TSG RAN Meeting #16 **RP-020303**
Marco Island, FL, USA, 4 - 7 June 2002

Title **CRs (Rel-5) for WI "Technical Enhancements and Improvements"**
Source **TSG RAN WG4**
Agenda Item **8.8**

RAN4 Tdoc	Spec	Curr Ver	New Ver	CR	R	Cat	Ph	Title	Acronym
R4-020787	25.101	5.2.0	5.3.0	164		F	Rel-5	Correction of ITU-R SM.329 references	TEI5
R4-020954	25.102	5.0.1	5.1.0	108	1	F	Rel-5	Removal of "AFC on" condition for frequency stability requirement	TEI5
R4-020987	25.104	5.2.0	5.3.0	132	1	F	Rel-5	Corrections to Spectrum Emission Mask	TEI5
R4-020788	25.104	5.2.0	5.3.0	129		F	Rel-5	Correction of ITU-R SM.329 references	TEI5
R4-021016	25.106	5.0.0	5.1.0	7		F	Rel-5	Correction of ITU-R SM.329 references	TEI5
R4-021019	25.113	5.0.1	5.1.0	14	1	B	Rel-5	New exclusion bands	TEI5
R4-021020	25.113	5.0.1	5.1.0	15	1	F	Rel-5	Restructuring of 25.113 and correction of references	TEI5
R4-020685	25.133	5.2.0	5.3.0	376		F	Rel-5	Wording correction to UTRAN measurements	TEI5
R4-020761	25.133	5.2.0	5.3.0	388		F	Rel-5	Correction to cell re-selection requirements in Cell-FACH state	TEI5
R4-021023	25.133	5.2.0	5.3.0	410	1	F	Rel-5	Correction of the definition of known cell	TEI5
R4-021042	25.141	5.2.0	5.3.0	199	1	F	Rel-5	UTRAN measurement Transmitted code power	TEI5
R4-020702	25.141	5.2.0	5.3.0	202		F	Rel-5	Correction to occupied bandwidth test	TEI5
R4-020932	25.141	5.2.0	5.3.0	205	1	A	Rel-5	Correction to PN Generator	TEI5
R4-020789	25.141	5.2.0	5.3.0	209		F	Rel-5	Correction of ITU-R SM.329 references	TEI5
R4-020810	25.141	5.2.0	5.3.0	212		F	Rel-5	Correction of the internal BER calculation verification test (Rel-5)	TEI5
R4-020819	25.141	5.2.0	5.3.0	221		F	Rel-5	Test tolerances for CPCH tests	TEI5
R4-020885	25.141	5.2.0	5.3.0	222		F	Rel-5	Change of Test Model for EVM	TEI5
R4-020988	25.141	5.2.0	5.3.0	225	1	F	Rel-5	Corrections to Spectrum Emission Mask	TEI5
R4-021018	25.143	5.0.0	5.1.0	10		F	Rel-5	Correction of ITU-R SM.329 references	TEI5

3GPP TSG RAN WG4 Meeting #23 **R4-020787**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.101** **CR** **164** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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

Title:	⌘	Update of reference to ITU-R recommendation SM.329-9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The present document refers to ITU-R SM.329-8, which has been superseded recently by SM.329-9. No actual requirements are changed.
Summary of change:	⌘	The reference to SM.329 is updated throughout the document
Consequences if not approved:	⌘	There would be an uncertainty whether the 3GPP regulatory radio requirements are based on the latest ITU recommendations.

Clauses affected:	⌘	2, 6.6.3		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	TS 34.121
Other comments:	⌘			

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, the latest version applies. 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*.

[1] (void)

[2] ITU-R Recommendation SM.329-9~~8~~: "Spurious emissions".

[3] (void)

[4] 3GPP TS 25.433: "UTRAN Iub Interface NBAP Signalling".

[5] ETSI ETR 273: "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".

[6] 3GPP TS 45.004: "Digital cellular telecommunications system (Phase 2+); Modulation".

6.6.3 Spurious emissions

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

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329-9~~8~~[2].

6.6.3.1 Minimum requirement

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

Table 6.12: General spurious emissions requirements

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

Table 6.13: Additional spurious emissions requirements

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

3GPP TSG RAN WG4 Meeting #23 **R4-020954**

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CHANGE REQUEST

⌘ **25.102** **CR** **108** ⌘ ev **1** ⌘ Current version: **5.0.1** ⌘

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

Title:	⌘	Removal of "AFC on" condition for frequency stability requirement
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The frequency stability requirement is defined with the parameter "AFC on". As there is no way to control the AFC (e.g. switch ON / OFF for test purposes) the parameter is useless.
Summary of change:	⌘	Removal of parameter " AFC on"
Consequences if not approved:	⌘	The frequency stability requirement will be ambiguous. Isolated impact statement: Correction to a function where in the specification was containing some contradictions. No impact on implementation

Clauses affected:	⌘	6.3		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.122
Other comments:	⌘			

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Comprehensive information and tips about how to create CRs can be found at: 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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

6.3 UE frequency stability

The UE modulated carrier frequency shall be accurate to within ±0.1 PPM observed over a period of one timeslot compared to carrier frequency received from the BS. These signals will have an apparent error due to BS frequency error and Doppler shift. In the later case, signals from the BS must be averaged over sufficient time that errors due to noise or interference are allowed for within the above ±0.1PPM figure. The UE shall use the same frequency source for both RF frequency generation and the chip clock.

Table 6.2: void ~~Frequency stability~~

~~AFC~~	~~Frequency stability~~
~~ON~~	~~within ± 0.1 PPM~~

3GPP TSG RAN WG4 Meeting #23 **R4-020788**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.104** **CR** **129** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

*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 ☐

Title:	⌘	Update of reference to ITU-R recommendation SM.329-9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Use one of the following releases:

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

Reason for change:	⌘	The present document refers to ITU-R SM.329-8, which has been superseded recently by SM.329-9. No actual requirements are changed.
Summary of change:	⌘	The reference to SM.329 is updated throughout the document. In clause 2 it is updated to be SM.329-9. In the main body of the document, the specific part "-8" of the document number is removed and replaced by a reference [1] to make future updating easier.
Consequences if not approved:	⌘	There would be an uncertainty whether the 3GPP regulatory radio requirements are based on the latest ITU recommendations.

Clauses affected:	⌘	2, 4.3, 6.6.3		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	TS 25.141
Other comments:	⌘			

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, the latest version applies. 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*.

[1] ITU-R Recommendation SM.329-9~~8~~, "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".

[4] 3GPP TR 25.942 "RF System Scenarios".

[5] 3GPP TS 45.004: "Digital cellular telecommunications system (Phase 2+); Modulation".

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.
5.4	Channel arrangement	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
6.2.1	Base station maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the range of conditions defined as normal.
6.6.2.1	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.6.2.3	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~~-8~~ [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~~-8~~ [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 the downlink bands as defined in clause 5.2in 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.
6.6.3.8.1	Co-existence with UTRA in frequency band III -Operation in the same geographic area	This requirement may be applied for the protection of UTRA UE in frequency band I in geographic areas in which both UTRA in frequency band I and III are deployed.
6.6.3.8.2	Co-existence with UTRA in frequency band III - Co-located base stations	This requirement may be applied for the protection of UTRA BTS receivers in frequency band I when UTRA BS in frequency band I and III are co-located.

6.6.3.9.1	Co-existence with UTRA in frequency band I -Operation in the same geographic area	This requirement may be applied for the protection of UTRA UE in frequency band I in geographic areas in which both UTRA in frequency band I and III are deployed.
6.6.3.9.2	Co-existence with UTRA in frequency band I - Co-located base stations	This requirement may be applied for the protection of UTRA BTS receivers in frequency band I when UTRA BS in frequency band I and III are co-located.
6.6.3.10.1	Co-existence with PCS1900 - Co-located base stations	This requirement may be applied for the protection of PCS 1900 BTS receivers when PCS 1900 BTS and UTRA BS are co-located.
6.6.3.11.1	Co-existence with GSM850 - Co-located base stations	This requirement may be applied for the protection of GSM 850 BTS receivers when GSM 850 BTS and UTRA BS are co-located.
7.4.2	Adjacent Channel Selectivity Co-location with UTRA-TDD	This requirement may be applied for the protection of UTRA-FDD BS receivers when UTRA-FDD BS and UTRA-TDD BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
7.5.2	Blocking characteristics Co-location with GSM900, DCS 1800, PCS1900 and/or UTRA	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900, DCS1800, PCS1900, GSM850 and/or UTRA BS (operating in different frequency bands) are co-located.
7.5.3	Blocking characteristics Co-location with UTRA TDD	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and UTRA TDD BS are co-located.
7.6	Intermodulation characteristics	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
7.7	Spurious emissions	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
	HSDPA*	The portion of HSDPA(High Speed Downlink Packet Access) is not applicable to ARIB standards by the time when ARIB is prepared to transpose.

Note: HSDPA*: This regional requirement should be reviewed to check its necessity every TSG RAN meeting.

6.6.3 Spurious emissions

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

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

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

6.6.3.1 Mandatory Requirements

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

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

6.6.3.1.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-~~8~~ [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-~~8~~ [1], s4.1
150kHz - 30MHz		10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
30MHz - 1GHz		100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
1GHz - 12.75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-~~8~~ [1], s2.5 table 1

6.6.3.1.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-~~8~~ [1], are applied.

6.6.3.1.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

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

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], 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 ITU-R SM.329-~~8~~ [1], s4.3 and Annex 7
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 ITU-R SM.329-~~8~~ [1], s4.3 and Annex 7
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 ITU-R SM.329-~~8~~ [1], s4.3 and Annex 7
Fc2 + 60 MHz or 2180 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1. Upper frequency as in ITU-R SM.329-~~8~~ [1], s2.5 table 1

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

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
1GHz ↔ Fc1 - 60 MHz or 1920 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
Fc1 - 60 MHz or 1920 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1920 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [1], s4.3 and Annex 7
Fc1 - 50 MHz or 1920 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 1890 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [1], s4.3 and Annex 7
Fc2 + 50 MHz or 2000 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 2000 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [1], s4.3 and Annex 1
Fc2 + 60 MHz or 2000 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1. Upper frequency as in ITU-R SM.329-~~8~~ [1], s2.5 table 16

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

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
1GHz ↔ Fc1 - 60 MHz or 1795 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1
Fc1 - 60 MHz or 1795 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1795 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [1], s4.3 and Annex 7
Fc1 - 50 MHz or 1795 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 1890 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [1], s4.3 and Annex 7
Fc2 + 50 MHz or 1890 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 1890 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [1], s4.3 and Annex 7
Fc2 + 60 MHz or 1890 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [1], s4.1. Upper frequency as in ITU-R SM.329-~~8~~ [1], s2.5 table 1

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

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

3GPP TSG RAN WG4 Meeting #23 **R4-020987**

Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.104** **CR** **132** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

*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 [X] Core Network ☐

Title:	⌘	Corrections to Spectrum Emission Mask
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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2	*(GSM Phase 2)*
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REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The interpretation of the lower limit to apply for band II is unclear, particularly since the band II limit is sometimes less stringent that the normal limit. A note regarding resolution and noise bandwidths is added to support the interpretation in the conformance tests in 25.141.
Summary of change:	⌘	The definition of the lower limit for band II is made explicit. Note added regarding resolution and noise bandwidths.
Consequences if not approved:	⌘	An incorrect interpretation of the minimum requirement could result in incorrect implementation of the tests and an incorrect pass/fail result. Isolated Impact Analysis: A Node B that conformed to the correct interpretation of the current specification will be unaffected by this change.
Clauses affected:	⌘	6.6.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ 25.141 ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

6.6 Output RF spectrum emissions

6.6.1 Occupied bandwidth

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

6.6.2 Out of band emission

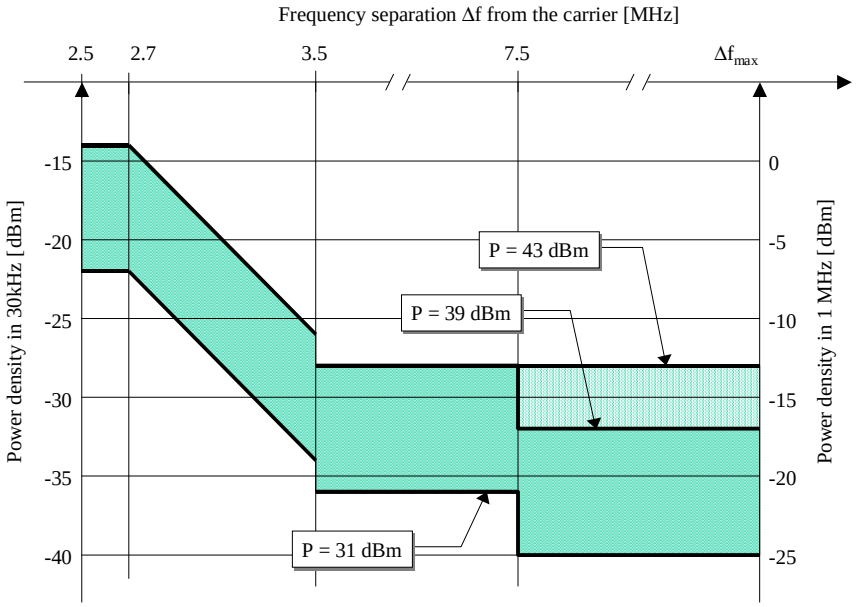
Out of band emissions are unwanted emissions immediately outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission requirement is specified both in terms of a spectrum emission mask and adjacent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

6.6.2.1 Spectrum emission mask

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

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

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



Illustrative diagram of spectrum emission mask

Figure 6.2: Spectrum emission mask

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

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement Band I, II, III	Additional requirements Band II[1] *	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-14dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	NA	30 kHz
3.5 MHz ≤ Δf ≤ Δf_{max}	4.0MHz ≤ f_offset < f_offset_{max}	-13 dBm	NA	1 MHz
~~* Whichever is less power~~				

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

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement Band I, II, III	Additional requirements Band II[1] *	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-14dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 8.0MHz	-13 dBm	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P - 56 dB	NA	1 MHz
~~* Whichever is less power~~				

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

Frequency offset of measurement filter -3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement Band I, II, III	Additional requirements Band II* [1]	Measurement bandwidth [1]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P - 53 dB	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$P - 53dB - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
(see note)	3.515MHz ≤ f_offset < 4.0MHz	P - 65 dB	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 8.0MHz	P - 52 dB	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P - 56 dB	NA	1 MHz
~~* Whichever is less power~~				

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

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement Band I, II, II	Measurement bandwidth [2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-22 dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-22dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	30 kHz
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-34 dBm	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 8.0MHz	-21 dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

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

Notes for Tables 6.3, 6.4, 6.5 & 6.6

Note 1 The minimum requirement for operation in band II is the lower power of the minimum requirement for band 1, II and III and the additional requirement for band II.

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

3GPP TSG RAN WG4 Meeting #23 **R4-021016**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.106** **CR** **7** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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

Title:	⌘	Update and correction of reference to ITU-R recommendation SM.329-9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The present document refers to ITU-R SM.329-8, which has been superseded recently by SM.329-9. No actual requirements are changed
Summary of change:	⌘	The reference to SM.329 is updated throughout the document. In clause 2 it is updated to be SM.329-9. In the main body of the document, the specific part "-8" of the document number is removed and replaced by a reference [1] to make future updating easier.
Consequences if not approved:	⌘	There would be an uncertainty whether the 3GPP regulatory radio requirements are based on the latest ITU recommendations.

Clauses affected:	⌘	2, 5.6, 9.2.2.1, 9.2.2.2		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	TS 25.143
Other comments:	⌘			

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

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, the latest version applies. 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*.

[1] ITU-R Recommendation SM.329-~~8~~9: "Spurious emissions".

[2] 3GPP TS 25.143: "UTRA Repeater Conformance Testing".

[3] 3GPP TS 25.113: "Base Station and Repeater Electromagnetic Compatibility".

[4] 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".

========== NEXT CHANGED SECTION ==========

5.6 Regional requirements

Some requirements in TS 25.143 may only apply in certain regions. Table 5.4 lists all requirements that may be applied differently in different regions.

Table 5.4: List of regional requirements

Sub-clause number	Requirement	Comments
4.1	Frequency bands	Some bands may be applied regionally.
4.2	Up-link to down-link frequency Separation	The requirement is applied according to what frequency bands in Clause 4.2 that are supported by the Repeater.
6.1	Maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges of conditions defined as normal.
9.1.2	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
9.2.2.1	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-~~8~~ [4], are applied.
9.2.2.2	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-~~8~~ [4], are applied.

========== NEXT CHANGED SECTION ==========

9.2.2.1 Spurious emission (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~~-8~~ [4], are applied.

At maximum Repeater gain, with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated output power per channel, the power of any spurious emission shall not exceed the limits specified in Table 9.9.

When the power in all channels is increased by 10 dB the requirements shall still be met.

The measurements shall apply both with or without an input signal applied.

NOTE 1: If the operating band corresponds to three or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals in the repeaters operating band.

Table 9.9: Up-link and down-link: General spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9kHz – 150kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
150kHz – 30MHz		10 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
30MHz – 1GHz		100 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
1GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329~~-8~~ [4], s2.~~6~~5 table 1

9.2.2.2 Minimum requirement (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~~-8~~ [4], are applied.

At maximum Repeater gain, with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated power output per channel, the power of any spurious emission shall not exceed the limits specified in Table 9.10 and Table 9.11 for the down- and up-link, respectively.

When the power in all channels is increased by 10 dB the requirements shall still be met.

The measurements shall apply both with or without an input signal applied.

NOTE 1: If the operating band corresponds to three or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals in the repeaters operating band.

Table 9.10: Down-link: General spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz whichever is the higher	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], 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 ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
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 ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
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 ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
Fc2 + 60 MHz or 2180 MHz whichever is the lower ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329~~-8~~, s4.1. Upper frequency as in ITU-R SM.329~~-8~~ [4], s2.~~6~~5 table 1

Table 9.11: Up-link: General spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 1910 MHz whichever is the higher	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
Fc1 – 60 MHz or 1910 MHz whichever is the higher ↔ Fc1 – 50 MHz or 1910 MHz whichever is the higher	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
Fc1 – 50 MHz or 1910 MHz whichever is the higher ↔ Fc2 + 50 MHz or 1990 MHz whichever is the lower	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
Fc2 + 50 MHz or 1990 MHz whichever is the lower ↔ Fc2 + 60 MHz or 1990 MHz whichever is the lower	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
Fc2 + 60 MHz or 1990 MHz whichever is the lower ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1. Upper frequency as in ITU-R SM.329~~-8~~ [4], s2.~~6~~5 table 16

Fc1: Centre frequency of emission of the first 5 MHz channel in an operating band.

