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Satellite Earth Stations and Systems (SES);
Receive-Only Mobile Earth Stations (ROMES) providing data communications operating in the 1,5 GHz frequency band;
Harmonised Standard for access to radio spectrum

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Foreword

This draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI Standardisation Request deliverable Approval Procedure.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.1] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

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

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Introduction

The present document is intended to cover the provisions of Directive 2014/53/EU [i.2] (RE Directive) article 3.2 which states that "….*radio equipment shall be so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference*".

Recital 10 of Directive 2014/53/EU [i.2] states that "*in order to ensure that radio equipment uses the radio spectrum effectively and supports the efficient use of radio spectrum, radio equipment should be constructed so that: in the case of a transmitter, when the transmitter is properly installed, maintained and used for its intended purpose it generates radio waves emissions that do not create harmful interference, while unwanted radio waves emissions generated by the transmitter (e.g. in adjacent channels) with a potential negative impact on the goals of radio spectrum policy should be limited to such a level that, according to the state of the art, harmful interference is avoided; and, in the case of a receiver, it has a level of performance that allows it to operate as intended and protects it against the risk of harmful interference, in particular from shared or adjacent channels, and, in so doing, supports improvements in the efficient use of shared or adjacent channel*".

Recital 11 of Directive 2014/53/EU [i.2] states that "*although receivers do not themselves cause harmful interference, reception capabilities are an increasingly important factor in ensuring the efficient use of radio spectrum by way of an increased resilience of receivers against harmful interference and unwanted signals on the basis of the relevant essential requirements of Union harmonisation legislation*".

As a consequence, the present document includes receiving parameters aiming to maximize the efficient use of radio spectrum.

1 Scope

The present document specifies technical characteristics and methods of measurement for Receive-Only Mobile Earth Stations (ROMES) radio equipment operating under the Land Mobile Satellite Service (LMSS), in the frequency band 1 518 MHz to 1 559 MHz (space-to-earth band).

The ROMESs operate as part of a satellite system providing one-way data communications.

ROMESs could have several configurations, including:

- either Portable Equipment (PE) or Vehicle Installed Equipment (VIE);
- a number of modules including a display/control interface to the user.

NOTE: The relationship between the present document and essential requirements of article 3.2 of Directive 2014/53/EU [i.2] is given in annex A.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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.

The following referenced documents are necessary for the application of the present document.

[1] Void.

[2] ETSI ETS 300 133-5 ed.2 (11-1997): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Enhanced Radio MEssage System (ERMES); Part 5: Receiver conformance specification".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

[i.2] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.

[i.3] ETSI EG 203 336 (V1.2.1): "Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

bearer type: carrier with certain bandwidth, certain modulation type and using certain error coding rate

effective receive operating band: receive band within 1 518 MHz to 1 559 MHz where the tests associated with table 3 are met

in-band signals: signals which are located in the operating band plus an offset of 10 MHz outside this operating band

operating frequency band: frequency range 1 518 MHz to 1 559 MHz

transition frequency: frequency which separates adjacent frequency ranges in a table of limits

3.2 Symbols

Void.

3.3 Abbreviations

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

BW	Bandwidth
CDMA	Code Division Multiple Access
CW	Continuous Wave
E_b/N_0	Energy per bit to noise power spectral density ratio
EC	European Commission
EFTA	European Free Trade Association
EIRP	Equivalent Isotropically Radiated Power
ETS	European Telecommunication Standard
EUT	Equipment Under Test
LMSS	Land Mobile Satellite Service
LO	Local Oscillator
LTE	Long Term Evolution
PE	Portable Equipment
QoS	Quality of Service
RED	Radio Equipment Directive
RF	Radio Frequency
ROMES	Receive-Only Mobile Earth Station
SNR	Signal to Noise Ratio
STE	Special Test Equipment
VIE	Vehicle Installed Equipment
VSWR	Voltage Standing Wave Ratio

4 Test conditions

4.1 Environment profile

The technical requirements of the present document apply under the environmental conditions described in clause 5.1.

4.2 Test report

The test report shall contain:

- the environmental parameters under which the tests were carried out;
- the results of the tests;
- all parameters and operational conditions;
- the value of the highest frequency conversion oscillator;
- measurement uncertainties.

