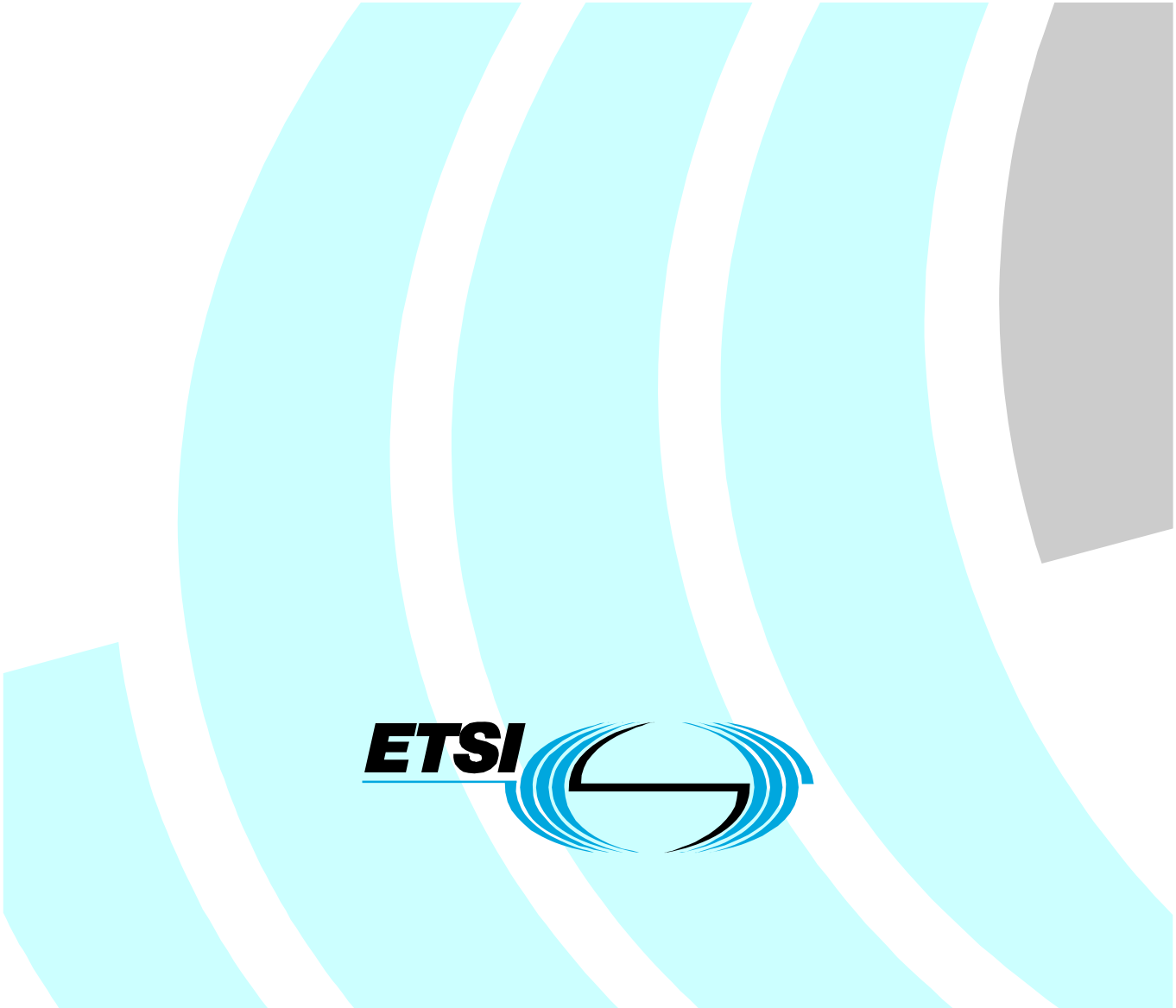
Draft ETSI EN 302 574-2 V1.1.0 (2009-11)

Harmonized European Standard (Telecommunications series)

**Satellite Earth Stations and Systems (SES);
Harmonized standard for satellite earth stations for
MSS operating in the 1 980 MHz to
2 010 MHz (earth-to-space) and 2 170 MHz to
2 200 MHz (space to-earth) frequency bands;
Part 2: User Equipment (UE) for wideband systems:
Harmonized EN covering essential requirements
of article 3.2 of the R&TTE Directive**



Reference
DEN/SES-00283-2

Keywords
broadband, IMT-2000, mobile, satellite

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Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

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Foreword

This Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES), and is now submitted for the Public Enquiry 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 [i.2] (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").

Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A.

The present document is part 2 of a multi-part deliverable covering the Harmonized Standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands, as identified below:

Part 1: "Complementary Ground Component (CGC) for wideband systems: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive";

Part 2: "User Equipment (UE) for wideband systems: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive";

Part 3: "User Equipment (UE) for narrowband systems: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".

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):	18 months after doa

Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive. The modular structure is shown in EG 201 399 [i.4].

1 Scope

The present document applies to User Equipment (UE) radio equipment type which has the following characteristics:

- these UEs have both transmit and receive capabilities and operate in an hybrid Satellite/terrestrial network i.e. a satellite and/or Complementary Ground Component (CGC) network,
- the satellite component is based on GSO,
- these UEs operate with an assigned channel signal bandwidth (CBw) of 1 MHz or greater,
- these UEs may be handset, handheld, portable, vehicle-mounted, host connected, semi-fixed or fixed equipment, or may be an element in a multi-mode terminal. It may consist of a number of modules with associated connections and user interface, or may be a self contained single unit,
- if the UE is an element in a multi-mode terminal, unless otherwise stated in the present document, its requirements apply only to the UE element of the terminal operating in the Mobile Satellite Service (MSS) frequency bands given in Table 1.

