TSG-RAN Meeting #7
Madrid, Spain, 13 – 15 March 2000

TSGRP#6(00)0017

Title: **Agreed CRs to TS 25.104**

Source: **TSG-RAN WG4**

Agenda item: **6.2.3**

Spec	CR	Rev	Phas	Subject	Cat	Current	New	WG4 doc
25.104	022		R99	Clarification of Receiver Dynamic Range requirement	F	3.1.0	3.2.0	R4-000030
25.104	023		R99	Change of propagation conditions for Case 2	F	3.1.0	3.2.0	R4-000096
25.104	024		R99	Removal of chapter 6.6.2.3 in 25.104	F	3.1.0	3.2.0	R4-000019
25.104	025		R99	Editorial changes to 25.104	D	3.1.0	3.2.0	R4-000086
25.104	026		R99	Corrections of spurious emissions aligning to GSM for UTRA: FDD BS	F	3.1.0	3.2.0	R4-000101
25.104	027	1	R99	Regional requirements in TS 25.104	D	3.1.0	3.2.0	R4-000299
25.104	028		R99	Specifications applicable in case of use of RF devices external to the BS	F	3.1.0	3.2.0	R4-000137
25.104	029		R99	Clarification for maximum output power and rated output power	F	3.1.0	3.2.0	R4-000186
25.104	030		R99	UL Performance requirement in multipath case 3	F	3.1.0	3.2.0	R4-000215
25.104	031		R99	ACLR	D	3.1.0	3.2.0	R4-000258
25.104	032		R99	Spectrum emission mask	F	3.1.0	3.2.0	R4-000254
25.104	033		R99	Rx spurious emissions measurement bandwidth	F	3.1.0	3.2.0	R4-000130
25.104	034		R99	Clarification for Peak code domain error	D	3.1.0	3.2.0	R4-000245
25.104	035		R99	Corrections for BS FDD Modulation Accuracy	F	3.1.0	3.2.0	R4-000026
25.104	036		R99	Modification to the handling of measurement equipment uncertainty	F	3.1.0	3.2.0	R4-000291
25.104	037		R99	Update to downlink test models	D	3.1.0	3.2.0	R4-000181
25.104	038		R99	Birth-Death tap delays	F	3.1.0	3.2.0	R4-000163

3G CHANGE REQUEST

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25.104 **CR** **022** Current Version: 3.1.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

Proposed change affects: *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

Source: RAN WG4 **Date:** 00-01-13

Subject: Clarification of Receiver Dynamic Range requirement

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: In version 3.1.0, the Receiver Dynamic Range requirement is unclear. The proposed correction specifies both the level of the received signal and the interference level. The text <REFSENS>+30 dB is replaced with –91 dBm

Clauses affected: 7.3

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:	Attached in Tdoc
Other 2G core specifications	[ ]	→ List of CRs:	
MS test specifications	[ ]	→ List of CRs:	
BSS test specifications	[X]	→ List of CRs:	
O&M specifications	[ ]	→ List of CRs:	

Other comments:

7.3 Dynamic range

~~The receiver dynamic range is the input power range at each BS antenna connector over which the {FER/BER} does not exceed a specific rate.~~

~~The static [BER/FER] reference performance as specified in clause 7.2.1 should be met over a receiver input range of [30] dB above the specified reference sensitivity level for [channel type ffs].~~

Receiver dynamic range is the receiver ability to handle a rise of interference in the reception frequency channel. The receiver shall fulfil a specified BER requirement for a specified sensitivity degradation of the wanted signal in the presence of an interfering AWGN signal in the same reception frequency channel.

7.3.1 Minimum requirement

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

Table x : Dynamic range

Parameter	**Level**	**Unit**
Data rate	12.2	kbps
Wanted signal	~~<REFSENS> + 30 dB~~ 91	dBm
Interfering AWGN signal	-73	dBm/3.84 MHz

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25.104	CR	023	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME		UTRAN / Radio	X	Core Network	

Source:	RAN WG4	**Date:**	2000-01-20

Subject:	Change of propagation conditions for Case 2

Work item:	

Category: *(only one category Shall be marked With an X)*			**Release:**		
F	Correction	X		Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:	Finalise propagation conditions for the FDD mode.

Clauses affected:	Annex B

Other specs Affected:			
Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:	

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.

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

Case 1, speed 3km/h		Case 2, speed 3 km/h		Case 3, 120 km/h	
Relative Delay [ns]	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**
0	0	0	0	0	0
976	-10	976	0	260	-3
		~~[~~20000~~]~~	0	521	-6
				781	-9

3G CHANGE REQUEST

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25.104 **CR** **024** Current Version: 3.1.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN#7 *list TSG meeting no. here ↑* for approval **X** for information *(only one box should be marked with an X)*

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

Proposed change affects: *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

Source: RAN WG4 **Date:** 21.1.2000

Subject: Removal of chapter 6.6.2.3 in 25.104

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: Requirement set in chapter 6.6.2.3 is covered by other spurious emission requirements in 25.104 and is therefore redundant.

Clauses affected: 6.6.2.3

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s). Both the transmitted power and the received power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

6.6.2.2.1 Minimum requirement

The ACLR shall be better 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

~~6.6.2.3 Protection outside a licensee's frequency block~~

~~This requirement is applicable if protection is required outside a licensee's defined frequency block.~~

~~6.6.2.3.1 Minimum requirement~~

~~This requirement applies for frequencies outside the licensee's frequency block, up to an offset of 12.5MHz from a carrier frequency.~~
~~The power of any emission shall be attenuated below the transmit power (P) by at least 43 + 10 log (P)dB.~~
~~Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz or greater. However, in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier centre frequency and one above the carrier centre frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.~~
~~When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.~~
~~The measurements of emission power shall be mean power.~~

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

3G CHANGE REQUEST

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25.104 **CR** **025** Current Version: 3.1.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

Proposed change affects: *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-01-12

Subject: Editorial changes to 25.104

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	[ ]
A	Corresponds to a correction in a 2G specification	[ ]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[X]

Reason for change: Language corrections, layout improvements, new tables and replacement of relative values with absolute values.

Clauses affected: 5.2, 6.4.1, 6.4.3, 6.4.4, 6.6.2.1, 6.6.2.2, 6.6.3.1, 6.6.3.2, 6.8.2, 7.4, 7.5, 7.6, 7.7, B.4

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

5.2 Frequency bands

UTRA/FDD is designed to operate in either of the following paired bands;

(a) 1920 – 1980MHz: Up-link (Mobile transmit, base receive)
2110 – 2170MHz: Down-link (Base transmit, mobile receive)

(b) * 1850 – 1910MHz: Up-link (Mobile transmit, base receive)
1930 – 1990MHz: Down-link (Base transmit, mobile receive)
(Note 1)

Notes:
*1. -Used in Region 2.

