

**TSG-RAN Meeting #11  
Palm Springs, CA, USA, 13 - 16 March 2001**

**RP-010087**

**Title: Agreed CRs (Release '99) to TS 25.104**

**Source: TSG-RAN WG4**

**Agenda item: 5.4.3**

Doc-1st-Level	Spec	CR	Subject	Cat	Status-2nd-Level	Version-Current	Version-New
RP-010087	25.104	55	CR to 25.104 for Test Tolerances	F	agreed	3.5.0	3.6.0
RP-010087	25.104	56	Correction of reference to SM.329-8 in TS 25.104	F	agreed	3.5.0	3.6.0
RP-010087	25.104	57	Receiver Blocking requirement for co-existence with GSM/DCS and co-located base stations - revised.	F	agreed	3.5.0	3.6.0
RP-010087	25.104	58	UL Performance requirement in fast fading	F	agreed	3.5.0	3.6.0
RP-010087	25.104	59	Performance requirement for 250km/h	F	agreed	3.5.0	3.6.0
RP-010087	25.104	60	Definition of EVM / PCDE measurement period	F	agreed	3.5.0	3.6.0
RP-010087	25.104	61	Inclusion of environmental requirements	F	agreed	3.5.0	3.6.0

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

**CHANGE REQUEST**
 ⌘ **25.104 CR 55** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network 

<b>Title:</b>	⌘ CR to 25.104 for Test Tolerances		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 27/01/01
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> 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)	

<b>Reason for change:</b>	⌘ New definitions of terms
<b>Summary of change:</b>	⌘
<b>Consequences if not approved:</b>	⌘ Inconsistency of wording between standards

<b>Clauses affected:</b>	⌘
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> O&M Specifications ⌘
<b>Other comments:</b>	⌘

**How to create CRs using this form:**
 Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

---

## 4 General

### 4.1 Relationship between Minimum Requirements and Test Requirements

The Minimum Requirements given in this specification make no allowance for measurement uncertainty. The test specification 25.141 section 4 defines Test Tolerances. These Test Tolerances are individually calculated for each test. The Test Tolerances are ~~then added used~~ to relax the ~~limits~~ Minimum Requirements in this specification to create Test Requirements.

The measurement results returned by the Test System are compared - without any modification - against the ~~Test limits~~ Requirements as defined by the shared risk principle.

The Shared Risk principle is defined in ETR 273 Part 1 sub-part 2 section 6.5.

## CHANGE REQUEST

⌘ **25.104 CR 56** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	⌘ Correction of reference to SM.329-8 in TS 25.104		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘ -	<b>Date:</b>	⌘ 2001-02-17
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> 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)	

**Reason for change:** ⌘ The reference was misleading since the current specification of Category A and B spurious emissions requirements are in accordance with the recently published SM.329-8.

**Summary of change:** ⌘ Reference is corrected to point at the relevant parts of SM.329-8.

**Consequences if not approved:** ⌘ Regional bodies may misunderstand the background of the spurious emissions requirement.

**Clauses affected:** ⌘ 2, 4.3, 6.6.3.1.1, 6.6.3.1.2

**Other specs affected:** ⌘  Other core specifications ⌘  Test specifications ⌘ CR for TS 25.141 in Tdoc R4-010340  
 O&M Specifications

**Other comments:** ⌘ This is a revision of the CR in R4-010198.

---

## 2 References

The following documents contain provisions, which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] ITU-R Recommendation SM.329-87, "Spurious emissions".
- [2] (void)
- [3] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".
- [5] 3GPP TS 25.104: "UTRA (BS) FDD; Radio transmission and reception".

## 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.329-87 [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.329-87 [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.