This radio equipment type is capable of operating in all or any part of the frequency bands given in Table 1.

Table 1: Mobile Satellite Service UE frequency bands

Operating band	Direction of transmission	UE frequency bands
I	Transmit	1 980 MHz to 2 010 MHz
	Receive	2 170 MHz to 2 200 MHz

The present document is intended to cover the provisions of Directive 1999/5/EC [1] (R&TTE Directive) 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".

NOTE 1: In addition to the unwanted emission limits defined in clauses 4.2.4 & 4.2.5 of the present document, additional operational constraints may be required to prevent harmful interference into services operating in the neighbouring bands outside the operational band defined in Table 1.

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 may apply to equipment within the scope of the present document.

NOTE 2: A list of such ENs is included on the web site http://www.newapproach.org.

2 References

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.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

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

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

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

[3] IEC 60068-2-1 (2007): "Environmental testing - Part 2-1: Tests - Test A: Cold".

[4] IEC 60068-2-2 (2007): "Environmental testing - Part 2-2: Tests - Test B: Dry heat".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1] ETSI TS 125 101: "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (FDD)".

[i.2] 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.

[i.3] Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.

[i.4] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive".

[i.5] ETSI EN 302 574-1: "Satellite Earth Stations and Systems (SES); Harmonized standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands; Part 1: Complementary Ground Component (CGC) for wideband systems: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".

[i.6] ETSI EN 302 574-3: "Satellite Earth Stations and Systems (SES); Harmonized Standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to- earth) frequency bands; Part 3: User Equipment (UE) for narrowband systems: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".

3 Definitions, symbols 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:

ancillary equipment: equipment (apparatus), used in connection with User Equipment (UE) is considered as ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction with a user equipment UE to provide additional operational and/or control features to the radio equipment, (e.g. to extend control to another position or location); and
- the equipment cannot be used on a stand alone basis to provide user functions independently of a UE; and
- the UE to which it is connected is capable of providing some intended operation, such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

channel raster: grade for a Centre Frequency: the centre frequency must be an integer multiple of the channel raster

3.2 Symbols

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

α	roll-of factor of the transmitter filter
Car_Bw	Sub-Carrier spacing for multi carrier signals
CBw	Channel signal bandwidth (channel spacing)
$CBw_{assigned}$	Assigned channel signal bandwidth (channel spacing)
$CBw_{adjacent}$	Adjacent channel signal bandwidth (channel spacing).
C_{raster}	Channel raster
F_{uw}	Frequency of unwanted signal

NOTE: This is specified in bracket in terms of an absolute frequency(s) or a frequency offset from the assigned channel frequency.

NBw Noise bandwidth

NOTE: In case of single carrier signal, it is equivalent to the Symbol Rate. NBw (MHz) = Symbol_rate.

In case of Multicarrier signal (for example OFDM), NBw (MHz) = (N+1) × Car_Bw (MHz), where N is the number of used sub-carriers.

<REFSENS> Reference sensitivity level

NOTE: Corresponding to the minimum mean power received at the UE antenna port at which the Bit Error Ratio (BER) shall not exceed a specific value (see [i.1]).

3.3 Abbreviations

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

ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
BER	Bit Error Ratio
CDMA	Code Division Multiple Access
CGC	Complementary Ground Component
CW	Continuous Wave

NOTE: Unmodulated signal.

FDD	Frequency Division Duplexing
F_{uw}	Frequency of unwanted signal
GSM	Global System for Mobile communications
MSS	Mobile Satellite Services
OFDM	Orthogonal Frequency Division Multiplexing
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
Rx	Receiver
SS	System Simulator
TH	Temperature High
TL	Temperature Low
ToL	Tolerance
TTE	Telecommunications Terminal Equipment
UE	User Equipment
VH	Voltage High
VL	Voltage Low
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

The requirements in the present document are based on the assumption that the operating band is shared between systems of the IMT-2000 satellite family or systems having compatible characteristics.

4.2.1 Introduction

To meet the essential requirements under article 3.2 of the R&TTE Directive [1] for IMT-2000 User Equipment (UE) eight essential parameters have been identified. Table 2 provides a cross reference between these eight essential parameters and the corresponding twelve technical requirements for equipment within the scope of the present document.

Table 2: Cross references

Essential parameter	Corresponding technical requirements
Spectrum emissions mask	4.2.4 Spectrum emission mask
	4.2.7 Adjacent Channel Leakage Power Ratio (ACLR)
Conducted spurious emissions from the transmitter antenna connector	4.2.5 Transmitter spurious emissions
Accuracy of maximum output power	4.2.3 Maximum output power
Prevention of harmful interference through control of power	4.2.6 Minimum Output Power
Conducted spurious emissions from the receiver antenna connector	4.2.13 Receiver spurious emissions
Impact of interference on receiver performance	4.2.10 Blocking characteristics
	4.2.11 Receiver spurious response
	4.2.12 Receiver inter-modulation characteristics
Receiver adjacent channel selectivity	4.2.9 Receiver Adjacent Channel Selectivity (ACS)
Control and monitoring functions	4.2.2 Control and monitoring functions
	4.2.8 Out of synchronisation handling of output power

4.2.2 Control and monitoring functions

4.2.2.1 Definition

This requirement, together with other control and monitoring technical requirements identified in the table of cross references in the applicable part, verifies that the control and monitoring functions of the UE prevent it from transmitting in the absence of a valid network.