Additional allocations in ITU region 2 are FFS.

2. Deployment in other frequency bands is not precluded.

6.4.1 Inner loop power control in the downlink

Inner loop power control in the downlink is the ability of the BS transmitter to adjust the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

6.4.1.1 Power control steps

The power control step is the required step change in the DL transmitter output power of a code channel in response to the corresponding power control command. The ~~combined~~aggregated output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

6.4.1.1.1 Minimum requirement

The BS transmitter shall have the capability of setting the inner loop output power with a step sizes of 1dB mandatory and 0.5 dB optional

(a) The ~~tolerance of the~~ power control step due to inner loop power control shall be within the range shown in Table 6.1.
(b) The ~~tolerance of the combined~~aggregated output power change due to inner loop power control shall be within the range shown in Table 6.2.

Table 6.1: Transmitter power control step ~~tolerance~~ range

Power control commands in the down link	Transmitter power control step ~~tolerance~~range			
	1 dB step size		0.5 dB step size	
	Lower	Upper	Lower	Upper
Up (TPC command "1")	+0.5 dB	+1.5 dB	+0.25 dB	+0.75 dB
Down (TPC command "0")	-0.5 dB	-1.5 dB	-0.25 dB	-0.75 dB

Table 6.2: Transmitter ~~combined~~aggregated output power change ~~tolerance~~range

Power control commands in the down link	Transmitter ~~combined~~aggregated output power change ~~tolerance~~range after 10 consecutive equal commands (up or down)			
	1 dB step size		0.5dB step size	
	Lower	Upper	Lower	Upper
Up (TPC command "1")	+8 dB	+12 dB	+4 dB	+6 dB
Down (TPC command "0")	-8 dB	-12 dB	-4 dB	-6 dB

6.4.2 Power control dynamic range

The power control dynamic range is the difference between the maximum and the minimum transmit output power of a code channel for a specified reference condition.

6.4.2.1 Minimum requirements

Down link (DL) power control dynamic range:

Maximum power: BS maximum output power – 3 dB or greater

Minimum power: BS maximum output power – 28 dB or less

6.4.3 Total power dynamic range

The total power dynamic range is the difference between the maximum and the minimum total transmit output power for a specified reference condition.

Note: The upper limit of the dynamic range is the BS maximum output power. The lower limit of the dynamic range is the lowest minimum power from the BS when no traffic channels are activated.

6.4.3.1 Minimum requirement

The ~~down link~~downlink (DL) total power dynamic range shall be 18 dB or greater.

6.4.4 Primary CPICH power

Primary CPICH power is the transmission power of the Common Pilot Channel averaged over one frame.
Primary CPICH power is indicated on the BCH.

6.4.4.1 Requirement

CPICH power shall be within ± 2.1dB of the value indicated by a ~~signaling~~signalling message.

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 limit is specified in terms of a spectrum emission mask or 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 by the mask in the frequency range with offset Δf from 2.5 MHz to Δf_{max} from the carrier frequency. The maximum offset Δf_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 5.2, whichever is the greatest.

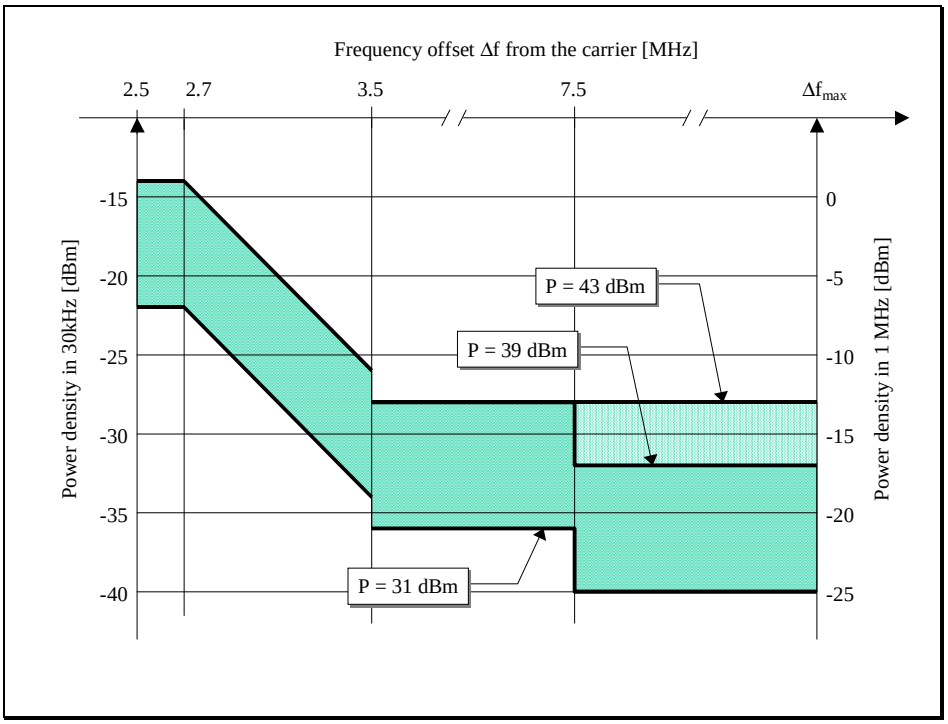

Table 6.3: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	-14 dBm	30 kHz [1]
2.7 ≤ Δf < 3.5 MHz	- 14 - 15·(Δf - 2.7) dBm	30 kHz [1]
3.5 ≤ Δf ≤ Δf_{max} MHz	-13 dBm	1 MHz [2]

Table 6.4: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	-14 dBm	30 kHz [1]
2.7 ≤ Δf < 3.5 MHz	-14 - 15·(Δf - 2.7) dBm	30 kHz [1]
3.5 ≤ Δf < 7.5 MHz	-13 dBm	1 MHz [2]
7.5 ≤ Δf ≤ Δf_{max} MHz	P - 56 dBm	1 MHz [2]

Table 6.5: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	P - 53 dBm	30 kHz [1]
2.7 ≤ Δf < 3.5 MHz	P - 53 - 15·(Δf - 2.7) dBm	30 kHz [1]
3.5 ≤ Δf < 7.5 MHz	P - 52 dBm	1 MHz [2]

$7.5 \le \Delta f \le \Delta f_{max}$ MHz	P - 56 dBm	1 MHz [2]

Table 6.6: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
$2.5 \le \Delta f < 2.7$ MHz	-22 dBm	30 kHz [1]
$2.7 \le \Delta f < 3.5$ MHz	-22 - 15·(Δf - 2.7) dBm	30 kHz [1]
$3.5 \le \Delta f < 7.5$ MHz	-21 dBm	1 MHz [2]
$7.5 \le \Delta f \le \Delta f_{max}$ MHz	-25 dBm	1 MHz [2]

Notes:

1. The first and last measurement positions with a 30 kHz filter are 2.515 MHz and 3.485 MHz
2. The first and last measurement positions with a 1 MHz filter are 4 MHz and (Δf_{max} – 500 kHz)

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s). Both the transmitted power and the received power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements shall apply whatever the type of transmitter considered (single carrier or ~~multi-~~ multiple carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

6.6.2.2.1 Minimum requirement

The ACLR shall be better 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

6.6.2.3 Protection outside a licensee's frequency block

This requirement is applicable if protection is required outside a licensee's defined frequency block.