4.3 Special Test Equipment (STE)

To enable the tests specified in the present document to be carried out, the use of STE, supplied by the manufacturer or system provider, may be necessary. Since the STE will be specific for the particular equipment, it is not possible to provide detailed specifications in the present document. However, the following baseline is provided:

- the STE shall enable the ROMES to tune to every channel in the operating frequency band, to enable spurious emissions to be measured;
- if the connection of the STE affects any of the parameters specified in the present document then the effects shall clearly be stated by the manufacturer.

4.4 Equipment Under Test (EUT)

The EUT shall include all units necessary for the intended operation.

5 Receiver requirements

5.1 Environmental conditions for testing

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be in accordance with its intended use. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the operational environmental profile defined by its intended use.

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

5.2 Radiated emission requirements

5.2.1 Purpose

To protect terrestrial and satellite radio services from emissions caused by ROMESs to which the present document applies.

5.2.2 Specification

The radiated power from the equipment, including its antenna, shall not exceed the limits in table 1.

Table 1

Frequency range (MHz) (see note)	EIRP limit (dBpW) (see note)	Measurement bandwidth (kHz)
30,0 to 1 000,0	33	100
1 000,0 to 1 518,0	43	100
1 518,0 to 1 559,0	17	3
1 559,0 to 12 750,0	43	100
12 750,0 to 21 200,0	48	100
21 200,0 to 40 000,0	60	100
NOTE: The lower limits shall apply at the transition frequency.		

5.2.3 Verification

The equipment shall be tested according to the test procedure given in annex B. The upper frequency to which tests shall be performed shall be at least the 10^{th} harmonic of the highest frequency conversion oscillator or ten times the highest operational frequency, whichever is greater.

5.3 Receiver Adjacent Channel Selectivity requirements

5.3.1 Purpose

To enable reception of a wanted signal in the presence of other signals in the adjacent channel.

Adjacent channel selectivity is a measure of a receiver's ability to receive a signal at its assigned channel frequency in the presence of a signal in the adjacent channel at a given frequency offset from the centre frequency of the assigned channel.

5.3.2 Technical requirements

The frequency offset and relative power level of the adjacent signal compared to the wanted signal shall take the values given in table 2. The adjacent signal shall occupy the same bandwidth as the wanted signal where BW is the wanted signal occupied bandwidth. There shall be no more than 0,5 dB degradation in the receiver signal to noise ratio under these conditions.

Table 2: Adjacent Channel frequency and power level

Signal	Centre frequency offset from wanted signal	Power level relative to wanted signal
Adjacent signal	BW	12 dB

5.3.3 Conformance test

Conformance tests shall be carried out in accordance with clause 6.2.

5.4 Receiver Blocking Characteristics requirements

5.4.1 Purpose

To prevent high power signals outside the receive frequency band from blocking the reception of wanted signals inside the receive frequency band.

5.4.2 Technical requirements

Receiver blocking response is a measure of the capability of the receiver to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels. It is defined as the maximum total signal level at the receiver input expressed in dBm reducing the specified receiver sensitivity (desensitization) by a certain number of decibels. As a test requirement, the blocking criterion is specified as the level of the unwanted signal at a given offset which will result in a 3 dB reduction in the wanted signal to noise ratio.

The receiver performance degradation, in terms of signal to noise ratio, shall not exceed 3 dB when the unwanted signal as specified in table 3 is present.

Table 3: Interfering blocking signal characteristics

Interfering Signal	Level (dBm)
5 MHz wide LTE carrier with centre frequency at 1 514,5 MHz and upper edge of carrier at 1 517 MHz	-30

The wanted carrier frequency centre shall be placed at the lowest possible carrier/channel assignment in the operating band.

The effective receive operating band for the intended use shall be provided with the equipment.

5.4.3 Conformance test

Conformance tests shall be carried out in accordance with clause 6.3.

6 Method of Testing Receiver requirements

6.1 Radiated emissions

The test methods in Annex B apply to the requirements in clause 5.2.

6.2 Receiver Adjacent Channel Selectivity

6.2.1 General

For the purpose of this test, the EUT is the ROMES without its antenna connected.

6.2.2 Test arrangement

The equipment should be set up as shown in figure 1.