6.6.3.1.1 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.329-87 [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.329-87, s4.1
150kHz - 30MHz		10 kHz	Bandwidth as in ITU-R SM.329-87, s4.1
30MHz - 1GHz		100 kHz	Bandwidth as in ITU-R SM.329-87, s4.1
1GHz - 12.75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-87, s2.5 Table 16

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.329-87 [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.329-87, s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-87, s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-87, s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz <i>whichever is the higher</i>	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-87, s4.1
Fc1 - 60 MHz or 2100 MHz <i>whichever is the higher</i> ↔ Fc1 - 50 MHz or 2100 MHz <i>whichever is the higher</i>	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-87, s4.34 and Annex 7
Fc1 - 50 MHz or 2100 MHz <i>whichever is the higher</i> ↔ Fc2 + 50 MHz or 2180 MHz <i>whichever is the lower</i>	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-87, s4.34 and Annex 7
Fc2 + 50 MHz or 2180 MHz <i>whichever is the lower</i> ↔ Fc2 + 60 MHz or 2180 MHz <i>whichever is the lower</i>	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-87, s4.34 and Annex 7
Fc2 + 60 MHz or 2180 MHz <i>whichever is the lower</i> ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-87, s4.1. Upper frequency as in ITU-R SM.329-87 s2.5 Table 16

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.

**CHANGE REQUEST**

⌘ **25.104 CR 57** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	⌘ Receiver Blocking requirement for co-existence with GSM/DCS and co-located base stations – revised.
<b>Source:</b>	⌘ RAN WG4
<b>Work item code:</b>	⌘ <b>Date:</b> ⌘ 19.02.01
<b>Category:</b>	⌘ <b>F</b> <b>Release:</b> ⌘ R99
<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (essential correction)  <b>A</b> (corresponds to a correction in an earlier release)  <b>B</b> (Addition of feature),  <b>C</b> (Functional modification of feature)  <b>D</b> (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	
<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)  R96 (Release 1996)  R97 (Release 1997)  R98 (Release 1998)  R99 (Release 1999)  REL-4 (Release 4)  REL-5 (Release 5)</p>	

<b>Reason for change:</b>	⌘ Insufficient blocking requirement for co-existence with GSM/DCS and co-located base stations. In countries deploying GSM/DCS networks co-location of GSM/DCS BTS with UMTS NodeB's is to be expected for a significant part of sites. In this case the UMTS Node B has to be able to handle the wanted GSM/DCS transmissions as an out of band blocking source. Assuming a GSM/DCS BTS output power of 40 dBm, and applying the agreed 30 dB minimum coupling loss for co-siting, gives an interfering signal of 10 dBm. As the GSM/DCS BTS may be using multiple carriers, a multiple interferer margin should be added. Taking the multiple interferer margin MIM = 6 dB used in R4-010424, gives an out of band blocking signal of 16 dBm, Therefore 16 dBm is suggested as the receiver blocking requirement for a blocking signal in the GSM and DCS BTS TX bands: 925-960 MHz and 1805-1880 MHz.
<b>Summary of change:</b>	⌘ Tightening of receiver blocking requirement for co-existence with GSM/DCS and co-located base stations.
<b>Consequences if not approved:</b>	⌘ Node B could be blocked or desensitised.

<b>Clauses affected:</b>	⌘ 4.3, 7.5
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input checked="" type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> O&M Specifications
	25.141 R4-010424

**Other comments:**

⌘

[Yellow highlighted area]

## 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.
<u>7.5.2</u>	<u>Blocking characteristics Co-location with GSM900 and/or DCS 1800</u>	<u>This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900/DCS1800 BS are co-located.</u>

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 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 7.4 : 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	10 MHz	WCDMA signal with one code
1900 - 1920 MHz 1980 - 2000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz -1900 MHz, and 2000 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier

**Table 7.5: 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	10 MHz	WCDMA signal with one code
1830 - 1850 MHz 1910 - 1930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier

### 7.5.2 Minimum Requirement – Co-location with GSM900 and/or DCS 1800

This requirement may be applied for the protection of FDD BS receivers when GSM900 and/or DCS1800 BTS are co-located with UTRA BS.