6.6.2.3.1 Minimum requirement

This requirement applies for frequencies outside the licensee's frequency block, up to an offset of 12.5MHz from a carrier frequency.

The power of any emission shall be attenuated below the transmit power (P) by at least 43 + 10 log (P)dB.

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz or greater. However, in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier centre frequency and one above the carrier centre frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

The measurements of emission power shall be mean power.

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.

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

Either requirement applies at frequencies within the specified frequency ~~ranges which~~ranges that are more than 12.5MHz ~~under~~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.329-7 [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	Bandwidth as in ITU-R SM.329-7, s4.1
150kHz – 30MHz		10 kHz	Bandwidth as in ITU-R SM.329-7, s4.1
30MHz – 1GHz		100 kHz	Bandwidth as in ITU-R SM.329-7, s4.1

1GHz – 12.75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-7, s2.6

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.329-7 [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, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-7, s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-7, s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-7, s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, s4.1
Fc1 – 60 MHz or 2100 MHz *whichever is the higher* ↔ Fc1 – 50 MHz or 2100 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ~~more stringent than~~ ITU-R SM.329-7, s4.1
Fc1 – 50 MHz or 2100 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2180 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ~~more stringent than~~ ITU-R SM.329-7, s4.1
Fc2 + 50 MHz or 2180 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 2180 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ~~more stringent than~~ ITU-R SM.329-7, s4.1
Fc2 + 60 MHz or 2180 MHz *whichever is the lower*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, s4.1. Upper frequency as in ITU-R

↔ 12.75 GHz			SM.329-7, s2.6

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

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

6.6.3.2. Protection of the BS receiver

This requirement may be applied in order to prevent the receiver of the BS being desensitised by emissions from the BS transmitter, which are coupled between the antennas of the BS. This is measured at the transmit antenna port.

6.6.3.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

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

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980MHz For operation in Frequency Bands defined in sub-clause 5.2(a)	-96 dBm	100 kHz	
1850-1910 MHz For operation in Frequency Bands defined in sub-clause 5.2(b)	-96 dBm	100kHz	

6.8.2 ~~Modulation Accuracy~~Error Vector Magnitude

The ~~modulation accuracy~~Error Vector Magnitude is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). The requirement is valid over the total power dynamic range as ~~specifeds~~specified in 6.4.3.

6.8.2.1 Minimum requirement

The Error Vector Magnitude ~~Modulation accuracy~~ shall not be worse than 12.5 %.

7.4 Adjacent Channel Selectivity (ACS)

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

7.4.1 Minimum requirement

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

Table 7.2 : Adjacent channel selectivity

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	-115~~Reference sensitivity level + 6dB~~	dBm
Interfering signal	-52	dBm
Fuw (Modulated)	5	MHz

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 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 as specified in the table 7.3(a) below, using a 1 MHz step size.

7.5.1 Minimum requirement

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

Table 7.3(a) : Blocking performance requirement for operation in frequency bands in sub-clause 5.2(a)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1920 – 1980 MHz	-40 dBm	-115 dBm ~~<REFSENS> + 6 dB~~	10 MHz	WCDMA signal with one code
1900 – 1920 MHz 1980 – 2000 MHz	-40 dBm	-115 dBm ~~<REFSENS> + 6 dB~~	10 MHz	WCDMA signal with one code
1 MHz -1900 MHz, and 2000 MHz – 12750 MHz	-15 dBm	-115 dBm ~~<REFSENS> + 6 dB~~	—	CW carrier

Table 7.3(b) : Blocking performance requirement for operation in frequency bands in sub-clause 5.2(b)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1850 – 1910 MHz	- 40 dBm	-115 dBm ~~<REFSENS> + 6dB~~	10 MHz	WCDMA signal with one code
1830 – 1850 MHz 1910 – 1930 MHz	-40 dBm	-115 dBm ~~<REFSENS> + 6dB~~	10 MHz	WCDMA signal with one code
1 MHz – 1830 MHz 1930 MHz – 12750 MHz	-15 dBm	-115 dBm ~~<REFSENS> + 6dB~~	—	CW carrier

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 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.

7.6.1 Minimum ~~requriement~~requirement

The static reference performance as specified in clause 7.2.1 should be met when the following signals are coupled to BS antenna input

- A wanted signal at the assigned channel frequency~~, 6 dB above the static reference level~~ with a signal level of -115 dBm.
- Two interfering signals with the following parameters.

Table 7.3 : Intermodulation performance requirement

Interfering Signal Level	Offset	Type of Interfering Signal
- 48 dBm	10 MHz	CW signal
- 48 dBm	20 MHz	WCDMA signal with one code

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:~~The spurious emission shall be:~~

~~(a)Less than -78 dBm/3.84 MHz at the BS receiver antenna connector, for frequencies from 1900MHz to 1980MHz and from 2010MHz to 2025MHz.~~

~~(b)Less than -57 dBm/100 kHz at the BS receiver antenna connector, for frequencies band from 9kHz to 1GHz.~~

~~(c)Less than -47 dBm/100 kHz at the BS receiver antenna connector, for frequencies band from 1GHz to 12.75 GHz with the exception of frequencies between 12.5MHz below the first carrier frequency used, and 12.5MHz above the last carrier frequency used.~~

Band	Maximum level	Measurement Bandwidth	Note
1900 – 1980 MHz and 2010 – 2025 MHz	-78 dBm	3.84 MHz	
9 kHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 12.75 GHz	-47 dBm	100 kHz	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.