Fc2: Centre frequency of emission of the last 5 MHz channel in an operating band.

3GPP TSG RAN WG4 Meeting #23 **R4-021019**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.113** **CR** **14** ⌘ **rev** **1** ⌘ Current version: **5.0.1** ⌘

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

Title:	⌘	New exclusion bands and requirements for telecommunications port
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**B**
Release:	⌘	Rel-5

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

Use one of the following releases:

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

Reason for change:	⌘	This CR proposes to update the current 3GPP EMC specification according to the changes in respective basic EMC standards.
Summary of change:	⌘	The updates are to: 1. Introduce a clause about the exclusion bands and extend the frequency range for radiated immunity from 80-1000 MHz to 80-2000 MHz. 2. Include the limit and test for conducted emissions from telecommunication ports.
Consequences if not approved:	⌘	The 3GPP EMC standard would not be aligned with new requirements in IEC.

Clauses affected:	⌘	4.5, 7, 8.8, A.2.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	NOTE: The inclusion and placing of clause 8.8 is related to the re-structuring in CR 15.

4.5 Exclusion bands

The receiver exclusion bands for BS and repeater extends from the lower frequency of the allocated receiver band minus 20 MHz to the upper frequency of the allocated receiver band plus 20 MHz according to ref. [1], ref. [2] and [10].

The RF exclusion band applies to radio equipment with an operating frequency up to 2 GHz, or for equipment operating above 2 GHz, but whose RF bandwith extends to a frequency below 2 GHz.

For equipment operating at frequencies above 2 GHz and whose RF bandwidth does not extend to a frequency below 2 GHz, there is no exclusion band.

The exclusion band for the receiver is the band of frequencies over which no tests of radiated immunity of a receiver are made.

7 Applicability overview

7.1 Emission

Table 3: Emission applicability

Phenomenon	Application	Equipment test requirement			Reference subclause in the present document	Reference Standard
		Base station equipment	Ancillary equipment	Repeater		
Radiated emission	Enclosure	applicable		applicable	A.1.3.1	ITU-R SM.329-8 [1]
Radiated emission	Enclosure		applicable		A.1.3.2	CISPR 22 [4]
Conducted emission	DC power input/output port	applicable	applicable	applicable	A.1.4	CISPR 22 [4], CISPR 16-1 [5]
Conducted emission	AC mains input/output port	applicable	applicable	applicable	A.1.5	CISPR 22 [4]
Harmonic current emissions	AC mains input port	applicable	applicable	applicable	A.1.6	IEC 61000-3-2 [6]
Voltage fluctuations and flicker	AC mains input port	applicable	applicable	applicable	A.1.7	IEC 61000-3-3 [7]
Conducted emission	telecommunication port	applicable	not applicable	applicable	8.8	CISPR 22 [13]

NOTE: spurious emissions from antenna connector shall be measured according to TS 25.141 [3] and TS 25.142 [4] and TS 25.143 [11].

7.2 Immunity

Table 4: Immunity applicability

Phenomenon	Application	Equipment test requirement			Reference subclause in the present document	Reference standard
		Base station equipment	Ancillary equipment	Repeater		
RF electro-magnetic field (80 - ~~1000~~ 2000 MHz)	Enclosure	applicable	applicable	applicable	A.2.3	IEC 61000-4-3 [9]
Electrostatic discharge	Enclosure	applicable	applicable	applicable	A.2.4	IEC 61000-4-2 [8]
Fast transients common mode	Signal, telecommunications and control ports, DC and AC power input ports	applicable	applicable	applicable	A.2.5	IEC 61000-4-4 [10]
RF common mode 0,15 - 80 MHz	Signal, telecommunications and control ports, DC and AC power input ports	applicable	applicable	applicable	A.2.6	IEC 61000-4-6 [12]
Voltage dips and interruptions	AC mains power input ports	applicable	applicable	applicable	A.2.7	IEC 61000-4-11 [13]
Surges, common and differential mode	AC power input ports and telecommunications port	applicable	applicable	applicable	A.2.8	IEC 61000-4-5 [11]

8.8 Telecommunication ports

This test is applicable for radio equipment and/or ancillary equipment for fixed use which have telecommunication ports.

This test shall be performed on a representative configuration of the combination of radio and ancillary equipment, or a representative configuration of the combination of radio and ancillary equipment.

8.8.1 Definition

This test assesses the EUT unwanted emission present at the telecommunication ports.

8.8.2 Test method

The test method shall be in accordance with CISPR 22 [13]

The measurement frequency range extends from 150 kHz to 30 MHz. When the EUT is a transmitter operating at frequencies below 30 MHz, then the exclusion band for transmitters applies (see subclause 4.3) for measurements in the transmit mode of operation.

8.8.3 Limits

The telecommunication ports shall meet the limits according to CISPR 22 [13] shown in table 10.

Table 10: Limits for conducted emissions from telecommunication ports

Frequency range	Voltage limits dB (µV)		Current limits dB (µA)	
MHz	Quasi-peak	Average	Quasi-peak	Average
0,15 to 0,5	84 to 74	74 to 64	40 to 30	30 to 20
0,5 to 30	74	64	30	20
NOTE 1: The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz. NOTE 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is 20 $\log_{10}$ 150/I = 44 dB).				

Alternatively, for equipment intended to be used in telecommunication centres only, the limits given in table 11 may be used.

Table 11: Limits for conducted emissions from telecommunication ports of equipment intended for use in telecommunication centres only

Frequency range	Voltage limits dB (µV)		Current limits dB (µA)	
MHz	Quasi-peak	Average	Quasi-peak	Average
0,15 to 0,5	97 to 87	84 to 74	53 to 43	40 to 30
0,5 to 30	87	74	43	30
NOTE 1: The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz. NOTE 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN), which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is 20 $\log_{10}$ 150/I = 44 dB).				

A.2.3 RF electromagnetic field (80 MHz - ~~1000~~2000 MHz)

The test shall be performed on a representative configuration of the equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

A.2.3.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to operate as intended in the presence of a radio frequency electromagnetic field disturbance at the enclosure.

A.2.3.2 Test method and level

The test method shall be in accordance with IEC 61000-4-3 [9]:

- for transmitters, receivers and transceivers the following requirements shall apply:
- the test level shall be 3 V/m amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 kHz;
- the stepped frequency increments shall be 1 % of the momentary frequency;
- the test shall be performed over the frequency range 80 MHz - ~~1 000~~2000 MHz with exception of the exclusion band (see clause 4);~~,~~
- responses in stand alone receivers or receivers which are part of transceivers occurring at discrete frequencies which are narrow band responses, shall be disregarded, see subclause 4.3;
- the frequencies selected during the test shall be recorded in the test report.

3GPP TSG RAN WG4 Meeting #23 **R4-021020**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.113** **CR** **15** ⌘ **rev** **1** ⌘ Current version: **5.0.1** ⌘

*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 ☐

Title:	⌘	Restructuring of 25.113 and correction of references
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Use one of the following releases:

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

Reason for change:	⌘	The document structure has not been optimal since a number of normative requirements and references were located in an Annex.
Summary of change:	⌘	The normative requirements are moved from Annex A to the specification body itself as clauses 8 and 9 to enable better usability. Annex A is deleted. Some corrections updating references are also made.
Consequences if not approved:	⌘	Not aligned with the latest revisions of international standards (IEC).

Clauses affected:	⌘	2, 3.3, 7, 8, 9, Annex A
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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, the latest version applies. 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*.

[1] 3GPP TS 25.104: "UTRA (BS) FDD; Radio transmission and reception".

[2] 3GPP TS 25.105: "UTRA (BS) TDD; Radio transmission and reception".

[3] 3GPP TS 25.141: "UTRA (BS) FDD; Base station conformance testing (FDD)".

[4] 3GPP TS 25.142: "UTRA (BS) TDD; Base station conformance testing (TDD)

[5] IEC 61000-6-1: 1997; “Electromagnetic compatibility (EMC) – Part 6: Generic standards – Section 1: Immunity for residential, commercial and light-industrial environments”

[6] IEC 61000-6-3: 1996; “Electromagnetic compatibility (EMC) – Part 6: Generic standards – Section 3: mission standard for residential, commercial and light industrial environments”.

[7] IEC 60050(161): ~~1998~~; "International Electrotechnical Vocabulary - Chapter 161: Electromagnetic compatibility".

[8] 3GPP TS 25.101: "UTRA (UE) FDD; UE Radio transmission and reception (FDD)"

[9] 3GPP TS 25.102: "UTRA (UE) TDD: UE Radio transmission and reception (TDD)"

[10] 3GPP TS 25.106: "UTRA Repeater; Radio Transmission and Reception"

[11] 3GPP TS 25.143: "UTRA Repeater conformance testing"

[12] ITU-R Rec. SM.329-9~~8~~: "Spurious emissions"

[13] CISPR 22 ~~(1997)~~: "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".

[14] CISPR 16-1 ~~(1993)~~: "Specification for radio disturbance and immunity measuring apparatus and methods".

[15] IEC 61000-3-2 (2000): "Electromagnetic compatibility (EMC) - Part 3: Limits – Section 2: Limits for harmonic current emissions (equipment input current ≤ 16 A) ".

[16] IEC 61000-3-3 (1995): "Electromagnetic compatibility (EMC) - Part 3: Limits – Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A"

[17] IEC 61000-4-2: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test".

[18] IEC 61000-4-3: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency electromagnetic field immunity test".

[19] IEC 61000-4-4: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test".

[20] IEC 61000-4-5: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 5: Surge immunity test".

[21] IEC 61000-4-6: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 6: Immunity to contacted disturbances, induced by radio frequency fields".

[22] IEC 61000-4-11 : " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques – Section 11: Voltage dips, short interruptions and voltage variations. Immunity tests".

~~Note: Other references relating only to annex A are given in that annex.~~

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AC	Alternating Current
AMN	Artificial Mains Network
DC	Direct Current
EMC	Electromagnetic Compatibility
ESD	Electrostatic discharge
EUT	Equipment Under Test
~~AMN~~	~~Artificial Mains Network~~
RF	Radio frequency
rms	root mean square
UTRA	Universal Terrestial Radio Access

7 Applicability overview

7.1 Emission

Table 3: Emission applicability

Phenomenon	Application	Equipment test requirement			Reference subclause in the present document	Reference Standard
		Base station equipment	Ancillary equipment	Repeater		
Radiated emission	Enclosure	applicable		applicable	~~A.1~~8.3.1	ITU-R SM.329-~~8~~9 [12]
Radiated emission	Enclosure		applicable		~~A.1~~8.3.2	CISPR 22 [~~4~~13]
Conducted emission	DC power input/output port	applicable	applicable	applicable	~~A.1~~8.4	CISPR 22 [~~4~~13], CISPR 16-1 [~~5~~14]
Conducted emission	AC mains input/output port	applicable	applicable	applicable	~~A.1~~8.5	CISPR 22 [~~4~~13]
Harmonic current emissions	AC mains input port	applicable	applicable	applicable	~~A.1~~8.6	IEC 61000-3-2 [~~6~~15]
Voltage fluctuations and flicker	AC mains input port	applicable	applicable	applicable	~~A.1~~8.7	IEC 61000-3-3 [~~7~~16]

NOTE: spurious emissions from antenna connector shall be measured according to TS 25.141 [3] and TS 25.142 [4] and TS 25.143 [11].

7.2 Immunity

Table 4: Immunity applicability

Phenomenon	Application	Equipment test requirement			Reference subclause in the present document	Reference standard
		Base station equipment	Ancillary equipment	Repeater		
RF electro-magnetic field (80 - 1000 MHz)	Enclosure	applicable	applicable	applicable	~~A.2~~.3	IEC 61000-4-3 [~~9~~18]
Electrostatic discharge	Enclosure	applicable	applicable	applicable	~~A.2~~.4	IEC 61000-4-2 [~~8~~17]
Fast transients common mode	Signal, telecommunications and control ports, DC and AC power input ports	applicable	applicable	applicable	~~A.2~~9.5	IEC 61000-4-4 [~~10~~19]
RF common mode 0,15 - 80 MHz	Signal, telecommunications and control ports, DC and AC power input ports	applicable	applicable	applicable	~~A.2~~.6	IEC 61000-4-6 [~~12~~21]
Voltage dips and interruptions	AC mains power input ports	applicable	applicable	applicable	~~A.2~~.7	IEC 61000-4-11 [~~13~~22~~]~~]
Surges, common and differential mode	AC power input ports and telecommunications port	applicable	applicable	applicable	~~A.2~~.8	IEC 61000-4-5 [~~11~~20]

~~Annex A (normative):~~
~~Methods of measurement~~

~~Note: References cited in this annex relate to those listed in clause A.3 of this annex, and not to the main references given in clause 2 above.~~

~~A.1~~8 Emission

~~A.1~~8.1 Methods of measurement and limits for EMC emissions

~~A.1~~8.2 Test configurations

This subclause defines the configurations for emission tests as follows:

- the equipment shall be tested under normal test conditions as specified in the functional standards;
- the test configuration shall be as close to normal intended use as possible;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum configuration of ancillary equipment necessary to exercise the ports;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operation conditions and to ensure that all the different types of termination are tested;
- the test conditions, test configuration and mode of operation shall be recorded in the test report;
- ports which in normal operation are connected shall be connected to an ancillary equipment or to a representative piece of cable correctly terminated to simulate the input/output characteristics of the ancillary equipment, Radio Frequency (RF) input/output ports shall be correctly terminated;
- ports which are not connected to cables during normal operation, e.g. service connectors, programming connectors, temporary connectors etc. shall not be connected to any cables for the purpose of EMC testing. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the EUT, precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables;
- the test arrangements for transmitter and receiver sections of the transceiver are described separately for the sake of clarity. However, where possible the test of the transmitter section and receiver section of the EUT may be carried out simultaneously to reduce test time.

~~A.1~~8.3 Radiated ~~spurious~~ emission from Base station, Repeater and ancillary equipment

~~A.1~~8.3.1 Radiated ~~spurious~~ emission, Base stations and Repeater

This test is applicable to Base station and Repeater. This test shall be performed on a representative configuration of the Base station or Repeater.

~~A.1~~8.3.1.1 Definition

This test assesses the ability of BS and Repeater to limit unwanted emission from the enclosure port.

~~A.1~~8.3.1.2 Test method

~~A.1~~8.3.1.2.1 FDD and 3,84 Mcps TDD option

a) A test site fulfilling the requirements of ITU-R SM. 329-~~8~~9 [~~1~~12] shall be used. The BS or Repeater shall be placed on a non-conducting support and shall be operated from a power source via a RF filter to avoid radiation from the power leads.

Average power of any spurious components shall be detected by the test antenna and measuring receiver (e.g. a spectrum analyser). At each frequency at which a component is detected, the BS or Repeater shall be rotated and the height of the test antenna adjusted to obtain maximum response, and the effective radiated power (e.r.p.) of that component determined by a substitution measurement. The measurement shall be repeated with the test antenna in the orthogonal polarization plane.

NOTE: Effective radiated power (e.r.p.) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2,15 dB between e.i.r.p. and e.r.p.

e.r.p. (dBm) = e.i.r.p. (dBm) – 2,15 Ref: ITU-R SM.329-~~8~~9 ANNEX 1 [~~1~~12].

b) The BS shall transmit with maximum power declared by the manufacturer with all transmitters active. Set the base station to transmit a signal as stated for measurement of spurious emission for FDD in the TS25.141 [~~2~~3] and for 3.84 Mcps TDD option in the TS25.142 [~~3~~4].

In case of a Repeater the gain and the output power shall be set to the maximum value as declared by the manufacturer.

c) The received power shall be measured over the frequency range 30 MHz to 12.75 GHz, excluding 12.5MHz below the first carrier frequency to 12.5 MHz above the last carrier frequency used. The measurement bandwidth shall be 100 kHz between 30 MHz and 1 GHz and 1 MHz above 1 GHz as given in ITU-R SM.329-~~8~~9 [~~1~~12]. The video bandwidth shall be approximately three times the resolution bandwidth. If this video bandwidth is not available on the measuring receiver, it shall be the maximum available and at least 1 MHz.

~~A.1~~8.3.1.2.2 1,28 Mcps TDD option

a) A test site fulfilling the requirements of ITU-R SM. 329-~~8~~9 [~~1~~12] shall be used. The BS shall be placed on a non-conducting support and shall be operated from a power source via a RF filter to avoid radiation from the power leads.

Radiated power of any spurious components shall be detected by the test antenna and measuring receiver (e.g. a spectrum analyser). At each frequency at which a component is detected, the BS shall be rotated and the height of the test antenna adjusted to obtain maximum response, and the effective radiated power (e.r.p.) of that component determined by a substitution measurement. The measurement shall be repeated with the test antenna in the orthogonal polarisation plane.

NOTE: Effective radiated power (e.r.p.) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2,15 dB between e.i.r.p. and e.r.p.

e.r.p. (dBm) = e.i.r.p. (dBm) – 2,15Ref: ITU-R SM.329-~~8~~9 ANNEX 1 [~~1~~12].

b) The BS shall transmit with maximum power declared by the manufacturer with all transmitters active. Set the base station to transmit a signal as stated for measurement of spurious emission for 1.28 Mcps TDD in the TS25.142 [~~3~~4].

c) The received power shall be measured over the frequency range 30 MHz to 12.75 GHz, excluding 4MHz below the first carrier frequency to 4 MHz above the last carrier frequency used. The measurement bandwidth shall be 100 kHz between 30 MHz and 1 GHz and 1 MHz above 1 GHz as given in ITU-R SM.329-~~8~~9 [~~1~~12]. The video bandwidth shall be approximately three times the resolution bandwidth. If this video bandwidth is not available on the measuring receiver, it shall be the maximum available and at least 1 MHz.

