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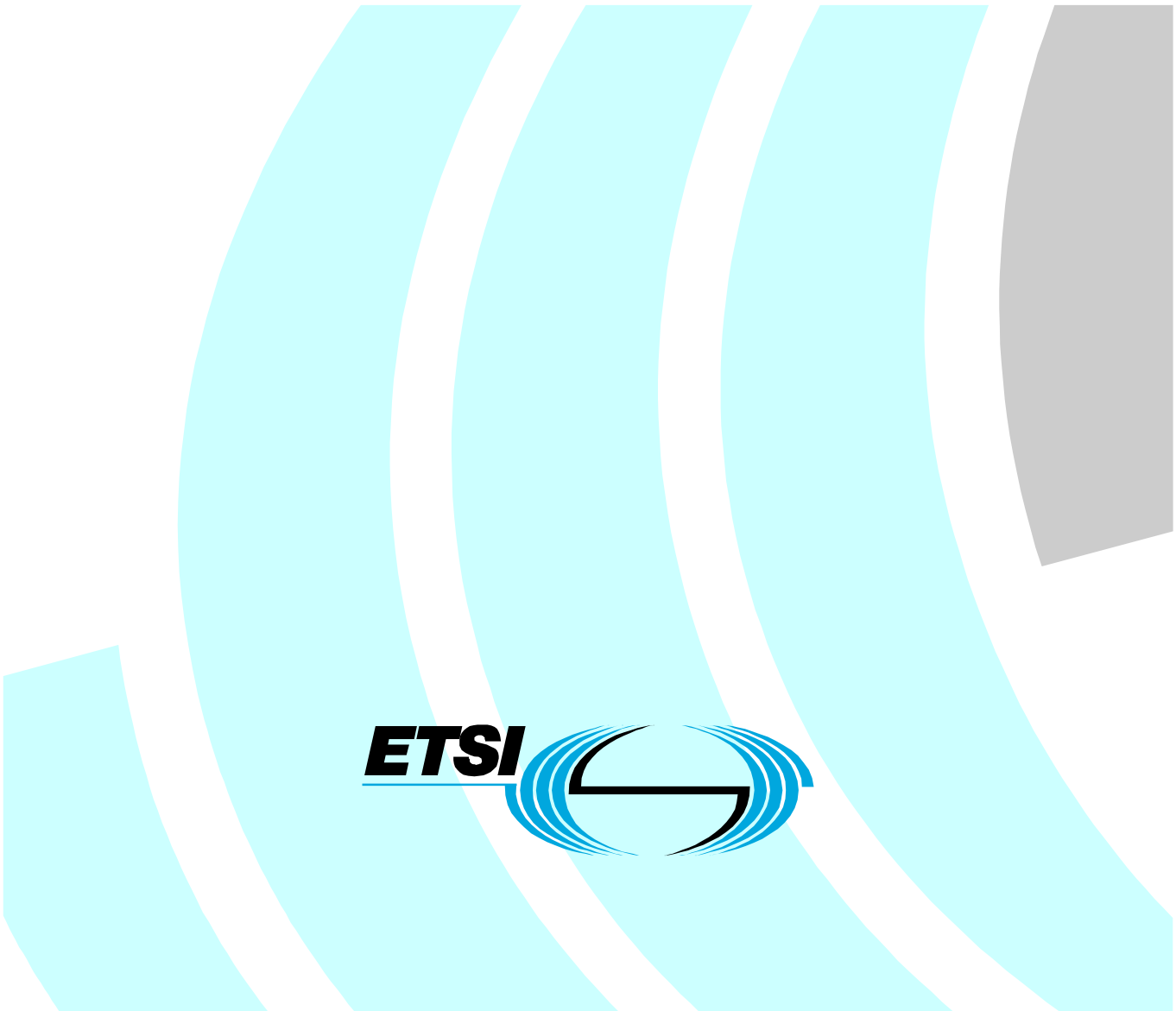
Candidate Harmonized European Standard (Telecommunications series)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 11: Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (Repeaters) covering essential requirements of article 3.2 of the R&TTE Directive



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Contents

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Foreword

This Candidate Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the Vote phase of the ETSI standards Two-step Approval Procedure.

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [8] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [1] of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive").

The present document is part 11 of a multi-part deliverable covering the Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks, as identified below:

Part 1: "Harmonized EN for IMT-2000, introduction and common requirements, covering essential requirements of article 3.2 of the R&TTE Directive";

Part 2: "Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 3: "Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 4: "Harmonized EN for IMT-2000, CDMA Multi-Carrier (cdma2000) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 5: "Harmonized EN for IMT-2000, CDMA Multi-Carrier (cdma2000) (BS and Repeaters) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 6: "Harmonized EN for IMT-2000, CDMA TDD (UTRA TDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 7: "Harmonized EN for IMT-2000, CDMA TDD (UTRA TDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 8: "Harmonized EN for IMT-2000, TDMA Single-Carrier (UWC 136) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 9: "Harmonized EN for IMT-2000, TDMA Single-Carrier (UWC 136) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 10: "Harmonized EN for IMT-2000 FDMA/TDMA (DECT) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 11: "Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (Repeaters) covering essential requirements of article 3.2 of the R&TTE Directive".

Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A in the present document and annex A of part 1.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	36 months after doa

Introduction

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [1]. Each standard is a module in the structure. The modular structure is shown in figure 1.