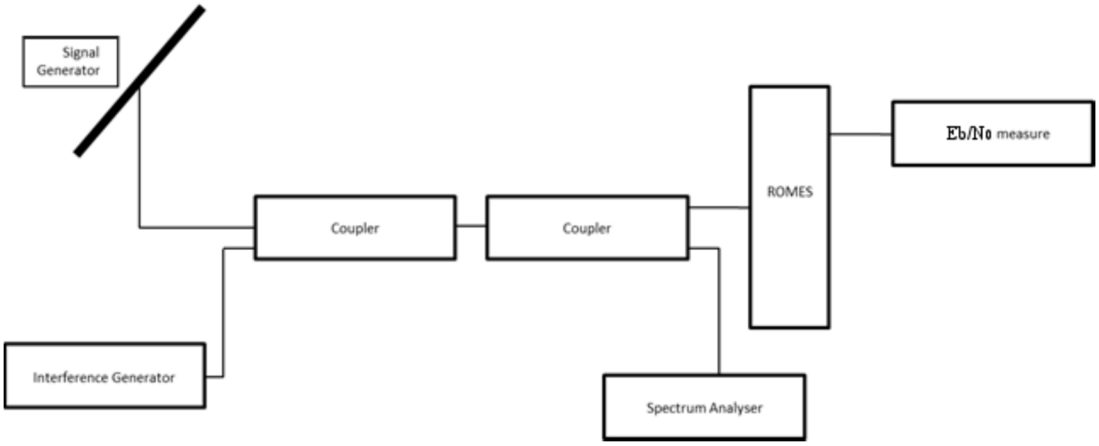


Figure 1: Measuring system set-up for Adjacent Channel Selectivity and Blocking Characteristics

Each coupler shall have a maximum insertion loss of 1 dB and a VSWR of less than 1,2:1.

6.2.3 Test Procedures

The test procedure is given below:

1) The wanted signal power is adjusted such that the SNR (at the receiver input) is set to the reference level plus 1 dB. The reference level is the minimum SNR required to achieve the target performance level for a given bearer type.

2) Read the reported E_b/N_0 at the output of the receiver, where E_b/N_0 is determined by the receiver demodulator.

3) Set the parameters of the interference signal generator as shown in table 2 in clause 5.3.2.

4) Add the interference signal and read the E_b/N_0 value at the output of the receiver.

5) The E_b/N_0 achieved in step 4 shall not exceed 0,5 dB degradation compared to the E_b/N_0 read in step 2.

6.3 Receiver Blocking Characteristics

6.3.1 General

If the EUT is a ROMES that has been modified by the manufacturer for these tests then full documentation of such modification(s) shall be provided to prove that the modification(s) will simulate the required test condition.

For the purpose of this test, the EUT is the ROMES without its antenna connected.

6.3.2 Test arrangement

The equipment should be set up as shown in figure 1.

6.3.3 Test procedures

The procedure is given below:

1) The wanted signal power is adjusted such that the SNR (at the receiver input) is set to the reference level plus 3 dB. The reference level is the minimum SNR required to achieve the target performance level for a given bearer type.

2) Read the reported E_b/N_0 at the output of the receiver, where E_b/N_0 is determined by the receiver demodulator.

3) Generate the interfering blocking signal with the parameters as shown in table 3 in clause 5.4.2.

4) Apply the interfering blocking signal (generated in step 3) and read the E_b/N_0 value at the output of the receiver.

5) The E_b/N_0 achieved in step 4 shall not exceed 3 dB degradation compared to the E_b/N_0 measured in step 2.

Annex A (informative): Relationship between the present document and the essential requirements of Directive 2014/53/EU

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.1] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table A.1: Relationship between the present document and the essential requirements of Directive 2014/53/EU

Harmonised Standard ETSI EN 300 487					
Requirement				Requirement Conditionality	
No	Description	Essential requirements of Directive	Clause(s) of the present document	U/C	Condition
1	RF emission limits	3.2	5.2	U	
2	Receiver Adjacent Channel Selectivity	3.2	5.3	U	
3	Receiver Blocking Characteristics	3.2	5.4	U	

Key to columns:

Requirement:

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

Description A textual reference to the requirement.

Essential requirements of Directive

Identification of article(s) defining the requirement in the Directive.

Clause(s) of the present document

Identification of clause(s) defining the requirement in the present document.

Requirement Conditionality:

U/C Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).