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

**Table 7.x : Blocking performance requirement for operation in frequency bands in sub-clause 5.2(a) when co-located with GSM900**

<u>Center Frequency of Interfering Signal</u>	<u>Interfering Signal Level</u>	<u>Wanted Signal Level</u>	<u>Minimum Offset of Interfering Signal</u>	<u>Type of Interfering Signal</u>
1920 - 1980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1900 - 1920 MHz 1980 - 2000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 – 925 MHz and 960 - 1900 MHz, and 2000 MHz - 12750 MHz	-15 dBm	-115 dBm	=	CW carrier
925 -960 MHz	+2016 dBm	-115 dBm	=	CW carrier

**Table 7.y : Blocking performance requirement for operation in frequency bands in sub-clause 5.2(a) when co-located with DCS1800**

<u>Center Frequency of Interfering Signal</u>	<u>Interfering Signal Level</u>	<u>Wanted Signal Level</u>	<u>Minimum Offset of Interfering Signal</u>	<u>Type of Interfering Signal</u>
1920 - 1980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1900 - 1920 MHz 1980 - 2000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 – 1805 MHz and 1880 - 1900 MHz, and 2000 MHz – 12750 MHz	-15 dBm	-115 dBm	=	CW carrier
1805 – 1880 MHz	+2016 dBm	-115 dBm	=	CW carrier

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

**CHANGE REQUEST**⌘ **25.104 CR 58** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.Proposed change affects: ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network 

<b>Title:</b>	⌘ UL Performance requirement in fast fading
<b>Source:</b>	⌘ RAN WG4
<b>Work item code:</b>	⌘ <b>Date:</b> ⌘ 2001-02-20
<b>Category:</b>	⌘ <b>F</b> <b>Release:</b> ⌘ R99
<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (essential correction)  <b>A</b> (corresponds to a correction in an earlier release)  <b>B</b> (Addition of feature),  <b>C</b> (Functional modification of feature)  <b>D</b> (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	
<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)  R96 (Release 1996)  R97 (Release 1997)  R98 (Release 1998)  R99 (Release 1999)  REL-4 (Release 4)  REL-5 (Release 5)</p>	

**Reason for change:** ⌘ Correction of implementation margin for the performance requirement with fast fading (Case 3, 120 km/h).**Summary of change:** ⌘ Case 3 performance is updated.**Consequences if not approved:** ⌘ Performance requirements will not be correct.**Clauses affected:** ⌘ 8.3.3

<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘
	<input checked="" type="checkbox"/> Test specifications	CR 25.141-xxx
	<input type="checkbox"/> O&M Specifications	

**Other comments:** ⌘

### 8.3.3 Multipath fading Case 3

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

#### 8.3.3.1 Minimum requirement

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

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

Measurement channel	Received $E_b/N_0$	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	<del>6.77.2</del> dB	$< 10^{-2}$
	<del>7.58.0</del> dB	$< 10^{-3}$
64 kbps	<del>2.93.4</del> dB	$< 10^{-1}$
	<del>3.33.8</del> dB	$< 10^{-2}$
	<del>3.64.1</del> dB	$< 10^{-3}$
144 kbps	<del>2.32.8</del> dB	$< 10^{-1}$
	<del>2.73.2</del> dB	$< 10^{-2}$
	<del>3.13.6</del> dB	$< 10^{-3}$
384 kbps	<del>2.73.2</del> dB	$< 10^{-1}$
	<del>3.13.6</del> dB	$< 10^{-2}$
	<del>3.74.2</del> dB	$< 10^{-3}$

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

**CHANGE REQUEST**⌘ **25.104 CR 59** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.Proposed change affects: ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network 

<b>Title:</b>	⌘ Performance requirement for 250km/h
<b>Source:</b>	⌘ RAN WG4
<b>Work item code:</b>	⌘ <b>Date:</b> ⌘ 20.2.2001
<b>Category:</b>	⌘ <b>F</b> <b>Release:</b> ⌘ R99
<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (essential correction)  <b>A</b> (corresponds to a correction in an earlier release)  <b>B</b> (Addition of feature),  <b>C</b> (Functional modification of feature)  <b>D</b> (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	
<p>Use <u>one</u> of the following releases:</p> <p><b>2</b> (GSM Phase 2)  <b>R96</b> (Release 1996)  <b>R97</b> (Release 1997)  <b>R98</b> (Release 1998)  <b>R99</b> (Release 1999)  <b>REL-4</b> (Release 4)  <b>REL-5</b> (Release 5)</p>	

<b>Reason for change:</b>	⌘ Currently there are no performance requirement for high terminal speeds.
<b>Summary of change:</b>	⌘ Performance requirement for demodulation of DCH in multipath fading conditions at 250km/h is added.
<b>Consequences if not approved:</b>	⌘ No performance requirement for high terminal speeds.