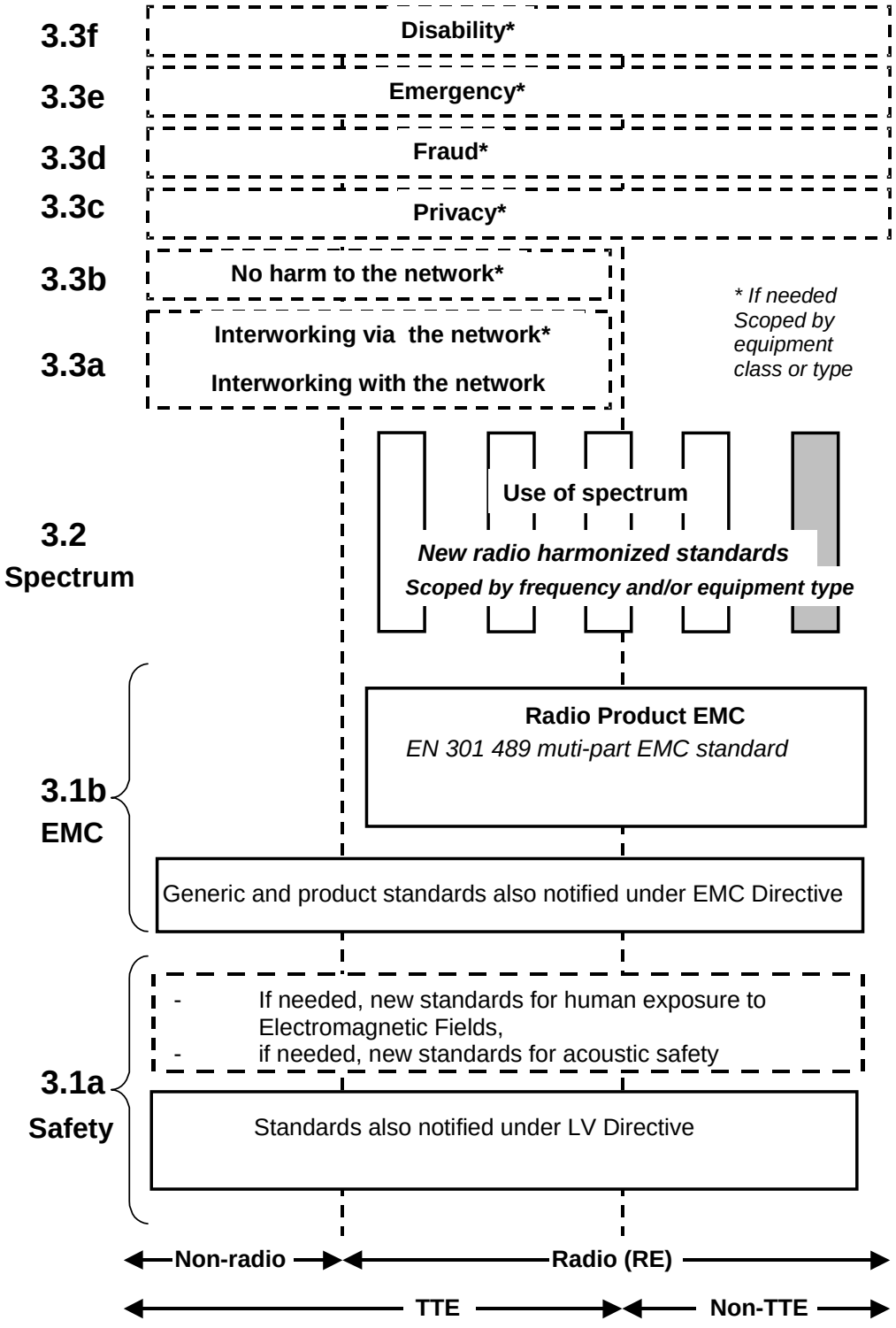

Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]

The left hand edge of the figure 1 shows the different clauses of article 3 of the R&TTE Directive [1].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted, and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.1b figure 1 shows EN 301 489, the multi-part product EMC standard for radio used under the EMC Directive [2].

For article 3.1a figure 1 shows the existing safety standards currently used under the LV Directive [3] and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of figure 1 shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. A radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement under the R&TTE Directive [1] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [1] may be covered in a set of standards.

The modularity principle has been taken because:

- It minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment.
- It provides scope for standards to be added:
  - under article 3.2 when new frequency bands are agreed; or
  - under article 3.3 should the Commission take the necessary decisions,

  without requiring alteration of standards that are already published.
- It clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

The product specifications upon which this multi-part deliverable is based, differ in presentation, and this is reflected in the present document.

1 Scope

The present document applies to the following radio equipment type:

- Repeaters for IMT-2000 CDMA Direct Spread (UTRA FDD).

This radio equipment type is capable of operating in all or any part of the frequency bands given below.

Table 1: CDMA Direct Spread Repeater frequency bands

Direction of transmission	CDMA Direct Spread Repeater frequency bands
Downlink	2 110 MHz to 2 170 MHz
Uplink	1 920 MHz to 1 980 MHz

The present document is intended to cover the provisions of Directive 1999/5/EC (R&TTE Directive) [1] article 3.2, which states that "[…] radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of Article 3 of the R&TTE Directive will apply to equipment within the scope of the present document.

NOTE: A list of such ENs is included on the web site http://www.newapproach.org.

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

[2] Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).

[3] Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).

[4] ETSI TR 100 028 (all parts) (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

[5] ETSI TS 125 143 (V5.8.0): "Universal Mobile Telecommunications System (UMTS); UTRA repeater; Conformance testing (3GPP TS 25.143 version 5.8.0 Release 5)".

[6] ITU-R Recommendation SM.329-10 (2003): "Unwanted emissions in the spurious domain".

[7] ETSI TS 125 141 (V5.8.0): "Universal Mobile Telecommunications System (UMTS); Base Station (BS) conformance testing (FDD) (3GPP TS 25.141 version 5.8.0 Release 5)".

[8] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

[9] IEC 60068-2-1: "Environmental testing - Part 2: Tests. Tests A: Cold".

[10] IEC 60068-2-2: "Environmental testing - Part 2: Tests. Tests B: Dry heat".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [1] and the following apply:

donor coupling loss: coupling loss between the repeater and the donor base station

down-link: signal path where base station transmits and mobile receives

maximum output power (Pmax): mean power level per carrier measured at the antenna connector of the repeater in specified reference condition

operating band: frequency range that the repeater operates in with operational configuration

NOTE 1: This frequency range can correspond to one or several consecutive nominal 5 MHz channels. If they are not consecutive each subset of channels shall be considered as an individual operating band.

NOTE 2: The Repeater can have one or several operating bands.

repeater: device that receives, amplifies and transmits the radiated or conducted RF carrier both in the down-link direction (from the base station to the mobile area) and in the up-link direction (from the mobile to the base station)

up-link: signal path where mobile transmits and base station receives

3.2 Abbreviations

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

ACRR	Adjacent Channel Rejection Ratio
BTS	Base Transceiver Station
CW	Continuous Wave (unmodulated signal)
DUT	Device Under Test
FDD	Frequency Division Duplexing
MS	Mobile Station
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
RRC	Root Raised Cosine
TDD	Time Division Duplexing
UARFCN	UTRA Absolute Radio Frequency Channel Number
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
UTRA	UMTS Terrestrial Radio Access
WCDMA	Wideband Code Division Multiple Access

4 Technical requirements specifications

4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the supplier. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile.

For guidance on how a supplier can declare the environmental profile see annex C.

4.2 Conformance requirements

4.2.1 Introduction

To meet the essential requirement under article 3.2 of the R&TTE Directive [1] for IMT-2000 repeater equipment five essential parameters in addition to those in part 1 have been identified. Table 2 provides a cross reference between these five essential parameters and the corresponding six technical requirements for equipment within the scope of the present document.

