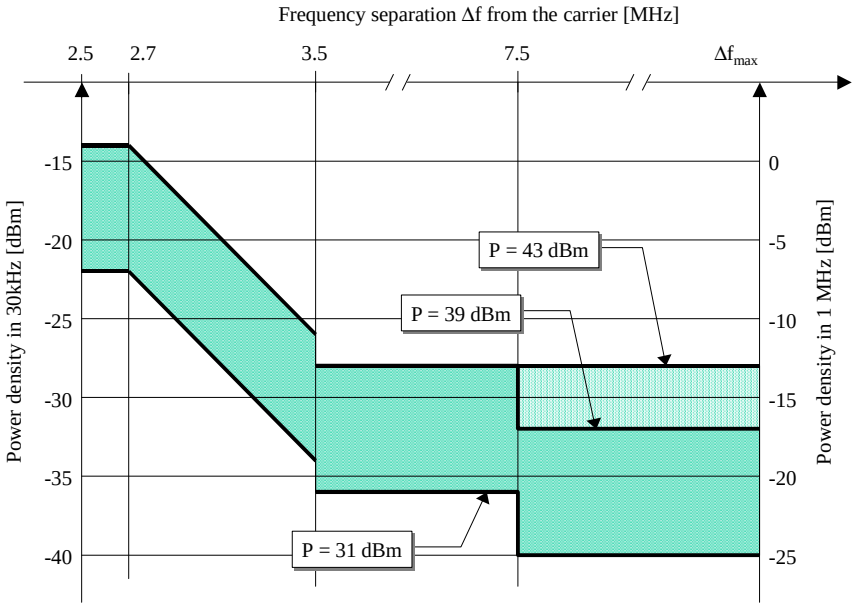
Out of band emissions are unwanted emissions immediately outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission requirement is specified both in terms of a spectrum emission mask and adjacent channel power ratio for the transmitter.

6.6.2.1 Spectrum emission mask

The mask defined in Tables 6.3 to 6.6 below may be mandatory in certain regions. In other regions this mask may not be applied.

For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 6.3 to 6.6 for the appropriate BS maximum output power, in the frequency range from Δf = 2.5 MHz to Δf_{max} from the carrier frequency, where:

- Δf is the separation between the carrier frequency and the nominal -3dB point of the measuring filter closest to the carrier frequency.
- F_offset is the separation between the carrier frequency and the centre of the measuring filter.
- f_offset_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 5.2, whichever is the greater.
- Δf_{max} is equal to f_offset_{max} minus half of the bandwidth of the measuring filter.



Illustrative diagram of spectrum emission mask

Figure 6.2: Spectrum emission mask

Table 6.3: 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	Minimum requirement Band I, II, III, IV, V	Additional requirements Band II, IV and V [1]	Measurement bandwidth [2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-14dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
(see note 3)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	NA	30 kHz
3.5 MHz ≤ Δf ≤ Δf_{max}	4.0MHz ≤ f_offset < f_offset_{max}	-13 dBm	NA	1 MHz

Table 6.4: 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	Minimum requirement Band I, II, III, IV, V	Additional requirements Band II, IV and V [1]	Measurement bandwidth [2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-14dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
(see note 3)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 8.0MHz	-13 dBm	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P - 56 dB	NA	1 MHz

Table 6.5: 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	Minimum requirement Band I, II, III, IV, V	Additional requirements Band II, IV and V [1]	Measurement bandwidth [2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P - 53 dB	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$P - 53dB - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
(see note 3)	3.515MHz ≤ f_offset < 4.0MHz	P - 65 dB	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 8.0MHz	P - 52 dB	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P - 56 dB	NA	1 MHz

Table 6.6: 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	Minimum requirement Band I, II, III, IV, V	Measurement bandwidth [2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-22 dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-22dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	30 kHz
(see note 3)	3.515MHz ≤ f_offset < 4.0MHz	-34 dBm	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 8.0MHz	-21 dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

Notes for Tables 6.3, 6.4, 6.5 & 6.6

NOTE 1 The minimum requirement for operation in band II, IV and V is the lower power of the minimum requirement for band I, II, III, IV and V and the additional requirement for band II, IV and V.

NOTE 2 As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 3: This frequency range ensures that the range of values of f_offset is continuous.

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the RRC filtered mean power centered on the assigned channel frequency to the RRC filtered mean power centered on an adjacent channel frequency.

6.6.2.2.1 Minimum requirement

The ACLR shall be higher than the value specified in Table 6.7.

Table 6.7: BS ACLR

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45 dB
10 MHz	50 dB

6.6.3 Spurious emissions

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions. This is measured at the base station RF output port.

The requirements shall apply whatever the type of transmitter considered (single carrier or multiple-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

Unless otherwise stated, all requirements are measured as mean power.

6.6.3.1 Mandatory Requirements

The requirements of either subclause 6.6.3.1.1 or subclause 6.6.3.1.2 shall apply.

Either requirement applies at frequencies within the specified frequency ranges that are more than 12.5MHz below the first carrier frequency used or more than 12.5MHz above the last carrier frequency used.

6.6.3.1.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329 [1], are applied.

6.6.3.1.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.8: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9kHz - 150kHz	-13 dBm	1 kHz	Note 1
150kHz - 30MHz		10 kHz	Note 1
30MHz - 1GHz		100 kHz	Note 1
1GHz - 12.75 GHz		1 MHz	Note 2
NOTE 1: Bandwidth as in ITU-R SM.329 [1], s4.1 NOTE 2: Upper frequency as in ITU-R SM.329 [1], s2.5 table 1			

6.6.3.1.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [1], are applied.