This test is applicable to radio communications equipment and ancillary equipment.

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

4.2.2.2 Limit

The maximum measured power during the duration of the test shall not exceed -30 dBm.

4.2.2.3 Conformance

Conformance tests described in clause 5.4.1 shall be carried out.

4.2.3 Maximum output power

4.2.3.1 Definition

The nominal maximum output power and its tolerance are defined according to the power class of the UE.

The nominal power defined is the broadband transmit power of the UE, i.e. the power in a bandwidth of at least $(1 + \alpha)$ times the symbol rate of the radio access mode. The duration of the measurement shall be at least 50 % of one contiguous unit of transmission time.

Note for both TDMA and OFDM, the unit of transmission time corresponds to a frame

4.2.3.2 Limit

The UE maximum output power shall be within the shown value in Table 3 even for the multi-physical channel transmission mode.

Table 3: UE power classes

Power Class 1		Power Class 1bis		Power Class 2		Power Class 3	
Power (dBm)	**Tol (dB)**	**Power (dBm)**	**Tol (dB)**	**Power (dBm)**	**Tol (dB)**	**Power (dBm)**	**Tol (dB)**
+39	+2,7/-2,7	+33	+1/-3	+27	+1/-3	+24	+1,7/-3,7

Power class depends on the transmit power. Corresponding EIRP figure depends on the antenna gain.

4.2.3.3 Conformance

Conformance tests described in clause 5.4.2 shall be carried out.

4.2.4 Spectrum emissions mask

4.2.4.1 Definition

The spectrum emission mask of the UE applies to frequencies, which are between CBw/2 and ((CBw/2)+10) MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the filtered mean power of the UE carrier.

4.2.4.2 Limit

The power of any UE emission shall not exceed the levels specified in Table 4.

Table 4: Spectrum emission mask requirement

Δf in bandwidth units (Notes 1 and 5)	Minimum requirement (Notes 2 and 5)		Measurement bandwidth (Note 4)
	Relative requirement	Absolute requirement	
$\frac{CBw}{2} \le \Delta f < \frac{CBw}{2} + 1\,MHz$	$\left\{-33{,}5 - \Delta_P - 15.\left(\Delta f - \frac{CBw}{2}\right)\right\} dBc$	-69,6 dBm	30 kHz (note 3)
$\frac{CBw}{2} + 1\,MHz \le \Delta f < \frac{CBw}{2} + 5\,MHz$	$\left\{-33{,}5 - \Delta_P - 1.\left(\Delta f - (\frac{CBw}{2} + 1)\right)\right\} dBc$	-54,3 dBm	1 MHz
$\frac{CBw}{2} + 5\,MHz \le \Delta f < \frac{CBw}{2} + 6\,MHz$	$\left\{-37{,}5 - \Delta_P - 10.\left(\Delta f - (\frac{CBw}{2} + 5)\right)\right\} dBc$	-54,3 dBm	1 MHz
$\frac{CBw}{2} + 6\,MHz \le \Delta f \le \frac{CBw}{2} + 10\,MHz$	-47,5-Δ_P dBc	-54,3 dBm	1 MHz

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.
NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.
NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to (CBw/2)+15 kHz and (CBw/2) + 985 kHz.
NOTE 4: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.
NOTE 5: Δf and CBw units are in MHz.
NOTE 6: According to ACLR values in Table 7, Δ_P =0, 3, 9 dB for Power class 3, Power class 2 and Power class 1 & 1bis respectively.

4.2.4.3 Conformance

Conformance tests described in clause 5.4.3 shall be carried out.

4.2.5 Transmitter spurious emissions

4.2.5.1 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.

4.2.5.2 Limits

The limits shown in Table 5 and Table 6 are only applicable for frequencies which are greater than ((CBw/2)+10) MHz away from the UE centre carrier frequency.

Table 5: 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 < 1 000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	-30 dBm

Table 6: 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
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm
	1 893,5 MHz < f < 1 919,6 MHz	300 kHz	-41 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 170 ≤ f ≤ 2 200 MHz	NBw	-60 dBm

4.2.5.3 Conformance

Conformance tests described in clause 5.4.3 shall be carried out.

4.2.6 Minimum output power

4.2.6.1 Definition

The minimum controlled output power of the UE is when the power is set to a minimum value. The minimum transmit power is defined as a mean power in one time slot.

4.2.6.2 Limits

The minimum output power shall be less than -49 dBm when a UE is connected to CGCs.

4.2.6.3 Conformance

Conformance tests described in clause 5.4.5 shall be carried out.

4.2.7 Adjacent Channel Leakage Power Ratio (ACLR)

4.2.7.1 Definition

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

4.2.7.2 Limits

The limits to ACLR are measured at frequency offsets which are determined by both the assigned channel bandwidth $CBw_{assigned}$ and the adjacent channel bandwidth $CBw_{adjacent}$.