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

Presumption of conformity stays valid only as long as a reference to the present document is maintained in the list published in the Official Journal of the European Union. Users of the present document should consult frequently the latest list published in the Official Journal of the European Union.

Other Union legislation may be applicable to the product(s) falling within the scope of the present document.

Annex B (normative): RF emissions - test procedure

B.1 Introduction

This annex, based on procedures described in Annex A of ETSI ETS 300 133-5 [2], describes the method of measurement of unwanted emissions generated by a ROMES terminal.

B.2 Measuring apparatus

In order to carry out the test, spectrum analysers covering the frequency range of interest are required.

For the apparatus utilized, it shall be verified, as part of the specification of the equipment, that the response of the apparatus to a constant amplitude sine wave signal remains within ±1 dB of calibration across the frequency range of interest.

B.3 Equipment Under Test (EUT)

For the purpose of the test, the ROMES terminal comprises:

- the VIE or PE with any deployable parts in their normal operating configuration;
- any externally mounted accessories as part of EUT delivery;
- any necessary power supply cables or other cable to ensure proper functioning of the terminal.

B.4 Special Test Equipment (STE)

In order to measure the system radiation under operational conditions, proper arrangement shall be made available (by the manufacturer) to put the ROMES terminal in its normal operating mode and tuned to any channel within its operating frequency band. This may require the use of STE provided by the manufacturer (see clause 4.3).

B.5 Measurement procedure

a) Any level of measurable spurious from the test site shall be at least 10 dB lower than the limits of spurious radiation defined for the frequency of interest for the EUT to be measured.

   The measurement antenna shall be oriented for vertical polarization and connected to a spectrum analyser.

   The bandwidth of the spectrum analyser shall be between 3 kHz and 100 kHz as listed in table 1.

   The specified height range of the centre of the measurement antenna shall be between 1 m and 3 m.

b) Using the measurement arrangement shown in figure B.1, the EUT shall be placed on a non-conducting support in its standard position. The EUT shall be tuned to the lowest, centre and highest frequency in the operating frequency band and shall be operated under normal transmission conditions with data received. The measuring antenna shall then be placed such that each antenna is positioned outside the near field of the other antenna.

The minimum far-field distance is defined as:

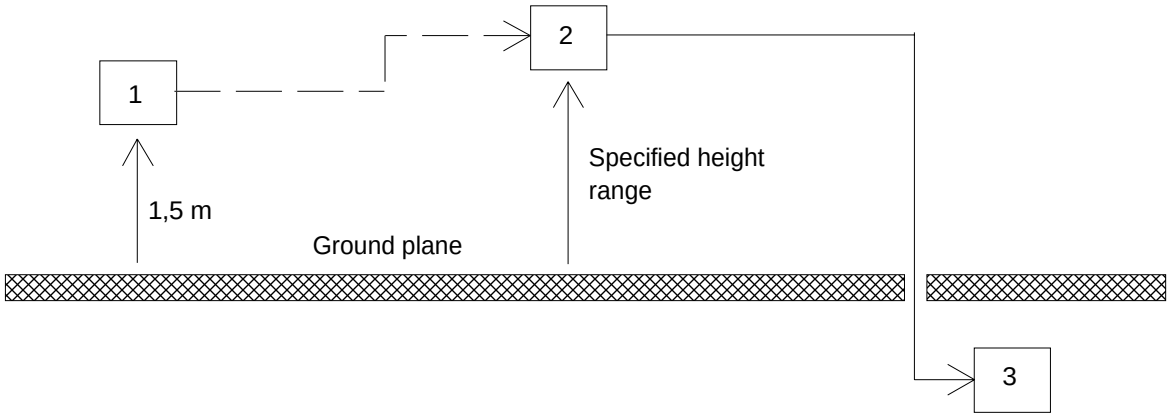
$$R > 2 \times D^2/\lambda$$

where:

R is the minimum far-field distance;

D is the largest dimension of the antenna;

λ is the free space wavelength at the test frequency.