~~A.1~~8.3.1.3 Limits

The BS or the Repeater shall meet the limits below:

Table 5: Limits for radiated emissions from BS and repeater

Frequency range	Minimum requirement (e.r.p.)/Reference Bandwidth
30 MHz≤ f <1000 MHz	-36 dBm/100 kHz
1 GHz≤ f <12,75 GHz	-30 dBm/ 1MHz
Fc1 – 12,5 MHz < f < Fc2+12,5 MHz	Not defined

Key:

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

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

~~A.1~~8.3.2 Radiated ~~spurious~~ emission, Ancillary equipment

This test is applicable to ancillary equipment. This test shall be performed on a representative configuration of the ancillary equipment.

~~A.1~~8.3.2.1 Definition

This test assesses the ability of ancillary equipment to limit unwanted emission from the enclosure port.

~~A.1~~8.3.2.2 Test method

The test method shall be in accordance with CISPR 22 [~~4~~13]

~~A.1~~8.3.2.3 Limits

The ancillary equipment shall meet the limits according to CISPR 22 [~~4~~13] (10 m measuring distance) shown in table 2:

Table 6: Limits for radiated emissions from ancillary equipment, measured on a stand alone basis

Frequency range	Quasi-peak
30 MHz-230 MHz	30 dBµV/m
230 MHz-1000 MHz	37 dBµV/m

~~A.1~~8.4 Conducted emission DC power input/output port

This test is applicable to equipment which may have DC cables longer than 3 m.

If the DC power cable of the radio equipment is intended to be less than 3 m in length, and intended only for direct connection to a dedicated AC to DC power supply, then the measurement shall be performed only on the AC power input of that power supply as specified in subclause ~~A.1~~8.5.

This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

~~A.1~~8.4.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to limit internal noise from the DC power input/output ports.

~~A.1~~8.4.2 Test method

The test method shall be in accordance with CISPR 22 [~~4~~13] and the Artificial Mains Network (AMN) shall be connected to a DC power source.

In the case of DC output ports, the ports shall be connected via a AMN to a load drawing the rated current of the source.

A measuring receiver shall be connected to each AMN measurement port in turn and the conducted emission recorded. ~~The AMN measurement ports not being used for measurement shall be terminated with a 50 Ω/50 µH load.~~

The equipment shall be installed with a ground plane as defined in CISPR 22 [~~4~~13]. The reference earth point of the AMNs shall be connected to the reference ground plane with a conductor as short as possible.

The measurement receiver shall be in accordance with the requirements of ~~section one of~~ CISPR 16-1 [~~5~~14].

~~A.1~~8.4.3 Limits

The equipment shall meet the limits below (including the average limit and the quasi-peak limit) when using, respectively, an average detector receiver and a quasi-peak detector receiver and measured in accordance with the method described in subclause ~~A.1~~8.4.2 above. If the average limit is met when using a quasi-peak detector, the equipment shall be deemed to meet both limits and measurement with the average detector receiver is not necessary.

The equipment shall meet the limits given in table 7.

Table 7: Limits for conducted emissions

Frequency range	Quasi-peak	Average
>0,15-0,5MHz	79dBµV	66dBµV
>0,5-30 MHz	73dBµV	60dBµV

~~A.1~~8.5 Conducted emissions, AC mains power input/output port

This test is applicable to equipment powered by the AC mains.

This test is not applicable to AC output ports which are connected directly (or via a circuit breaker) to the AC power port of the EUT.

This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

~~A.1~~8.5.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to limit internal noise from the AC mains power input/output ports.

~~A.1~~8.5.2 Test method

The test method shall be in accordance with CISPSR 22 [~~4~~13].

Mains connected ancillary equipment which is not part of the EUT shall be connected to the mains via a separate AMN. According to ~~clause 11.9 of~~ CISPR 16-1 [~~5~~14], the Protective Earth (PE) conductor shall also be terminated by a 50 Ω/50 µH common mode RF impedance.

~~A.1~~8.5.3 Limits

The equipment shall meet the limits below (including the average limit and the quasi-peak limit) when using, respectively, an average detector receiver and a quasi-peak detector receiver and measured in accordance with the method described in subclause ~~A.1~~8.5.2 above. If the average limit is met when using a quasi-peak detector, the equipment shall be deemed to meet both limits and measurement with the average detector receiver is not necessary.

Table 8: Limits for conducted emissions

Frequency range	Quasi-peak	Average
> 0,15-0,5 MHz	66 - 56 dBµV	56 - 46 dBµV
> 0.5- 5 MHz	56 dBµV	46 dBµV
> 5-30 MHz	60 dBµV	50 dBµV
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

Alternatively, for equipment intended to be used in telecommunication centres the limits given in table ~~10~~9 shall be used.

Table 9: Limits for conducted emissions

Frequency range	Quasi-peak	Average
>0,15-0,5MHz	79dBµV	66dBµV
>0,5-30 MHz	73dBµV	60dBµV

~~A.1~~8.6 Harmonic Current emissions (AC mains input port)

The requirements of IEC 61000-3-2 [~~6~~15] for harmonic current emission apply for equipment covered by the scope of the present document.

~~A.1~~8.7 Voltage fluctuations and flicker (AC mains input port)

The requirements of IEC 61000-3-3 [~~7~~16] for voltage fluctuations and flicker apply for equipment covered by the scope of the present document.

~~A.2~~9 Immunity

~~A.2~~9.1 Test methods and levels for immunity tests

~~A.2~~9.2 Test configurations

This subclause defines the configurations for immunity tests as follows:

- the equipment shall be tested under normal test conditions as specified in the functional standards;
- the test configuration shall be as close to normal intended use as possible;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum configuration of ancillary equipment necessary to exercise the ports;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operation conditions and to ensure that all the different types of termination are tested;
- the test conditions, test configuration and mode of operation shall be recorded in the test report;
- ports which in normal operation are connected shall be connected to an ancillary equipment or to a representative piece of cable correctly terminated to simulate the input/output characteristics of the ancillary equipment, Radio Frequency (RF) input/output ports shall be correctly terminated;

- ports which are not connected to cables during normal operation, e.g. service connectors, programming connectors, temporary connectors etc. shall not be connected to any cables for the purpose of EMC testing. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the EUT, precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables;

- Immunity tests on the entire base station shall be performed by establishing communication links at the air-interface (e.g. with the mobile simulator) and the Iub-interface (e.g. with an RNC simulator) and evaluating the BLER (see figure 1);

- Immunity tests shall be performed on both the Uplink and Downlink paths. The tests shall also include both the air-interface and Iub-interface. BLER evaluation may be carried out at either interface, where appropriate, and the measurements for the Uplink and Downlink paths may be carried out as a single path looped at either the air-interface or Iub-interface. In case of looping is used care have to be taken that the BLER information doesn't change due to looping. The BLER evaluation shall be based on the number of transmitted blocks i.e including possible deleted blocks.

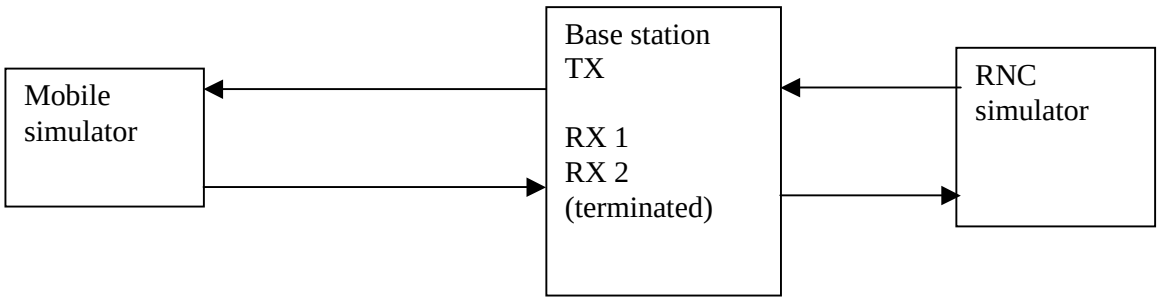

Figure ~~A.1~~2: Communication link set up for BS immunity measurement

~~A.2~~9.3 RF electromagnetic field (80 MHz - 1000 MHz)

The test shall be performed on a representative configuration of the equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

~~A.2~~9.3.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to operate as intended in the presence of a radio frequency electromagnetic field disturbance at the enclosure.

~~A.2~~9.3.2 Test method and level

The test method shall be in accordance with IEC 61000-4-3 [~~9~~18]:

- for transmitters, receivers and transceivers the following requirements shall apply:

- the test level shall be 3 V/m amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 kHz;

- the stepped frequency increments shall be 1 % of the momentary frequency;

- the test shall be performed over the frequency range 80 MHz - 1 000 MHz,

- responses in stand alone receivers or receivers which are part of transceivers occurring at discrete frequencies which are narrow band responses, shall be disregarded, see subclause 4.3;

- the frequencies selected during the test shall be recorded in the test report.

~~A.2~~9.3.3 Performance criteria

Base station:

The performance criteria of subclause 6.1 shall apply.

Ancillary equipment:

The performance criteria of subclause 6.4 shall apply.

Repeater:

The performance criteria of subclause 6.7 shall apply.

A.29.4 Electrostatic discharge

The test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

A.29.4.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to operate as intended in the event of an electrostatic discharge.

A.29.4.2 Test method and level

The test method shall be in accordance with IEC 61000-4-2 [817]:

- for contact discharge, the equipment shall pass at ±2 kV and ±4 kV;
- for air discharge shall pass at ±2 kV, ±4 kV and ±8 kV;
- electrostatic discharge shall be applied to all exposed surfaces of the EUT except where the user documentation specially indicates a requirement for appropriate protective measures.

NOTE: Ensure that the EUT is fully discharged between each ESD exposure.

A.29.4.3 Performance criteria

Base station:

The performance criteria of subclause 6.2 shall apply.

Ancillary equipment:

The performance criteria of subclause 6.5 shall apply.

Repeater:

The performance criteria of subclause 6.8 shall apply.

A.29.5 Fast transients common mode

The test shall be performed on AC mains power input ports.

This test shall be performed on signal ports, telecommunication ports, control ports and DC power input/output ports if the cables may be longer than 3 m.

Where this test is not carried out on a port or any other ports because the manufacturer declares that it is not intended to be used with cables longer than 3 m, a list of ports which were not tested for this reason shall be included in the test report.

This test shall be performed on a representative configuration of the equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

~~A.2~~9.5.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to operate as intended in the event of fast transients present on one of the input/output ports.

~~A.2~~9.5.2 Test method and level

The test method shall be in accordance with IEC 61000-4-4 [~~10~~19]:

- the test level for signal ports, telecommunication ports and control ports shall be 0,5 kV open circuit voltage as given in IEC 61000-4-4 [~~10~~19];
- the test level for DC power input/output ports shall be 0.5 kV open circuit voltage as given in IEC 61000-4-4 [~~10~~19];
- the test level for AC mains power input ports shall be 1 kV open circuit voltage as given in IEC 61000-4-4 [~~10~~19].

For AC and DC power input ports the transients shall be applied (in parallel) to all the conductors in the cable with reference to the cabinet reference earth (true common mode) and the source impedance shall be 50 Ω.

~~A.2~~9.5.3 Performance criteria

Base station:

The performance criteria of subclause 6.2 shall apply.

Ancillary equipment:

The performance criteria of subclause 6.5 shall apply.

Repeater:

The performance criteria of subclause 6.8 shall apply.

~~A.2~~9.6 RF common mode (0,15 MHz - 80 MHz)

The test shall be performed on AC mains power input/output ports.

This test shall be performed on signal ports, telecommunication ports, control and DC power input/output ports, which may have cables longer than 3 m.

Where this test is not carried out on a port or any other ports because the manufacturer declares that it is not intended to be used with cables longer than stated above, a list of ports which were not tested shall be included in the test report.

This test shall be performed on a representative configuration of the equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

NOTE: This test can also be performed using the intrusive method, where appropriate, see IEC 61000-4-6 [~~12~~21].

~~A.2~~9.6.1 Definition

This test assesses the ability of radio equipment and ancillary equipment to operate as intended in the presence of a radio frequency electromagnetic disturbance.

~~A.2~~9.6.2 Test method and level

The test method shall be in accordance with IEC 61000-4-6 [~~12~~21]:

- the test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 kHz;

- the stepped frequency increments shall be 50 kHz in the frequency range 150 kHz to 5 MHz and 1%frequency increment of the momentary frequency in the frequency range 5 MHz to 80 MHz.
- the test level shall be severity level 2 as given in IEC 61000-4-6 [~~12~~21] corresponding to 3 V rms, at a transfer impedance of 150 Ω;
- the test shall be performed over the frequency range 150 kHz - 80 MHz;
- the injection method to be used shall be selected according to the basic standard IEC 61000-4-6 [~~12~~21];
- responses of stand alone receivers or receivers which are part of transceivers occurring at discrete frequencies which are narrow band responses, shall be disregarded, see subclause 4.3;
- the frequencies of the immunity test signal selected and used during the test shall be recorded in the test report.

~~A.2~~9.6.3 Performance criteria

Base station:

The performance criteria of subclause 6.1 shall apply.

Ancillary equipment:

The performance criteria of subclause 6.4 shall apply.

Repeater:

The performance criteria of subclause 6.7 shall apply.

~~A.2~~9.7 Voltage dips and interruptions

The tests shall be performed on AC mains power input ports.

These tests shall be performed on a representative configuration of the equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

~~A.2~~9.7.1 Definition

These tests assess the ability of radio equipment and ancillary equipment to operate as intended in the event of voltage dips and interruptions present on the AC mains power input ports.

~~A.2~~9.7.2 Test method and level

The following requirements shall apply.

The test method shall be in accordance with IEC 61000-4-11 [~~13~~22].

The test levels shall be:

- a voltage dip corresponding to a reduction of the supply voltage of 30 % for 10 ms;
- a voltage dip corresponding to a reduction of the supply voltage of 60 % for 100 ms;
- a voltage interruption corresponding to a reduction of the supply voltage of > 95 % for 5 000 ms.

~~A.2~~9.7.3 Performance criteria

For a voltage dip corresponding to a reduction of the supply voltage of 30 % for 10 ms the performance criteria of subclause 6.2 shall apply for base station and performance criteria of subclause 6.5 for ancillary equipment and performance criteria of subclause 6.8 for repeater.

For a voltage dip corresponding to a reduction of the supply voltage of 60 % for 100 ms and/or a voltage interruption corresponding to a reduction of the supply voltage of > 95 % for 5 000 ms the performance criteria of subclause 6.3 shall apply for base station, performance criteria of subclause 6.6 for ancillary equipment and performance criteria of subclause 6.9 for repeater with following exception:

- in the case where the equipment is powered solely from the AC mains supply (without the use of a parallel battery back-up the communications link need not be maintained and may have to be re-established and volatile user data may have been lost.

In the event of loss of the communications link or in the event of loss of user data, this fact shall be recorded in the test report, the product description and the user documentation.

~~A.2~~9.8 Surges, common and differential mode

The tests shall be performed on AC mains power input ports.

This test shall be additionally performed on telecommunication ports.

These tests shall be performed on a representative configuration of the equipment, the associated ancillary equipment, or representative configuration of the combination of radio and ancillary equipment.

~~A.2~~9.8.1 Definition

These tests assess the ability of radio equipment and ancillary equipment to operate as intended in the event of surges being present at the AC mains power input ports.

~~A.2~~9.8.2 Test method and level

The test method shall be in accordance with IEC 61000-4-5 [~~11~~20].

The following requirements and evaluation of test results shall apply:

- the test levels for telecommunication ports, intended to be directly connected to a telecommunication network, shall be 0,5 kV line to ground as given in IEC 61000-4-5. In this case the total output impedance of the surge generator shall be in accordance with the basic standard IEC 61000-4-5 [20].
- the test level for ac mains power input ports shall be 1 kV line to earth and 0,5 kV line to line with the output impedance of the surge generator as given in the IEC61000-4-5 [~~11~~20];
- the test generator shall provide the 1,2/50 (8/20)µsec pulse as defined in IEC 61000-4-5 [~~11~~20].

~~A.2~~9.8.3 Performance criteria

Base station:

The performance criteria of subclause 6.2 shall apply.

Ancillary equipment:

The performance criteria of subclause 6.5 shall apply.

Repeater:

The performance criteria of subclause 6.8 shall apply.

~~A.3 References~~

~~This Annex incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text of annex A and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this specification only when~~

incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ITU-R Rec. SM.329-8: "Spurious emissions"

[2] (see reference [3] of clause 2 above)

[3] (see reference [4] of clause 2 above)

[4] CISPR 22 (1997): "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".

[5] CISPR 16-1 (1993): "Specification for radio disturbance and immunity measuring apparatus and methods".

[6] IEC 61000-3-2 (1995): "Electromagnetic compatibility (EMC) - Part 3: Limits - Section 2: Limits for harmonic current emissions (equipment input current ≤ 16 A) ".

[7] IEC 61000-3-3 (1995): "Electromagnetic compatibility (EMC) - Part 3: Limits - Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A"

[8] IEC 61000-4-2 (1995): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 2: Electrostatic discharge immunity test".

[9] IEC 61000-4-3 (1995): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 3: Radiated, radio-frequency electromagnetic field immunity test".

[10] IEC 61000-4-4 (1995): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test".

[11] IEC 61000-4-5 (1995): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity test".

[12] IEC 61000-4-6 (1996): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 6: Immunity to contacted disturbances, induced by radio-frequency fields".

[13] IEC 61000-4-11 (1994): " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 11: Voltage dips, short interruptions and voltage variations. Immunity tests".

3GPP TSG RAN WG4 Meeting #23 **R4-020685**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **376** ⌘ ev ⌘ Current version: **5.2.0** ⌘

*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 ☐

Title:	⌘	Wording correction to UTRAN measurements
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	It has been decided to have test like test descriptions located in TS 25.141 as an informative Annex H. Reference to that can be found in chapter 9.2. Anyhow the wording of that reference has been seen ambiguous. RAN#15 decided that the wording on the use of this annex for interpretation of the core requirements should not be used in this annex.
Summary of change:	⌘	Correction of the wording in reference to TS 25.141 informative Annex H. "Interpretation of core requirements" has been removed and replaced by new wording.
Consequences if not approved:	⌘	Current wording is ambiguous as it suggested that core specifications could be left ambiguous. The Annex could be used for "interpretation of core requirements".