In fact, it is necessary to distinguish two cases:

- Case 1: Adjacent channel bandwidth is the same as the assigned channel bandwidth.
  - This refers to $CBw_{assigned} = CBw_{adjacent} = CBw$.
  - if the adjacent channel power exceeds -50 dBm then the ACLR shall be higher than the value specified in Table 7.
- Case 2: Adjacent and assigned channel bandwidths are different.
  - This refers to $CBw_{assigned} \neq CBw_{adjacent}$.
  - if the adjacent channel power exceeds -50 dBm then the ACLR should be higher than the value specified in Table 8.

Table 7: UE ACLR for same assigned and adjacent channel bandwidth characteristics

Power Class	Adjacent channel frequency relative to assigned channel frequency	ACLR limit
1	±CBw	42 dB (see note 4)
1	±2 × CBw	52 dB (see note 4)
1bis	±CBw	42 dB (see note 4)
1bis	±2 × CBw	52 dB (see note 4)
2	±CBw	36 dB
2	±2 × CBw	46 dB
3	±CBw	33 dB
3	±2 × CBw	43 dB
NOTE 1: The requirement shall still be met in the presence of switching transients. NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology. NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses. NOTE 4: if necessary a guard band may be introduced.		

Table 8: UE ACLR for different assigned and adjacent channel bandwidth characteristics

Power Class	Adjacent channel frequency relative to assigned channel frequency	ACLR limit
1	1st adjacent channel centre	42 dB (see note 4)
1	2nd adjacent channel centre	52 dB (see note 4)
1bis	1st adjacent channel centre	42 dB (see note 4)
1bis	2nd adjacent channel centre	52 dB (see note 4)
2	1st adjacent channel centre	36 dB
2	2nd adjacent channel centre	46 dB
3	1st adjacent channel centre	33 dB
3	2nd adjacent channel centre	43 dB
NOTE 1: The requirement shall still be met in the presence of switching transients. NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology. NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses. NOTE 4: if necessary a guard band may be introduced.		

Conformance tests described in clause 5.4.6 shall be carried out.

4.2.8 Out of synchronization handling of output power

4.2.8.1 Definition

The UE shall monitor the downlink signal (associated to the transmission signal of the two ways services) in order to detect a loss of the signal. Upon quality level threshold detection, the UE shall stop transmitting.

4.2.8.2 Limits

Limits are dependent on the radio interface. In any case, in band spurious emitted shall be lower than minimum output power defined in clause 4.2.6.

4.2.8.3 Conformance

Conformance tests described in clause 5.4.7 shall be carried out.

4.2.9 Receiver Adjacent Channel Selectivity (ACS)

4.2.9.1 Definition

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel.

4.2.9.2 Limits

The limits to ACS are measured at frequency offsets which are determined by both the assigned channel bandwidth $CBw_{assigned}$ and the adjacent channel bandwidth $CBw_{adjacent}$.

In fact, it is necessary to distinguish two cases:

- In the first case, adjacent channel bandwidth is the same as the assigned channel bandwidth:
  - $CBw_{assigned} = CBw_{adjacent} = CBw$
- In the second case, adjacent channel bandwidth is different:
  - $CBw_{assigned} \neq CBw_{adjacent}$

In the first case Table 9 applies. In the second case, Table 10 applies.

Table 9: Adjacent Channel Selectivity for the same channel characteristic

Case	ACS	Interference frequency offset
1	48 dB	±CBw
2	55 dB	±2 × CBw
3	55 dB	> 2 × CBw

Table 10: Adjacent Channel Selectivity for different channel characteristic

Case	ACS	Interference frequency offset
1	48 dB	1st adjacent channel centre
2	55 dB	2nd adjacent channel centre
3	55 dB	> 2nd adjacent channel centre
NOTE: If necessary a guard band may be introduced.		

4.2.9.3 Conformance

Conformance tests described in clause 5.4.8 shall be carried out.

4.2.10 Blocking characteristics

4.2.10.1 Definition

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. Receiver blocking is specified separately for in-band and out-of-band signals. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

In-band signals are signals in the 2 160 MHz to 2 210 MHz band, i.e. signals in the MSS and neighbouring bands.

Out-of-band signals are signals outside this band.

4.2.10.2 Limits

The BER shall not exceed 0,001 for the parameters specified in Table 11.

Table 11: Test parameters for in-band blocking characteristics

Parameter	Unit	Level	
Wanted signal	dBm	<REFSENS> + 3 dB	
Interfering signal	dBm	-56 (for F_{uw} offset ±2 × CBw	-44 (for F_{uw} offset ±3 × CBw)

In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first (3×CBw) below or above the UE receive band. The BER shall not exceed 0,001 for the parameters specified in Table 12.

Table 12: Test parameters for out-of-band blocking characteristics

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3
Wanted signal	dBm	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB
Interfering signal (CW)	dBm	-44	-30	-15
F_{uw}	MHz	2 110 < f < 2 155 2 215 < f < 2 260	2 085 < f ≤ 2 110 2 260 ≤ f < 2 285	1< f ≤ 2085 2 285 ≤ f < 1 2750

4.2.10.3 Conformance

Conformance tests described in clause 5.4.9 shall be carried out.

4.2.11 Receiver spurious response

4.2.11.1 Definition

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

4.2.11.2 Limits

The BER shall not exceed 0,001 for the parameters specified in.Table 13

Table 13: Test parameters for spurious response

Parameter	Unit	Level
Wanted signal	dBm	<REFSENS> + 3 dB
Interfering signal (CW)	dBm	-44
F_{uw}	MHz	Spurious response frequencies

4.2.11.3 Conformance

Conformance tests described in clause 5.4.7 shall be carried out.