<b>Clauses affected:</b>	⌘ 8.3, B.2
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input checked="" type="checkbox"/> Test specifications ⌘ TS 25.141 <input type="checkbox"/> O&M Specifications
<b>Other comments:</b>	⌘

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## 8.3 Demodulation of DCH in multipath fading conditions

### 8.3.1 Multipath fading Case 1

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

#### 8.3.1.1 Minimum requirement

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

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

Measurement channel	Received $E_b/N_0$	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 Ratio (BLER) allowed when the receiver input signal is at a specified  $E_b/N_0$  limit. The BLER is calculated for each of the measurement channels supported by the base station.

#### 8.3.2.1 Minimum requirement

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

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

Measurement channel	Received $E_b/N_0$	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	$< 10^{-2}$

### 8.3.3 Multipath fading Case 3

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

### 8.3.3.1 Minimum requirement

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

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

Measurement channel	Received $E_b/N_0$	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	6.7 dB	$< 10^{-2}$
	7.5 dB	$< 10^{-3}$
64 kbps	2.9 dB	$< 10^{-1}$
	3.3 dB	$< 10^{-2}$
	3.6 dB	$< 10^{-3}$
144 kbps	2.3 dB	$< 10^{-1}$
	2.7 dB	$< 10^{-2}$
	3.1 dB	$< 10^{-3}$
384 kbps	2.7 dB	$< 10^{-1}$
	3.1 dB	$< 10^{-2}$
	3.7 dB	$< 10^{-3}$

## 8.3.4 Multipath fading Case 4

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

### 8.3.4.1 Minimum requirement

The BLER should not exceed the limit for the  $E_b/N_0$  specified in Table 8.x.

**Table 8.x: Performance requirements in multipath Case 4 channel**

Measurement channel	Received $E_b/N_0$	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	10.2 dB	$< 10^{-2}$
	11.0 dB	$< 10^{-3}$
64 kbps	6.4 dB	$< 10^{-1}$
	6.8 dB	$< 10^{-2}$
	7.1 dB	$< 10^{-3}$
144 kbps	5.8 dB	$< 10^{-1}$
	6.2 dB	$< 10^{-2}$
	6.6 dB	$< 10^{-3}$
384 kbps	6.2 dB	$< 10^{-1}$
	6.6 dB	$< 10^{-2}$
	7.2 dB	$< 10^{-3}$

## 8.4 Demodulation of DCH in moving propagation conditions

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

### 8.4.1 Minimum requirement

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

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

Measurement channel	Received $E_b/N_0$	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	5.7 dB	$< 10^{-2}$
64 kbps	2.1 dB	$< 10^{-1}$
	2.2 dB	$< 10^{-2}$

## 8.5 Demodulation of DCH in birth/death propagation conditions

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

### 8.5.1 Minimum requirement

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

## 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

Case 1, speed 3km/h		Case 2, speed 3 km/h		Case 3, 120 km/h		Case 4, 250 km/h	
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

### B.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 parameters for the equation are shown in Table B.2. The taps have equal strengths and equal phases.



Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

**CHANGE REQUEST**⌘ **25.104 CR 60** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.Proposed change affects: ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network 

<b>Title:</b>	⌘ Definition of EVM / PCDE measurement period		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 23/02/01
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:	
<b>F</b> (essential correction)		2 (GSM Phase 2)	
<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)	
<b>B</b> (Addition of feature),		R97 (Release 1997)	
<b>C</b> (Functional modification of feature)		R98 (Release 1998)	
<b>D</b> (Editorial modification)		R99 (Release 1999)	
Detailed explanations of the above categories can be found in 3GPP TR 21.900.		REL-4 (Release 4)	
		REL-5 (Release 5)	

<b>Reason for change:</b>	⌘ The measurement period was not well specified. The text describing EVM and PCDE is also aligned with 25.141.
<b>Summary of change:</b>	⌘ The measurement period is defined with reference to the CPICH / SCH
<b>Consequences if not approved:</b>	⌘ Possible difference in EVM measurement results.