Clauses affected:	⌘	9.2		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	Wording in TS 25.141 Annex H need to be modified according to this change.
Other comments:	⌘			

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

9.2 Measurements Performance for UTRAN

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS 25.302.

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

Test like descriptions of these measurements are located in the TS 25.141 as an informative Annex H. The Annex H specifies test specific parameters for some of the UTRAN requirements in this chapter. The tests provide additional information to how the requirements should be ~~interpreted~~tested. Some requirements may lack a test.

9.2.1 Received total wideband power

The measurement period shall be 100 ms.

9.2.1.1 Absolute accuracy requirement

Table 9.35

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	dBm/3.84 MHz	± 4	–103<= Io <= -74 dBm/3.84 MHz

9.2.1.2 Relative accuracy requirement

The relative accuracy is defined as the Received total wideband power measured at one frequency compared to the Received total wideband power measured from the same frequency at a different time.

Table 9.36

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	dBm/3.84 MHz	± 0.5-	For changes <= ±5.0dB and –103 <= Io <= -74dBm/3.84 MHz

9.2.1.3 Received total wideband power measurement report mapping

The reporting range for *Received total wideband power (RTWP)* is from -112 ... -50 dBm.

In table 9.37 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

3GPP TSG RAN WG4 Meeting #23 **R4-020761**

Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.133** **CR** **388** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

*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 **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Clarification to cell re-selection requirements in Cell-FACH state
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Use one of the following releases:
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R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Section 5.5 describes cell re-selection in Cell-FACH state, which are based on the evaluation of the cell re-selection criteria performed by the UE according to TS25.304. The general introduction of this section contains a comment related to RRC triggered cell re-selections based on TS25.331 but they are subject of section 5.9.
Summary of change:	⌘	Removal of the comment related to triggered cell re-selections from section 5.5.1.
Consequences if not approved:	⌘	No clear distinction between the UE based cell re-selection requirements in section 5.4 and the RRC triggered cell change order in section 5.9. Isolated Impact Analysis: This CR has no impact on current implementations because it only corrects a general statement not directly related to a requirement.

Clauses affected:	⌘	5.5.1
Other specs affected:	⌘	☐ Other core specifications ⌘ - Test specifications - O&M Specifications
Other comments:	⌘	

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

5.5 Cell Re-selection in CELL_FACH

5.5.1 Introduction

~~When a Cell Re-selection process is triggered according to TS 25.331, t~~The UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

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CHANGE REQUEST

⌘ **25.133** **CR** **410** ⌘ ev **1** ⌘ Current version: **5.2.0** ⌘

c

*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 ☐

Title: ⌘	Correction of the definition of known cell	
Source: ⌘	RAN WG4	
Work item code: ⌘	TEI5	***Date:*** ⌘ 17/5/2002
Category: ⌘	**F**	***Release:*** ⌘ Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
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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: ⌘ "Known cell" is defined as follows in section 5 of TS25.133.

A cell is known if either or both of the following conditions are true:

- the UE has had radio links connected to the cell in the previous (old) active set

- the cell has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.

However, the definition of "the previous (old) active set" is not clear how old "the previous (old) active set" is. Extreme condition is the cell that connected 1 year before if that UE is not switched on in one year. In this case the UE would not successfully uses radio links connected to the cell in "the previous (old) active set" for power control within 50+10*KC.

On the other hand, the cell in active set is measured and SFN is known by UE. So we think the first condition is covered by second condition except 5 seconds rule. We propose 5-second rule is also applied to the cell in previous active set.Then the first condition could be deleted.
Another method to clarify how old "the previous (old) active set" is to clarify by "just previous (old) active set". In this case the first condition is covered by second condition.

Summary of change: ⌘ The first condition in the definition of "a known cell" is deleted.

Isolated Impact Analysis:

The previous (old) active set cell is still checked by the second condition but these cells are limited the cells measured within 5 seconds.

This correction would not affect the tests of FDD/FDD Soft Handover and FDD/FDD Hard Handover described in TS34.121 8.3.1and 8.3.2 on the condition described in TS25.133 A.5.1.1, A.5.2.1.1 and A.5.2.2.1 (i.e. the second condition is true).

Consequences if not approved:	⌘	It isn't clear how long the UE should keep tracking "the previous (old) active set" as a known cell by the ACTIVE SET UPDATE procedure. This may cause the UE behaviour is different between manufactures and some degradation of the performance of FDD/FDD handover can be occurred.

Clauses affected:	⌘	5.1,5.2		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	34.121
Other comments:	⌘			

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

5 UTRAN Connected mode mobility

This section contains the requirements on the mobility procedures in UTRAN connected mode such as handover and cell re-selection.

Requirements related to the measurements in support of the execution of the UTRAN connected mode mobility procedures are specified, currently not necessarily for all UTRAN connected mode states, in section 8 .

The radio links the UE shall use are controlled by UTRAN with RRC signalling.

UE behaviour in response to UTRAN RRC messages is described in TS25.331.

The purpose of Cell reselection in CELL_FACH, CELL_PCH and URA_PCH states is that the UE shall select a better cell according to the cell reselection criteria in TS 25.304. CELL_FACH, CELL_PCH and URA_PCH states are described in TS 25.331.

5.1 FDD/FDD Soft Handover

5.1.1 Introduction

Soft handover is a function in which the UE is connected to several UTRAN access points at the same time. Addition and/or release of radio links are controlled by the ACTIVE SET UPDATE procedure.

The soft handover function includes a measurement phase, a decision algorithm in UTRAN and the ACTIVE SET UPDATE procedure.

5.1.2 Requirements

5.1.2.1 Active set dimension

The UE shall be capable of supporting at least 6 radio links in the active set.

5.1.2.2 Active set update delay

The active set update delay is defined as the time from when the UE has received the ACTIVE SET UPDATE message from UTRAN, or at the time stated through the activation time when to perform the active set update, to the time when the UE successfully uses the set of radio links stated in that message for power control.

The active set update delay is depending on the number of known cells referred to in the ACTIVE SET UPDATE message. A cell is known if ~~either or both of the following conditions are~~is ~~true:~~

~~- the UE has had radio links connected to the cell in the previous (old) active set~~

~~- the cell~~ it has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.~~.~~

And the phase reference is the primary CPICH.

The active set update delay shall be less than 50+10*KC+100*OC ms, where

KC is the number of known cells in the active set update message.

OC is the number of cells that are not known in the active set update message.

If the UE have radio links in the active set that it can not use for data detection (due to low signal level), the UE shall at least every 150 ms search for the radio link

5.1.2.3 Interruption Time

The UE shall not interrupt the data flow when adding, changing or removing radio links to the active set.

5.2 FDD/FDD Hard Handover

5.2.1 Introduction

The hard handover procedure is initiated from UTRAN with a RRC message that implies a hard handover, see TS 25.331 section 8.3.5.

5.2.2 Requirements

5.2.2.1 Hard handover delay

Procedure delay for all procedures, that can command a hard handover, are specified in TS25.331 section 13.5.2.

When the UE receives a RRC message implying hard handover with the activation time "now" or earlier than than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2.

5.2.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCCH, is depending on whether the target cell is known for the UE or not.

If intra-frequency hard handover is commanded or inter-frequency hard handover is commanded when the UE does not need compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1}=T_{IU}+40+20*KC+150*OC \text{ ms}$$

where

T_{IU} is the interruption uncertainty when changing the timing from the old to the new cell. T_{IU} can be up to one frame (10 ms).

KC is the number of known target cells in the message, and

OC is the number of target cells that are not known in the message.

NOTE: The figure 40 ms is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

In the interruption requirement $T_{interrupt1}$ a cell is known if ~~either or both of the following conditions are~~is ~~true:~~

~~the UE has had radio links connected to the cell in the previous (old) active set~~

~~the cell~~ it has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.

~~when hard handover procedures are performed with transitions between CELL_DCH and CELL_FACH etc, if intra or inter frequency measurement is continued after the transition, this condition shall be applied.~~

If inter-frequency hard handover is commanded and the UE needs compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{IU}+40+50*KC+150*OC \text{ ms}$$

In the interruption requirement $T_{interrupt2}$ a cell is known if:

- the cell has been measured by the UE during the last 5 seconds.

The phase reference is the primary CPICH.

The requirements in this section assume that N312 has the smallest possible value i.e. only one insync is required.

3GPP TSG RAN WG4 Meeting #23 **R4-021042**

Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.141** **CR** **199** ⌘ ev **1** ⌘ Current version: **5.2.0** ⌘

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

Title:	⌘	UTRAN measurement Transmitted code power
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	UTRAN measurement Transmitted code power is defined in TS 25.133. There is no test case defined for this in current TS 25.141, Annex H. The definition of measurement may be therefore interpreted differently. Additional information is included in an informative Annex H to enable a consistent test method for the requirement.
Summary of change:	⌘	Inclusion of Annex H.X which includes a testlike description for UTRAN measurement Transmitted code power. Test system uncertainties and test tolerances corrected according to this change.
Consequences if not approved:	⌘	Manufacturers may interpret test methods for the requirements differently.

Clauses affected:	⌘	4.1.2; 4.2.1; Annex F, Annex G, New chapter H.X in Annex H.
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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4.1.2 Measurement of transmitter

Table 4.1: Maximum Test System Uncertainty for transmitter tests

Subclause	Maximum Test System Uncertainty	Derivation of Test System Uncertainty
6.2.1 Maximum Output Power	±0.7 dB	
6.2.2 CPICH Power accuracy	± 0.8 dB	
6.3.4 Frequency error	± 12 Hz	
6.4.2 Power control steps	± 0.1 dB for one 1 dB step ± 0.1 dB for one 0.5 dB step ± 0.1 dB for ten 1 dB steps ± 0.1 dB for ten 0.5 dB steps	Result is difference between two absolute CDP measurements on the power controlled DPCH. Assume BTS output power on all other channels is constant. Assume Test equipment relative power accuracy over the range of the test conditions is perfect, or otherwise included in the system measurement error. For this test the absolute power change is < 3 dB.
6.4.3 Power dynamic range	± 0.2 dB	
6.4.4 Total power dynamic range	± 0.3 dB	
6.5.1 Occupied Bandwidth	±100 kHz	Accuracy = ±3*RBW. Assume 30 kHz bandwidth
6.5.2.1 Spectrum emission mask	±1.5 dB Due to carrier leakage, for measurements specified in a 1 MHz bandwidth close to the carrier (4 MHz to 8 MHz), integration of the measurement using several narrower measurements may be necessary in order to achieve the above accuracy.	
6.5.2.2 ACLR	5 MHz offset ± 0.8 dB 10 MHz offset ± 0.8 dB Note: Impact of measurement period (averaging) and intermod effects in the measurement receiver not yet fully studied. However, the above limits remain valid.	
6.5.3 Spurious emissions	± 2.0 dB for BS and coexistance bands for results > -60 dBm ± 3.0 dB for results < -60 dBm Outside above range: f≤2.2GHz : ± 1.5 dB 2.2 GHz < f ≤ 4 GHz : ± 2.0 dB f > 4 GHz : ±4.0 dB	
6.6 Transmit intermodulation (interferer requirements)	The value below applies only to the interference signal and is unrelated to the measurement uncertainty of the tests (6.5.2.1, 6.5.2.2 and 6.5.3) which have to be carried out in the presence of the interfer. . ± 1.0 dB	The uncertainty of interferer has double the effect on the result due to the frequency offset.
6.7.1 EVM	±2.5 % (for single code)	
6.7.2 Peak code Domain error	±1.0 dB	
Annex H.X Transmitted code power. Absolute	±0.9 dB	Absolute power accuracy = 0.7dB + relative power accuracy 0.2 dB.
Annex H.X Transmitted code power. Relative	±0.2 dB	

4.1.3 Measurement of receiver

Table 4.1A: Maximum Test System Uncertainty for receiver tests

Subclause	Maximum Test System Uncertainty[1]	Derivation of Test System Uncertainty
7.2 Reference sensitivity level	± 0.7 dB	
7.3 Dynamic range	± 1.2 dB	Formula = SQRT(signal level error^2 and AWGN level error^2)
7.4 Adjacent channel selectivity	± 1.1 dB	Formula = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect. The ACLR effect is calculated by: (Formula to follow)
7.5 Blocking characteristics	System error with blocking signal <15 MHz offset: ± 1.4 dB Blocking signal >= 15 MHz offset and f ≤ 2.2 GHz: ± 1.1 dB + broadband noise 2.2 GHz < f ≤ 4 GHz : ±1.8 dB f > 4 GHz: ±3.2 dB	Formula = SQRT (wanted_level_error^2 + interferer_level_error^2) + ACLR effect + Broadband noise. (Assuming ACLR 68 dB, and 0.7 dB for signals) Assume-130 dBc broadband noise from blocking signal has 0.1 dB effect. Harmonics and spurs of the interferer need to be carefully considered. Perhaps need to avoid harmonics of the interfere that fall on top of the receive channel. For the –15 dBm CW blocking case, filtering of the blocking signal (at least 25 dB) is necessary to eliminate problems with broadband noise.
7.6 Intermod Characteristics	±1.3 dB	Formula = $\sqrt{(2 \cdot CW\_level\_error)^2 + (\mathrm{mod}\_level\_error)^2}$ (Using CW interferer ±0.5 dB, modulated interferer ±0.5 dB, wanted signal ±0.7 dB)
7.7 Spurious Emissions	The Test System uncertainty figures for Spurious emissions apply to the the measurement of the DUT and not any stimulus signals. ± 3.0 dB for BS receive band (-78 dBm) Outside above range: f≤2.2GHz : ± 2.0 dB (-57 dBm) 2.2 GHz < f ≤ 4 GHz : ± 2.0 dB (-47 dBm) f > 4 GHz : ±4.0 dB (-47 dBm)	
Note 1: Unless otherwise noted, only the Test System stimulus error is considered here. The effect of errors in the BER/FER measurements due to finite test duration is not considered.		

4.1.4 Measurement of performance requirement

Table 4.1B: Maximum Test System Uncertainty for Performance Requirements

Subclause	Maximum Test System Uncertainty[1]
8.2, Demodulation in static propagation condition	TBD
8.3, Demodulation of DCH in multiplath fading conditions	TBD
8.4 Demodulation of DCH in moving propagation conditions	TBD
8.5 Demodulation of DCH in birth/death propagation conditions	TBD
8.6 Verification of the internal BLER calculation	TBD
Note 1: Only the overall stimulus error is considered here. The effect of errors in the BER/FER measurements due to finite test duration is not considered.	

4.2 Test Tolerances (informative)

The Test Tolerances defined in this subclause have been used to relax the Minimum Requirements in this specification to derive the Test Requirements.

The Test Tolerances are derived from Test System uncertainties, regulatory requirements and criticality to system performance. As a result, the Test Tolerances may sometimes be set to zero.

The test tolerances should not be modified for any reason e.g. to take account of commonly known test system errors (such as mismatch, cable loss, etc.)

4.2.1 Transmitter

Table 4.1C: Test Tolerances for transmitter tests.

Subclause	Test Tolerance[1]
6.2.1 Maximum Output Power	0.7 dB
6.2.2 CPICH Power accuracy	0.8 dB
6.3.4 Frequency error	12 Hz
6.4.2 Power control steps	0.1 dB
6.4.3 Power dynamic range	0.2 dB
6.4.4 Total power dynamic range	0.3 dB
6.5.1 Occupied Bandwidth	0 kHz
6.5.2.1 Spectrum emission mask	1.5 dB[3]
6.5.2.2 ACLR	0.8 dB
6.5.3 Spurious emissions	0 dB
6.6 Transmit intermodulation (interferer requirements)	0 dB[2]
6.7.1 Frequency error	12 Hz
6.7.12 EVM	0 %
6.7.23 Peak code Domain error	1.0dB
Annex H.X Transmitted code power (absolute)	0.9 dB
Annex H.X Transmitted code power (relative)	0.2 dB
Note 1: Unless otherwise stated, The Test Tolerances are applied to the DUT Minimum Requirement. See Annex F. Note 2: The Test Tolerance is applied to the stimulus signal(s). See Annex F. Note 3: 0 dB test tolerance for the additional Band II requirements.	

NEXT MODIFIED SECTION

Annex F (informative): Derivation of Test Requirements

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 4.2. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in tables F.1, F.2 and F.3

Note that a formula for applying Test Tolerances is provided for all tests, even those with a test tolerance of zero. This is necessary in the case that the Test System uncertainty is greater than that allowed in subclause 4.1. In this event, the excess error shall be subtracted from the defined test tolerance in order to generate the correct tightened Test Requirements as defined in subclause 4.3.

For example, a Test System having 0.9 dB accuracy for test 6.2.1 Base Station maximum output power (which is 0.2 dB above the limit specified in subclause 4.) would subtract 0.2 dB from the Test Tolerance of 0.7 dB defined in subclause 4.2. This new test tolerance of 0.5 dB would then be applied to the Minimum Requirement using the formula defined in Table F.1 to give a new range of ±2.5 dB of the manufacturer's rated output power.

Using this same approach for the case where a test had a test tolerance of 0 dB, an excess error of 0.2 dB would result in a modified test tolerance of –0.2 dB.