4.2.12 Receiver intermodulation characteristics

4.2.12.1 Definition

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

4.2.12.2 Limits

The BER shall not exceed 0,001 for the parameters specified in Table 14.

Table 14: Receive intermodulation characteristics

Parameter	Level		Unit
Wanted signal	<REFSENS> + 3 dB		dBm
Interfering signal 1 (CW)	-46		dBm
Interfering signal 2 (same as wanted)	-46		dBm
F_{uw1} (offset)	2 × CBw	-2 × CBw	
F_{uw2} (offset)	4 × CBw	-4 × CBw	

4.2.13 Receiver spurious emissions

4.2.13.1 Definition

Conformance tests described in clause 5.4.11 shall be carried out.

4.2.13.2 Limits

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in Table 15 and Table 16.

Table 15 General receiver spurious emission requirements

Frequency Band	Measurement Bandwidth	Maximum level
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm

Table 16: Additional receiver spurious emission requirements

Band	Frequency Band	Measurement Bandwidth	Maximum level
I	860 MHz ≤ f ≤ 895 MHz	100 kHZ	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHZ	-60 dBm (see note)
	925 MHz ≤ f ≤ 935 MHz	100 kHZ	-67 dBm (see note) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHZ	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHZ	-71 dBm (see note)
	1 920 MHz ≤ f ≤ 1 980 MHz	NBw	-60 dBm
	1 980 MHz ≤ f ≤ 2 010 MHz	NBw	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	NBw	-60 dBm
	2 170 MHz ≤ f ≤ 2 200 MHz	NBw	-60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	NBw	-60 dBm
NOTE	The measurements are made on frequencies which are integer multiples of C_{raster}. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 15 are permitted for each channel used in the measurement.		

4.2.13.3 Conformance

Conformance tests described in clause 5.4.12 shall be carried out.

5 Testing for compliance with technical requirements

5.1 Environmental 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.

5.1.1 Specification of the environmental test conditions

The tests shall be performed under the conditions given in Table 17.

Table 17: Environmental test conditions

Equipment Category	Temperature	Voltage
Handheld and handset	Normal	Normal condition voltage (±1 %)
other than handheld/handset	Normal	Higher extreme voltage (+0/-2 %)
other than handheld/handset	Normal	Lower extreme voltage (-0/+2 %)

Normal temperature shall be between +15 °C and +35 °C.

All other tests shall be performed under normal conditions for temperature and voltage, and without vibration.

5.1.2 Tests under extreme voltage conditions

During tests under extreme voltage conditions, the power source of the equipment shall be replaced by a test power source, capable of producing extreme test voltages as specified in clause 5.1.1. The internal impedance of the test power source shall be low enough for its effect on the test results to be negligible. For the test purposes, the voltage of the power source shall be measured at the input terminals of the equipment.

If the equipment is provided with a permanently connected power cable, the test voltage shall be measured at the point of connection of the power cable to the equipment.

In equipment with incorporated batteries, the test power source shall be applied as close to the battery terminals as is practical. In each case connections shall be made readily available by the applicant.

During tests, the power source voltages shall be maintained within a tolerance of ±3 % relative to the voltage at the beginning of each test.

5.2 Tests frequencies

MSS radio equipment is designed to operate in paired bands. The reference test frequencies for the common test environment are defined in Table 18.

Table 18: Reference test frequencies

Test Frequency ID	Frequency of Uplink	Frequency of Downlink
Low Range	1 982,6 MHz	2 172,6 MHz
Mid Range	1 990,0 MHz	2 180,0 MHz
High Range	2 007,4 MHz	2 197,4 MHz

The applicant shall declare the possible values of assigned and adjacent channel bandwidth used by the system. At a minimum, the test cases shall be defined to include all of the declared channel bandwidths. It is assumed that the assigned and adjacent channel bandwidth can respectively fall in the range of 1 MHz to 8 MHz.

5.3 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 19.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [2] and shall correspond to an expansion factor (coverage factor) k = 1,96 (which provides a confidence level of 95 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Table 19 is based on this expansion factor.

Table 19: Maximum measurement uncertainty of the test system

Parameter	Conditions	Test system uncertainty
Transmitter maximum output power		±0,7 dB
Transmitter spectrum emissions mask		±1,5 dB
Transmitter spurious emissions	f ≤ 2,3 GHz 2,3 GHz < f ≤ 4 GHz f > 4 GHz Co-existence band (> -60 dBm) Co-existence band (< -60 dBm)	±1,5 dB ±2,0 dB ±4,0 dB ±2,0 dB ±3,0 dB
Transmitter Minimum output power		±1,0 dB
Receiver Adjacent Channel Selectivity (ACS)		±1,1 dB
Receiver Blocking characteristics	f < ±(3 × CBw) offset: ±(3 × CBw) offset ≤ f ≤ 2,3 GHz 2,3 GHz < f ≤ 4 GHz f > 4 GHz	±1,4 dB ±1,0 dB ±1,7 dB ±3,1 dB
Receiver spurious response	f ≤ 2,3 GHz 2,3 GHz < f ≤ 4 GHz f > 4 GHz	±1,0 dB ±1,7 dB ±3,1 dB
Receiver intermodulation characteristics		±1,3 dB
Receiver spurious emissions	For UE receive band (-60 dBm) For UE transmit band (-60 dBm) Outside the UE receive band: f ≤ 2,3 GHz 2,3 GHz < f ≤ 4 GHz f > 4 GHz	±3,0 dB ±3,0 dB ±2,0 dB ±2,0 dB ±4,0 dB
Out of synchronization of handling power	Data channel Ec/Ior Transmit OFF power	±0,4 dB ±1,0 dB
Transmitter adjacent channel leakage power ratio	-	±0,8 dB