6.6.3.1.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.9: BS Mandatory spurious emissions limits, operating band I, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Note 1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz *whichever is the higher*	-30 dBm	1 MHz	Note 1
Fc1 - 60 MHz or 2100 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 2100 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 50 MHz or 2100 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2180 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 50 MHz or 2180 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 2180 MHz *whichever is the lower*	-25 dBm	1 MHz	Note 2
Fc2 + 60 MHz or 2180 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Note 3

NOTE 1: Bandwidth as in ITU-R SM.329[1], s4.1
NOTE 2: Specification in accordance with ITU-R SM.329[1], s4.3 and Annex 7
NOTE 3: Bandwidth as in ITU-R SM.329[1], s4.1. Upper frequency as in ITU-R SM.329[1], s2.5 table 1

Table 6.9A: BS Mandatory spurious emissions limits, operating band II, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Note 1
1GHz ↔ Fc1 - 60 MHz or 1920 MHz *whichever is the higher*	-30 dBm	1 MHz	Note 1
Fc1 - 60 MHz or 1920 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1920 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 50 MHz or 1920 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2000 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 50 MHz or 2000 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 2000 MHz *whichever is the lower*	-25 dBm	1 MHz	Note 2
Fc2 + 60 MHz or 2000 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Note 3
NOTE 1: Bandwidth as in ITU-R SM.329 [1], s4.1 NOTE 2: Specification in accordance with ITU-R SM.329 [1], s4.3 and Annex 7 NOTE 3: Bandwidth as in ITU-R SM.329 [1], s4.1. Upper frequency as in ITU-R SM.329 [1], s2.5 table 1			

Table 6.9B: BS Mandatory spurious emissions limits, operating band III, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Note 1
1GHz ↔ Fc1 - 60 MHz or 1795 MHz *whichever is the higher*	-30 dBm	1 MHz	Note 1
Fc1 - 60 MHz or 1795 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1795 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 50 MHz or 1795 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 1890 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 50 MHz or 1890 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 1890 MHz *whichever is the lower*	-25 dBm	1 MHz	Note 2
Fc2 + 60 MHz or 1890 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Note 3
NOTE 1: Bandwidth as in ITU-R SM.329 [1], s4.1 NOTE 2: Specification in accordance with ITU-R SM.329 [1], s4.3 and Annex 7 NOTE 3: Bandwidth as in ITU-R SM.329 [1], s4.1. Upper frequency as in ITU-R SM.329 [1], s2.5 table 1			

Table 6.9C: BS Mandatory spurious emissions limits, operating band V, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 859 MHz	-36 dBm	100 kHz	Note 1
859 MHz ↔ Fc1 - 20 MHz or 859 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 20 MHz or 859 MHz *whichever is the higher* ↔ Fc2 + 20 MHz or 904 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 20 MHz or 904 MHz *whichever is the lower* ↔ 904 MHz	-25 dBm	1 MHz	Note 2
904 MHz ↔ 1 GHz	-36 dBm	100 kHz	Note 3
1GHz ↔ 12.75GHz	-30 dBm	1 MHz	Note 3
NOTE 1: Bandwidth as in ITU-R SM.329 [1], s4.1 NOTE 2: Specification in accordance with ITU-R SM.329 [1], s4.3 and Annex 7 NOTE 3: Bandwidth as in ITU-R SM.329 [1], s4.1. Upper frequency as in ITU-R SM.329 [1], s2.5 table 1			

Table 6.9D: BS Mandatory spurious emissions limits, operating band IV, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Note 1
1GHz ↔ 2100 MHz	-30 dBm	1 MHz	Note 1
2100 MHz ↔ Fc1 - 50 MHz or 2100 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 50 MHz or 2100 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2165 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 50 MHz or 2165 MHz *whichever is the lower* ↔ 2165 MHz	-25 dBm	1 MHz	Note 2
2165 MHz ↔ 12.75 GHz	-30 dBm	1 MHz	Note 3
NOTE 1: Bandwidth as in ITU-R SM.329[1], s4.1 NOTE 2: Specification in accordance with ITU-R SM.329[1], s4.3 and Annex 7 NOTE 3: Bandwidth as in ITU-R SM.329[1], s4.1. Upper frequency as in ITU-R SM.329[1], s2.5 table 1			

Fc1: Center frequency of emission of the first carrier transmitted by the BS.

Fc2: Center frequency of emission of the last carrier transmitted by the BS.

6.6.3.2 Protection of the BS receiver of own or different BS

This requirement shall be applied in order to prevent the receivers of the BSs being desensitised by emissions from a BS transmitter.

6.6.3.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.10: Wide Area BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-96 dBm	100 kHz	
II	1850-1910 MHz	-96 dBm	100 kHz	
III	1710-1785 MHz	-96 dBm	100 kHz	
IV	1710-1755 MHz	-96 dBm	100 kHz	
V	824-849 MHz	-96 dBm	100 kHz	
VI	830-840 MHz	-96 dBm	100 kHz	

Table 6.10A: Medium Range BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-86 dBm	100 kHz	
II	1850-1910 MHz	-86 dBm	100 kHz	
III	1710-1785 MHz	-86 dBm	100 kHz	
IV	1710-1755 MHz	-86 dBm	100 kHz	
V	824-849 MHz	-86 dBm	100 kHz	
VI	830-840 MHz	-86 dBm	100 kHz	

Table 6.10B: Local Area BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-82 dBm	100 kHz	
II	1850-1910 MHz	-82 dBm	100 kHz	
III	1710-1785 MHz	-82 dBm	100 kHz	
IV	1710-1755 MHz	-82 dBm	100 kHz	
V	824-849 MHz	-82 dBm	100 kHz	
VI	830-840 MHz	-82 dBm	100 kHz	

---NEXT MODIFIED SECTION---

7.5 Blocking characteristics

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 the tables 7.4 to 7.5B below, using a 1 MHz step size.

7.5.1 Minimum requirement

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.

Table 7.4: Blocking performance requirement 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 C					

Table 7.4A: Blocking performance requirement 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
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 C					

Table 7.4B: Blocking performance requirement 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
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 C					

Table 7.5: 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 [5].					

Table 7.5A: 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 [5].					

Table 7.5B: 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 [5].					

---NEXT MODIFIED SECTION---

7.6 Intermodulation characteristics

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

7.6.1 Minimum requirement

The static reference performance as specified in clause 7.2.1 shall be met for a Wide Area BS when the following signals are coupled to BS antenna input:

- A wanted signal at the assigned channel frequency with a mean power of -115 dBm.
- Two interfering signals with the following parameters.

Table 7.6: Intermodulation performance requirement (Wide Area BS)

Operating band	Interfering Signal mean power	Offset	Type of Interfering Signal
I, II, III, IV, V, VI	- 48 dBm	10 MHz	CW signal
	- 48 dBm	20 MHz	WCDMA signal *
Note*: The characteristics of the W-CDMA interference signal are specified in Annex C			

Table 7.6A: Narrowband intermodulation performance requirement (Wide Area BS)

Operating band	Interfering Signal mean power	Offset	Type of Interfering Signal
II, III, IV, V	- 47 dBm	3.5 MHz	CW signal
	- 47 dBm	5.9 MHz	GMSK modulated*
* GMSK as defined in TS45.004			

The static reference performance as specified in clause 7.2.1 shall be met for a Medium Range BS when the following signals are coupled to BS antenna input:

- A wanted signal at the assigned channel frequency with a mean power of -105 dBm.
- Two interfering signals with the following parameters.