1) EUT
2) Measurement antenna
3) Spectrum analyzer

Figure B.1: Measurement arrangement number 1

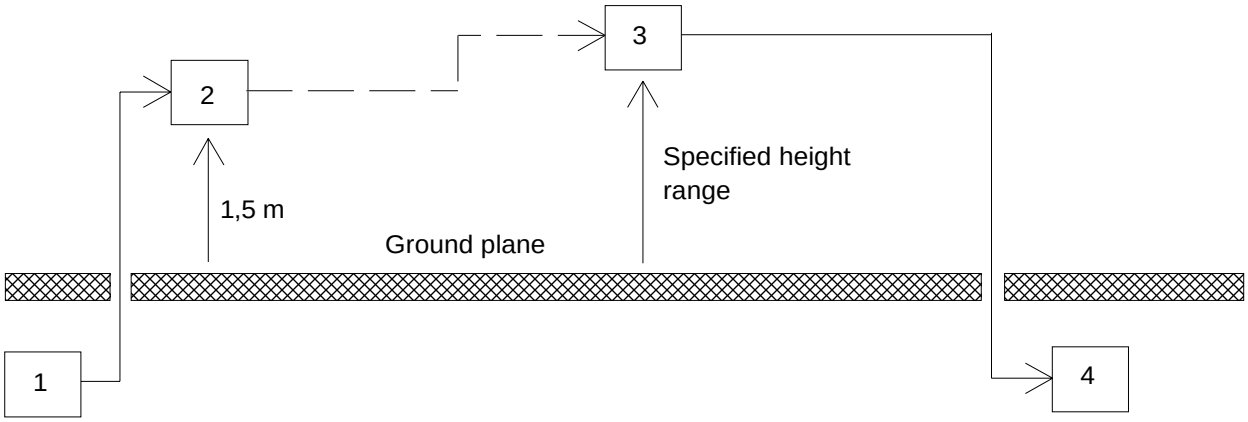
c) The radiation of any spurious component worth recording, i.e. 6 dB below the limit, shall be detected by the measurement antenna and spectrum analyser over the specified frequency range. The frequency of each component shall be recorded. If the test site is disturbed by radiation coming from outside, a screened room shall be used on signals that were qualified and recorded first on the actual test site.

d) At each frequency at which a component has been detected, the measurement antenna height shall be adjusted through the range until the maximum signal level is detected on the spectrum analyser.

e) The EUT shall be rotated up to 360° around a vertical axis to further maximize the signal level detected on the spectrum analyser.

f) The measurement antenna height shall again be adjusted through the range until the maximum signal level is detected on the spectrum analyser. This level shall be recorded.

g) Using the measurement arrangement shown in figure B.2, the substitution antenna shall replace the receiver antenna in the same position and in vertical polarization. It shall be connected to the signal generator.



1) Signal generator
2) Substitution antenna
3) Measurement antenna
4) Spectrum analyzer

Figure B.2: Measurement arrangement number 2

h) For each frequency at which an emission has been detected, the signal generator and spectrum analyser shall be tuned and the measurement antenna shall be raised or lowered throughout the specified height range until the maximum signal level is detected. The level of the signal generator shall be adjusted to give the same level as previously recorded. This value, after correction due to the gain difference between the substitution antenna and the receiver antenna and adding the loss of the interconnecting cable, is the EIRP at this frequency and this shall be recorded.

i) All of the tests a) to h) shall be repeated with the test and substitution antennas oriented for horizontal polarization and with the EUT tuned to the lowest, centre and highest frequency in the operating frequency band.

Annex C:
Void

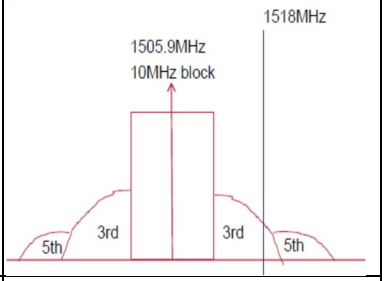
Annex D (informative): Applicability of parameters given in ETSI EG 203 336

Table D.1 below lists receiver parameters, definitions and technical justification for the absence of certain receiver parameters in the present document versus those given in ETSI EG 203 336 [i.3].