Table 2: Cross references

Essential parameter	Corresponding technical requirements
Spectrum emissions mask	4.2.2 Spectrum emissions mask
Conducted spurious emissions from the antenna connector	4.2.3 Spurious emissions
Accuracy of maximum output power	4.2.4 Maximum output power
Receiver immunity	4.2.5 Input intermodulation
	4.2.6 Out of band gain
	4.2.7 Adjacent Channel Rejection Ratio
Intermodulation attenuation of the output	4.2.8 Output intermodulation

The technical requirements also apply to Repeater configurations described in annex B.

4.2.2 Spectrum emissions mask

4.2.2.1 Definition

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 for the transmitter.

4.2.2.2 Limit

The requirement shall be met by a repeater's RF-signal output at maximum gain with WCDMA signals in the operating band of the repeater, at levels that produce the maximum rated output power per channel, configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 3, 4, 5 and 6 for the appropriate Repeater maximum output power, in the frequency range from Δf = 2,5 MHz to Δf_{max} from the 5 MHz channel, where:

- Δf is the separation between the centre frequency of first or last 5 MHz channel used in the operating band and the nominal -3 dB point of the measuring filter closest to the carrier frequency;
- f_offset is the separation between the centre frequency of first or last 5 MHz channel in the operating band and the centre of the measuring filter;
- f_offset_{max} is either 12,5 MHz or the offset to the UTRA band edge at both up- and down-link as defined in clause 1, whichever is the greater;

- Δf_{max} is equal to f_offset_{max} minus half of the bandwidth of the measurement filter.

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

To select the table of the maximum level for the spectrum emission mask test, use the maximum output power as defined in clause 3.1. If one channel is used for the spectrum emission mask test use this power for the selection. If two channels are used for the spectrum emission mask test use the power of one of these.

Table 3: Spectrum emission mask values, maximum output power P ≥ 43 dBm

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515 MHz ≤ f_offset < 2,715 MHz	-12,5 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715 MHz ≤ f_offset < 3,515 MHz	$-12{,}5\text{dBm} - 15 \times \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
	3,515 MHz ≤ f_offset < 4,0 MHz	-24,5 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0 MHz	-11,5 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max}	8,0 MHz ≤ f_offset < f_offset_{max}	-11,5 dBm	1 MHz

Table 4: Spectrum emission mask values, maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515 MHz ≤ f_offset < 2,715 MHz	-12,5 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715 MHz ≤ f_offset < 3,515 MHz	$-12{,}5\,\text{dBm} - 15 \times \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
	3,515 MHz ≤ f_offset < 4,0 MHz	-24,5 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0 MHz	-11,5 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max}	8,0 MHz ≤ f_offset < f_offset_{max}	P - 54,5 dB	1 MHz

Table 5: Spectrum emission mask values, maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter -3 dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515 MHz ≤ f_offset < 2,715 MHz	P - 51,5 dB	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715 MHz ≤ f_offset < 3,515 MHz	$\text{P} - 51{,}5\text{dB} - 15 \times \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right) \text{dB}$	30 kHz
	3,515 MHz ≤ f_offset < 4,0 MHz	P - 63,5 dB	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0 MHz	P - 50,5 dB	1 MHz
7,5 MHz ≤ Δf ≤ f_{max}	8,0 MHz ≤ f_offset < f_offset_{max}	P - 54,5 dB	1 MHz

Table 6: Spectrum emission mask values, maximum output power P < 31 dBm

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515 MHz ≤ f_offset < 2,715 MHz	-20,5 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715 MHz ≤ f_offset < 3,515 MHz	$-20{,}5\ \text{dBm} - 15 \times \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715\right)\text{dB}$	30 kHz
	3,515 MHz ≤ f_offset < 4,0 MHz	-32,5 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0 MHz	-19,5 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max}	8,0 MHz ≤ f_offset < f_offset_{max}	-23,5 dBm	1 MHz

4.2.2.3 Conformance

Conformance tests described in clause 5.3.1 shall be carried out.

4.2.3 Spurious emissions

4.2.3.1 Definition

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 repeater output port.

The requirements of clause 4.2.3.2 shall apply whatever the type of Repeater considered (one or several operating bands). It applies for all configurations foreseen by the manufacturer's specification.

The requirement applies at frequencies within the specified frequency ranges that are more than 12,5 MHz below the centre frequency of the first 5 MHz channel or more than 12,5 MHz above the centre frequency of the last 5 MHz channel in the operating band.

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

4.2.3.2 Limit

4.2.3.2.1 Spurious emissions

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 tables 7 and 8 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 requirement shall apply both with and without an input signal applied.

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

Table 7: Down-link: General spurious emissions limits

Band	Maximum level	Measurement bandwidth	Note
9 kHz ↔ 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1
150 kHz ↔ 30 MHz	-36 dBm	10 kHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1
30 MHz ↔ 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1
1 GHz ↔ Fc1 - 60 MHz or 2 100 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1
Fc1 - 60 MHz or 2 100 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 2 100 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R Recommendation SM.329 [6], clause 4.3 and annex 7
Fc1 - 50 MHz or 2 100 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2 180 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R Recommendation SM.329 [6], clause 4.3 and annex 7
Fc2 + 50 MHz or 2 180 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 2 180 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R Recommendation SM.329 [6], clause 4.3 and annex 7
Fc2 + 60 MHz or 2 180 MHz *whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1. Upper frequency as in ITU-R Recommendation SM.329 [6], clause 2.5, table 1

Table 8: Up-link: General spurious emissions limits

Band	Maximum level	Measurement bandwidth	Note
9 kHz ↔ 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1
150 kHz ↔ 30 MHz	-36 dBm	10 kHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1
30 MHz ↔ 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1
1 GHz ↔ Fc1 - 60 MHz or 1 910 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1
Fc1 - 60 MHz or 1 910 MHz *whichever is the higher* ↔ Fc1 - 50 MHz or 1 910 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R Recommendation SM.329 [6], clause 4.3 and annex 7
Fc1 - 50 MHz or 1 910 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 1 990 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R Recommendation SM.329 [6], clause 4.3 and annex 7
Fc2 + 50 MHz or 1 990 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 1 990 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R Recommendation SM.329 [6], clause 4.3 and annex 7
Fc2 + 60 MHz or 1 990 MHz *whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R Recommendation SM.329 [6], clause 4.1. Upper frequency as in ITU-R Recommendation SM.329 [6], clause 2.5, table 1
NOTE: 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.			