Table 7.6B: Intermodulation performance requirement (Medium Range BS)

Operating band	Interfering Signal mean power	Offset	Type of Interfering Signal
I, II, III, IV, V, VI	- 44 dBm	10 MHz	CW signal
	- 44 dBm	20 MHz	WCDMA signal *
Note*: The characteristics of the W-CDMA interference signal are specified in Annex C			

Table 7.6C: Narrowband intermodulation performance requirement (Medium Range BS)

Operating band	Interfering Signal mean power	Offset	Type of Interfering Signal
II, III, IV, V	- 43 dBm	3.5 MHz	CW signal
	- 43 dBm	5.9 MHz	GMSK modulated*
* GMSK as defined in TS45.004			

The static reference performance as specified in clause 7.2.1 shall be met for a Local Area BS when the following signals are coupled to BS antenna input:

- A wanted signal at the assigned channel frequency with a mean power of –101 dBm.
- Two interfering signals with the following parameters.

Table 7.6D: Intermodulation performance requirement (Local Area BS)

Operating band	Interfering Signal mean power	Offset	Type of Interfering Signal
I, II, III, IV, V, VI	-38 dBm	10 MHz	CW signal
	-38 dBm	20 MHz	WCDMA signal *
Note*: The characteristics of the W-CDMA interference signal are specified in Annex C			

Table 7.6E: Narrowband intermodulation performance requirement (Local Area BS)

Operating band	Interfering Signal mean power	Offset	Type of Interfering Signal
II, III, IV, V	-37 dBm	3.5 MHz	CW signal
	-37 dBm	5.9 MHz	GMSK modulated*
* GMSK as defined in TS45.004			

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 6.6.3.3.2, 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 and 6.6.3.13.2 may also be applied.

---NEXT MODIFIED SECTION---

Annex B (normative): Propagation conditions

B.1 Static propagation condition

The propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading or multi-paths exist for this propagation model.

B.2 Multi-path fading propagation conditions

Table B.1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum, defined as:

(CLASS) $$S(f) \propto 1/(1-(f/f_D)^2)^{0.5}$$ for f ∈ -f_d, f_d.

Table B.1: Propagation Conditions for Multi path Fading Environments

Case 1		Case 2		Case 3		Case 4	
Speed for Band I, II, III, IV 3 km/h		Speed for Band I, II, III, IV 3 km/h		Speed for Band I, II, III, IV 120 km/h		Speed for Band I, II, III, IV 250 km/h	
Speed for Band V, VI 7 km/h		Speed for Band V, VI 7 km/h		Speed for Band V, VI 280 km/h		Speed for Band V, VI 583 km/h (Note 1)	
Relative Delay [ns]	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**
0	0	0	0	0	0	0	0
976	-10	976	0	260	-3	260	-3
		20000	0	521	-6	521	-6
				781	-9	781	-9

NOTE 1: Speed above 250km/h is applicable to demodulation performance requirements only.

3GPP TSG RAN WG4 (Radio) Meeting #30 **R4-040148**

Munich, Germany 9 - 13 February 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **650** ⌘ **rev** **1** ⌘ Current version: **6.4.0** ⌘

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

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

Title:	⌘	Introduction of Band IV, V and VI requirements in measurement
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-UMTS850; UMTS800; UMTS1721
Date:	⌘	23/02/2004
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:	⌘	Introduction of Band IV, V and VI requirements in measurement section.
Summary of change:	⌘	Introduce sensitivity levels for the measurements per band
Consequences if not approved:	⌘	The sensitivity levels will be missing

Clauses affected:	⌘	9.1			
Other specs affected:	⌘	**Y**	**N**		
			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.

9 Measurements Performance Requirements

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

Since the UE reference sensitivity requirements are different depending on supported band, this is noted in each case with definition of the range Io for each frequency band. Definitions of each frequency bands can be found in TS 25.101.

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

9.1 Measurement Performance for UE

The requirements in this clause are applicable for a UE:

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

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

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

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

9.1.1 CPICH RSCP

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

9.1.1.1 Intra frequency measurements accuracy

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

9.1.1.1.1 Absolute accuracy requirement

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

CPICH_RSCP1$|_{\text{dBm}} \geq$ -114 dBm for Bands I, IV and VI,

CPICH_RSCP1$|_{\text{dBm}} \geq$ -112 dBm for Bands II and V,

CPICH_RSCP1$|_{\text{dBm}} \geq$ -111 dBm for Band III.

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

Table 9.1: CPICH_RSCP Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 6	± 9	-94...-70	-92…-70	-91…-70
	dBm	± 8	± 11	-70...-50	-70…-50	-70…-70

9.1.1.1.2 Relative accuracy requirement

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

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

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Bands II and V,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

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

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

Table 9.2: CPICH_RSCP Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 3	± 3	-94...-50	-92…-50	-91…-50

9.1.1.2 Inter frequency measurement accuracy

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

9.1.1.2.1 Relative accuracy requirement

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

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

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Bands II, and V,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

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

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$ | ≤ 20 dB.

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

Table 9.3: CPICH_RSCP Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 6	± 6	-94...-50	-92…-50	-91…-50

9.1.1.3 CPICH RSCP measurement report mapping

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

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

Table 9.4

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

9.1.2 CPICH Ec/Io

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

9.1.2.1 Intra frequency measurements accuracy

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

9.1.2.1.1 Absolute accuracy requirement

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

CPICH_RSCP1|$_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

CPICH_RSCP1|$_{dBm}$ ≥ -112 dBm for Bands II and V,

CPICH_RSCP1|$_{dBm}$ ≥ -111 dBm for Band III.

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

Table 9.5: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.1.2 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io is defined as the maximum allowable error in the measured difference between the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on the same frequency.

The relative accuracy is defined using the lower CPICH_Ec/Io of cell 1 and cell 2.

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

$CPICH\_RSCP1,2|_{dBm} \geq -114$ dBm for Bands I, IV and VI,

$CPICH\_RSCP1,2|_{dBm} \geq -112$ dBm for Bands II and V,

$CPICH\_RSCP1,2|_{dBm} \geq -111$ dBm for Band III.