B.4 Birth-Death propagation conditions

The dynamic propagation conditions for the test of the baseband performance is a non-fading propagation channel with two taps. The moving propagation conditions 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~~ are shown in Figure B.2.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	026	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: *list expected approval meeting # here ↑*

for approval [ ] for information [ ]

strategic [ ] non-strategic [ ] *(for SMG use only)*

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

roposed change affects: *least one should be marked with an X)*

(U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

ource: RAN WG4 **Date:** 2000-01-19

ubject: Corrections of spurious emissions aligning to GSM for UTRA: FDD BS

ork item: 25-Series

ategory: *ly one category all be marked h an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

eason for ange:

TS 25.104 cl.6.6.3.3.1.1 BS Tx spurious matched to GSM 05.05 v.8.2.0 cl.4.3.2 BTS spurious corrects the limit to –57 dBm/100 kHz for co-coverage of GSM 900 MS Rx bands.
TS 25.104 cl.6.6.3.4.1.1 BS Tx spurious matched to GSM 05.05 v.8.2.0 cl.4.3.2 BTS spurious corrects the limit to –47 dBm/100 kHz for co-coverage of DCS 1800 MS Rx bands.
Some editorial modifications are done as well.

lauses affected: 6.6.3.3, 6.6.3.4

ther specs fected:

Other 3G core specifications	[ ]	→ List of CRs:	
Other GSM core specifications	[ ]	→ List of CRs:	
MS test specifications	[ ]	→ List of CRs:	
BSS test specifications	[ ]	→ List of CRs:	
O&M specifications	[ ]	→ List of CRs:	

ther mments:

6.6.3.3 Co-existence with GSM 900

6.6.3.3.1 Operation in the same geographic area

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

~~[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.~~

6.6.3.3.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

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

Band	Maximum Level	Measurement Bandwidth	Note
921 – 960 MHz	~~-~~457 dBm	100 kHz	

6.6.3.3.2 Co-located base stations

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

6.6.3.3.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

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

Band	Maximum Level	Measurement Bandwidth	Note
876-915 MHz	-98 dBm ~~-98 dBm~~	100 kHz	

6.6.3.4 Co-existence with DCS 1800

6.6.3.4.1 Operation in the same geographic area

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

~~[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.~~

6.6.3.4.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

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

Band	Maximum Level	Measurement Bandwidth	Note
1805 – 1880 MHz	~~-~~547 dBm	100 kHz	

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	027 r1	Current Version:	3.1.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X] for information [ ] *(only one box should be marked with an X)*

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

Proposed change affects: *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-03-03

Subject: Regional requirements in TS 25.104

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: Several requirements in TS 25.104 will be applied regionally, since they depend on regional regulatory requirements or on co-existence with systems that are deployed regionally. The proposed text for the “General” section clarifies this.
A regional requirement is also added for Clause 6.2.

Clauses affected: 4.3, 6.2.1.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:	
Other 2G core specifications	[ ]	→ List of CRs:	
MS test specifications	[ ]	→ List of CRs:	
BSS test specifications	[X]	→ List of CRs:	CR 25.141-xxx attached
O&M specifications	[ ]	→ List of CRs:	

Other comments:

4 General

4.1 Measurement uncertainty

The requirements given in this specification are absolute. Compliance with the requirement is determined by comparing the measured value with the specified limit, without making allowance for measurement uncertainty.

4.2 Base station classes

The requirements in this specification apply to base station intended for general-purpose applications.

In the future further classes of base stations may be defined; the requirements for these may be different than for general-purpose applications.

4.3 Regional requirements

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

Table 4.1: List of regional requirements.

Clause number	Requirement	Comments
5.2	Frequency bands	Some bands may be applied regionally.
5.3	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
6.2.1	Base station maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the range of conditions defined as normal.
6.6.2.1	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.6.2.3	Protection outside a licensee's frequency block	This requirement is applicable if protection is required outside a licensee's frequency block.
6.6.3.1.1	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-7 [1], are applied.
6.6.3.1.2	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-7 [1], are applied.
6.6.3.3.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.

6.6.3.3.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.6.3.4.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.6.3.4.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.6.3.5	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.
6.6.3.6	Co-.existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in sub-clause 5.2(a) and 1930-1990 MHz, as defined in sub-clause 5.2(b) in geographic areas in which both an adjacent band service and UTRA are deployed.
6.6.3.7.1	Co-existence with UTRA TDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.7.2	Co-existence with UTRA TDD – Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.

6.2 Base station output power

Output power, Pout, of the base station is the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter.

6.2.1 Base station maximum output power

Maximum output power, Pmax, of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.

6.2.1.1 Minimum requirement

In normal conditions, the Base station maximum output power shall remain within +2 dB and –2dB of the manufacturer's rated power.

In extreme conditions, the Base station maximum output power shall remain within +2.5 dB and –2.5 dB of the manufacturer's rated power.

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the range of conditions defined as normal.

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104 **CR** **028** Current Version: 3.0.1

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

Source: RAN WG4 **Date:** 00-02-29

Subject: Specifications applicable in case of use of RF devices external to the BS

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: The purpose of that contribution is to clarify the situation when RF apparatuses outside of the BS are used (*i.e. a masthead power amplifier or a low noise amplifier external to the BS cabinet*).

Clauses affected: 6.1 & 7.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

6 Transmitter characteristics

6.1 General

~~Unless detailed the transmitter characteristic are specified at the antenna connector.~~

Unless otherwise stated, the transmitter characteristics are specified at the BS antenna connector (test port A) with a full complement of transceivers for the configuration in normal operating conditions. If any external apparatus such as a TX amplifier, a diplexer, a filter or the combination of such devices is used, requirements apply at the far end antenna connector (port B).

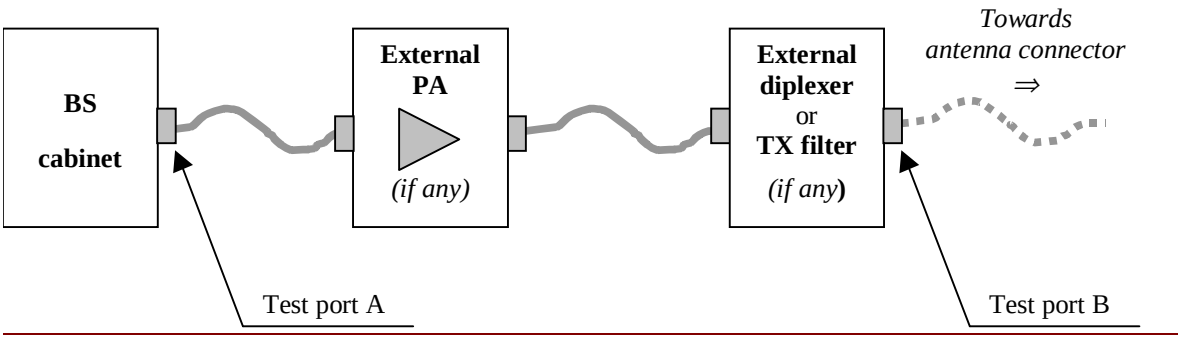

Figure 1: Transmitter test ports

7 Receiver characteristics

7.1 General

~~Unless detailed the receiver characteristic are specified at each antenna connector of the BS.~~

Unless otherwise stated, the receiver characteristics are specified at the BS antenna connector (test port A) with a full complement of transceivers for the configuration in normal operating conditions. If any external apparatus such as a RX amplifier, a diplexer, a filter or the combination of such devices is used, requirements apply at the far end antenna connector (port B).