4.2.3.2.2 Co-existence with GSM 900

This requirement shall be applied for the protection of GSM 900 MS and GSM 900 BTS receivers.

The power of any spurious emission shall not exceed the limit specified in table 9.

Table 9: UTRA Repeater Spurious emissions limits in geographic coverage area of GSM 900 MS receiver

Band	Maximum level	Measurement bandwidth
876 MHz to 915 MHz	-61 dBm	100 kHz
921 MHz to 960 MHz	-57 dBm	100 kHz

4.2.3.2.3 Co-existence with DCS 1800

This requirement shall be applied for the protection of DCS 1800 MS and DCS 1800 BTS receivers.

The power of any spurious emission shall not exceed the limit specified in table 10.

Table 10: UTRA Repeater Spurious emissions limits in geographic coverage area of DCS 1800 MS receiver

Band	Maximum level	Measurement bandwidth
1 710 MHz to 1 785 MHz	-61 dBm	100 kHz
1 805 MHz to 1 880 MHz	-47 dBm	100 kHz

4.2.3.2.4 Co-existence with services in adjacent frequency bands

This requirement shall be applied for the protection in bands adjacent to the frequency band 2 110 MHz to 2 170 MHz.

The power of any spurious emission shall not exceed the limits specified in table 11.

Table 11: Spurious emissions limits for protection of adjacent band services

Band (f)	Maximum level	Measurement bandwidth
2 100 MHz to 2 105 MHz	-30 + 3,4 (f - 2 100 MHz) dBm	1 MHz
2 175 MHz to 2 180 MHz	-30 + 3,4 (2 180 MHz - f) dBm	1 MHz

4.2.3.2.5 Co-existence with UTRA-TDD

This requirement shall be applied for the protection of the UTRA-TDD. The requirement applies only to the down-link direction of the repeater.

The power of any spurious emission shall not exceed the limit specified in table 12.

Table 12: UTRA Repeater Spurious emissions limits in geographic coverage area of UTRA-TDD

Band	Maximum level	Measurement bandwidth
1 900 MHz to 1 920 MHz	-52 dBm	1 MHz
2 010 MHz to 2 025 MHz	-52 dBm	1 MHz

4.2.3.2.6 Co-existence with UTRA-FDD BS

This requirement shall be applied for the protection of UTRA-FDD BS receivers.

In the down-link direction of the repeater the power of any spurious emission shall not exceed the limit specified in table 13.

Table 13: UTRA Repeater Spurious emissions limits in geographic coverage area of UTRA FDD BS receiver for the down-link direction of the repeater

Band	Maximum level	Measurement bandwidth	Note
1 920 MHz to 1 980 MHz	-96 dBm	100 kHz	

In the up-link direction of the repeater the power of any spurious emission shall not exceed the limit specified in table 14.

Table 14: UTRA Repeater Spurious emissions limits in geographic coverage area of UTRA FDD BS receiver for the up-link direction of the repeater

Band	Maximum level	Measurement bandwidth	Note
1 920 MHz to 1 980 MHz	-53 dBm	100 kHz	

4.2.3.3 Conformance

Conformance tests described in clause 5.3.2 shall be carried out.

4.2.4 Maximum output power

4.2.4.1 Definition

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

4.2.4.2 Limit

In normal conditions, the repeater maximum output power shall remain within limits specified in table 15 relative to the manufacturer's rated output power.

Table 15: Repeater output power; normal conditions

Rated output power	Limit
P ≥ 43 dBm	+2,7 dB and -2,7 dB
39 dBm ≤ P < 43 dBm	+2,7 dB and -2,7 dB
31 dBm ≤ P < 39 dBm	+2,7 dB and -2,7 dB
P < 31 dBm	+3,7 dB and -3,7 dB

In extreme conditions, the repeater maximum output power shall remain within limits specified in table 16 relative to the manufacturer's rated output power.

Table 16: Repeater output power; extreme conditions

Rated output power	Limit
P ≥ 43 dBm	+3,2 dB and -3,2 dB
39 dBm ≤ P < 43 dBm	+3,2 dB and -3,2 dB
31 dBm ≤ P < 39 dBm	+3,2 dB and -3,2 dB
P < 31 dBm	+4,7 dB and -4,7 dB

4.2.4.3 Conformance

Conformance tests described in clause 5.3.3 shall be carried out.

4.2.5 Input intermodulation

4.2.5.1 Definition

The input intermodulation is a measure of the capability of the repeater to inhibit the generation of interference in the operating band, in the presence of interfering signals on frequencies other than the operating band.

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the repeater to maintain the wanted frequency free of internally created interference.

This test applies to Uplink and Downlink path of the repeater.

4.2.5.2 Limit

4.2.5.2.1 General input intermodulation requirement

The intermodulation performance should be met when the following signals are applied to the repeater.

Table 17: General input intermodulation requirement

f_offset	Interfering signal levels	Type of signals	Measurement bandwidth
3,5 MHz	-40 dBm	2 CW carriers	1 MHz

For the parameters specified in table 17, the power in the operating band shall not increase with more than the limit in table 18 at the output of the repeater as measured in the centre of the operating band, compared to the level obtained without interfering signals applied.

Table 18: General input intermodulations limit

Limit for the increase of power in the operating band
+11,2 dB

4.2.5.2.2 Co-existence with GSM 900 and/or DCS 1800

The intermodulation performance should be met when the following signals are applied to the repeater.

Table 19: Input intermodulation requirements for interfering signals in the GSM 900 and DCS 1800 bands

Frequency of interfering signals	Interfering signal levels	Type of signals	Measurement bandwidth
876 MHz to 915 MHz	-15 dBm	2 CW carriers	1 MHz
1 710 MHz to 1 785 MHz	-15 dBm	2 CW carriers	1 MHz

For the parameters specified in table 19, the power in the operating band shall not increase with more than the limit in table 20 at the output of the repeater as measured in the centre of the operating band, compared to the level obtained without interfering signals applied.

Table 20: Co-existence with GSM 900 and/or DCS 1800 input intermodulations limit

Limit for the increase of power in the operating band
+11,2 dB

4.2.5.3 Conformance

Conformance tests described in clause 5.3.4 shall be carried out.

4.2.6 Out of band gain

4.2.6.1 Definition

Out of band gain refers to the gain of the repeater immediately outside the operating band. The measurements shall apply to both paths Uplink and Downlink of the repeater.

4.2.6.2 Limits

The intended use of a repeater in a system is to amplify the in band signals and not to amplify the out of band emission of the donor base station.