Table F.1: Derivation of Test Requirements (Transmitter tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
6.2.1 Base station maximum output power	In normal conditions … within +2 dB and -2 dB of the manufacturer's rated output power In extreme conditions… within +2.5 dB and –2.5 dB of the manufacturer's rated output power	0.7 dB	Formula: Upper limit + TT Lower limit – TT In normal conditions … within +2.7 dB and –2.7 dB of the manufacturer's rated output power In extreme conditions… within +3.2 dB and –3.2 dB of the manufacturer's rated output power
6.2.2 CPICH Power accuracy	CPICH power shall be within ±2.1dB	0.8 dB	Formula: Upper limit + TT Lower limit – TT CPICH power shall be within ±2.9dB
6.3.4 Frequency error	Frequency error limit = 0.05 ppm	12 Hz	Formula: Frequency Error limit + TT Frequency Error limit = 0.05 ppm + 12 Hz
6.4.2 Power control steps	Lower and upper limits as specified in tables 6.9 and 6.10a	0.1 dB	Formula: Upper limits + TT Lower limits – TT 0.1 dB applied as above to tables 6.9 and 6.10a
6.4.3 Power dynamic range	maximum power limit = BS maximum output power -3 dB minimum power limit = BS maximum output power –28 dB	0.2 dB	Formula: maximum power limit – TT minimum power limit + TT maximum power limit = BS maximum output power –3.2 dB minimum power limit = BS maximum output power –27.8 dB
6.4.4 Total power dynamic range	total power dynamic range limit = 18 dB	0.3 dB	Formula: total power dynamic range limit – TT total power dynamic range limit = 17.7 dB
6.5.1 Occupied Bandwidth	occupied bandwidth limit = 5 MHz	0 kHz	Formula: Occupied bandwidth limit + TT Occupied bandwidth limit = 5 MHz
6.5.2.1 Spectrum emission mask	Maximum level defined in tables 6.11, 6.12, 6.13 and 6.14:	1.5 dB(0 dB for the additional Band II requirements)	Formula: Maximum level + TT Add 1.5 to Maximum level entries in tables 6.11, 6.12, 6.13 and 6.14.
6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)	ACLR limit = 45 dB at 5 MHz ACLR limit = 50 dB at 10 MHz	0.8 dB	Formula: ACLR limit – TT ACLR limit = 44.2 dB at 5 MHz ACLR limit = 49.2 dB at 10 MHz
6.5.3 Spurious emissions	Maximum level defined in tables 6.16 to 6.26	0 dB	Formula: Maximum limit + TT Add 0 to Maximum level in tables 6.16 to 6.26
6.6 Transmit intermodulation (interferer requirements) This tolerance applies to the stimulus and not the measurements defined in 6.5.2.1, 6.5.2.2 and 6.5.3.	Wanted signal level – interferer level = 30 dB	0 dB	Formula: Ratio + TT Wanted signal level – interferer level = 30 + 0 dB
6.7.1 EVM	EVM limit =17.5 %	0 %	Formula: EVM limit + TT EVM limit = 17.5%
6.7.2 Peak code Domain error	Peak code domain error limit = -33 dB	1.0 dB	Formula: Peak code domain error limit + TT Peak code domain error limit = -32 dB

Annex H.X Transmitted code power (absolute)	Absolute accuracy limit = Pout,code – 3 dB Pout,code + 3 dB	0.9 dB	Formula: Absolute accuracy limit –TT Absolute accuracy limit +TT Absolute accuracy limit: minimum power limit = -3.9 dB maximum power limit = +3.9 dB
Annex H.X Transmitted code power (relative)	Relative accuracy limit = $\lvert$ Pout,code1 - Pout,code2 $\rvert \leq$ 2 dB	0.2 dB	Formula: Relative accuracy limit + TT Relative accuracy limit = 2.2 dB

Table F.2: Derivation of Test Requirements (Receiver tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
7.2 Reference sensitivity	Reference sensitivity level = -121 dBm FER/BER limit = 0.001	0.7 dB	Formula: Reference sensitivity level + TT Reference sensitivity level = -120.3 dBm FER/BER limit is not changed
7.3 Dynamic range	Wanted signal level = -91 dBm AWGN level = -73 dBm/3.84 MHz	1.2 dB	Formula: Wanted signal level + TT AWGN level unchanged Wanted signal level = -89.8 dBm
7.4 Adjacent channel selectivity	Wanted signal level = -115 dBm W-CDMA interferer level = -52 dBm	0 dB	Formula: Wanted signal level + TT W-CDMA interferer level unchanged Wanted signal level = -115 dBm
7.5 Blocking characteristics	Wanted signal level = -115 dBm Interferer level See table 7.4a / 7.4b	0 dB	Formula: Wanted signal level + TT Interferer level unchanged Wanted signal level = -115 dBm
7.6 Intermod Characteristics	Wanted signal level = -115 dBm Interferer1 level (10 MHz offset CW) = -48 dBm Interferer2 level (20 MHz offset W-CDMA Modulated) = -48 dBm	0 dB	Formula: Wanted signal level + TT Interferer1 level unchanged Interferer2 level unchanged Wanted signal level = -115 dBm
7.7 Spurious Emissions	Maximum level defined in Table 7.7	0 dB	Formula: Maximum level + TT Add TT to Maximum level in table 7.7

Table F.3: Derivation of Test Requirements (Performance tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
8.2, Demodulation in static propagation condtion		TBD	
8.3, Demodulation of DCH in multiplath fading conditons		TBD	
8.4 Demodulation of DCH in moving propagation conditions		TBD	
8.5 Demodulation of DCH in birth/death propagation conditions		TBD	
8.6 Verification of the internal BLER calculation		TBD	

Annex G (informative): Acceptable uncertainty of Test Equipment

This informative annex specifies the critical parameters of the components of an overall Test System (e.g. Signal generators, Signal Analysers etc.) which are necessary when assembling a Test System which complies with subclause 4.1 Acceptable Uncertainty of Test System. These Test Equipment parameters are fundamental to the accuracy of the overall Test System and are unlikely to be improved upon through System Calibration.

G.1 Transmitter measurements

Table G.1: Equipment accuracy for transmitter measurements

Test	Equipment accuracy	Range over which equipment accuracy applies
6.2.1 Maximum Output Power	Not critical	Not critical
6.2.2 CPICH Power accuracy	Not critical	Not critical
6.3.4 Frequency error	± 10 Hz + timebase = [12] Hz	Measurements in the range ±500 Hz.
6.4.2 Power control steps	± 0.1 dB for one 1 dB step ± 0.1 dB for ten 1 dB steps	Pmax – 3dB to Pmax – 28 dB
6.4.3 Power control dynamic range	± 0.2 dB	Pmax – 3dB to Pmax – 28 dB
6.4.4 Total power dynamic range	±0.3 dB relative error over 18 dB	Pmax to Pmax – 18 dB
6.5.1 Occupied Bandwidth	± 100 kHz	±1 MHz of the minimum requirement
6.5.2.1 Spectrum emission mask	Not critical	Not critical
6.5.2.2 ACLR	± 0.8 dB	Measurements in the range ±3 dB of the minumum requirement at signal power = Pmax
6.5.3 Spurious emissions	Not critical	Not critical
6.6 Transmit intermodulation (interferer requirements)	Not critical	Not critical
6.7.1 EVM	± 2.5 % (for single code)	Measurements in the range 12.5% to 22.5% at signal power = Pmax –3 dB to Pmax – 18 dB
6.7.2 Peak code Domain error	±1.0dB	Measurements in the range –30 to –36 dB at signal power = Pmax
Annex H.X Transmitted code power (absolute)	±0.9dB	Pmax – 3dB to Pmax – 28 dB
Annex H.X Transmitted code power (relative)	±0.2dB	Pmax – 3dB to Pmax – 28 dB

G.2 Receiver measurements

Table G.2: Equipment accuracy for receiver measurements

Test	Equipment accuracy	Range over which equipment accuracy applies
7.2 Reference sensitivity level	Not critical	Not critical
7.3 Dynamic range	Not critical	Not critical
7.4 Adjacent channel selectivity	Not critical	Not critical
7.5 Blocking characteristics	Not critical	Not critical
7.6 Intermod Characteristics	Not critical	Not critical
7.7 Spurious Emissions	Not critical	Not critical

Annex H (Informative):
UTRAN Measurement Test Cases

H.1 Purpose of Annex

This Annex specifies test specific parameters for some of the UTRAN requirements in chapter 9.2 TS 25.133. The tests provide additional information to how the requirements should be interpreted. Some requirements may lack a test.

H.2 Received Total Wideband Power

H.2.1 Absolute RTWP measurement

1. Terminate the BS RX inputs, measure the RTWP and record it.
2. Connect a signal generator and increase the signal generator power until the reported RTWP level (Irep) has increased 3dB.
3. Measure the signal level power at the antenna connector port. This signal level is now called the "Internally generated noise" (Ni).
4. Sweep the sum of internally generated noise (Ni) and signal generator power (I) through the defined accuracy range.
5. Check that: |(Ni+I)-Irep| meets the requirements in chapter 9.2.1.

Note that Io= (Ni+I)

H.2.2 Relative RTWP measurement

1. Terminate the BS RX inputs, measure the RTWP and record it.
2. Attach a signal generator to the RX input and increase the power until the by the BS reported RTWP value (Irep) has increased 3 dB.
3. Measure the signal level power at the antenna connector port. This signal level is now called the "Internally generated noise" (Ni).
4. Calculate the required signal levels I such that the sum of the internally generated noise (Ni) and the signal generator power (I)
5. The difference between the reported RTWP values shall meet the requirements specified in chapter 9.2.1.

H.X Transmitted code power

1. Generate the wanted signal in accordance to test model 2, subclause 6.1.1.2. Set power of the DPCH under test to the Pmax-3 dB level. Power levels for other code channels shall be adjusted as necessary.
2. Measure the output power on code channel under test, Pout,code, at the antenna connector. Record the transmitted code power reported in the BS, Pcode.
3. Check that Pout,code meets the absolute accuracy requirement in TS 25.133 chapter 9.2.5.1. If STTD or closed loop transmit diversity is supported by the BS, the transmitted code power for each branch are measured,

summed together and reported to higher layers. In case of TX diversity both branches need to be measured and summed together in order to find out the wanted value. The absolute accuracy of Pcode can be accepted if Pout,code will fullfill the following conditions:

$$Pcode\text{-}3.9\ dB \leq Pout,code \leq Pcode + 3.9\ dB$$

4. Check that the relative accuracy requirement for Pcode in TS 25.133 chapter 9.2.5.2 is met. Set Pcode1 and Pcode2 to transmit with the same power level. The relative accuracy between Pcode1 and Pcode2 can be accepted if the difference between the measured power of one code channel, Pout,code1 and another code channel Pout,code 2 will fullfill the following conditions:

$$\left| Pout,code1 - Pout,code2 \right| \leq 2.2\ dB.$$

5. Set the power of the DPCH under test to the minimum power of the power control dynamic range and repeat steps 2, 3 and 4.

3GPP TSG RAN WG4 Meeting #23 **R4-020702**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.141 CR 202** ⌘ ev **-** ⌘ Current version: **5.2.0** ⌘

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

Title:	⌘	Correction to occupied bandwidth test
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Use one of the following releases:

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

Reason for change:	⌘	The output power to be used in the occupied bandwidth test is not specified.
Summary of change:	⌘	Output power for occupied bandwidth test is set to maximum output power.
Consequences if not approved:	⌘	The occupied bandwidth test will be ambiguous. Isolated impact statement: Correction to a function where in the specification was procedural text or rules missing. Would affect conformance testing only, would not affect implementations, BS-UE interoperability or system performance.
Clauses affected:	⌘	6.5.1.4.1
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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6.1.1.1 Test Model 1

This model shall be used for tests on:

- occupied bandwidth;
- spectrum emission mask;
- ACLR;
- spurious emissions;
- transmit intermodulation;
- base station maximum output power.

64 DPCHs at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random timing offsets are defined so as to simulate a realistic traffic scenario which may have high PAR (Peak to Average Ratio).

Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.

"Fraction of power" is relative to the maximum output power on the TX antenna interface under test.

Table 6.1: Test Model 1 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset ($x256T_{chip}$)
P-CCPCH+SCH	1	10	-10	1	0
Primary CPICH	1	10	-10	0	0
PICH	1	1.6	-18	16	120
S-CCPCH containing PCH (SF=256)	1	1.6	-18	3	0
DPCH (SF=128)	16/32/64	76.8 in total	see table 6.2	see table 6.2	see table 6.2

Table 6.2: DPCH Spreading Code, Timing offsets and level settings for Test Model 1

Code	Timing offset ($x256T_{chip}$)	Level settings (dB) (16 codes)	Level settings (dB) (32 codes)	Level settings (dB) (64 codes)
2	86	-10	-13	-16
11	134	-12	-13	-16
17	52	-12	-14	-16
23	45	-14	-15	-17
31	143	-11	-17	-18
38	112	-13	-14	-20
47	59	-17	-16	-16
55	23	-16	-18	-17
62	1	-13	-16	-16
69	88	-15	-19	-19
78	30	-14	-17	-22
85	18	-18	-15	-20
94	30	-19	-17	-16
102	61	-17	-22	-17
113	128	-15	-20	-19
119	143	-9	-24	-21
7	83		-20	-19
13	25		-18	-21
20	103		-14	-18
27	97		-14	-20
35	56		-16	-24
41	104		-19	-24
51	51		-18	-22
58	26		-17	-21
64	137		-22	-18
74	65		-19	-20
82	37		-19	-17
88	125		-16	-18
97	149		-18	-19
108	123		-15	-23
117	83		-17	-22
125	5		-12	-21
4	91			-17
9	7			-18
12	32			-20
14	21			-17
19	29			-19
22	59			-21
26	22			-19
28	138			-23
34	31			-22
36	17			-19
40	9			-24
44	69			-23
49	49			-22
53	20			-19
56	57			-22
61	121			-21
63	127			-18
66	114			-19
71	100			-22
76	76			-21
80	141			-19
84	82			-21
87	64			-19
91	149			-21
95	87			-20
99	98			-25
105	46			-25
110	37			-25
116	87			-24

Code	Timing offset ($x256T_{chip}$)	Level settings (dB) (16 codes)	Level settings (dB) (32 codes)	Level settings (dB) (64 codes)
118	149			-22
122	85			-20
126	69			-15

--- next changed section ---

6.5.1 Occupied bandwidth

6.5.1.1 Definition and applicability

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage $\beta/2$ of the total mean transmitted power.

The value of $\beta/2$ should be taken as 0,5%.

6.5.1.2 Minimum Requirements

The occupied bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

The normative reference for this requirement is TS 25.104 subclause 6.6.1.

6.5.1.3 Test purpose

The occupied bandwidth, defined in the Radio Regulations of the International Telecommunication Union ITU, is a useful concept for specifying the spectral properties of a given emission in the simplest possible manner; see also Recommendation ITU-R Recommendation SM.328-9 [11]. The test purpose is to verify that the emission of the BS does not occupy an excessive bandwidth for the service to be provided and is, therefore, not likely to create interference to other users of the spectrum beyond undue limits.

6.5.1.4 Method of test

6.5.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

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

1) Connect the Measurement device to the BS antenna connector.

2) Start transmission on a single carrier according to test model 1 defined in subclause 6.1.1.1 at the manufacturer's specified maximum output power.

6.5.1.4.2 Procedure

1) Measure the spectrum of the transmitted signal across a span of 10 MHz, based on an occupied bandwidth requirement of 5 MHz. The selected resolution bandwidth (RBW) filter of the analyser shall be 30 kHz or less. The spectrum shall be measured at 400 or more points across the measurement span.

NOTE: The detection mode of the spectrum analyzer will not have any effect on the result if the statistical properties of the out-of-OBW power are the same as those of the inside-OBW power. Both are expected to have the Rayleigh distribution of the amplitude of Gaussian noise. In any case where the statistics are not the same, though, the detection mode must be power responding. There are at least two ways to be power responding. The spectrum analyser can be set to "sample" detection, with its video bandwidth setting at least three times its RBW setting. Or the analyser may be set to respond to the average of the power (root-mean-square of the voltage) across the measurement cell.

2) Compute the total of the power, P0, (in power units, not decibel units) of all the measurement cells in the measurement span. Compute P1, the power outside the occupied bandwidth on each side. P1 is half of the total power outside the bandwidth. P1 is half of (100 % - (occupied percentage)) of P0. For the occupied percentage of 99 %, P1 is 0.005 times P0.

3) Determine the lowest frequency, f1, for which the sum of all power in the measurement cells from the beginning of the span to f1 exceeds P1.

4) Determine the highest frequency, f2, for which the sum of all power in the measurement cells from the end of the span to f2 exceeds P1.

5) Compute the occupied bandwidth as f2 - f1.

6.5.1.5 Test requirements

The occupied bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps

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

3GPP TSG RAN WG4 Meeting #23 **R4-020932**

Gyeongju, Korea 13th -17th May, 2002

eCR-Form-v5

CHANGE REQUEST

⌘ **25.141** **CR** **205** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

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

Title:	⌘	Corrections to PN Generator
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

Use one of the following releases:

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

Reason for change:	⌘	The stage number of the registers is unclear in Figure 6.2.
Summary of change:	⌘	Adding stage number of the registers in Figure 6.2.
Consequences if not approved:	⌘	The PN generator is defined by the equation and the figure. But the relationship between the equation and the figure is unclear. Isolated Impact Analysis: This CR has no impact on current implementations because it is not changing the requirements and just being accurate.

Clauses affected:	⌘			
Other specs affected:	⌘	☐ Other core specifications - Test specifications - O&M Specifications	⌘	
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6.1.1.5 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by TS 25.211-slot format 10 and 6 that are reproduced in table 6.7.

Table 6.7: DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData1	Ndata2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8
6	30	15	256	150	150	300	20	2	8	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of TS 25.211, which are reproduced in table 6.8.

Table 6.8: Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	**0**	**1**	**2**	**3**
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. In case there are less data bits/frame needed then the first bits of the aggregate shall be selected. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelization code as the seed for the PN sequence at the start of each frame, according to its timing offset.

The sequence shall be generated in a nine-stage shift register whose 5^{th} and 9^{th} stage outputs are added in a modulo-two addition stage, and the result is fed back to the input of the first stage. The generator shall be seeded so that the sequence begins with the channelization code starting from the LSB, and followed by 2 consecutive ONEs for SF=128 and 1 consecutive ONE for SF=256.

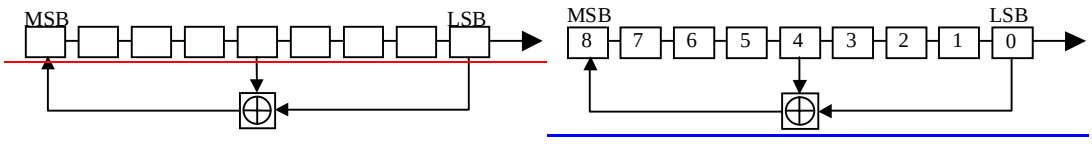

Figure 6.2

3GPP TSG RAN WG4 Meeting #23 **R4-020789**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.141** **CR** **209** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

*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 **X** Core Network ☐

Title:	⌘	Update of reference to ITU-R recommendation SM.329-9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Use one of the following releases:

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

Reason for change:	⌘	The present document refers to ITU-R SM.329-8, which has been superseded recently by SM.329-9. No actual requirements are changed.
Summary of change:	⌘	The reference to SM.329 is updated throughout the document. In clause 2 it is updated to be SM.329-9. In the main body of the document, the specific part "-8" of the document number is removed and replaced by a reference [4] to make future updating easier.
Consequences if not approved:	⌘	There would be an uncertainty whether the 3GPP regulatory radio requirements are based on the latest ITU recommendations.