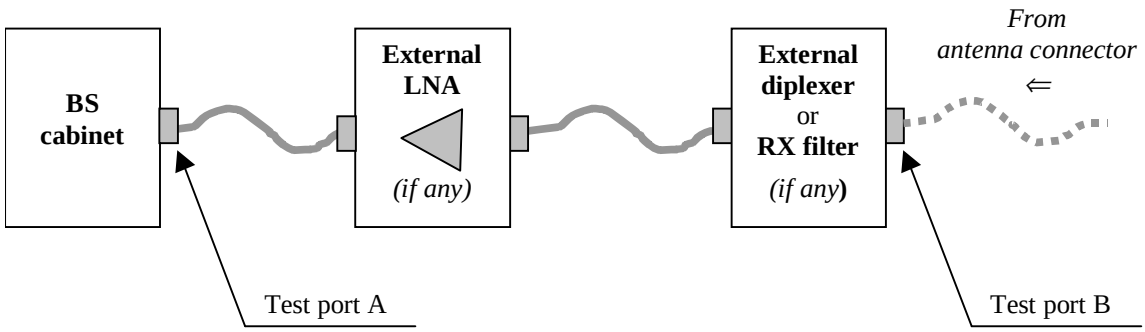

Figure 2: Receiver test ports

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	029	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#7	for approval	X	strategic		(for SMG use only)
List expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME		UTRAN / Radio	X	Core Network	

Source:	RAN WG4	**Date:**	

Subject:	Clarification for maximum output power and rated output power

Work item:	

Category: *(only one category shall be marked with an X)*				**Release:**	
F	Correction	X		Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:	The reason for this CR is to clarify the maximum output power and rated power definitions

Clauses affected:	6.2

Other specs Affected:				
	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:	

6 Transmitter characteristics

6.1 General

Unless detailed the transmitter characteristic are specified at the antenna connector.

6.2 Base station output power

Output power, Pout, of the base station is the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter.

Rated output power, PRAT, of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.

6.2.1 Base station maximum output power

Maximum output power, Pmax, of the base station is the mean power level per carrier measured at the antenna connector in specified reference condition.

6.2.1.1 Minimum requirement

In normal conditions, the Base station maximum output power shall remain within +2 dB and –2dB of the manufacturer's rated output power.

In extreme conditions, the Base station maximum output power shall remain within +2.5 dB and –2.5 dB of the manufacturer's rated output power.

6.3 Frequency stability

Frequency stability is ability of the BS to transmit at the assigned carrier frequency.

6.3.1 Minimum requirement

The modulated carrier frequency of the BS shall be accurate to within ± 0.05 ppm for RF frequency generation.

6.4 Output power dynamics

Power control is used to limit the interference level. The transmitter uses a quality-based power control on both the uplink and downlink.

6.4.1 Inner loop power control in the downlink

Inner loop power control in the downlink is the ability of the BS transmitter to adjust the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

6.4.1.1 Power control steps

The power control step is the required step change in the DL transmitter output power of a code channel in response to the corresponding power control command. The combined output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

CHANGE REQUEST

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25.104	CR	030	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG RAN#7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 3.3.2000

Subject: UL Performance requirement in multipath case 3

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: As previous agreed, simulations to derive performance requirements in UL multipath case 3 have been checked. Performance requirements are updated to reflect simulation results.

Clauses affected: 8.3.3.1

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

384 kbps	0.9 dB	1.0 dB

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

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

8.3.1.1 Minimum requirement

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

Table 8.3: Performance requirements in multipath Case 1 channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}
12.2 kbps	n.a.	11.9 dB
64 kbps	6.2 dB	9.2 dB
144 kbps	5.4 dB	8.4 dB
384 kbps	5.8 dB	8.8 dB

8.3.2 Multipath fading Case 2

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

8.3.2.1 Minimum requirement

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

Table 8.4: Performance requirements in multipath Case 2 channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}
12.2 kbps	n.a.	9.0 dB
64 kbps	4.3 dB	6.4 dB
144 kbps	3.7 dB	5.6 dB
384 kbps	4.1 dB	6.1 dB

8.3.3 Multipath fading Case 3

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

8.3.3.1 Minimum requirement

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

Table 8.5: Performance requirements in multipath Case 3 channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}	Required E_b/N_0 BLER < 10^{-3}
12.2 kbps	n.a.	6.7 dB	7.5 dB
64 kbps	2.9 ~~2.7~~ dB	3.3 ~~3.2~~ dB	3.6 ~~3.4~~ dB
144 kbps	2.3 ~~2.2~~ dB	2.7 ~~2.5~~ dB	3.1 ~~2.8~~ dB
384 kbps	2.7 ~~2.6~~ dB	3.1 ~~3.0~~ dB	3.7 ~~3.5~~ dB

8.4 Demodulation of DCH in moving propagation conditions

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

8.4.1 Minimum requirement

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

Table 8.6: Performance requirements in moving channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}
12.2 kbps	n.a.	
64 kbps		
144 kbps		
384 kbps		

8.5 Demodulation of DCH in birth/death propagation conditions

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

8.5.1 Minimum requirement

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

Table 8.7: Performance requirements in birth/death channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	031	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN #7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: RAN WG4 **Date:** 00-02-27

Subject: Clarification of ACLR

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification	X		Release 99	X
				Release 00	

Reason for change: This CR clarifies the definition of ACLR.

Clauses affected: 6.6.2.2, 6.6.2.2.1

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured ~~after a receiver filter~~ in an~~the~~ adjacent channel~~(s)~~. Both the transmitted power and the ~~received~~ adjacent channel power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements shall apply ~~whatever the type of transmitter considered~~ for all configurations of BS (single carrier or multi-carrier), and for ~~. It applies for~~ all ~~transmission~~ operating modes foreseen by the manufacturer's specification.

6.6.2.2.1 Minimum requirement

The ACLR shall be ~~better~~ 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

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	032	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN #7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: RAN WG4 **Date:** 00-02-27

Subject: CR for Spectrum emission mask in TS 25.104

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The frequency ranges for measurement are currently only defined in a note. This is ambiguous, and is incorrect according to 3GPP drafting rules. At the same time, a number of editorial improvements are also made.

Clauses affected: 6.6.2, 6.6.2.1, 6.6.2.1.1

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications	X	→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments: The current way that the requirement is defined results in some ambiguity at the offset where the measurement bandwidth changes. It is important for the spectrum mask to be clearly defined at all offsets, so that co-existence with other systems can be evaluated.

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 ~~limit~~requirement ~~-~~is specified both in terms of a spectrum emission mask and~~or~~ adjacent channel power ratio for the transmitter.