In the intended application of the repeater, the out of band gain is less than the donor coupling loss.

The repeater minimum donor coupling loss shall be declared by the manufacturer. This is the minimum required attenuation between the donor BS and the repeater for proper repeater operation.

The gain outside the operating band shall not exceed the maximum level specified in table 21, where:

- f_offset is the distance from the centre frequency of the first or last 5 MHz channel within the operating band.

Table 21: Out of band gain limits 1

Frequency offset from the carrier frequency, f_offset	Maximum gain
2,7 ≤ f_offset < 3,5 MHz	60,5 dB
3,5 ≤ f_offset < 7,5 MHz	45,5 dB
7,5 ≤ f_offset < 12,5 MHz	45,5 dB
12,5 MHz ≤ f_offset	35,5 dB

For 12,5 MHz ≤ f_offset the out of band gain shall not exceed the maximum gain of table 21 or the maximum gain stated in table 22 whichever is lower.

Table 22: Out of band gain limits 2

Repeater maximum output power as in clause 4.2.2	Maximum gain
P < 31 dBm	Out of band gain ≤ minimum donor coupling loss + 0,5 dB
31 dBm ≤ P < 43 dBm	Out of band gain ≤ minimum donor coupling loss + 0,5 dB
P ≥ 43 dBm	Out of band gain ≤ minimum donor coupling loss - (P-43 dBm) + 0,5 dB
NOTE: The out of band gain is considered with 12,5 MHz ≤ f_offset.	

4.2.6.3 Conformance

Conformance tests described in clause 5.3.5 shall be carried out.

4.2.7 Adjacent Channel Rejection Ratio

4.2.7.1 Definition

Adjacent Channel Rejection Ratio (ACRR) is the ratio of the RRC weighted gain per carrier of the repeater in the pass band to the RRC weighted gain of the repeater on an adjacent channel.

The requirement shall apply to the Uplink and Downlink of Repeater where the donor link is maintained via antennas (over the air Repeater).

4.2.7.2 Limit

The ACRR shall be higher than the value specified in table 23.

Table 23: Repeater ACRR

Repeater maximum output power as in clause 4.2.2	Channel offset from the centre frequency of the first or last 5 MHz channel within the pass band	ACRR limit
P ≥ 31 dBm	5 MHz	32,3 dB
P ≥ 31 dBm	10 MHz	32,3 dB
P < 31 dBm	5 MHz	19,3 dB
P < 31 dBm	10 MHz	19,3 dB

4.2.7.3 Conformance

Conformance tests described in clause 5.3.6 shall be carried out.

4.2.8 Output intermodulation

4.2.8.1 Definition

The output intermodulation requirement is a measure of the ability of the repeater to inhibit the generation of intermodulation products signals created by the presence of an interfering signal reaching the repeater via the output port.

The output intermodulation level is the power of the intermodulation products when a WCDMA modulated interference signal is injected into the output port at a level of 30 dB lower than that of the wanted signal. The frequency of the interference signal shall be ±5 MHz, ±10 MHz and ±15 MHz offset from the wanted signal, but within the frequency band allocated for UTRA FDD downlink as specified in clause 1.

The requirement is applicable for downlink signals.

4.2.8.2 Limit

The output intermodulation level shall not exceed the out of band emission of clause 4.2.2.2 or the downlink spurious emission requirements clause 4.2.3.2.

4.2.8.3 Conformance

Conformance tests described in clause 5.3.7 shall be carried out.

5 Testing for compliance with technical requirements

5.1 Conditions for testing

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile.

Where technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions (within the boundary limits of the declared operational environmental profile) to give confidence of compliance for the affected technical requirements.

Normally it should be sufficient for all tests to be conducted using normal test conditions except where otherwise stated. For guidance on the use of other test conditions to be used in order to show compliance reference can be made to TS 125 143 [5], clause 5.4.

The measurement system required for each test is described in TS 125 143 [5], annex A.

5.2 Interpretation of the measurement results

The interpretation of the results recorded in a test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit will be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be included in the test report;
- the recorded value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in table 24.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [4] and shall correspond to an expansion factor (coverage factor) k = 1,96 (which provide a confidence level of 95 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 24 is based on this expansion factor.

Table 24: Maximum uncertainty of the test system

Parameter	Conditions	Uncertainty
Spectrum emissions mask	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 bandwidth measurements may be necessary in order to achieve the above accuracy. The interference from the signal generator ACLR shall be minimum 10 dB below that of a Base Station according to TS 125 141 [7]	±1,5 dB
Spurious emissions	For "Spurious emissions": f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz f > 4 GHz	 ±1,5 dB ±2,0 dB ±4,0 dB
	In UTRA and co-existence receive bands: for results > -60 dBm for results < -60 dBm	 ±2,0 dB ±3,0 dB
	The interference from the signal generator ACLR shall be minimum 10 dB below that of a Base Station according to TS 125 141 [7]	
Maximum output power		±0,7 dB
Input intermodulation characteristics	Formula: $\sqrt{(CW1\_level\_error)^2 + (2 \cdot CW2\_level\_error)^2 + (measurement\_error)^2}$ RSS: CW1 level error, 2 x CW2 level error, and measurement error (using all errors = ±0,5 dB)	±1,2 dB
Out of band gain	5 MHz offset	±0,5 dB
	Calibration of test set-up shall be made without DUT in order to achieve the accuracy.	

Parameter	Conditions	Uncertainty
Output intermodulation	Spectrum emissions mask	±2,1 dB
	$\sqrt{(2 \cdot Interference\_level\_error)^2 + (Spectrum\_emission\_measurement\_error)^2}$	
	RSS: 2x Interference signal level error and Spectrum emission measurement level error. (1 dB interference signal level error is assumed.)	
	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 bandwidth measurements may be necessary in order to achieve the above accuracy.	
	The interference from the signal generator ACLR shall be minimum 10 dB below that of a Base Station according to TS 125 141 [7]	
	For "Spurious emissions": f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz f > 4 GHz	 ±1,5 dB ±2,0 dB ±4,0 dB
	In UTRA and co-existence receive bands: for results > -60 dBm for results < -60 dBm	 ±2,0 dB ±3,0 dB
	The interference from the signal generator ACLR shall be minimum 10 dB below that of a Base Station according to TS 125 141 [7]	
	The interference signal must have a spurious emission level at least [10 dB] below the spurious levels required in clause 4.2.3.2.	
Adjacent Channel Rejection Ratio		±0,7 dB

NOTE 1: For RF tests it should be noted that the uncertainties in table 24 apply to the Test System operating into a nominal 50 Ω load and do not include system effects due to mismatch between the EUT and the Test System.