Clauses affected:	⌘	2, 4.3, 6.6.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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, the latest version applies. 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*.

[1] 3GPP TS 25.104: "UTRA(BS) FDD; Radio transmission and Reception".

[2] 3GPP TS 25.942: "RF system scenarios".

[3] 3GPP TS 25.113: "Base station EMC".

[4] ITU-R recommendation SM.329-~~8~~9: "Spurious emissions".

[5] ITU-T recommendation O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[6] IEC 60721-3-3 (1994): "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weather protected locations".

[7] IEC 60721-3-4 (1995): "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weather protected locations".

[8] IEC 60068-2-1 (1990): "Environmental testing - Part 2: Tests. Tests A: Cold".

[9] IEC 60068-2-2 (1974): "Environmental testing - Part 2: Tests. Tests B: Dry heat".

[10] IEC 60068-2-6 (1995): "Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal)".

[11] ITU-R recommendation SM.328-9: "Spectra and bandwidth of emissions".

[12] 3GPP TS 45.004: "Digital cellular telecommunications system (Phase 2+); Modulation".

4.7 Regional requirements

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

Table 4.4: List of regional requirements

Subclause number	Requirement	Comments
3.4.1	Frequency bands	Some bands may be applied regionally.
3.4.2	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
3.5.	Channel arrangement	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
4.2	Test Tolerances * (*: This regional requirement should be reviewed to check its necessity every TSG RAN meeting.)	Until the time the non-zero test tolerances are reflected in the Japanese regulations, shared risk against core specification value with test tolerance of zero may be applied provisionally for the following minimum requirements as regional requirement in Japan. - 6.2.1.2 Base station maximum output power - 6.3 Frequency error - 6.4.2 Power control steps - 6.4.3 Power control dynamic range - 6.4.4 Total power dynamic range - 6.5.2.2 Adjacent Channel Leakage power Ratio(ACLR) - 6.7.2 Peak code Domain error - 7.2 Receiver sensitivity Level
6.2.1.2	Base station output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 4.4.1.
6.5.2.1	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.5.3.4.1	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329~~-8 [1]~~ [4], are applied.
6.5.3.4.2	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329~~-8 [1]~~ [4], are applied.
6.5.3.4.4.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.
6.5.3.4.4.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.5.3.4.5.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.5.3.4.5.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.5.3.4.6	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.
6.5.3.4.7	Co-.existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to the downlink band as defined in clause 3.4.1 in geographic areas in which both an adjacent band service and UTRA are deployed.
6.5.3.4.8.1	Co-existence with UTRA TDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.5.3.4.8.2	Co-existence with UTRA TDD – Co-located base stations	This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.

6.5.3.4.9.1	Co-existence with UTRA in frequency band III -Operation in the same geographic area	This requirement may be applied for the protection of UTRA UE in frequency band I in geographic areas in which both UTRA in frequency band I and III are deployed.
6.5.3.4.9.2	Co-existence with UTRA in frequency band III - Co-located base stations	This requirement may be applied for the protection of UTRA BTS receivers in frequency band I when UTRA BS in frequency band I and III are co-located.
6.5.3.4.10.1	Co-existence with UTRA in frequency band I -Operation in the same geographic area	This requirement may be applied for the protection of UTRA UE in frequency band I in geographic areas in which both UTRA in frequency band I and III are deployed.
6.5.3.4.10.2	Co-existence with UTRA in frequency band I - Co-located base stations	This requirement may be applied for the protection of UTRA BTS receivers in frequency band I when UTRA BS in frequency band I and III are co-located.
6.5.3.4.11.1	Co-existence with PCS1900 - Co-located base stations	This requirement may be applied for the protection of PCS 1900 BTS receivers when PCS 1900 BTS and UTRA BS are co-located.
6.5.3.4.12.1	Co-existence with GSM 850 - Co-located base stations	This requirement may be applied for the protection of GSM 850 BTS receivers when GSM 850 BTS and UTRA BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands inclause 3.4.1 that are supported by the BS.
7.5	Blocking characteristics	This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA FDD BS and GSM 900, GSM850, PCS 1900 and BS operating in the /DCS1800 band (GSM or UTRA) are co-located.
7.6	Intermodulation characteristics	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
7.7	Spurious emissions	The requirement is applied according to what frequency bands in clause 3.4.1 that are supported by the BS.
	HSDPA*	The portion of HSDPA(High Speed Downlink Packet Access) is not applicable to ARIB standards by the time when ARIB is prepared to transpose.

Note: HSDPA*: This regional requirement should be reviewed to check its necessity every TSG RAN meeting.

6.5.3.4.1 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 [4], are applied.

6.5.3.4.1.1 Minimum Requirement

The power of any spurious emission shall be attenuated by at least the minimum requirement.

Table 6.24: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9 kHz to 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], subclause 4.1
150 kHz to 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], subclause 4.1
30 MHz to 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], subclause 4.1
1 GHz to 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-~~8~~ [4], subclause 2.5 Table 1

6.5.3.4.2 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 [4], are applied.

6.5.3.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

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

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], 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 ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
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 ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
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 ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 60 MHz or 2180 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1. Upper frequency as in ITU-R SM.329-~~8~~ [4], s2.5 table 1

Table 6.25A: BS Mandatory spurious emissions limits, operating band II, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 1920 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
Fc1 - 60 MHz or 1920 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1920 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc1 - 50 MHz or 1920 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2000 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 50 MHz or 2000 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 2000 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 60 MHz or 2000 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1. Upper frequency as in ITU-R SM.329-~~8~~ [4], s2.5 table 1

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

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 1795 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
Fc1 - 60 MHz or 1795 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1795 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc1 - 50 MHz or 1795 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 1890 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 50 MHz or 1890 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 1890 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 60 MHz or 1890 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1. Upper frequency as in ITU-R SM.329-~~8~~ [4], s2.5 table 1

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

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

6.5.3.7.1 Spurious emissions (Category A)

Table 6.35: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9 kHz to 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8 [4], subclause 4.1
150 kHz to 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-8 [4], subclause 4.1
30 MHz to 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-8 [4], subclause 4.1
1 GHz to 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-8 [4], subclause 2.5 Table 1

6.5.3.7.2 Spurious emissions (Category B)

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

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8 [4], 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 ITU-R SM.329-8 [4], s4.3 and Annex 7
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 ITU-R SM.329-8 [4], s4.3 and Annex 7
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 ITU-R SM.329-8 [4], s4.3 and Annex 7
Fc2 + 60 MHz or 2180 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1. Upper frequency as in ITU-R SM.329-8 [4], s2.5 table 1

Table 6.36A: BS Mandatory spurious emissions limits, operating band II, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 1920 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
Fc1 - 60 MHz or 1920 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1920 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc1 - 50 MHz or 1920 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2000 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 50 MHz or 2000 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 2000 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 60 MHz or 2000 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1. Upper frequency as in ITU-R SM.329-~~8~~ [4], s2.5 table 1

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

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 1795 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1
Fc1 - 60 MHz or 1795 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1795 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc1 - 50 MHz or 1795 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 1890 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 50 MHz or 1890 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 1890 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-~~8~~ [4], s4.3 and Annex 7
Fc2 + 60 MHz or 1890 MHz *whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-~~8~~ [4], s4.1. Upper frequency as in ITU-R SM.329-~~8~~ [4], s2.5 table 1

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

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

3GPP TSG RAN WG4 Meeting #23 **R4-020810**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v6.1

CHANGE REQUEST

⌘ **25.141** **CR** **212** ⌘ **rev** ⌘ Current version: **5.2.0** ⌘

*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 ☐

Title:	⌘	Correction of the internal BER calculation verification test (Rel-5)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The BS receiver internal BER calculation verification test is performed for the data rate 12.2 kbps since all of the BER related tests are performed only for the channel 12.2 kbps, but some description of the test for all data rates remain in the test specification 25.141 which is not correct. The functional test set-up figure referenced in the test method was absent in the annex B.
Summary of change:	⌘	- Delete the sentence that the BER calculation verification test is for all data rates in the definition and in the test procedure. - Add the functional test set-up figure in annex B. Isolated Impact Analysis: This CR brings the correction of the receiver internal BER calculation verification test method and procedure, there is no impact on BS performance or features implementation.
Consequences if not approved:	⌘	The inconsistence errors will stay in the test procedures

Clauses affected:	⌘	7.8, Annex B
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

7.8 Verification of the internal BER calculation

7.8.1 Definition and applicability

Base Station System with internal BER calculation can synchronise it's receiver to known pseudo-random data sequence and calculates bit error ratio from the received data. This test is performed only if Base Station System has this kind of feature. ~~All data rate's which are used in RX conformance testing shall be used in verification test.~~ This test is performed by feeding measurement signal with known BER to the input of the receiver. Locations of the erroneous bits shall be randomly distributed within a frame. Erroneous bits shall be inserted to the data bit stream as shown in figure 7.1.

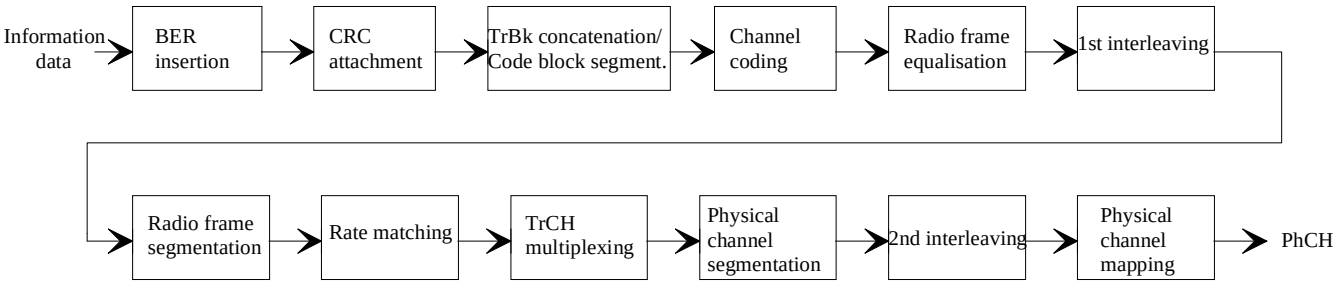

Figure 7.1: BER insertion into the information data

7.8.2 Minimum Requirement

BER indicated by the Base Station System shall be within ±10% of the BER generated by the RF signal source. Measurement shall be performed for the measurement signal specified in table 7.8.

Table 7.8

Transport channel combination	Data rate	BER
DPCH	12,2 kbps	~~BER~~ 0,01

7.8.3 Test purpose

To verify that the internal BER calculation accuracy shall meet requirements for conformance testing.

7.8.4 Method of test

7.8.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8

1) Connect BS RX antenna connector to the RF signal source or UE simulator as shown in annex B.

2) Set correct signal source parameters as specified in table 7.9.

Table 7.9

Parameter	Level/status	Unit
UL signal level	Ref.sens +10 dB	dBm/3,84 MHz
Data sequence	PN9 or longer	

7.8.4.2 Procedure

1) Measure the BER of received signal from RF signal source or UE simulator to BS antenna connector.

2) BER calculation shall be done at least over 50 000 bits.

~~3) Repeat test for all required data rates.~~

7.8.5 Test Requirement

BER indicated by the Base Station System shall be within requirement as specified in subclause 7.8.2.

B.3.3 Verification of the internal BLER calculation

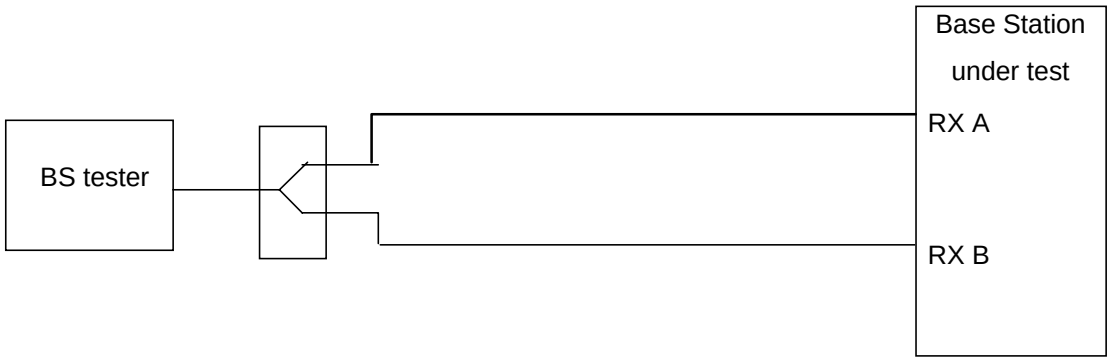

Figure B.15: Functional Set-up for Verification of the internal BLER calculation

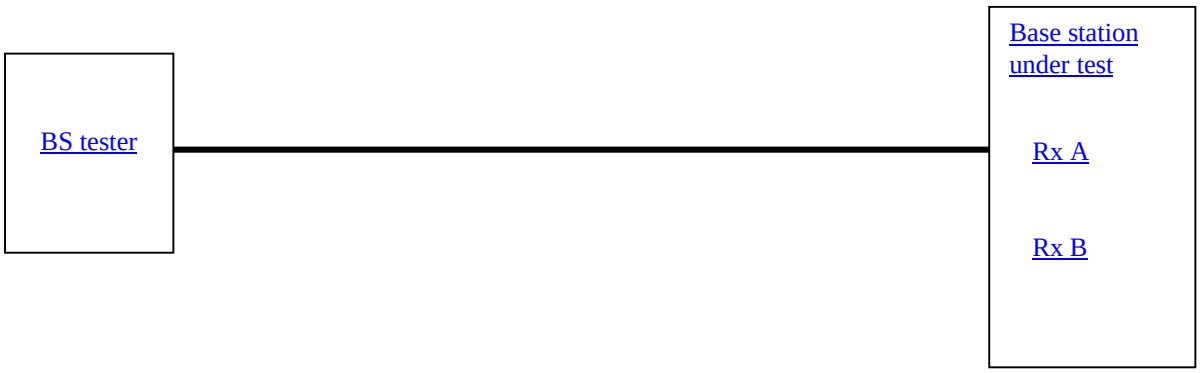

Figure B.16: Functional Set-up for Verification of the internal BER calculation

3GPP TSG RAN WG4 Meeting #23 **R4-020819**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v6.1

CHANGE REQUEST

⌘ **25.141** **CR** **221** ⌘ **rev** ⌘ Current version: **5.2.0** ⌘

*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 ☐

Title:	⌘	Test tolerances for CPCH tests
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	There are no test system uncertainties or test tolerances in 25.141 for the CPCH performance test requirements and the corresponding CPCH test requirements are without test tolerances
Summary of change:	⌘	Agreed test system uncertainties and test tolerances are introduced and the test requirements are corrected with the introduction of the test tolerance to the minimum requirement (from the core specification) Isolated Impact Analysis: A Base Station fulfilling the existing requirements in Clause 8 will also fulfil the updated requirements.
Consequences if not approved:	⌘	The core specification values have been derived without consideration of test tolerance. If it is not applied, the tests will be incorrect.

Clauses affected:	⌘	4.1.4, 4.2.3, 8.9, Annex B, Annex F
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

4.1.4 Measurement of performance requirement

Table 4.1B: Maximum Test System Uncertainty for Performance Requirements

Subclause	Maximum Test System Uncertainty[1]	Derivation of Test System Uncertainty
8.2, Demodulation in static propagation condtion	± 0.4dB	Wanted/AWGN: ± 0.4dB (relative uncertainty for E_b/N_0) (AWGN: ±1dB)
8.3, Demodulation of DCH in multiplath fading conditons	± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.4 Demodulation of DCH in moving propagation conditions	± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.5 Demodulation of DCH in birth/death propagation conditions	± 0.6dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.8.1 RACH preamble detection in static propagation conditions	± 0.4 dB	Wanted/AWGN: ± 0.4dB (relative uncertainty for E_c/N_0) (AWGN: ±1dB)
8.8.2 RACH preamble detection in multipath fading case 3	± 0.6 dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_c/N_0: ± 0.6dB
8.8.3 Demodulation of RACH message in static propagation conditions	± 0.4 dB	Wanted/AWGN: ± 0.4dB (relative uncertainty for E_b/N_0) (AWGN: ±1dB
8.8.4 Demodulation of RACH message in multipath fading case 3	± 0.6 dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
8.9.3 Demodulation of CPCH message in static propagation conditions	± 0.4 dB	Wanted/AWGN: ± 0.4dB (relative uncertainty for E_b/N_0) (AWGN: ±1dB
8.9.4 Demodulation of CPCH message in multipath fading case 3	± 0.6 dB	Fader: ± 0.5dB Wanted/AWGN: ± 0.4dB (relative) Combined relative uncertainty for E_b/N_0: ± 0.6dB
Note 1: Only the overall stimulus error is considered here. The effect of errors in the BER/FER measurements due to finite test duration is not considered.		

4.2 Test Tolerances (informative)

The Test Tolerances defined in this subclause have been used to relax the Minimum Requirements in this specification to derive the Test Requirements.
The Test Tolerances are derived from Test System uncertainties, regulatory requirements and criticality to system performance. As a result, the Test Tolerances may sometimes be set to zero.
The test tolerances should not be modified for any reason e.g. to take account of commonly known test system errors (such as mismatch, cable loss, etc.)

4.2.1 Transmitter

Table 4.1C: Test Tolerances for transmitter tests.

Subclause	Test Tolerance[1]
6.2.1 Maximum Output Power	0.7 dB
6.2.2 CPICH Power accuracy	0.8 dB
6.3.4 Frequency error	12 Hz
6.4.2 Power control steps	0.1 dB
6.4.3 Power dynamic range	0.2 dB
6.4.4 Total power dynamic range	0.3 dB
6.5.1 Occupied Bandwidth	0 kHz
6.5.2.1 Spectrum emission mask	1.5 dB
6.5.2.2 ACLR	0.8 dB
6.5.3 Spurious emissions	0 dB
6.6 Transmit intermodulation (interferer requirements)	0 dB[2]
6.7.1 Frequency error	12 Hz
6.7.12 EVM	0 %
6.7.23 Peak code Domain error	1.0dB
Note 1: Unless otherwise stated, The Test Tolerances are applied to the DUT Minimum Requirement. See Annex F. Note 2: The Test Tolerance is applied to the stimulus signal(s). See Annex F.	