6.6.2.1 Spectrum emission mask

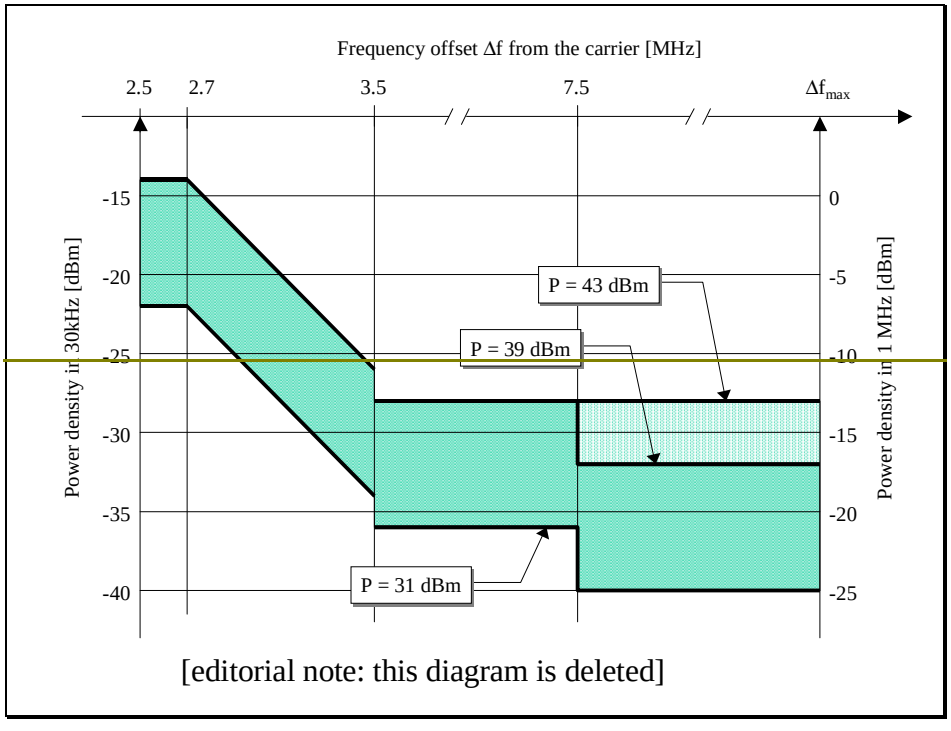
The mask defined in Table 6.3 to 6.6 below may be mandatory in certain regions. In other regions this mask may not be applied.

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 ~~by the mask~~ in tables 6.3 to 6.6 for the appropriate BS maximum output power, in the frequency range ~~with offset~~ from Δf ~~=from~~ 2.5 MHz to ~~Δ~~f_offset$_{max}$ from the carrier frequency~~.~~, where:

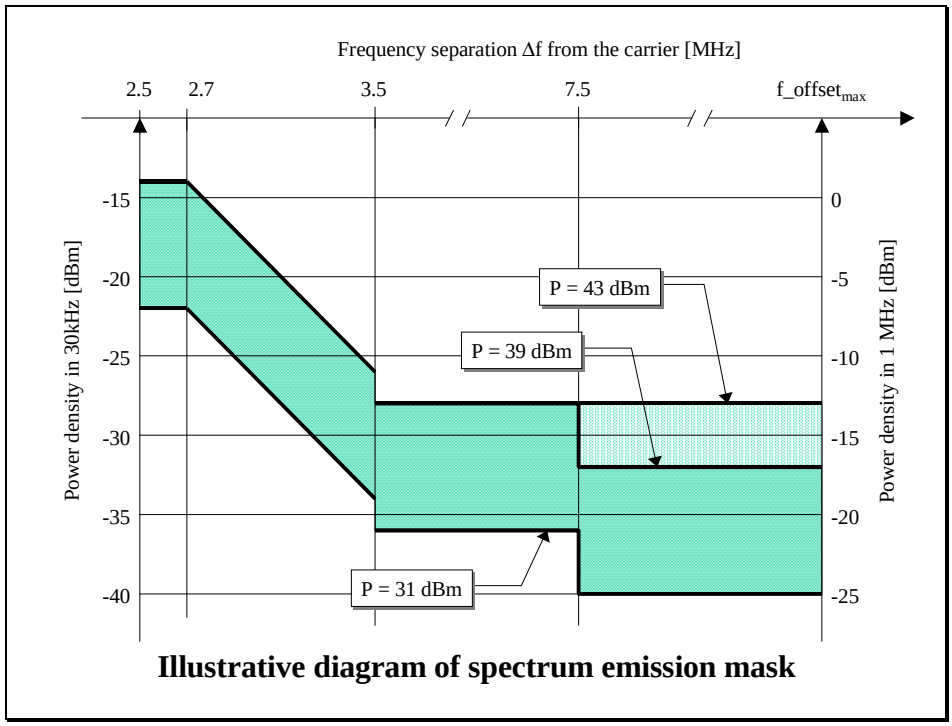
- Δf is the separation between the carrier frequency and the nominal –3dB point of the measuring filter closest to the carrier frequency.

- F_offset is the separation between the carrier frequency and the centre of the measuring filter.

- ~~The maximum offset Δ~~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 greate~~rst~~.



[editorial note: this diagram is deleted]



Illustrative diagram of 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	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	30 kHz [1]
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	- 14 - 15·(f_offset~~Δf~~ - 2.715) dBm	30 kHz [1]
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf ~~≤ Δf$_{max}$~~ MHz	4.0MHz ≤ f_offset < f_offset$_{max}$	-13 dBm	1 MHz [2]

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	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	30 kHz [1]
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-14 - 15·(f_offset~~Δf~~ - 2.715) dBm	30 kHz [1]
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 7.5MHz	-13 dBm	1 MHz [2]
7.5 ≤ Δf ~~≤ Δf$_{max}$~~ MHz	7.5MHz ≤ f_offset < f_offset$_{max}$	P - 56 dBm	1 MHz [2]

Table 6.5: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter –3dB	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth

point, Δf	filter centre frequency, f_offset		bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P - 53 dBm	30 kHz [1]
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	P - 53 - 15·(f_offset Δf - 2.715) dBm	30 kHz [1]
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 7.5MHz	P - 52 dBm	1 MHz [2]
7.5 ≤ Δf ≤ Δf_{max} MHz	7.5MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz [2]

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	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-22 dBm	30 kHz [1]
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-22 - 15·(f_offset Δf - 2.715) dBm	30 kHz [1]
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 7.5MHz	-21 dBm	1 MHz [2]
7.5 ≤ Δf ≤ Δf_{max} MHz	7.5MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz [2]

Notes:

1. NOTE: This frequency range ensures that the range of values of f_offset is continuous. The first and last measurement positions with a 30 kHz filter are 2.515 MHz and 3.485 MHz

2. The first and last measurement positions with a 1 MHz filter are 4 MHz and (Δf_{max} - 500 kHz)

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104 **CR** **033** Current Version: 3.1.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

Proposed change affects: *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-03-02

Subject: Rx spurious emissions measurement bandwidth

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: The measurement bandwidth applied from 1 GHz to 12.75 GHz is changed to 1 MHz according to ITU-R SM.329-7.