NOTE 2: Annex G of TR 100 028 [4], part 2 provides guidance for the calculation of the uncertainty components relating to mismatch.

NOTE 3: If the Test System for a test is known to have a measurement uncertainty greater than that specified in table 24, this equipment can still be used, provided that an adjustment is made follows:

- Any additional uncertainty in the Test System over and above that specified in table 24 is used to tighten the Test Requirements - making the test harder to pass (for some tests, e. g. receiver tests, this may require modification of stimulus signals). This procedure will ensure that a Test System not compliant with table 24 does not increase the probability of passing an EUT that would otherwise have failed a test if a Test System compliant with table 24 had been used.

5.3 Essential radio test suites

5.3.1 Spectrum emission mask

5.3.1.1 Initial conditions

Test environment: Normal; see TS 125 143 [5], clause 5.4.1.

1) Set-up the equipment as shown in TS 125 143 [5], annex A.

2) Connect a signal generator to the input port of the repeater for tests of repeaters with an operating band corresponding to one 5 MHz channel. If the operating band corresponds to two or more 5 MHz carriers, two signal generators with a combining circuit or one signal generator with the ability to generate several WCDMA carriers is connected to the input.

3) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4,0 MHz shall use a 30 kHz measurement bandwidth.

4) 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 1 MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements.

5) Detection mode: True RMS.

5.3.1.2 Procedures

1) Set the repeater to maximum gain.

2) Set the signal generator(s) to generate signal(s) in accordance to test model 1, TS 125 141 [7], at level(s) which produce the manufacturer specified maximum output power at maximum gain.

3) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

4) Increase the input power with 10 dB compare to the level obtained in step 2).

5) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

6) Repeat the test for the opposite path of the repeater.

The results obtained shall be compared to the limits in clause 4.2.2.2 in order to prove compliance.

5.3.2 Spurious emissions

5.3.2.1 Initial conditions

Test environment: Normal; see TS 125 143 [5], clause 5.4.1.

1) Set-up the equipment as shown in TS 125 143 [5], annex A.

2) Connect a signal generator to the input port of the repeater for tests of repeaters with an operating band corresponding to one 5 MHz channel. If the operating band corresponds to two or more 5 MHz carriers, two signal generators with a combining circuit or one signal generator with the ability to generate several WCDMA carriers is connected to the input.

3) Detection mode: True RMS.

5.3.2.2 Procedure

1) Set the repeater to maximum gain.

2) Set the signal generator(s) to generate signal(s) in accordance to test model 1, TS 125 141 [7], at level(s) which produce the manufacturer specified maximum output power at maximum gain.

3) The detecting device shall be configured with a measurement bandwidth as stated in the tables.

4) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

5) Increase the input power with 10 dB compare to the level obtained in step 2).

6) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

The results obtained shall be compared to the limits in clause 4.2.3.2 in order to prove compliance.

5.3.3 Maximum output power

5.3.3.1 Initial conditions

Test environment: Normal: see TS 125 143 [5], clause 5.4.1 and
Extreme: see TS 125 143 [5], clause 5.4.2.

In addition, on one UARFCN only, the test shall be performed under extreme power supply conditions as defined in clause B.1.

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

1) Set-up the equipment as shown in TS 125 143 [5], annex A.

2) Connect the signal generator equipment to the repeater input port.

3) Connect the power measuring equipment to the repeater output port.

5.3.3.2 Procedure

1) Set the signal generator to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model 1 in TS 125 141 [7].

2) Adjust the input power to the repeater to create the maximum nominal Repeater output power at maximum gain.

3) Measure the mean power at the RF output port over a certain slot.

4) Increase the power with 10 dB compare to the level obtained in step 2).

5) Measure the mean power at the RF output port over a certain slot.

The results obtained shall be compared to the limits in clause 4.2.4.2 in order to prove compliance.

5.3.4 Input intermodulation

5.3.4.1 Initial conditions

Test environment: Normal: see TS 125 143 [5], clause 5.4.1.

1) Set-up the equipment as shown in TS 125 143 [5], annex A.

2) Set the repeater to maximum gain.

3) Connect two signal generators with a combining circuit or one signal generator with the ability to generate several CW carriers to the input.

4) Connect a spectrum analyser to the output of the repeater. Set the resolution bandwidth to 1 MHz in the centre of the operating band. Set averaging to 1 s.

5.3.4.2 Procedures

1) Adjust the frequency of the input signals, either below or above the operating band, so that the lowest order intermodulation product is positioned in the centre of the operating band, according to clause 4.2.5.2.

2) Take the measurement of the rise of the output signal.

3) Repeat the measurement for the opposite path of the repeater.

The results obtained shall be compared to the limits in clause 4.2.5.2 in order to prove compliance.

5.3.5 Out of band gain

5.3.5.1 Initial conditions

Test environment: Normal; see TS 125 143 [5], clause 5.4.1.

1) Set-up the equipment as shown in TS 125 143 [5], annex A.

2) The test shall be performed with an offset between CW-signal and the first or last 5 MHz channel within the operating band of 2,7 MHz, 3 MHz, 3,5 MHz, 5 MHz, 7,5 MHz, 10 MHz, 12,5 MHz, 15 MHz and 20 MHz, excluding other operating bands. In addition the test shall also be performed for all harmonic frequencies of the repeaters operating band up to 12,75 GHz.

5.3.5.2 Procedure

1) Set the repeater to maximum gain.

2) Set the signal generator to generate a CW-signal, applied to the input port of the repeater. The power level of the RF input signal shall be at least 5 dB below the power level which, when applied within the operating band, would produce the maximum rated output power, as declared by the manufacturer. This is to ensure that the equipment is operating in the linear output range.

3) The average output power in each case shall be measured using a spectrum analyser connected to the output port of the repeater and the net gain shall be recorded and compared to tables 21 or 22 whichever is lower.

4) With the same input power as in step 1) set the repeater gain to the minimum specified by the manufacturer.

5) The average output power in each case shall be measured using a spectrum analyser connected to the output port of the repeater and the net gain shall be recorded and compared to tables 21 or 22 whichever is lower.

The results obtained shall be compared to the limits in clause 4.2.6.2 in order to prove compliance.

5.3.6 Adjacent Channel Rejection Ratio

5.3.6.1 Initial conditions

Test environment: Normal; see TS 125 143 [5], clause 5.4.1.

1) Set-up the equipment as shown in TS 125 143 [5], annex A.