NOTE 1: For RF tests it should be noted that the uncertainties in Table 15 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 100 028-2 [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 19, 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 19 should be 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 19 does not increase the probability of passing an EUT that would otherwise have failed a test if a test system compliant with Table 19 had been used.

5.4 Essential radio test suites

5.4.1 Control and monitoring functions

5.4.1.1 Test method

a) At the start of the test, the UE shall be switched off. The UE antenna connector shall be connected to a power measuring equipment, with the following characteristics:

- the RF bandwidth shall exceed the total operating transmit frequency range of the UE for operation with an applicable part;

- the response time of the power measuring equipment shall be such that the measured power has reached within 1 dB of its steady state value within 100 µs of a CW signal being applied;

- it shall record the maximum power measured.

NOTE: The equipment may include a video low pass filter to minimize its response to transients or Gaussian noise peaks.

b) The UE shall be switched on for a period of approximately fifteen minutes, and then switched off.

c) The UE shall remain switched off for a period of at least thirty seconds, and shall then be switched on for a period of approximately one minute.

d) Step b) shall be repeated four times.

e) The maximum power emitted from the UE throughout the duration of the test shall be recorded.

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

5.4.2 Maximum output power

5.4.2.1 Method of test

5.4.2.1.1 Initial conditions

Test environment: normal, TL/VL,TL/VH,TH/VL,TH/VH (for guidance see annex C.

The frequencies to be tested are low range, mid range and high range as defined in clause 4.2.3.2.

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

5.4.2.1.2 Procedure

1) Set and send continuously Up power control commands to the UE.

2) Measure the mean power of the UE in a bandwidth of at least $(1 + \alpha)$ times the symbol rate of the radio access mode. The mean power shall be averaged over at least one transmission time unit.

5.4.2.2 Test requirements

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

5.4.3 Spectrum emission mask

5.4.3.1 Method of test

5.4.3.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (for guidance see annex C).

The frequencies to be tested are low range, mid range and high range as defined in clause 4.2.3.2

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

5.4.3.1.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be at the maximum level.

2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to Table 4. Measurements with an offset from the carrier centre frequency between ((CBw/2) + 0,015) MHz and ((CBw/2) + 0,985) MHz shall use a 30 kHz measurement filter. Measurements with an offset from the carrier centre frequency between 4 MHz and 12 MHz shall use 1 MHz measurement bandwidth and the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyser filter). The centre frequency of the filter shall be stepped in contiguous steps according to Table 4. The measured power shall be recorded for each step.

3) Measure the filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5.4.3.2 Test requirements

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

5.4.4 Transmitter spurious emissions

5.4.4.1 Method of test

5.4.4.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (for guidance see annex C).

The frequencies to be tested are low range, mid range and high range as defined in clause 4.2.3.2:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

5.4.4.1.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyser (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

5.4.4.2 Test requirements

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

5.4.5 Minimum output power

5.4.5.1 Method of test

5.4.5.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (for guidance see annex C).

The frequencies to be tested are mid range as defined in clause Set the parameters of the interference signal generator as shown in Table 7 case 1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

5.4.5.1.2 Procedure

1) Set and send continuously down power control commands to the UE.

2) Measure the mean power of the UE.

5.4.5.2 Test requirements

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

5.4.6 Adjacent Channel Leakage power Ratio (ACLR)

The ACLR related tests shall take into account the two cases described in clause 4.2.7.2.

5.4.6.1 Method of test

5.4.6.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (for guidance see annex C).

The frequencies to be tested are mid range as defined in clause 4.2.3.2:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

5.4.6.1.2 Procedure

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reach maximum level.

2) Measure the filtered mean power.

3) Measure the filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in 2) and 3) above.

5.4.6.2 Test requirements

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

5.4.7 Out of synchronisation handling of output power

5.4.7.1 Method of test

5.4.7.1.1 Initial conditions

Test environment: normal (for guidance see annex C).

The frequencies to be tested are mid range as defined in clause 4.2.3.2:

1) Connect the SS to the UE antenna connector.
2) A call is set up according to the Generic call setup procedure, with the following exception.
3) RF parameters are set up.
4) Enter the UE into loopback test mode and start the loopback test.

5.4.7.1.2 Procedure

1) The SS sends continuously up power control commands to the UE until the UE transmitter power reach maximum level.
2) The SS reduces the downlink synchronisation signal level until the declared threshold is reached.
3) The SS waits 200 ms and then verifies that the UE transmitter has been switched off.
4) The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

5.4.7.2 Test requirements

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

5.4.8 Adjacent Channel Selectivity (ACS)

5.4.8.1 Method of test

5.4.8.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (for guidance see annex C).