Clauses affected: 7.7.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:	
Other 2G core specifications	[ ]	→ List of CRs:	
MS test specifications	[ ]	→ List of CRs:	
BSS test specifications	[X]	→ List of CRs:	CR 25.141-xxx in this Tdoc 130
O&M specifications	[ ]	→ List of CRs:	

Other comments:

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 spurious emission shall be:

(a) Less than –78 dBm/3.84 MHz at the BS receiver antenna connector, for frequencies from 1900MHz to 1980MHz and from 2010MHz to 2025MHz.

(b) Less than –57 dBm/100 kHz at the BS receiver antenna connector, for frequencies band from 9kHz to 1GHz.

(c) Less than –47 dBm/~~100 kHz~~1 MHz at the BS receiver antenna connector, for frequencies band from 1GHz to 12.75 GHz with the exception of frequencies between 12.5MHz below the first carrier frequency used, and 12.5MHz above the last carrier frequency used.

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25.104	CR	034	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#7	for approval	X	strategic		(for SMG use only)
List expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: Clarification for Peak code domain error

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	X

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Clarify definition for Peak code domain error

Clauses affected: 6.8.3 Peak code domain error

Other specs Affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

power expressed as a %. The measurement interval is one power control group (timeslot). The requirement is valid over the total power dynamic range as specifed in 6.4.3.

6.8.2.1 Minimum requirement

The Modulation accuracy shall not be worse than 12.5 %.

6.8.3 Peak code Domain error

The code domain error is computed by projecting the error vector onto the code domain at the maximum spreading factor. The code domain error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform expressed in dB. The peak code domain error is defined as the maximum value for the code domain error. The measurement interval is one power control group (timeslot).

6.8.3.1 Minimum requirement

The peak code domain error shall not exceed -33 dB

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25.104	CR	035	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN #7	For approval	X	strategic		*(for SMG use only)*
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 13/1/2000

Subject: Corrections for BS FDD Modulation Accuracy

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The Modulation Accuracy is proposed to be changed to 17.5%.

Clauses affected: 6.8.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications	X	→ List of CRs:	TS 25.141 v3.0.0
O&M specifications		→ List of CRs:	

Other comments:

6.8.2 Modulation Accuracy

The modulation accuracy is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). The requirement is valid over the total power dynamic range as specifed in 6.4.3.

6.8.2.1 Minimum requirement

The Modulation accuracy shall not be worse than 17.5~~12.5~~ %.

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25.104	CR	036	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG RAN #7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-03-03

Subject: Modification to the handling of measurement equipment uncertainty.

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Due to a previous misunderstanding the specification is returned to its original position.

Clauses affected: 4

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

4 General

4.1 Measurement uncertainty

~~The requirements given in this specification are absolute. Compliance with the requirement is determined by comparing the measured value with the specified limit, without making allowance for measurement uncertainty.~~

The requirements given in this specification make no allowance for measurement uncertainty. Where the measurement uncertainty can be determined, the test limit shall be relaxed from the value given in this specification. See section 4 of 25.141. Where the measurement uncertainty cannot reasonably be determined, the “Shared Risk” principle is applied, i.e. the test limit is not relaxed.

The Shared Risk principle is defined in ETR 028.

3GPP TSG RAN WG4
29th Feb - 3rd March 2000
San Diego, California, USA

3GPP/TSG R4 #11 (00) 0181

CHANGE REQUEST

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25.104	CR	037	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG RAN #7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: Agilent Technologies **Date:** 2000-02-29

Subject: Clarification of Eb/No and BLER relationship

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification	X		Release 99	X
				Release 00	

Reason for change: The current text is unclear

Clauses affected: 8.1, 8.2, 8.3, 8.4, 8.5

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: Corresponding change needed to 25.141
R4-000215 makes changes to the numbers in the tables. This CR is intended to change the format.

8 Performance requirement

8.1 General

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

The requirements only apply to a base station with dual receiver antenna diversity. The required E_b/N_0 shall be applied separately at each antenna port.

Table 8.1: Summary of Base Station performance targets

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

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

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

8.2.1.1 Minimum requirement

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

~~**Table 8.2: Performance requirements in AWGN channel.**~~

~~Measurement channel~~	~~Required E_b/N_0 BLER < 10^{-1}~~	~~Required E_b/N_0 BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~5.1 dB~~

~~64 kbps~~	~~1.5 dB~~	~~1.7 dB~~
~~144 kbps~~	~~0.8 dB~~	~~0.9 dB~~
~~384 kbps~~	~~0.9 dB~~	~~1.0 dB~~

Table 8.2: Performance requirements in AWGN channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	5.1 dB	$< 10^{-2}$
64 kbps	1.5 dB	$< 10^{-1}$
	1.7 dB	$< 10^{-2}$
144 kbps	0.8 dB	$< 10^{-1}$
	0.9 dB	$< 10^{-2}$
384 kbps	0.9 dB	$< 10^{-1}$
	1.0 dB	$< 10^{-2}$

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

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

8.3.1.1 Minimum requirement

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

~~**Table 8.3: Performance requirements in multipath Case 1 channel.**~~

~~Measurement channel~~	~~Required E_b/N_0 BLER < 10^{-1}~~	~~Required E_b/N_0 BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	~~11.9 dB~~
~~64 kbps~~	~~6.2 dB~~	~~9.2 dB~~
~~144 kbps~~	~~5.4 dB~~	~~8.4 dB~~
~~384 kbps~~	~~5.8 dB~~	~~8.8 dB~~

Table 8.3: Performance requirements in multipath Case 1 channel.

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

64 kbps	6.2 dB	$< 10^{-1}$
	9.2 dB	$< 10^{-2}$
144 kbps	5.4 dB	$< 10^{-1}$
	8.4 dB	$< 10^{-2}$
384 kbps	5.8 dB	$< 10^{-1}$
	8.8 dB	$< 10^{-2}$

8.3.2 Multipath fading Case 2

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

8.3.2.1 Minimum requirement

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

~~**Table 8.4: Performance requirements in multipath Case 2 channel.**~~

~~Measurement channel~~	~~Required E_b/N_0 BLER $< 10^{-1}$~~	~~Required E_b/N_0 BLER $< 10^{-2}$~~
~~12.2 kbps~~	~~n.a.~~	~~9.0 dB~~
~~64 kbps~~	~~4.3 dB~~	~~6.4 dB~~
~~144 kbps~~	~~3.7 dB~~	~~5.6 dB~~
~~384 kbps~~	~~4.1 dB~~	~~6.1 dB~~