2) Connect a signal generator to the input port of the repeater.

3) Connect a power measuring equipment to the output port of the repeater.

4) The measurement device characteristics shall be:

   - measurement filter bandwidth: defined in clause 4.2.7.1;

   - detection mode: true RMS voltage or true average power.

5.3.6.2 Procedures

1) Set the signal generator to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model 1 in TS 125 141 [7] at the first or last 5 MHz channel within the pass band.

2) Adjust the input power to the Repeater to create the maximum nominal Repeater output power at maximum gain

3) Measure the RRC filtered mean power at the RF output port over a certain slot.

4) Set the signal generator to transmit the same signal and the same input power at one of the channel offsets according to table 23.

5) Measure the RRC filtered mean power at the RF output port over a certain slot.

6) Calculate the ratio of the measured power in the pass band to the measured power at the channel offset.

7) Repeat step 4) to 6) until all channel offsets in table 23 are measured.

The results obtained shall be compared to the limits in clause 4.2.7.2 in order to prove compliance.

5.3.7 Output intermodulation

5.3.7.1 Initial conditions

Test environment: Normal; see TS 125 143 [5], clause 5.4.1.

1) Set-up the equipment as shown in TS 125 143 [5], annex A.

2) Connect a signal generator to the input port of the repeater for tests of repeaters with an operating band corresponding to one 5 MHz channel. Connect a signal generator to the circulator on the output port and make sure the signal generator power is directed to the repeater output port.

3) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4,0 MHz shall use a 30 kHz measurement bandwidth.

4) Measurements with an offset from the carrier centre frequency between 4,0 MHz and (Δfmax - 500 kHz) shall use a 1 MHz measurement bandwidth. The 1 MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements

5) Detection mode: True RMS.

5.3.7.2 Procedures

1) Set the repeater to maximum gain.

2) Set the signal generator at the repeater input port (subject signal) to generate a signal in accordance to test model 1, TS 125 141 [7], clause 6.1.1.1, at the level which produce the manufacturer specified maximum output power at maximum gain.

3) Set the signal generator at the repeater output port (interference signal) to generate a signal in accordance to test model 1, TS 125 141 [7], clause 6.1.1.1, at the level producing signal power corresponding to 30 dB below the manufacturer specified maximum output power at the repeater output port with the specified frequency offset from the wanted signal.

4) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value. Measurements in the band of the interfering signal shall be excluded. The measurements can be limited to the power of all third and fifth order intermodulation products.

5) Repeat from clause 3 until interference signals ±5 MHz, ±10 MHz and ±15 MHz frequency offset from the wanted signal has been tested. Note that interfering signals outside the UTRA-FDD allocated frequency band , as specifies in clause 4.1 need not be tested.

The results obtained shall be compared to the limits in clause 4.2.8.2 in order to prove compliance.

Annex A (normative): EN Requirements Table (EN-RT)

The EN Requirements Table (EN-RT) serves a number of purposes, as follows:

- it provides a tabular summary of all the requirements for this part;
- it shows the status of each EN-R, whether it is essential to implement in all circumstances (Mandatory), or whether the requirement is dependent on the supplier having chosen to support a particular optional service or functionality (Optional). In particular it enables the EN-Rs associated with a particular optional service or functionality to be grouped and identified;
- when completed in respect of a particular equipment it provides a means to undertake the static assessment of conformity with the EN.

Table A.1: EN Requirements Table (EN-RT)

EN Reference		EN 301 908-11				Comment
No.	**Reference**	**EN-R (note)**	**Status**			
1	4.2.2	Spectrum emissions mask	M			
2	4.2.3	Spurious emissions	M			
3	4.2.4	Maximum output power	M			
4	4.2.5	Input intermodulation	M			
5	4.2.6	Out of band gain	M			
6	4.2.7	Adjacent Channel Rejection Ratio	M			
7	4.2.8	Output intermodulation	M			
NOTE: These EN-Rs are justified under article 3.2 of the R&TTE Directive [1].						

Key to columns:

No Table entry number;

Reference Clause reference number of conformance requirement within the present document;

EN-R Title of conformance requirement within the present document;

Status Status of the entry as follows:

- M Mandatory, shall be implemented under all circumstances;
- O Optional, may be provided, but if provided shall be implemented in accordance with the requirements;
- O.n this status is used for mutually exclusive or selectable options among a set. The integer "n" shall refer to a unique group of options within the EN-RT. A footnote to the EN-RT shall explicitly state what the requirement is for each numbered group. For example, "It is mandatory to support at least one of these options", or, "It is mandatory to support exactly one of these options".

Comments To be completed as required.

Annex B (normative): Repeater configurations

B.1 Power supply

When extreme power supply conditions are specified for a test, the test shall be performed at the standard upper and lower limits of operating voltage defined by manufacturer's declaration for the equipment under test.

Upper voltage limit:

The equipment shall be supplied with a voltage equal to the upper limit declared by the manufacturer (as measured at the input terminals to the equipment). The tests shall be carried out at the steady state minimum and maximum temperature limits declared by the manufacturer for the equipment, to the methods described in IEC 60068-2-1 [9] Test Ab/Ad and IEC 60068-2-2 [10] Test Bb/Bd: Dry Heat.

Lower voltage limit:

The equipment shall be supplied with a voltage equal to the lower limit declared by the manufacturer (as measured at the input terminals to the equipment). The tests shall be carried out at the steady state minimum and maximum temperature limits declared by the manufacturer for the equipment, to the methods described in IEC 60068-2-1 [9] Test Ab/Ad and IEC 60068-2-2 [10] Test Bb/Bd: Dry Heat.

B.2 Power supply options

If the repeater is supplied with a number of different power supply configurations, it may not be necessary to test RF parameters for each of the power supply options, provided that it can be demonstrated that the range of conditions over which the equipment is tested is at least as great as the range of conditions due to any of the power supply configurations.

B.3 Combining of Repeaters

If the repeater is intended for combination with additional apparatus connected to a repeater port and this combination is supplied as a system, the combination of repeater together with the additional apparatus must also fulfil the repeater requirements. E.g. if the repeater is intended for combination such that multiple repeaters amplify the same signals into the same ports the combination must also fulfil the repeater requirements.

An example of such a configuration is shown in figure B.1.