<b>Clauses affected:</b>	⌘ 6.8.2, 6.8.3		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
<b>Other comments:</b>	⌘		

**How to create CRs using this form:**Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

## 6.8.2 Error Vector Magnitude

~~The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. This difference is called the error vector. The measured waveform is modified by first passing it through a matched Root Raised Cosine filter with bandwidth 3.84 MHz and roll-off  $\alpha = 0.22$ . The waveform is then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as 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 specified in 6.4.3.~~

The Error Vector Magnitude is a measure of the difference between the reference waveform and the measured waveform. This difference is called the error vector. Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3.84 MHz and roll-off  $\alpha = 0.22$ . Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference power expressed as a %. The measurement interval is one timeslot as defined by the C-PICH (when present) otherwise the measurement interval is one timeslot starting with the beginning of the SCH. The requirement is valid over the total power dynamic range as specified in subclause 6.4.3.

### 6.8.2.1 Minimum requirement

The Error Vector Magnitude shall not be worse than 17.5 %.

## 6.8.3 Peak code Domain error

The Peak Code Domain Error is computed by projecting the power of the error vector (as defined in 6.8.2) onto the code domain at a specified 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. This ratio is expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes. ~~The measurement interval is one power control group (timeslot). The measurement interval is one timeslot as defined by the C-PICH (when present) otherwise the measurement interval is one timeslot starting with the beginning of the SCH. The requirement is valid over the total power dynamic range as specified in subclause 6.4.3.~~

Vienna, Austria 19th - 23rd February 2001

CR-Form-v3

**CHANGE REQUEST**⌘ **TS 25.104 CR 61** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network 

<b>Title:</b>	⌘ Inclusion of environmental requirements
<b>Source:</b>	⌘ RAN WG4
<b>Work item code:</b>	⌘ <b>Date:</b> ⌘ 21-02-2001
<b>Category:</b>	⌘ <b>F</b> <b>Release:</b> ⌘ R99
<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (essential correction)  <b>A</b> (corresponds to a correction in an earlier release)  <b>B</b> (Addition of feature),  <b>C</b> (Functional modification of feature)  <b>D</b> (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p> <p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)  R96 (Release 1996)  R97 (Release 1997)  R98 (Release 1998)  R99 (Release 1999)  REL-4 (Release 4)  REL-5 (Release 5)</p>	

<b>Reason for change:</b>	⌘ It is currently not stated under what environmental conditions the requirements in TS25.104 apply
<b>Summary of change:</b>	⌘ Inclusion of chapter that clarifies that the range shall be declared by the manufacturer. ⌘ Inclusion of text that clarifies that test conditions are specified in TS25.141
<b>Consequences if not approved:</b>	⌘ It remains unclear under what conditions test shall be performed.

<b>Clauses affected:</b>	⌘ 4.X
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input checked="" type="checkbox"/> Test specifications ⌘ R4-010434 ⌘ <input type="checkbox"/> O&M Specifications
<b>Other comments:</b>	⌘

**4 General****4.1 Test tolerances**

The requirements given in this specification make no allowance for measurement uncertainty. The test specification 25.141 section 4 defines test tolerances. These test tolerances are individually calculated for each test. The test

tolerances are then added to the limits in this specification to create test limits. The measurement results are compared against the test limits as defined by the shared risk principle.

The Shared Risk principle is defined in ETR 273 Part 1 sub-part 2 section 6.5.

## 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.

## 4.4 Environmental requirements for the BS equipment

The BS equipment shall fulfil all the requirements in the full range of environmental conditions for the relevant environmental class from the relevant IEC specifications listed below

60 721-3-3 “Stationary use at weather protected locations”

60 721-3-4 “Stationary use at non weather protected locations”

The operator can specify the range of environmental conditions according to his needs.

Normally it should be sufficient for all tests to be conducted using normal test conditions except where otherwise stated. For guidance on the use of test conditions to be used in order to show compliance refer to TS 25.141.