4.2.2 Receiver

Table 4.1D: Test Tolerances for receiver tests.

Subclause	Test Tolerance[1]
7.2 Reference sensitivity level	0.7 dB
7.3 Dynamic range	1.2 dB
7.4 Adjacent channel selectivity	0 dB
7.5 Blocking characteristics	0 dB
7.6 Intermod Characteristics	0 dB
7.7 Spurious Emissions	0 dB[2]
Note 1: Unless otherwise stated, the Test Tolerances are applied to the stimulus signal(s). See Annex F. Note 2: The Test Tolerance is applied to the DUT Minimum Requirement. See Annex F.	

4.2.3 Performance requirement

Table 4.1E: Test Tolerances for Performance Requirements.

Subclause	Test Tolerance[1]
8.2 Demodulation in static propagation condtion	0.4dB
8.3 Demodulation of DCH in multiplath fading conditons	0.6dB
8.4 Demodulation of DCH in moving propagation conditions	0.6dB
8.5 Demodulation of DCH in birth/death propagation conditions	0.6dB

8.8.1 RACH preamble detection in static propagation conditions	0.4dB
8.8.2 RACH preamble detection in multipath fading case 3	0.6dB
8.8.3 Demodulation of RACH message in static propagation conditions	0.4dB
8.8.4 Demodulation of RACH message in multipath fading case 3	0.6dB
8.9.3 Demodulation of CPCH message in static propagation conditions	0.4dB
8.9.4 Demodulation of CPCH message in multipath fading case 3	0.6dB
Note 1: Unless otherwise stated, the Test Tolerances are applied to the stimulus signal(s). See Annex F.	

8.9 CPCH Performance

8.9.1 CPCH access preamble and collision detection preamble detection in static propagation conditions

8.9.1.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.9.1.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble in section 8.8.1 of this specification. No additional conformance test is needed.

8.9.2 CPCH access preamble and collision detection preamble detection in multipath fading case 3

8.9.2.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.9.2.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble in section 8.8.2 of this specification. No additional conformance test is needed.

8.9.3 Demodulation of CPCH message in static propagation conditions

8.9.3.1 Definition and applicability

The performance requirement of CPCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9~~x~~.1 and 8.9~~x~~.2. Only one signature is used and it is known by the receiver.
The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.9.3.2 Minimum~~Conformance~~ requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.24.

Table 8.24: Performance requirements in AWGN channel

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

The reference for this requirement is TS 25.104 subclause 8.8.2.

8.9.3.3 Test purpose

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

8.9.3.4 Method of test

Annex B functional setups for DCH shall also be used for CPCH tests.

8.9.3.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8
Preamble threshold factor:chosen to fulfil the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2

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

8.9.3.4.2 Procedure

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

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

3) Adjust the equipment so that required E_b/N_0 specified in table 8.254 is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

~~-84+~~10*Log10(TB/(TTI*3.84*10^6))+E_b/N_0 [dB~~m~~].

~~The wanted signal levels during transmission (of the message part) at the BS input for the specified E_b/N_0 levels in table 8.24 is found in table 8.25.~~

~~Table 8.25: Wanted signal levels (of the CPCH message part) during transmission in AWGN channel~~

~~Transport Block size TB and TTI in frames~~	~~Wanted signal level during transmission for required BLER<10^{-1}~~	~~Wanted signal level during transmission for required BLER<10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~-106.5 dBm~~	~~-105.6 dBm~~
~~360 bits, TTI = 20 ms~~	~~-103.4 dBm~~	~~-102.5 dBm~~

4) The test signal generator sends an access preamble followed by a collision detection preamble then followed by the actual CPCH message. This pattern is repeated (see figure 8.6). The receiver tries to detect the AP and CD preambles and the CPCH message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

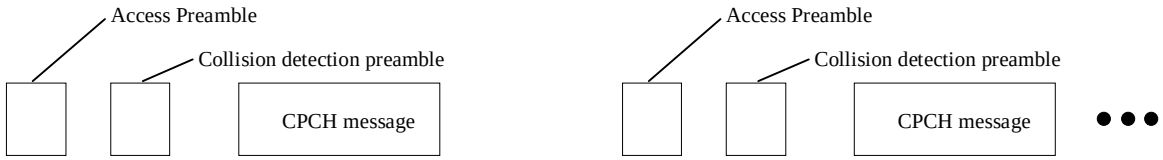

Figure 8.6: CPCH test signal pattern

8.9.3.5 Test requirements

The BLER measured according the subclause 8.9.3.4.2 shall not exceed the limits specified in table 8.254.

Table 8.25: Test requirements in AWGN channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	4.5 dB	5.4 dB
360 bits, TTI = 20 ms	4.3 dB	5.2 dB

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

8.9.4 Demodulation of CPCH message in multipath fading case 3

8.9.4.1 Definition and applicability

The performance requirement of CPCH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.
The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.
The requirement in this subclause shall apply to base stations intended for general-purpose applications.

8.9.4.2 Minimum~~Conformance~~ requirement

The BLER shall not exceed the limit for the E_b/N_0 specified in table 8.26.

Table 8.26: Performance requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	7.5 dB	8.5 dB
360 bits, TTI = 20 ms	7.3 dB	8.1 dB

The reference for this requirement is TS 25.104 subclause 8.8.2.

8.9.4.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under multipath fading case 3 propagation conditions with a BLER not exceeding a specified limit.

8.9.4.4 Method of test

Annex B functional setups for DCH shall also be used for CPCH tests.

8.9.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.
RF channels to be tested: B, M and T; see subclause 4.8
Preamble threshold factor:chosen to fulfil the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2

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

8.9.4.4.2 Procedure

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

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

3) Adjust the equipment so that required E_b/N_0 specified in table 8.27~~ff~~ is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level (of the message part) relative to the AWGN signal at the BS input should be adjusted to:

~~-84+~~10*Log10(TB/(TTI*3.84*10^6))+E_b/N_0 [dB~~m~~].

~~The wanted signal levels during transmission (of the message part) at the BS input for the specified E_b/N_0 levels in table 8.26 is found in table 8.27.~~

~~Table 8.27: Wanted signal levels (of the CPCH message part) during transmission in fading case 3 channel~~

~~Transport Block size TB and TTI in frames~~	~~Wanted signal level during transmission for required BLER<10^{-1}~~	~~Wanted signal level during transmission for required BLER<10^{-2}~~
~~168 bits, TTI = 20 ms~~	~~-103.1 dBm~~	~~-102.1 dBm~~
~~360 bits, TTI = 20 ms~~	~~-100.0 dBm~~	~~-99.2 dBm~~

4) The test signal generator sends an access preamble followed by a collision detection preamble then followed by the actual CPCH message. This pattern is repeated (see figure 8.7). The receiver tries to detect the preamble and the message. The block error rate is calculated for the messages that have been decoded. Messages following undetected preambles shall not be taken into account in the BLER measurement.

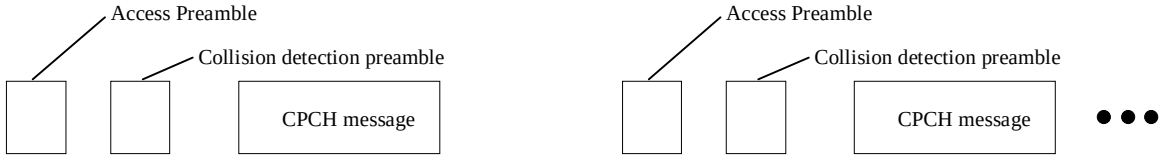

Figure 8.7: CPCH test signal pattern

8.9.4.5 Test requirements

The BLER measured according to subclause 8.9.4.4.2 shall not exceed the limits specified in table 8.27.~~6~~

Table 8.27: Test requirements in fading case 3 channel

Transport Block size TB and TTI in frames	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
168 bits, TTI = 20 ms	8.1 dB	9.1 dB
360 bits, TTI = 20 ms	7.9 dB	8.7 dB

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

Annex B (informative): Measurement system set-up

Example of measurement system set-ups are attached below as an informative annex.

B.3 Performance requirement

B.3.1 Demodulation of DCH, ~~and~~ RACH, and CPCH in static conditions

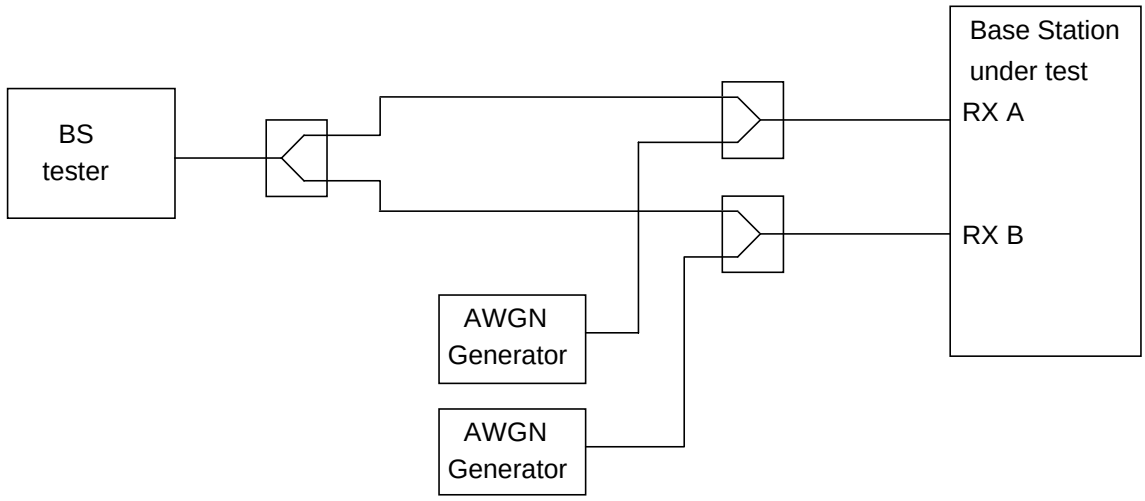

Figure B.13: Functional Set-up for Demodulation of DCH, ~~and~~ RACH, and CPCH in static conditions

B.3.2 Demodulation of DCH, ~~and~~ RACH, and CPCH in multipath fading conditions

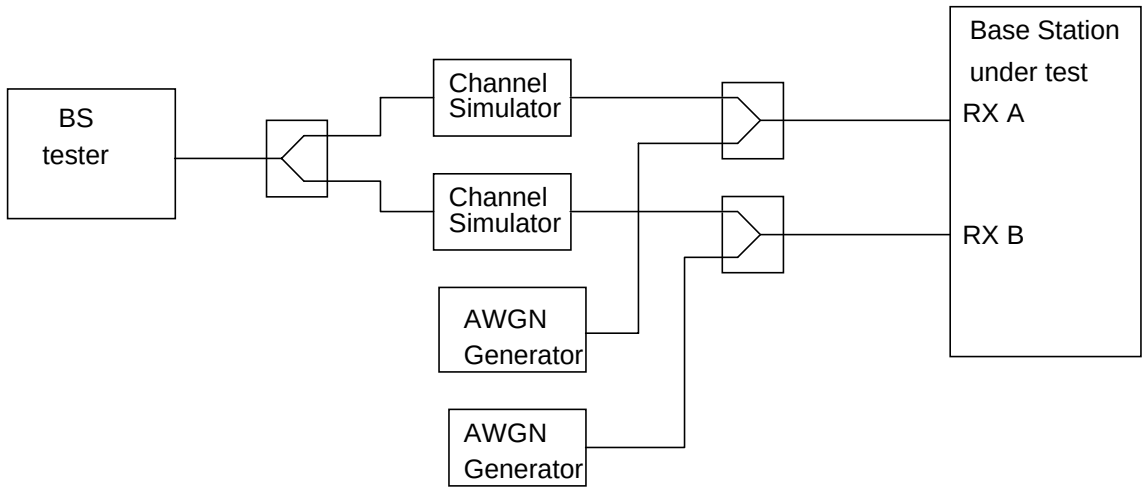

Figure B.14: Functional Set-up for Demodulation of DCH, ~~and~~ RACH, and CPCH in multipath fading conditions

B.3.3 Verification of the internal BLER calculation

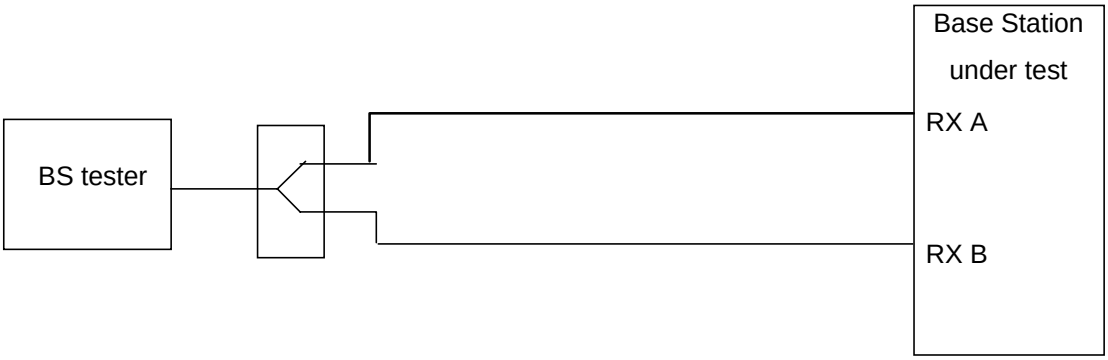

Figure B.15: Functional Set-up for Verification of the internal BLER calculation

Annex F (informative): Derivation of Test Requirements

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 4.2. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in tables F.1, F.2 and F.3

Note that a formula for applying Test Tolerances is provided for all tests, even those with a test tolerance of zero. This is necessary in the case that the Test System uncertainty is greater than that allowed in subclause 4.1. In this event, the excess error shall be subtracted from the defined test tolerance in order to generate the correct tightened Test Requirements as defined in subclause 4.3.

For example, a Test System having 0.9 dB accuracy for test 6.2.1 Base Station maximum output power (which is 0.2 dB above the limit specified in subclause 4.) would subtract 0.2 dB from the Test Tolerance of 0.7 dB defined in subclause 4.2. This new test tolerance of 0.5 dB would then be applied to the Minimum Requirement using the formula defined in Table F.1 to give a new range of ±2.5 dB of the manufacturer's rated output power. Using this same approach for the case where a test had a test tolerance of 0 dB, an excess error of 0.2 dB would result in a modified test tolerance of –0.2 dB.

Table F.1: Derivation of Test Requirements (Transmitter tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
6.2.1 Base station maximum output power	In normal conditions … within +2 dB and -2 dB of the manufacturer's rated output power In extreme conditions… within +2.5 dB and –2.5 dB of the manufacturer's rated output power	0.7 dB	Formula: Upper limit + TT Lower limit – TT In normal conditions … within +2.7 dB and –2.7 dB of the manufacturer's rated output power In extreme conditions… within +3.2 dB and –3.2 dB of the manufacturer's rated output power
6.2.2 CPICH Power accuracy	CPICH power shall be within ±2.1dB	0.8 dB	Formula: Upper limit + TT Lower limit – TT CPICH power shall be within ±2.9dB
6.3.4 Frequency error	Frequency error limit = 0.05 ppm	12 Hz	Formula: Frequency Error limit + TT Frequency Error limit = 0.05 ppm + 12 Hz
6.4.2 Power control steps	Lower and upper limits as specified in tables 6.9 and 6.10a	0.1 dB	Formula: Upper limits + TT Lower limits – TT 0.1 dB applied as above to tables 6.9 and 6.10a
6.4.3 Power dynamic range	maximum power limit = BS maximum output power -3 dB minimum power limit = BS maximum output power –28 dB	0.2 dB	Formula: maximum power limit – TT minimum power limit + TT maximum power limit = BS maximum output power –3.2 dB minimum power limit = BS maximum output power –27.8 dB
6.4.4 Total power dynamic range	total power dynamic range limit = 18 dB	0.3 dB	Formula: total power dynamic range limit – TT total power dynamic range limit = 17.7 dB
6.5.1 Occupied Bandwidth	occupied bandwidth limit = 5 MHz	0 kHz	Formula: Occupied bandwidth limit + TT Occupied bandwidth limit = 5 MHz
6.5.2.1 Spectrum emission mask	Maximum level defined in tables 6.11, 6.12, 6.13 and 6.14:	1.5 dB	Formula: Maximum level + TT Add 1.5 to Maximum level entries in tables 6.11, 6.12, 6.13 and 6.14.
6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)	ACLR limit = 45 dB at 5 MHz ACLR limit = 50 dB at 10 MHz	0.8 dB	Formula: ACLR limit – TT ACLR limit = 44.2 dB at 5 MHz ACLR limit = 49.2 dB at 10 MHz
6.5.3 Spurious emissions	Maximum level defined in tables 6.16 to 6.26	0 dB	Formula: Maximum limit + TT Add 0 to Maximum level in tables 6.16 to 6.26
6.6 Transmit intermodulation (interferer requirements) This tolerance applies to the stimulus and not the measurements defined in 6.5.2.1, 6.5.2.2 and 6.5.3.	Wanted signal level – interferer level = 30 dB	0 dB	Formula: Ratio + TT Wanted signal level – interferer level = 30 + 0 dB
6.7.1 EVM	EVM limit =17.5 %	0 %	Formula: EVM limit + TT EVM limit = 17.5%
6.7.2 Peak code Domain error	Peak code domain error limit = -33 dB	1.0 dB	Formula: Peak code domain error limit + TT Peak code domain error limit = -32 dB