Table 8.4: Performance requirements in multipath Case 2 channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	9.0 dB	$< 10^{-2}$
64 kbps	4.3 dB	$< 10^{-1}$
	6.4 dB	$< 10^{-2}$
144 kbps	3.7 dB	$< 10^{-1}$
	5.6 dB	$< 10^{-2}$
384 kbps	4.1 dB	$< 10^{-1}$
	6.1 dB	$< 10^{-2}$

Multipath fading Case 3

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

8.3.3.1 Minimum requirement

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

~~**Table 8.5: Performance requirements in multipath Case 3 channel.**~~

~~Measurement channel~~	~~Required E_b/N_0 BLER < 10^{-1}~~	~~Required E_b/N_0 BLER < 10^{-2}~~	~~Required E_b/N_0 BLER < 10^{-3}~~
~~12.2 kbps~~	~~n.a.~~	~~6.7 dB~~	~~7.5 dB~~
~~64 kbps~~	~~2.7 dB~~	~~3.2 dB~~	~~3.4 dB~~
~~144 kbps~~	~~2.2 dB~~	~~2.5 dB~~	~~2.8 dB~~
~~384 kbps~~	~~2.6 dB~~	~~3.0 dB~~	~~3.5 dB~~

Table 8.5: Performance requirements in multipath Case 3 channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	6.7 dB	$< 10^{-2}$
	7.5 dB	$< 10^{-3}$
64 kbps	2.7 dB	$< 10^{-1}$
	3.2 dB	$< 10^{-2}$
	3.4 dB	$< 10^{-3}$
144 kbps	2.2 dB	$< 10^{-1}$
	2.5 dB	$< 10^{-2}$
	2.8 dB	$< 10^{-3}$
384 kbps	2.6 dB	$< 10^{-1}$
	3.0 dB	$< 10^{-2}$
	3.5 dB	$< 10^{-3}$

8.4 Demodulation of DCH in moving propagation conditions

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

8.4.1 Minimum requirement

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

~~**Table 8.6: Performance requirements in moving channel.**~~

~~Measurement channel~~	~~Required E_b/N_0 BLER < 10^{-1}~~	~~Required E_b/N_0 BLER < 10^{-2}~~
~~12.2 kbps~~	~~n.a.~~	

~~64 kbps~~		
~~144 kbps~~		
~~384 kbps~~		

Table 8.6: Performance requirements in moving channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
		$< 10^{-2}$
64 kbps		$< 10^{-1}$
		$< 10^{-2}$
~~144 kbps~~		~~$< 10^{-1}$~~
		~~$< 10^{-2}$~~
~~384 kbps~~		~~$< 10^{-1}$~~
		~~$< 10^{-2}$~~

8.5 Demodulation of DCH in birth/death propagation conditions

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

8.5.1 Minimum requirement

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

~~**Table 8.7: Performance requirements in birth/death channel.**~~

~~Measurement channel~~	~~Required E_b/N_0 BLER $< 10^{-1}$~~	~~Required E_b/N_0 BLER $< 10^{-2}$~~
~~12.2 kbps~~	~~n.a.~~	
~~64 kbps~~		
~~144 kbps~~		
~~384 kbps~~		

Table 8.7: Performance requirements in birth/death channel.

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

		< 10^{-2}
~~144 kbps~~		~~< 10^{-1}~~
		~~< 10^{-2}~~
~~384 kbps~~		~~< 10^{-1}~~
		~~< 10^{-2}~~

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25.104	CR	038	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-02-24

Subject: Birth-Death tap delays
Tap strengths for Birth-Death and Moving propagation conditions

Work item:

Category: *(only one category Shall be marked With an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Finalise propagation conditions for the FDD mode.

Clauses affected: Annex B

Other specs Affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

Annex B (normative): Propagation conditions

B.1 General

B.2 Propagation Conditions

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.

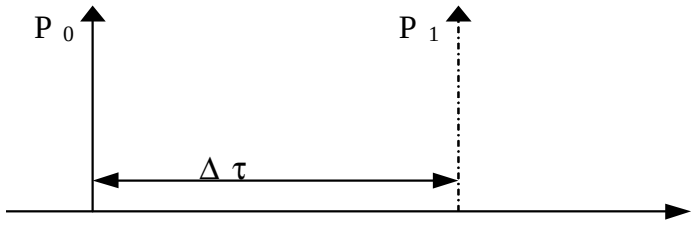

Figure B1: The moving propagation conditions

$$\Delta\tau = \left(1 + \frac{A}{2}(1 + \sin(\Delta\omega \cdot t))\right) \mu s \qquad \textit{Equation B.1}$$

The parameters in the equation are shown in.

A	5 μs
Δω	$40*10^{-3}$ s^{-1}

B.2.4 Birth-Death propagation conditions

The dynamic propagation conditions for the test of the baseband 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 B2.

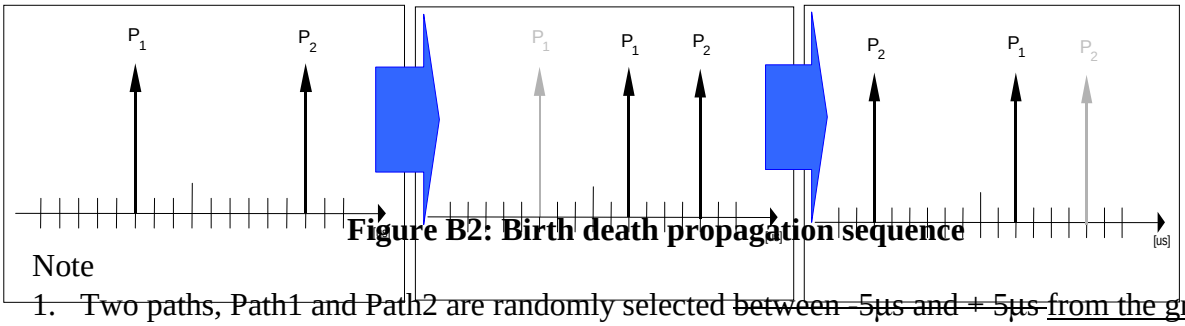

Figure B2: Birth death propagation sequence

Note

1. Two paths, Path1 and Path2 are randomly selected ~~between -5μs and + 5μs~~ from the group [-5, -4, -3, -2, -1, 0 ,1, 2, 3, 4, 5] μs. The paths have equal strengths and equal phases.
2. After 191 ms, Path1 vanishes and reappears immediately at a new location randomly selected ~~between -5μs and + 5μs from~~ from the group [-5, -4, -3, -2, -1, 0 ,1, 2, 3, 4, 5] μs but excludes the point Path2.

3. After an additional 191 ms, Path2 vanishes and reappears immediately at a new location randomly selected ~~between - 5μs and + 5μs~~ from the group [-5, -4, -3, -2, -1, 0 ,1, 2, 3, 4, 5] μs but excludes the point Path1.
4. The sequence in 2) and 3) is repeated.