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

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

Table 9.6: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
The lower of the CPICH_Ec/Io from cell1 and cell2	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.2 Inter frequency measurement accuracy

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

9.1.2.2.1 Absolute accuracy requirement

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

$CPICH\_RSCP1|_{dBm} \geq -114$ dBm for Bands I, IV and VI,

$CPICH\_RSCP1|_{dBm} \geq -112$ dBm for Bands II and V,

CPICH_RSCP1|$_{dBm}$ ≥ -111 dBm for Band III.

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

Table 9.7: CPICH_Ec/Io Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.2.2 Relative accuracy requirement

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

The relative accuracy is defined using the lower CPICH_Ec/Io of cell 1 and cell 2.

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

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

CPICH_RSCP1,2|$_{dBm}$ ≥ -112 dBm for Bands II and V,

CPICH_RSCP1,2|$_{dBm}$ ≥ -111 dBm for Band III.

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

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$ | ≤ 20 dB.

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

Table 9.8: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
The lower of the CPICH_Ec/Io from cell1 and cell2	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.3 CPICH Ec/Io measurement report mapping

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

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

Table 9.9

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

9.1.3 UTRA Carrier RSSI

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

The measurement period is equal to the measurement period for UE CPICH measurements, For CELL_DCH state the measurement period can be found in sub clause 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSI Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 4	± 7	-94...-70	-92…-70	-91…-70
	dBm	± 6	± 9	-70...-50	-70…-50	-70…-50

9.1.3.2 Relative accuracy requirement

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

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

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

Table 9.11: UTRA Carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I, IV and VI	Band II and V	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 7	± 11	-94...-70	-92…-70	-91…-70

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

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

Table 9.12

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

9.1.4 GSM carrier RSSI

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

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

The measurement period for CELL_DCH state can be found in section 8.1.2.5. The measurement period for CELL_FACH state can be found in section 8.4.2.5.

If the UE, in CELL_DCH state, does not need compressed mode to perform GSM measurements, the measurement accuracy requirements for RXLEV in TS 45.008 shall apply.

If the UE, in CELL_DCH state, needs compressed mode to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement is stated in section 8.1.2.5 shall apply.

If the UE, in CELL_FACH state, does not need measurement occasions to perform GSM measurements, the measurement accuracy requirements for RXLEV in TS 45.008 shall apply.

If the UE, in CELL_FACH state, needs measurement occasions to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement stated in section 8.4.2.5 shall apply.

The reporting range and mapping specified for RXLEV in TS 45.008 shall apply.

9.1.5 Transport channel BLER

9.1.5.1 BLER measurement requirement

Transport channel BLER value shall be calculated from a window with the size equal to the IE Reporting interval as specified in section 10.3.7.53 Periodical reporting criteria in TS 25.331.

9.1.5.2 Transport channel BLER measurement report mapping

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

In table 9.13 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.13

Reported value	Measured quantity value	Unit
BLER_LOG _00	Transport channel BLER = 0	-
BLER_LOG _01	-∞ < Log10(Transport channel BLER) < -4.03	-
BLER_LOG _02	-4.03 ≤ Log10(Transport channel BLER) < -3.965	-
BLER_LOG _03	-3.965 ≤ Log10(Transport channel BLER) < -3.9	-
…	…	…
BLER_LOG _61	-0.195 ≤ Log10(Transport channel BLER) < -0.13	-
BLER_LOG _62	-0.13 ≤ Log10(Transport channel BLER) < -0.065	-
BLER_LOG _63	-0.065 ≤ Log10(Transport channel BLER) ≤ 0	-

9.1.6 UE transmitted power

9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 9.14: UE transmitted power absolute accuracy

Parameter	Unit	Accuracy [dB]	
		PUEMAX 24dBm	PUEMAX 21dBm
UE transmitted power=PUEMAX	dBm	+1/-3	±2
UE transmitted power=PUEMAX-1	dBm	+1.5/-3.5	±2.5
UE transmitted power=PUEMAX-2	dBm	+2/-4	±3
UE transmitted power=PUEMAX-3	dBm	+2.5/-4.5	±3.5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dBm	+3/-5	±4

NOTE 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in TS 25.101 [3] section 6.2.1.

NOTE 2: UE transmitted power is the reported value.

For each empty slot created by compressed mode, no value shall be reported by the UE L1 for those slots.

9.1.6.2 UE transmitted power measurement report mapping

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

In table 9.15 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.15

Reported value	Measured quantity value	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power < -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power < 34	dBm

9.1.7 SFN-CFN observed time difference

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

9.1.7.1 Intra frequency measurement requirement

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

The accuracy requirement in table 9.16 is valid under the following conditions:

$CPICH\_RSCP1,2|_{dBm} \geq -114$ dBm for Bands I, IV and VI,

$CPICH\_RSCP1,2|_{dBm} \geq -112$ dBm for Bands II and V,

$CPICH\_RSCP1,2|_{dBm} \geq -111$ dBm for Band III.

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

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

$$\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left|\left(\frac{P-CCPCH\_E_c}{I_{or}}\right)\right|_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.16

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I, IV and VI	Band II and V	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	± 1	-94...-50	-92…-50	-91…-50

9.1.7.2 Inter frequency measurement requirement

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

The accuracy requirement in table 9.17 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Bands II and V,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

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

| Channel 1_Io$|_{dBm/3.84\ MHz}$ -Channel 2_Io$|_{dBm/3.84\ MHz}$ | ≤ 20 dB.

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

Table 9.17

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I, IV and VI	Band II and V	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	± 1	-94...-50	-92…-50	-91…-50

9.1.7.3 SFN-CFN observed time difference measurement report mapping

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

In table 9.18 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.18

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

9.1.8 SFN-SFN observed time difference

9.1.8.1 SFN-SFN observed time difference type 1

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

9.1.8.1.1 Measurement requirement

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

The accuracy requirement in table 9.19 is valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

. CPICH_RSCP1,2|$_{dBm}$ ≥ -112 dBm for Bands II and V,

CPICH_RSCP1,2|$_{dBm}$ ≥ -111 dBm for Band III.

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

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

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left. \left(\frac{P - CCPCH\_E_c}{I_{or}} \right) \right|_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.19

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I, IV and VI	Band II and V	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type1	chip	± 1	-94...-50	-92…-50	-91…-50

9.1.8.1.2 SFN-SFN observed time difference type 1 measurement report mapping

The reporting range is for *SFN-SFN observed time difference type 1* is from 0 ... 9830400 chip.