The frequencies to be tested are mid range defined in clause 4.2.3.2:

1) Connect the SS to the UE antenna connector.
2) A call is set up according to the Generic call setup procedure, and tested adjacent frequencies are set up according to Table 9 and Table 10.
3) Enter the UE into loopback test mode and start the loopback test.

5.4.8.1.2 Procedure

The procedure basics are illustrated in figure 1.

1) Set the parameters of the interference signal generator as shown in Table 9, Table 10.
2) The wanted signal power is adjusted so that the wanted signal is received with 14 dB excess with respect to the SNR threshold, called $(SNR)_o$ corresponding to the reference BER
3) The interference level signal can be adjusted and can exceed the wanted signal by an excess power M

4) Measure the BER of data channel received from the UE at the SS.

5) The interference signal level is increased until the BER exceeds the reference value corresponding to a given SNR

6) The ACS is given by the following formula in dB: ACS = M + $(SNR)_o$ + 0,17. O,17 is a correcting factor coming from bullet 2).

Channel frequencies are set according to figure 1. The three channels are set to normalized 5 MHz channels (2 172,5 MHz, 2 177,5 MHz and 2 182,5 MHz). Figure 1 shows two possible interferers.

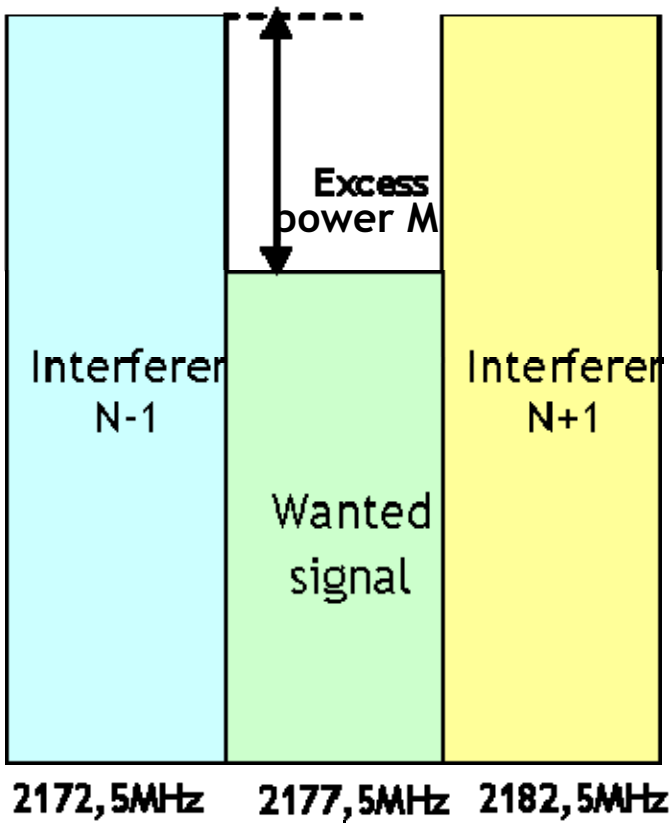

Figure 1: Adjacent channel spectrum

5.4.8.2 Test requirements

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

5.4.9 Blocking characteristics

5.4.9.1 Method of test

5.4.9.1.1 Initial requirements

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (for guidance see annex C).

The frequencies to be tested are mid range as defined in clause 4.2.3.2.

For narrow band case, frequencies to be tested are mid range as defined in clause 4.2.3.2.

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 11 and Table 12.

3) Enter the UE into loopback test mode and start the loopback test.

5.4.9.1.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in Table 11 and Table 12. For Table 12 the frequency step size is 1 MHz.

2) Set the power level of the UE according to Table 11 and Table 12 with a ±1 dB tolerance.

3) Measure the BER of data channel received from the UE at the SS.

4) For Table 12 record the frequencies for which the BER exceeds the test requirements.

5.4.9.2 Test requirements

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

5.4.10 Receiver spurious response

5.4.10.1 Method of test

5.4.10.1.1 Initial conditions

Test environment: normal, TL/VL,TL/VH,TH/VL,TH/VH (for guidance see annex C):

1) The frequencies to be tested are mid range as defined in clause 4.2.3.2.

2) Connect the SS to the UE antenna connector.

3) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 10.

4) Enter the UE into loopback test mode and start the loopback test.

5.4.10.1.2 Procedure

1) Set the parameter of the CW generator as shown in annex C. The spurious response frequencies are determined in step 4) of clause 5.4.9.1.2.

2) Set the power level of the UE according to Table 13 with a ±1 dB tolerance.

3) Measure the BER of data channel received from the UE at the SS.

5.4.10.2 Test requirements

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

5.4.11 Receiver intermodulation characteristics

5.4.11.1 Method of test

5.4.11.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (for guidance see annex C).

The frequencies to be tested are mid range as defined in clause 4.2.3.2.

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 14.

3) Enter the UE into loopback test mode and start the loopback test.

5.4.11.1.2 Procedure

1) Set the parameters of the CW generator and interference generator as shown in Table 14.

2) Set the power level of the UE according to Table 11 with a ±1 dB tolerance.

3) Measure the BER of data channel received from the UE at the SS.

5.4.11.2 Test requirements

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

5.4.12 Receiver spurious emissions

5.4.12.1 Method of test

5.4.12.1.1 Initial conditions

Test environment: normal, TL/VL,TL/VH,TH/VL,TH/VH (for guidance see annex C).