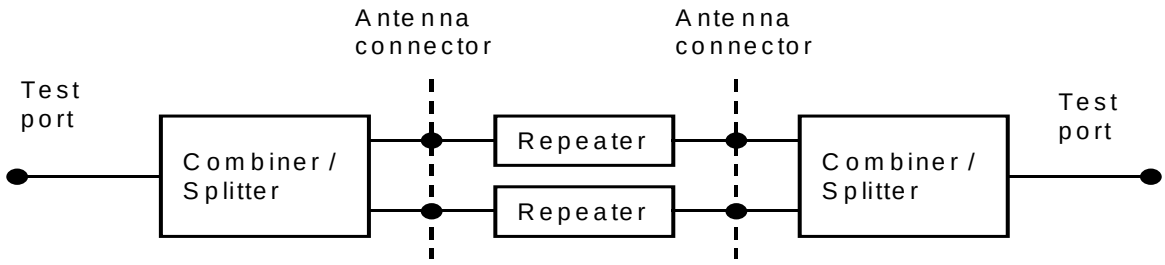

Figure B.1: Example of repeater configuration

Annex C (informative): Environmental profile specification

The following environmental conditions may be declared by the supplier:

- barometric pressure: minimum and maximum;
- temperature: minimum and maximum;
- relative humidity: minimum and maximum;
- power supply: lower and upper voltage limit.

When operating outside the boundary limits of the declared operational environmental profile the equipment should not make ineffective use of the radio frequency spectrum so as to cause harmful interference.

Annex D (informative): Bibliography

ETSI TS 125 106: "Universal Mobile Telecommunications System (UMTS); UTRA repeater radio transmission and reception (3GPP TS 25.106)".

CEPT/ERC/REC 74-01E (Siófok 1998, Nice 1999, Sesimbra 2002): "Spurious emissions".

ETSI EN 301 489 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".

Annex E (informative): The EN title in the official languages

Language	EN title
Czech	
Danish	Elektromagnetisk kompatibilitet og radiospektrumanliggender (ERM); Basisstationer (BS), Repeaters og brugerudstyr (UE) for IMT-2000 CDMA tredje generations cellulær radionet; Part 11: Harmoniseret EN for IMT-2000, CDMA direkte spredt (UTRA FDD) (Repeaters) , der dækker de væsentlige krav i R&TTE Direktivets artikel 3.2
Dutch	Elektromagnetische compatibiliteit en radiospectrum-zaken (ERM); Basisstations (BS), Repeaters en gebruikersapparatuur (UE) voor IMT-2000 derde generatie mobiele netwerken; Deel 11: Geharmoniseerde EN voor IMT-2000, CDMA Direct Spread (UTRA FDD) (Repeaters), welke invulling geeft aan de wezenlijke vereisten, neergelegd in artikel 3.2 van de R&TTE-richtlijn
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part11: Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (Repeaters) covering essential requirements of article 3.2 of the R&TTE Directive
Estonian	
Finnish	Sähkömagneettinen yhteensopivuus ja radiospektriasiat (ERM); IMT-2000 kolmannen sukupolven solukkoverkkojen tukiasemat (BS), toistimet ja päätelaitteet (UE); Osa 11: R&TTE direktiivin artiklan 3.2 olennaiset vaatimukset toteuttava yhdenmukaistettu EN IMT-2000 CDMA suorasekvenssihajaspektritekniikkaa (UTRA FDD) käyttäville toistimille
French	Compatibilité électromagnétique et Radioélectrique (ERM); Stations de Base (BS), Répéteurs et Equipement Utilisateur (UE) pour les réseaux cellulaires de troisième génération IMT-2000; Partie 11: Norme harmonisée pour l'IMT-2000, CDMA à Etalement direct (UTRA FDD) (Répéteurs) couvrant les exigences essentielles de l'article 3.2 de la Directive R&TTE
German	Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM); Feststationen (BS), Repeater und Einrichtungen für den Nutzer (UE) für digitale zellulare IMT-2000 Funknetze der 3. Generation, Teil 11: Harmonisierte Europäische Norm (EN) für IMT-2000, CDMA-Direkt-Spreizspektrum (UTRA FDD) (Repeater) mit wesentlichen Anforderungen nach R&TTE-Richtlinie Artikel 3.2
Greek	Ζητήματα Ηλεκτρομαγνητικής συμβατότητας και Ηλεκτρομαγνητικού φάσματος (ERM); Σταθμοί Βάσης (BS), αναμεταδότες και Τερματικό Χρήστη (UE) για IMT-2000 κυψελωτά συστήματα 3ης Γενιάς; Μέρος 11. Εναρμονισμένο «EN» για IMT-2000, CDMA Άμεσης Διασποράς (UTRA FDD) (αναμεταδότες) που καλύπτει βασικές αρχές του άρθρου 3.2 της R&TT Οδηγίας
Hungarian	
Icelandic	
Italian	Compatibilità elettromagnetica e problematiche di Spettro Radio (ERM); Stazioni Base (BS), Ripetitori e Terminali Mobili (UE) per le reti cellulari di terza generazione IMT-2000; Parte 3: Norma armonizzata per IMT-2000, CDMA Direct Spread (UTRA FDD) (Ripetitori) relativa ai requisiti essenziali dell'articolo 3.2 della Direttiva R&TTE
Latvian	
Lithuanian	
Maltese	
Polish	
Portuguese	Assuntos de Espectro Radioeléctrico e Compatibilidade Electromagnética (ERM); Estações de Base (BS), Repetidores e equipamento de utilizador (UE) para a terceira geração de redes celulares IMT-2000; Parte 11: EN Harmonizada para o IMT-2000, Espalhamento Directo CDMA (UTRA-FDD) (Repetidores), cobrindo os requisitos essenciais no âmbito do artigo 3.º, n.º 2 da Directiva R&TTE
Slovak	
Slovenian	
Spanish	Compatibilidad electromagnética y espectro radio (ERM); estaciones base (BS), Repetidores y equipos de usuario (UE) de redes móviles de tercera generación IMT-2000; EN harmonizada que cubre los requisitos mínimos del artículo 3.2 de la directiva de R&TTE (1999/5/EC); parte 11: CDMA con ensanchamiento por secuencia directa (UTRA FDD) (Repetidores)
Swedish	Elektromagnetisk kompatibilitet och radio-spektrumfrågor (ERM); Basstationer (BS), repeatrar och Mobilstationer (UE) för tredje generationens mobilnät IMT-2000; Del 11: Harmoniserad standard för IMT-2000, CDMA med direktspridning (UTRA FDD) (repeatrar) omfattande väsentliga krav enligt artikel 3.2 i R&TTE-direktivet

History

Document history				
V2.1.1	January 2003	Public Enquiry	PE 20030516:	2003-01-15 to 2003-05-16
V2.3.1	July 2004	Vote	V 20040924:	2004-07-26 to 2004-09-24