In table 9.20 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.20

Reported value	Measured quantity value	Unit
T1_SFN-SFN_TIME _0000000	0 ≤ SFN-SFN observed time difference type 1 < 1	chip
T1_SFN-SFN_TIME _0000001	1 ≤ SFN-SFN observed time difference type 1 < 2	chip
T1_SFN-SFN_TIME _0000002	2 ≤ SFN-SFN observed time difference type 1 < 3	chip
…	…	…
T1_SFN-SFN_TIME _9830397	9830397 ≤ SFN-SFN observed time difference type 1 < 9830398	chip
T1_SFN-SFN_TIME _9830398	9830398 ≤ SFN-SFN observed time difference type 1 < 980399	chip
T1_SFN-SFN_TIME _9830399	9830399 ≤ SFN-SFN observed time difference type 1 < 9830400	chip

9.1.8.2 SFN-SFN observed time difference type 2

NOTE: This measurement is for location service purposes to identify time difference between two cells.

It is optional for terminal to support the use of IPDL periods together with SFN-SFN observed time difference type 2. The support of IPDL depends on the supported UE positioning methods.

NOTE: Requirement on the UE shall be reconsidered when the state of the art technology progress.

9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

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

The accuracy requirement in table 9.21 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Bands II and V,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III,.

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

Table 9.21

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I, IV and VI	Band II and V	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type2	chip	± 0.5	-94...-50	-92…-50	-91…-50

9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

This requirement is valid only for UEs supporting IPDL measurements.

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

The accuracy requirement in table 9.22 is valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

CPICH_RSCP1,2|$_{dBm}$ ≥ -112 dBm for Bands II and V,

. CPICH_RSCP1,2|$_{dBm}$ ≥ -111 dBm for Band III.

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

Additionally the accuracy requirement in table 9.22 is also valid for neighbour cells for which the following conditions apply to during idle periods provided idle periods have a length of 1 slot:

CPICH_RSCPx,y|$_{dBm}$ ≥ -114 dBm.

$$\left.\frac{I_{o\_idle\_period}}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB\,,$$

where *x* and *y* represent cells measured using idle periods and $I_{o\_idle\text{-}period}$ is the total received power during the idle period.

NOTE: Additional general conditions are needed for the requirements in table 9.22 to be valid.

Table 9.22

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I, IV and VI	Band II and V	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 0.5	-94...-50	-92…-50	-91…-50

9.1.8.2.3 Inter frequency measurement requirement accuracy

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

The accuracy requirement in table 9.23 is valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm for Bands I, IV and VI,

. CPICH_RSCP1,2|$_{dBm}$ ≥ -112 dBm for Bands II and V,

CPICH_RSCP1,2|$_{dBm}$ ≥ -111 dBm for Band III.

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

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

Table 9.23

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I, IV and VI	Band II and V	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 1	-94...-50	-92…-50	-91…-50

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

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

In table 9.24 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.24

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

9.1.9 UE Rx-Tx time difference

9.1.9.1 UE Rx-Tx time difference type 1

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

The measurement period in CELL_DCH state is 100 ms.

9.1.9.1.1 Measurement requirement

Table 9.25

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I, IV and VI	Band II and V	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± 1.5	-94...-50	-92…-50	-91…-50

9.1.9.1.2 UE Rx-Tx time difference type 1 measurement report mapping

The reporting range is for *UE Rx-Tx time difference type 1* is from 768 ... 1280 chip.

In table 9.26 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.26

Reported value	Measured quantity value	Unit
RX-TX_TIME _768	UE Rx-Tx Time difference type 1< 768	chip
RX-TX_TIME _769	768 ≤ UE Rx-Tx Time difference type 1< 769	chip
RX-TX_TIME _770	769 ≤ UE Rx-Tx Time difference type 1< 770	chip
RX-TX_TIME _771	770 ≤ UE Rx-Tx Time difference type 1< 771	chip
…	…	…
RX-TX_TIME _1277	1276 ≤ UE Rx-Tx Time difference type 1< 1277	chip
RX-TX_TIME _1278	1277 ≤ UE Rx-Tx Time difference type 1< 1278	chip
RX-TX_TIME _1279	1278 ≤ UE Rx-Tx Time difference type 1< 1279	chip
RX-TX_TIME _1280	1279 ≤ UE Rx-Tx Time difference type 1	chip

9.1.9.2 UE Rx-Tx time difference type 2

NOTE: This measurement is used for UE positioning purposes.

It is optional for a terminal to support a subset of UE positioning methods. This measurement represents an instantaneous value that is time stamped as defined in the IE description in TS 25.331 [16].

9.1.9.2.1 Measurement requirement

Table 9.27

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I, IV and VI	Band II and V	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± 1.0	-94...-50	-92…-50	-91…-50

9.1.9.2.2 UE Rx-Tx time difference type 2 measurement report mapping

The reporting range is for *UE Rx-Tx time difference type2* is from 768 ... 1280 chip.

In table 9.28 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.28

Reported value	Measured quantity value	Unit
RX-TX_TIME _0000	UE Rx-Tx Time difference type 2 < 768.000	chip
RX-TX_TIME _0001	768.000 ≤ UE Rx-Tx Time difference type 2 < 768.0625	chip
RX-TX_TIME _0002	768.0625 ≤ UE Rx-Tx Time difference type 2 < 768.1250	chip
RX-TX_TIME _0003	768.1250 ≤ UE Rx-Tx Time difference type 2 < 768.1875	chip
…	…	…
RX-TX_TIME _8189	1279.7500 ≤ UE Rx-Tx Time difference type 2 < 1279.8125	chip
RX-TX_TIME _8190	1279.8125 ≤ UE Rx-Tx Time difference type 2 < 1279.8750	chip
RX-TX_TIME _8191	1279.8750 ≤ UE Rx-Tx Time difference type 2	chip

9.1.10 Observed time difference to GSM cell

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

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

9.1.10.1 Measurement requirement

The measurement period for CELL_DCH state is equal to the maximum time between two successive BSIC re-confirmations for one particular GSM cell according to sub clause 8.1.2.5.2. The measurement period for CELL_FACH state is equal to the maximum time between two successive BSIC re-confirmations according to sub clause 8.4.2.5.2.

The accuracy requirement in table 9.29 is valid in the conditions defined in sub clause 8.1.2.5.2.

Table 9.29

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

9.1.10.2 Observed time difference to GSM cell measurement report mapping

The reporting range is for *Observed time difference to GSM cell* is from 0 ... 3060/13 ms.