Table F.2: Derivation of Test Requirements (Receiver tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
7.2 Reference sensitivity	Reference sensitivity level = -121 dBm FER/BER limit = 0.001	0.7 dB	Formula: Reference sensitivity level + TT Reference sensitivity level = -120.3 dBm FER/BER limit is not changed
7.3 Dynamic range	Wanted signal level = -91 dBm AWGN level = -73 dBm/3.84 MHz	1.2 dB	Formula: Wanted signal level + TT AWGN level unchanged Wanted signal level = -89.8 dBm
7.4 Adjacent channel selectivity	Wanted signal level = -115 dBm W-CDMA interferer level = -52 dBm	0 dB	Formula: Wanted signal level + TT W-CDMA interferer level unchanged Wanted signal level = -115 dBm
7.5 Blocking characteristics	Wanted signal level = -115 dBm Interferer level See table 7.4a / 7.4b	0 dB	Formula: Wanted signal level + TT Interferer level unchanged Wanted signal level = -115 dBm
7.6 Intermod Characteristics	Wanted signal level = -115 dBm Interferer1 level (10 MHz offset CW) = -48 dBm Interferer2 level (20 MHz offset W-CDMA Modulated) = -48 dBm	0 dB	Formula: Wanted signal level + TT Interferer1 level unchanged Interferer2 level unchanged Wanted signal level = -115 dBm
7.7 Spurious Emissions	Maximum level defined in Table 7.7	0 dB	Formula: Maximum level + TT Add TT to Maximum level in table 7.7

Table F.3: Derivation of Test Requirements (Performance tests)

Test	Minimum Requirement in TS 25.104	Test Tolerance (TT)	Test Requirement in TS 25.141
8.2, Demodulation in static propagation condtion	Received E_b/N_0 values	0.4 dB	Minimum requirement + TT
8.3, Demodulation of DCH in multiplath fading conditons	Received E_b/N_0 values	0.6 dB	Minimum requirement + TT
8.4 Demodulation of DCH in moving propagation conditions	Received E_b/N_0 values	0.6 dB	Minimum requirement + TT
8.5 Demodulation of DCH in birth/death propagation conditions	Received E_b/N_0 values	0.6 dB	Minimum requirement + TT
8.8.1 RACH preamble detection in static propagation conditions	Received E_c/N_0 values	0.4 dB	Minimum requirement + TT
8.8.2 RACH preamble detection in multipath fading case 3	Received E_c/N_0 values	0.6 dB	Minimum requirement + TT
8.8.3 Demodulation of RACH message in static propagation conditions	Received E_b/N_0 values	0.4 dB	Minimum requirement + TT
8.8.4 Demodulation of RACH message in multipath fading case 3	Received E_b/N_0 values	0.6 dB	Minimum requirement + TT
8.9.3 Demodulation of CPCH message in static propagation conditions	Received E_b/N_0 values	0.4 dB	Minimum requirement + TT
8.9.4 Demodulation of CPCH message in multipath fading case 3	Received E_b/N_0 values	0.6 dB	Minimum requirement + TT

3GPP TSG RAN WG4 Meeting #23 **R4-020885**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.141** **CR** **222** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

*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 [X] Core Network ☐

Title:	⌘	Change of Test Model for EVM
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Use one of the following releases:

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

Reason for change:	⌘	The existing test for EVM uses Test Model 4, which is a simple signal with low peak to average ratio. This does not sufficiently stress the Node B transmitter which will likely have the worst EVM performance when the loading is high as with Test Model 1.
Summary of change:	⌘	The EVM test is modified to use Test Model 1 for the Maximum power case but retains Test Model 4 for the lower end. The EVM test is also corrected to include the steps necessary to test the Total Power Dynamic range, which are currently missing.
Consequences if not approved:	⌘	A node B passing the existing test would not be an indication that it would operate correctly under full loading. Isolated Impact Analysis: A Node B that conformed to the correct interpretation of the current conformance test will be unaffected by this change.

Clauses affected:	⌘	6.1.1.1, 6.1.1.4, 6.3, 6.4.4, 6.7
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

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

6.1.1 Test Models

The set-up of physical channels for transmitter tests shall be according to one of the test models below. A reference to the applicable table is made with each test.

A code "level setting" of -X dB is the setting that according to the base station manufacturer will result in a code domain power of nominally X dB below the maximum output power. The relative accuracy of the code domain power to the maximum output power shall have tolerance of ±1 dB.

6.1.1.1 Test Model 1

This model shall be used for tests on:

- spectrum emission mask;
- ACLR;
- spurious emissions;
- transmit intermodulation;
- base station maximum output power.
- Total power dynamic range (at Pmax)
- Frequency error (at Pmax)
- Error Vector Magnitude (at Pmax)

64 DPCHs at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random timing offsets are defined so as to simulate a realistic traffic scenario which may have high PAR (Peak to Average Ratio).

Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.

"Fraction of power" is relative to the maximum output power on the TX antenna interface under test.

6.1.1.4 Test Model 4

This model shall be used for tests on:

- EVM measurement (at Pmax -18 dB).
- Total power dynamic range (at Pmax – 18 dB)
- Frequency error (at Pmax – 18 dB)

Table 6.6: Test Model 4 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset
PCCPCH+SCH when Primary CPICH is disabled	1	50 to 1.6	-3 to -18	1	0
PCCPCH+SCH when Primary CPICH is enabled	1	25 to 0.8	-6 to -21	1	0
Primary CPICH[1]	1	25 to 0.8	-6 to -21	0	0
Note 1: The CPICH channel is optional.					

6.3 Frequency error

6.3.1 Definition and applicability

Frequency error is the measure of the difference between the actual BS transmit frequency and the assigned frequency. The same source shall be used for RF frequency and data clock generation.

It is not possible to verify by testing that the data clock is derived from the same frequency source as used for RF generation. This may be confirmed by a manufacturers declaration

6.3.2 Minimum Requirement

The Frequency Error shall be within ± 0.05 PPM.

The normative reference for this requirement is in TS 25.104 [1] subclause 6.3

6.3.3 Test purpose

To verify that the Frequency Error is within the limit specified in 6.3.2

6.3.4 Method of test

Requirement is tested together with Error Vector Magnitude test, as described in subclause 6.7.1.4.

~~6.3.4.1 Initial Conditions~~

~~Test environment: normal; see subclause 4.4.1~~

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

~~The following additional tests shall be performed:~~

~~a) On each of B, M and T, the test shall be performed under extreme power supply as defined in subclause 4.4.2~~

~~NOTE: Tests under extreme power supply also test extreme temperature.~~

~~1) Connect the base station RF output port to the test equipment. Refer to annex B.1.2 for a functional block diagram of the test set-up.~~

~~2) Set the base station to transmit a signal according to 6.1.1.4 (test model 4). Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.~~

~~6.3.4.2 Procedure~~

~~1) Measure the Frequency Error according to annex E.~~

6.3.5 Test requirement

The Frequency Error shall be within the range (–0.05 PPM – 12 Hz) to (+0.05 PPM + 12 Hz).

6.4.4 Total power dynamic range

6.4.4.1 Definition and applicability

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

6.4.4.2 Minimum Requirement

The down link (DL) total power dynamic range shall be 18 dB or greater. The normative reference for this requirement is TS 25.104 [1] subclause 6.4.3.1.

6.4.4.3 Test purpose

To verify that the total power dynamic range is met as specified in TS 25.104 subclause 6.4.3.1. The test is to ensure that the total output power can be reduced while still transmitting a single code. This is to ensure that the interference to neighbouring cells is reduced.

6.4.4.4 Method of test

Requirement is tested together with Error Vector Magnitude test, as described in subclause 6.7.1.4.

6.4.4.5 Test requirement

The down link (DL) total power dynamic range shall be 17.7 dB or greater.

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

6.7 Transmit modulation

6.7.1 Error Vector Magnitude

6.7.1.1 Definition and applicability

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 α =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 25.104 subclause 6.4.3. See Annex E of this specification for further details

6.7.1.2 Minimum Requirement

The Error Vector Magnitude shall be less than 17.5%

The normative reference for this requirement is in TS 25.104 [1] subclause 6.8.2

6.7.1.3 Test Purpose

To verify that the Error Vector Magnitude is within the limit specified in 6.7.1.2

6.7.1.4 Method of Test

This test method includes the procedure for subclause 6.3.4 Frequency error and 6.4.4.4 Total power dynamic range.

6.7.1.4.1 Initial Conditions

Test environment: normal; see subclause 4.4.1.

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

Refer to annex B for a functional block diagram of the test set-up.

1) Connect the base station RF output port to the measurement equipment.
2) Set the base station to transmit a signal according to 6.1.1.14 (test model 14)
3) Set BS frequency

6.7.1.4.2 Procedure

1) Start BS transmission at Pmax ~~-3dB~~
2) Measure the Error Vector Magnitude and frequency error as defined in annex E and the mean power of the signal. If the base station supports STTD or closed loop transmit diversity, ~~EVM~~ the measurements shall be ~~measured~~ made on both main and diversity RF output ports.
3) Set the total output power to Pmax-18 dB using 6.1.1.4 (test model 4) and repeat step 2)

6.7.1.5 Test Requirement

The Error Vector Magnitude shall be less than 17.5%

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

3GPP TSG RAN WG4 Meeting #23 **R4-020988**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.141** **CR** **225** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

*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 **X** Core Network ☐

Title:	⌘	Corrections to Spectrum Emission Mask
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The interpretation of the lower limit to apply for band II is unclear, particularly since the band II limit is sometimes less stringent that the normal limit. Other procedural matters are clarified.
Summary of change:	⌘	The definition of the lower limit for band II is made explicit. A general note is added to allow for resolution bandwidth to be less than the measurement bandwidth. The specific reference to this in 6.5.2.1.4.1 Step 3 is obsoleted. The measurement procedure is clarified to ensure contiguous measurements are taken across the specified frequency ranges and that each measurement shall comply with the test requirement.
Consequences if not approved:	⌘	An incorrect interpretation of the test requirement could result in incorrect implementation of the tests and an incorrect pass/fail result. Isolated Impact Analysis: A Node B that conformed to the correct interpretation of the current conformance test will be unaffected by this change.

Clauses affected:	⌘	6.5.2.1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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

6.5.2 Out of band emission

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

6.5.2.1 Spectrum emission mask

6.5.2.1.1 Definitions and applicability

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

6.5.2.1.2 Minimum Requirements

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

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

Table 6.14: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement Band I, II, III	Additional requirements Band II * [1]	Measurement bandwidth [2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-14dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-13 dBm	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0 MHz ≤ f_offset < f_offset_{max}	-13 dBm	NA	1 MHz
~~* Whichever is less power~~				

Table 6.15: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement Band I, II, III	Additional requirements Band II *[1]	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-14dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-13 dBm	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P – 56 dB	NA	1 MHz
* Whichever is less power				

Table 6.16: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter –3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement Band I, II, III	Additional requirements Band II *[1]	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P – 53 dB	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$P - 53dB - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 65 dB	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 52 dB	NA	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P – 56 dB	NA	1 MHz
* Whichever is less power				

Table 6.17: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Minimum requirement Band I, II, III	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-22 dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-22dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-34 dBm	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-21 dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

Notes for Tables 6.14, 6.15, 6.16 & 6.17

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

Note 2 As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be

smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

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

6.5.2.1.3 Test purpose

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

6.5.2.1.4 Method of test

6.5.2.1.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

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

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

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

3) Measurements with an offset from the carrier centre frequency between 4.0 MHz and (f_offset_{max} – 500 kHz).shall use a 1 MHz measurement bandwidth. ~~The 1MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements in order to obtain the equivalent noise bandwidth of the measurement bandwidth.~~

4) Detection mode: True RMS.

6.5.2.1.4.2 Procedures

1) Set the BS to transmit a signal in accordance to test model 1, subclause 6.2.1.1.1 at the manufacturer's specified maximum output power.

2) Step the centre frequency of the measurement filter in contiguous steps and ~~M~~measure the emission ~~at~~ within the specified frequency~~ies~~ ranges with the specified measurement bandwidth~~ and note that the measured value does not exceed the specified value~~.

6.5.2.1.5 Test requirements

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

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

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	~~Maximum level~~ Test Requirement Band I, II, III	~~Maximum level~~ Additional Requirements Band II~~*~~[1]	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-12.5dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	-13dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0 MHz ≤ f_offset < f_offset_{max}	-11.5 dBm		1 MHz
~~* Whichever is less power~~				

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

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	~~Maximum level~~ Test Requirement Band I, II, III	~~Maximum level~~Additional Requirements Band II~~*~~[1]	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-12.5 dBm	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-12.5dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-24.5 dBm	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-11.5 dBm	-13dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.5 dB	-13dBm	1 MHz
~~* Whichever is less power~~				

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

Frequency offset of measurement filter –3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	~~Maximum level~~ Test Requirement Band I, II, III	~~Maximum level~~Additional Requirements Band II~~*~~[1]	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P – 51.5 dB	-15dBm	30 kHz
2.7 MHz ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$P - 51.5dB - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	-15dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P – 63.5 dB	NA	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P – 50.5 dB	-13dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	P – 54.5 dB	-13dBm	1 MHz
~~* Whichever is less power~~				

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

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	~~Maximum level~~Test Requirement Band I, II, III	Measurement bandwidth[2]
2.5 MHz ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-20.5 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	$-20.5dBm - 15 \cdot \left(\frac{f\_offset}{MHz} - 2.715 \right) dB$	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-32.5 dBm	30 kHz
3.5 MHz ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-19.5 dBm	1 MHz
7.5 MHz ≤ Δf ≤ Δf_{max}	8.0MHz ≤ f_offset < f_offset_{max}	-23.5 dBm	1 MHz

Notes for Tables 6.18, 6.19, 6.20 & 6.21

Note 1 The test requirement for operation in band II is the lower power of the test requirement for Band I, II & III and the additional requirement for band II.

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

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

3GPP TSG RAN WG4 Meeting #23 **R4-021018**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.143** **CR** **10** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network [X] Core Network ☐

Title:	⌘	Update and correction of reference to ITU-R recommendation SM.329-9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Use one of the following releases:

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

Reason for change:	⌘	The present document refers to ITU-R SM.329-8, which has been superseded recently by SM.329-9. No actual requirements are changed
Summary of change:	⌘	The reference to SM.329 is updated throughout the document. In clause 2 it is updated to be SM.329-9. In the main body of the document, the specific part "-8" of the document number is removed and replaced by a reference [1] to make future updating easier.
Consequences if not approved:	⌘	There would be an uncertainty whether the 3GPP regulatory radio requirements are based on the latest ITU recommendations.

Clauses affected:	⌘	2, 5.6, 9.2.2.1, 9.2.2.2		
Other specs affected:	⌘	[X] Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	TS 25.106
Other comments:	⌘			

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

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

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

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

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, the latest version applies.

[1] 3GPP TS 25.104: "UTRA(BS) FDD; Radio transmission and Reception".

[2] 3GPP TS 25.942: "RF system scenarios".

[3] 3GPP TS 25.113: "Base station EMC".

[4] ITU-R recommendation SM.329~~-89~~: "Spurious emissions".

[5] ITU-T recommendation O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[6] IEC 60721-3-3 (1994): "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weather protected locations".

[7] IEC 60721-3-4 (1995): "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weather protected locations".

[8] IEC 60068-2-1 (1990): "Environmental testing - Part 2: Tests. Tests A: Cold".

[9] IEC 60068-2-2 (1974): "Environmental testing - Part 2: Tests. Tests B: Dry heat".

[10] IEC 60068-2-6 (1995): "Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal)".

[11] 3GPP TS 25.141: "Base station conformance testing (FDD)".

[12] 3GPP TS 25.106: "UTRA Repeater; Radio transmission and reception".

========== NEXT CHANGED SECTION ==========

5.6 Regional requirements

Some requirements in TS 25.143 may only apply in certain regions. Table 5.4 lists all requirements that may be applied differently in different regions.

Table 5.4: List of regional requirements

Sub-clause number	Requirement	Comments
4.1	Frequency bands	Some bands may be applied regionally.
4.2	Up-link to down-link frequency Separation	The requirement is applied according to what frequency bands in Clause 4.2 that are supported by the Repeater.
6.1	Maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges of conditions defined as normal.
9.1.2	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
9.2.2.1	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~~-8~~ [4], are applied.
9.2.2.2	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~~-8~~ [4], are applied.

========== NEXT CHANGED SECTION ==========

9.2.2.1 Spurious emission (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~~-8~~ [4], are applied.

At maximum Repeater gain, with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated output power per channel, the power of any spurious emission shall not exceed the limits specified in Table 9.9.

When the power in all channels is increased by 10 dB the requirements shall still be met.

The measurements shall apply both with or without an input signal applied.

NOTE 1: If the operating band corresponds to three or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals in the repeaters operating band.

Table 9.9: Up-link and down-link: General spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9kHz – 150kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
150kHz – 30MHz		10 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
30MHz – 1GHz		100 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
1GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329~~-8~~ [4], s2.~~6~~5 table 1

9.2.2.2 Minimum requirement (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~~-8~~ [4], are applied.

At maximum Repeater gain, with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated power output per channel, the power of any spurious emission shall not exceed the limits specified in Table 9.10 and Table 9.11 for the down- and up-link, respectively.

When the power in all channels is increased by 10 dB the requirements shall still be met.

The measurements shall apply both with or without an input signal applied.

NOTE 1: If the operating band corresponds to three or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals in the repeaters operating band.

Table 9.10: Down-link: General spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz whichever is the higher	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], 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 ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
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 ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
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 ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
Fc2 + 60 MHz or 2180 MHz whichever is the lower ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329~~-8~~, s4.1. Upper frequency as in ITU-R SM.329~~-8~~ [4], s2.~~6~~5 table 1

Table 9.11: Up-link: General spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 1910 MHz whichever is the higher	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1
Fc1 – 60 MHz or 1910 MHz whichever is the higher ↔ Fc1 – 50 MHz or 1910 MHz whichever is the higher	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
Fc1 – 50 MHz or 1910 MHz whichever is the higher ↔ Fc2 + 50 MHz or 1990 MHz whichever is the lower	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
Fc2 + 50 MHz or 1990 MHz whichever is the lower ↔ Fc2 + 60 MHz or 1990 MHz whichever is the lower	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329~~-8~~ [4], s4.~~1~~3 and Annex 7
Fc2 + 60 MHz or 1990 MHz whichever is the lower ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329~~-8~~ [4], s4.1. Upper frequency as in ITU-R SM.329~~-8~~ [4], s2.~~6~~5 table 16

Fc1: Centre frequency of emission of the first 5 MHz channel in an operating band.

Fc2: Centre frequency of emission of the last 5 MHz channel in an operating band.