The frequencies to be tested are mid range as defined in clause 4.2.3.2:

1) Connect a spectrum analyser (or other suitable test equipment) to the UE antenna connector.

2) The UE shall be setup such that UE will not transmit during the measurement.

5.4.12.1.1 Procedure

Sweep the spectrum analyser (or other suitable test equipment) over a frequency range from 30 MHz to 12,75 GHz and measure the average power of the spurious emissions.

5.4.12.2 Test requirements

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

Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT)

The HS Requirements and conformance Test specifications Table (HS-RTT) in Table A.1 serves a number of purposes, as follows:

- it provides a statement of all the requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it provides a statement of all the test procedures corresponding to those requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
  - Unconditional: meaning that the requirement applies in all circumstances, or
  - Conditional: meaning that the requirement is dependant on the manufacturer having chosen to support optional functionality defined within the schedule.
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
  - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
  - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)

Harmonized Standard EN 303 574-2 The following requirements and test specifications are relevant to the presumption of conformity under the article <art> of the R&TTE Directive						
Requirement			**Requirement Conditionality**		**Test Specification**	
No	**Description**	**Reference: Clause No**	**U/C**	**Condition**	**E/O**	**Reference: Clause No**
1	Spectrum emission mask	4.2.4	U		E	5.4.3
2	Adjacent channel leakage power ratio (ACLR)	4.2.7	U		E	5.4.6
3	Transmitter spurious emissions	4.2.5	U		E	5.4.4
4	UE maximum output power	4.2.3	U		E	5.4.2
5	Receiver spurious emissions	4.2.11	U		E	5.4.10
6	Blocking characteristics	4.2.10	U		E	5.4.9
7	Receiver intermodulation characteristics	4.2.12	U		E	5.4.11
8	Receiver adjacent channel selectivity (ACS)	4.2.9	U		E	5.4.8

Key to columns:

Requirement:

No A unique identifier for one row of the table which may be used to identify a requirement or its test specification.

Description A textual reference to the requirement.

Clause Number Identification of clause(s) defining the requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

U/C Indicates whether the requirement is to be *unconditionally* applicable (U) or is *conditional* upon the manufacturers claimed functionality of the equipment (C).

Condition Explains the conditions when the requirement shall or shall not be applicable for a technical requirement which is classified "conditional".

Test Specification:

E/O Indicates whether the test specification forms part of the Essential Radio Test Suite (E) or whether it is one of the Other Test Suite (O).

NOTE: All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement . The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

Clause Number Identification of clause(s) defining the test specification in the present document unless another document is referenced explicitly. Where no test is specified (that is, where the previous field is "X") this field remains blank.

Annex B:
Void

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.

C.1 Introduction

This informative annex specifies the environmental profile of the UE.

C.2 Temperature

The UE should fulfil all the requirements in the full temperature range as given in Table C.1.

Table C.1: Temperatures

Range	Conditions
+15 °C to +35 °C	For normal conditions (with relative humidity of 25 % to 75 %)
-10 °C to +55 °C	For extreme conditions (see IEC 60068-2-1 [3] and IEC 60068-2-2 [4])

The low and high extreme temperature conditions are denoted as TL (temperature low, -10 °C) and TH (temperature high, +55 °C).

C.3 Voltage

The UE should fulfil all the requirements in the full voltage range, i.e. the voltage range between the extreme voltages.

The supplier should declare the lower and higher extreme voltages and the approximate shutdown voltage. For the equipment that can be operated from one or more of the power sources listed below, the lower extreme voltage should not be higher, and the higher extreme voltage should not be lower than that specified in Table C.2.

Table C.2: Power sources

Power source	Lower extreme voltage	Higher extreme voltage	Normal conditions voltage
AC mains	0,9 × nominal	1,1 × nominal	nominal
Regulated lead acid battery	0,9 × nominal	1,3 × nominal	1,1 × nominal
Non regulated batteries: Leclanché/lithium Mercury/nickel and cadmium	 0,85 × nominal 0,90 × nominal	 nominal nominal	 nominal nominal

C.4 Test environment

Where a normal environment is required then the normal conditions shown in clauses C.2 and C.3 should be applied.

Where an extreme environment is required then the various combinations of extreme temperatures together with the extreme voltages shown in clauses C.2 and C.3 should be applied. The combinations are:

- low extreme temperature/low extreme voltage (TL/VL);
- low extreme temperature/high extreme voltage (TL/VH);
- high extreme temperature/low extreme voltage (TH/VL);
- high extreme temperature/high extreme voltage (TH/VH).

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

The enlargement of the European Union (EU) resulted in a requirement from the EU for a larger number of languages for the translation of the titles of Harmonized Standards and mandated ENs that are to be listed in the Official Journal to support the implementation of this legislation.

For this reason the title translation concerning the present document can be consulted via the e-approval application.

Annex E (informative): Bibliography

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).

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).

ETSI EN 301 908-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 2: Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD and E-UTRA FDD) (UE) covering the essential requirements of article 3.2 of the R&TTE Directive".

ITU-R Recommendation SM.329: "Unwanted emissions in the spurious domain".

ITU-R Recommendation SM.1539: "Variation of the boundary between the out-of-band and spurious domains required for the application of Recommendations ITU-R SM.1541 and ITU-R SM.329".

History

Document history			
V1.1.0	November 2009	Public Enquiry	PE 20100311: 2009-11-11 to 2010-03-11