In table 9.30 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.30

Reported value	Measured quantity value	Unit
GSM_TIME _0000	0 ≤ Observed time difference to GSM cell < 1x3060/(4096x13)	ms
GSM_TIME _0001	1x3060/(4096x13) ≤ Observed time difference to GSM cell < 2x3060/(4096x13)	ms
GSM_TIME _0002	2x3060/(4096x13)≤ Observed time difference to GSM cell < 3x3060/(4096x13)	ms
GSM_TIME _0003	3x3060/(4096x13) ≤ Observed time difference to GSM cell < 4x3060/(4096x13)	ms
…	…	…
GSM_TIME _4093	4093x3060/(4096x13) ≤ Observed time difference to GSM cell < 4094x3060/(4096x13)	ms
GSM_TIME _4094	4094x3060/(4096x13) ≤ Observed time difference to GSM cell < 4095x3060/(4096x13)	ms
GSM_TIME _4095	4095x3060/(4096x13) ≤ Observed time difference to GSM cell < 3060/13	ms

9.1.11 P-CCPCH RSCP

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

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

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

9.1.11.1 Absolute accuracy requirements

9.1.11.1.1 3.84 Mcps TDD Option

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

P-CCPCH_RSCP ≥ -102 dBm.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{P-CCPCH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 8dB$$

Table 9.31: P-CCPCH_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm/3.84 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

9.1.11.1.2 1.28 Mcps TDD Option

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

P-CCPCH RSCP ≥ -102 dBm

P-CCPCH Ec/Io ≥ -8 dB

Table 9.31A: P-CCPCH_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm/1.28 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

9.1.11.2 P-CCPCH RSCP measurement report mapping

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

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

Table 9.32

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

9.1.12 UE GPS Timing of Cell Frames for UE positioning

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

Table 9.33

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

9.1.12.1 UE GPS timing of Cell Frames for UE positioning measurement report mapping

The reporting range is for UE GPS timing of Cell Frames for UE positioning is from 0 ... 2322432000000 chip.

In table 9.34 the mapping of measured quantity is defined.

Table 9.34

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UE GPS timing of Cell Frames for UE positioning < 0.0625	chip
GPS_TIME_00000000000001	0.0625 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1250	chip
GPS_TIME_00000000000002	0.1250 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1875	chip
...	...	...
GPS_TIME_3715891199997	2322431999999.8125 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.8750	chip
GPS_TIME_37158911999998	2322431999999.8750 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.9375	chip
GPS_TIME_37158911999999	2322431999999.9375 ≤ UE GPS timing of Cell Frames for UE positioning < 2322432000000.0000	chip

3GPP TSG RAN WG4 (Radio) Meeting #30 **R4-040120**

Munich, Germany 9 - 13 February 2004

CR-Form-v7

CHANGE REQUEST

⌘ **25.141** **CR** **336** ⌘ **rev** **1** ⌘ Current version: **6.4.0** ⌘

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

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

Title:	⌘	Introduction of UMTS 1.7/2.1 GHz requirements
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-UMTS1721
Date:	⌘	23/02/2004
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:	⌘	Introduction of UMTS 1.7/2.1 GHz requirements
Summary of change:	⌘	Re-structure of relevant sections: Spectrum emission mask, Spurious emissions, Blocking characteristics, Intermodulation characteristics, Receiver spurious emissions and Multi-path fading propagation conditions.
Consequences if not approved:	⌘	No requirements for UMTS 1.7/2.1 GHz band specified.

Clauses affected:	⌘	6.5.2.1.2; 6.5.2.1.5; 6.5.3.4.2.1; 6.5.3.4.3.1; 6.5.3.7.2; 6.5.3.7.3; 7.5.2; 7.5.5; 7.6.2; 7.6.5; 7.7.2; 7.7.5; Annex D.2

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

Other comments:	⌘	Linked to CR 216 for TS25.104.

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 reques

6.5.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission limit is specified in terms of a spectrum emission mask and adjacent channel leakage power ratio for the transmitter.

6.5.2.1 Spectrum emission mask

6.5.2.1.1 Definitions and applicability

The mask defined in Tables 6.14 to 6.17 below may be mandatory in certain regions. In other regions this mask may not be applied.

6.5.2.1.2 Minimum Requirements

For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 6.14 to 6.17 for the appropriate BS maximum output power, in the frequency range from Δf =2.5 MHz to Δf_{max} from the carrier frequency, where:

- Δf is the separation between the carrier frequency and the nominal –3dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the carrier frequency and the centre of the measurement filter;
- f_offset_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in subclause 3.4.1, whichever is the greater.
- Δf_{max} is equal to f_offset_{max} minus half of the bandwidth of the measuring filter.

Table 6.14: 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	Minimum 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	-14 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-14dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-13 dBm	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0 MHz ≤ f_offset < f_offset_{max}	-13 dBm	NA	1 MHz

NOTE 1: ~~The minimum requirement for operation in band II and V is the lower power of the minimum requirement for band I, II, III, V and the additional requirement for band II and V.~~ 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 6.15: 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	Minimum 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	-14 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-14dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-13 dBm	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P – 56 dB	NA	1 MHz

NOTE 1: ~~The minimum requirement for operation in band II and V is the lower power of the minimum requirement for band I, II, III, V and the additional requirement for band II and V.~~ 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 6.16: 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	Minimum 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	P – 53 dB	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$P - 53dB - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 65 dB	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 52 dB	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P – 56 dB	NA	1 MHz

NOTE 1: ~~The minimum requirement for operation in band II and V is the lower power of the minimum requirement for band I, II, III, V and the additional requirement for band II and V.~~ 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 6.17: 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	Minimum requirement Band I, II, III, IV, V	Measurement bandwidth
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-22 dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-22dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-34 dBm	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-21 dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

The normative reference for this requirement is in TS 25.104 [1] subclause 6.6.2.1

6.5.2.1.3 Test purpose

This test measures the emissions of the BS, close to the assigned channel bandwidth of the wanted signal, while the transmitter is in operation.

6.5.2.1.4 Method of test

6.5.2.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

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

1) Set-up the equipment as shown in annex B.
As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity, efficiency and avoiding e.g. carrier leakage, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

2) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4.0 MHz shall use a 30 kHz measurement bandwidth.

3) Measurements with an offset from the carrier centre frequency between 4.0 MHz and (f_offset_{max} – 500 kHz).shall use a 1 MHz measurement bandwidth.

4) Detection mode: True RMS.

6.5.2.1.4.2 Procedures

1) Set the BS to transmit a signal in accordance to test model 1, subclause 6.1.1.1 at the manufacturer's specified maximum output power.

2) Step the centre frequency of the measurement filter in contiguous steps and measure the emission within the specified frequency ranges with the specified measurement bandwidth.

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 test requirement for operation in band II and V is the lower power of the test requirement for Band I, II, III, V and the additional requirement for band II and V.~~ 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 test requirement for operation in band II and V is the lower power of the test requirement for Band I, II, III, V and the additional requirement for band II and V.~~ 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 test requirement for operation in band II and V is the lower power of the test requirement for Band I, II, III, V and the additional requirement for band II and V.~~ 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, 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.

---NEXT MODIFIED SECTION---

Table 6.25C: BS Mandatory spurious emissions limits, operating band V, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 859 MHz	-36 dBm	100 kHz	Note 1
859 MHz ↔ Fc1 - 20 MHz or 859 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 20 MHz or 859 MHz *whichever is the higher* ↔ Fc2 + 20 MHz or 904 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 20 MHz or 904 MHz *whichever is the lower* ↔ 904 MHz	-25 dBm	1 MHz	Note 2
904 MHz ↔ 1 GHz	-36 dBm	100 kHz	Note 3
1GHz ↔ 12.75GHz	-30 dBm	1 MHz	Note 3
NOTE 1: Bandwidth as in ITU-R SM.329 [4], s4.1 NOTE 2: Specification in accordance with ITU-R SM.329 [4], s4.3 and Annex 7 NOTE 3: Bandwidth as in ITU-R SM.329 [4], s4.1. Upper frequency as in ITU-R SM.329 [4], s2.5 table 1			

Table 6.25D: BS Mandatory spurious emissions limits, operating band IV, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Note 1
1GHz ↔ 2100 MHz	-30 dBm	1 MHz	Note 1
2100 MHz ↔ Fc1 - 50 MHz or 2100 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 50 MHz or 2100 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2165 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 50 MHz or 2165 MHz *whichever is the lower* ↔ 2165 MHz	-25 dBm	1 MHz	Note 2
2165 MHz ↔ 12.75 GHz	-30 dBm	1 MHz	Note 3
NOTE 1: Bandwidth as in ITU-R SM.329[1], s4.1 NOTE 2: Specification in accordance with ITU-R SM.329[1], s4.3 and Annex 7 NOTE 3: Bandwidth as in ITU-R SM.329[1], s4.1. Upper frequency as in ITU-R SM.329[1], s2.5 table 1			

Fc1: Centre frequency of emission of the first carrier transmitted by the BS.

Fc2: Centre frequency of emission of the last carrier transmitted by the BS.

6.5.3.4.3 Protection of the BS receiver of own or different BS

This requirement shall be applied in order to prevent the receivers of the BSs being desensitised by emissions from a BS transmitter. This is measured at the transmit antenna port for any type of BS which has common or separate Tx/Rx antenna ports.

6.5.3.4.3.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.26: Wide Area BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-96 dBm	100 kHz	
II	1850 - 1910 MHz	-96 dBm	100 kHz	
III	1710 - 1785 MHz	-96 dBm	100 kHz	
IV	1710 - 1755 MHz	-96 dBm	100 kHz	
V	824-849 MHz	-96 dBm	100 kHz	
VI	830-840 MHz	-96 dBm	100 kHz	

Table 6.26A: Medium Range BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-86 dBm	100 kHz	
II	1850 - 1910 MHz	-86 dBm	100 kHz	
III	1710 - 1785 MHz	-86 dBm	100 kHz	
IV	1710 - 1755 MHz	-86 dBm	100 kHz	
V	824-849 MHz	-86 dBm	100 kHz	
VI	830-840 MHz	-86 dBm	100 kHz	

Table 6.26B: Local Area BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-82 dBm	100 kHz	
II	1850 - 1910 MHz	-82 dBm	100 kHz	
III	1710 - 1785 MHz	-82 dBm	100 kHz	
IV	1710 - 1755 MHz	-82 dBm	100 kHz	
V	824-849 MHz	-82 dBm	100 kHz	
VI	830-840 MHz	-82 dBm	100 kHz	

---NEXT MODIFIED SECTION---

6.5.3.7.2 Spurious emissions (Category B)

Table 6.36C: BS Mandatory spurious emissions limits, operating band V, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 859 MHz	-36 dBm	100 kHz	Note 1
859 MHz ↔ Fc1 - 20 MHz or 859 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 20 MHz or 859 MHz *whichever is the higher* ↔ Fc2 + 20 MHz or 904 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 20 MHz or 904 MHz *whichever is the lower* ↔ 904 MHz	-25 dBm	1 MHz	Note 2
904 MHz ↔ 1 GHz	-36 dBm	100 kHz	Note 3
1GHz ↔ 12.75GHz	-30 dBm	1 MHz	Note 3

NOTE 1: Bandwidth as in ITU-R SM.329 [4], s4.1
NOTE 2: Specification in accordance with ITU-R SM.329 [4], s4.3 and Annex 7
NOTE 3: Bandwidth as in ITU-R SM.329 [4], s4.1. Upper frequency as in ITU-R SM.329 [4], s2.5 table 1

Table 6.36D: BS Mandatory spurious emissions limits, operating band IV, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Note 1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Note 1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Note 1
1GHz ↔ 2100 MHz	-30 dBm	1 MHz	Note 1
2100 MHz ↔ Fc1 - 50 MHz or 2100 MHz *whichever is the higher*	-25 dBm	1 MHz	Note 2
Fc1 - 50 MHz or 2100 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2165 MHz *whichever is the lower*	-15 dBm	1 MHz	Note 2
Fc2 + 50 MHz or 2165 MHz *whichever is the lower* ↔ 2165 MHz	-25 dBm	1 MHz	Note 2
2165 MHz ↔ 12.75 GHz	-30 dBm	1 MHz	Note 3

NOTE 1: Bandwidth as in ITU-R SM.329[1], s4.1
NOTE 2: Specification in accordance with ITU-R SM.329[1], s4.3 and Annex 7
NOTE 3: Bandwidth as in ITU-R SM.329[1], s4.1. Upper frequency as in ITU-R SM.329[1], s2.5 table 1

Fc1: Centre frequency of emission of the first carrier transmitted by the BS.

Fc2: Centre frequency of emission of the last carrier transmitted by the BS.

6.5.3.7.3 Protection of the BS receiver of own or different BS

Table 6.37: Wide Area BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-96 dBm	100 kHz	
II	1850 - 1910 MHz	-96 dBm	100 kHz	
III	1710 - 1785 MHz	-96 dBm	100 kHz	
IV	1710 - 1755 MHz	-96 dBm	100 kHz	
V	824-849 MHz	-96 dBm	100 kHz	
VI	830-840 MHz	-96 dBm	100 kHz	

Table 6.37A: Medium Range BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-86 dBm	100 kHz	
II	1850 - 1910 MHz	-86 dBm	100 kHz	
III	1710 - 1785 MHz	-86 dBm	100 kHz	
IV	1710 - 1755 MHz	-86 dBm	100 kHz	
V	824-849 MHz	-86 dBm	100 kHz	
VI	830-840 MHz	-86 dBm	100 kHz	

Table 6.37B: Local Area BS Spurious emissions limits for protection of the BS receiver

Operating Band	Band	Maximum Level	Measurement Bandwidth	Note
I	1920 - 1980MHz	-82 dBm	100 kHz	
II	1850 - 1910 MHz	-82 dBm	100 kHz	
III	1710 - 1785 MHz	-82 dBm	100 kHz	
IV	1710 - 1755 MHz	-82 dBm	100 kHz	
V	824-849 MHz	-82 dBm	100 kHz	
VI	830-840 MHz	-82 dBm	100 kHz	

---NEXT MODIFIED SECTION---

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 is 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 7.4(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 7.4 (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 7.4.

Table 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 7.4(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 7.4(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 7.4(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 7.4(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 7.4(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 7.4(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

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 7.4A(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 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 7.4A.

Table 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 7.4A(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 7.4A(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 7.4A(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 7.4A(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 7.4A(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 7.4A(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

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.

7.6 Intermodulation characteristics

7.6.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

7.6.2 Minimum Requirement

The intermodulation performance shall be met when the following signals are applied to the receiver.

Table 7.5(a): Interferer signals for intermodulation performance requirement

Operating Band	Type of Signal	Offset	Signal mean power		
			Wide Area BS	Medium Range BS	Local Area BS
I, II, III, IV, V, VI	Wanted signal	-	-115 dBm	-105 dBm	-101 dBm
	CW signal	10 MHz	-48 dBm	-44 dBm	-38 dBm
	WCDMA signal *	20 MHz	-48 dBm	-44 dBm	-38 dBm
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.5(b): Narrowband intermodulation performance requirement

Operating band	Type of Signal	Offset	Signal mean power		
			Wide Area BS	Medium Range BS	Local Area BS
II, III, IV, V	Wanted signal	-	-115 dBm	-105 dBm	-101 dBm
	CW signal	3.5 MHz	- 47 dBm	- 43 dBm	-37 dBm
	GMSK modulated*	5.9 MHz	- 47 dBm	- 43 dBm	-37 dBm
* GMSK as defined in TS 45.004 [12].					

The BER for wanted signal shall not exceed 0,001 for the parameters specified in table 7.5.

The normative reference for this requirement is in TS 25.104 [1] subclause 7.6

7.6.3 Test purpose

The test purpose is to verify the ability of the BS receiver to inhibit the generation of intermodulation products in its non-linear elements caused by the presence of two high-level interfering signals at frequencies with a specific relationship to the frequency of the wanted signal.

7.6.4 Method of test

7.6.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

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

1) Set-up the equipment as shown in annex B.

7.6.4.2 Procedures

1) Generate the wanted signal (reference signal) and adjust ATT1 to set the signal level to the BS under test to the level specified in table 7.5A.

2) Adjust the signal generators to the type of interfering signals and the frequency offsets as specified in Tables 7.5A(a) and 7.5A(b). 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 intermodulation characteristics measurement.

3) Adjust the ATT2 and ATT3 to obtain the specified level of interference signal at the BS input.

4) Measure the BER

5) Repeat the whole test for the port which was terminated.

7.6.5 Test requirements

The intermodulation performance shall be met when the following signals are applied to the receiver.

Table 7.5A(a): Interferer signals for intermodulation performance requirement

Operating Band	Type of Signal	Offset	Signal mean		
			Wide Area BS	Medium Range BS	Local Area BS
I, II, III, IV, V, VI	Wanted signal	-	-115 dBm	-105 dBm	-101 dBm
	CW signal	10 MHz	-48 dBm	-44 dBm	-38 dBm
	WCDMA signal *	20 MHz	-48 dBm	-44 dBm	-38 dBm
Note*: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.5A(b): Narrowband intermodulation performance requirement

Operating band	Type of Signal	Offset	Signal mean power		
			Wide Area BS	Medium Range BS	Local Area BS
II, III, IV, V	Wanted signal	-	-115 dBm	-105 dBm	-101 dBm
	CW signal	3.5 MHz	- 47 dBm	- 43 dBm	-37 dBm
	GMSK modulated*	5.9 MHz	- 47 dBm	- 43 dBm	-37 dBm
* GMSK as defined in TS 45.004 [12].					

The BER for wanted signal shall not exceed 0,001 for the parameters specified in table 7.5A.

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.

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 subclauses 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 and 6.5.3.4.14 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 subclauses 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 and 6.5.3.7.14 may also be applied.

---NEXT MODIFIED SECTION---

Annex D (normative): Propagation conditions

D.1 Static propagation condition

The propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading or multi-paths exist for this propagation model.

D.2 Multi-path fading propagation conditions

Table D.1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum, defined as:

(CLASS) $$S(f) \propto 1/(1-(f/f_D)^2)^{0.5}$$ for f ∈ -f_d, f_d.

Table D.1: Propagation Conditions for Multi path Fading Environments

Case 1		Case 2		Case 3		Case 4	
Speed for Band I, II, III, IV 3 km/h		Speed for Band I, II, III, IV 3 km/h		Speed for Band I, II, III, IV 120 km/h		Speed for Band I, II, III, IV 250 km/h	
Speed for Band V, VI 7 km/h		Speed for Band V, VI 7 km/h		Speed for Band V, VI 280 km/h		Speed for Band V, VI 583 km/h (Note 1)	
Relative Delay [ns]	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**
0	0	0	0	0	0	0	0
976	-10	976	0	260	-3	260	-3
		20000	0	521	-6	521	-6
				781	-9	781	-9

NOTE 1: Speed above 250km/h is applicable to demodulation performance requirements only.