Table D.1: Parameters given in ETSI EG 203 336 [i.3]

Clause in ETSI EG 203 336 [i.3]	Parameter Name	Definition as per ETSI EG 203 336 [i.3]	Included in the present document?	Technical Justification for absence
5.3.2	Receiver sensitivity	Receiver sensitivity is the ability to receive a wanted signal at low input signal levels while providing a pre-determined level of performance. The guide includes the following points for the inclusion of receiver sensitivity in the present document: • Good sensitivity is generally valuable in minimizing interference as it allows the corresponding transmitter power to be lower for a particular link budget. • Knowing the sensitivity of receivers is essential when planning coverage areas for the siting of wide area transmitters, e.g. cellular base stations and broadcast transmitters, or the link budget calculation of fixed links for reaching the expected availability and QoS.	NO	For radio equipment, including receive only, operating in power limited systems such as satellite systems, it is not viable to lower the satellite transmitter power for these reasons: 1) Satellites transmit signals from distances as great as 36 000 km, and in order to overcome the huge propagation loss that is inherent, satellites are required to transmit the maximum possible power. Note that space stations are not under RED [i.2]. 2) Satellite earth stations (terminals) receive and detect very weak signals transmitted by satellites from distances as great as 36 000 km, and in order to close the required link budget, earth station receiver design has to be engineered inherently to be extremely sensitive in order to be able to detect the weak signals, and therefore making receiver sensitivity as a requirement does not achieve anything. Finally, for systems with fixed transmit power, such satellites at a distance of 36 000 km, having receivers with better sensitivity, does not have an impact on efficient use of spectrum for the avoidance of harmful interference. Because of the above, TC-SES does not believe that sensitivity needs to be included in the present document as in this particular case (satellite earth station ENs), sensitivity does not have an impact on efficient use of spectrum for the avoidance of harmful interference, which is the mandate, of article 3.2 under the RED [i.2].

Clause in ETSI EG 203 336 [i.3]	Parameter Name	Definition as per ETSI EG 203 336 [i.3]	Included in the present document?	Technical Justification for absence
5.3.3	Receiver co-channel rejection	Receiver co-channel rejection is a measure of the capability of a receiver to receive a wanted signal, without exceeding a given degradation, due to the presence of an unwanted signal, both signals being at the nominal frequency of the receiver.	YES, Included in C, Ku- and Ka-band ENs. NO, not included in ENs covering L- and S-bands.	The primary means to achieve co-channel interference rejection is through the use of directional earth station antennas. For HSs covering earth stations operating on higher bands, such as C-band, Ku-band and Ka-band, these HSs already include receiver co-channel rejection requirement in terms of the earth station's antenna radiation pattern in order to reject the same frequency coming from adjacent satellite. However, for ENs covering earth stations operating in lower bands, such as S-band L-band and lower bands, where they have low gain and Omni-directional antennas, there is no scope for using the antenna to discriminate the interfering signal.
5.3.4	Receiver Selectivity	Receiver selectivity is a measure of the capability to receive a wanted signal, without exceeding a given degradation, due to the presence of an unwanted signal, which differs in frequency from the wanted signal by a specified amount.		This clause does not address particular parameter, see clauses below.
5.3.4.2.1	Receiver adjacent channel selectivity		YES	This is covered by adjacent channel requirements already included in the present document.
5.3.4.4	Receiver spurious response rejection	The spurious response rejection is a measure of the capability of the receiver to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted signal at any frequency at which a response is obtained. The frequencies of the adjacent signals (channels) are excluded. Technical Bodies should specify the frequency range over which this requirement should be evaluated.	This is covered by alternative parameters.	This is covered by receiver blocking and adjacent channel requirements which are already included in the receiver.
5.3.4.3	Receiver blocking	Receiver blocking is a measure of the capability of the receiver to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted input signal at any frequency other than those of the spurious responses or of the adjacent channels.	YES	

Clause in ETSI EG 203 336 [i.3]	Parameter Name	Definition as per ETSI EG 203 336 [i.3]	Included in the present document?	Technical Justification for absence
5.3.4.5	Receiver radio-frequency intermodulation	The receiver radio-frequency intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal, without exceeding a given degradation due to the presence of at least two unwanted signals at frequencies F1 and F2 with a specific frequency relationship to the wanted signal frequency.	This is covered by alternative parameter (receiver blocking).	Historically, it was common to test the receiver blocker performance using a CW signal, where most systems were narrow-band. CW is unmodulated single-tone signal with constant-envelope and is a good approximation for a narrow-band interfering/blocking signal. However, today's systems are generally based on wideband signals like LTE or CDMA; hence CW signal as a blocker is not a representative of real deployed wideband signal systems. Receiver blocking parameter is already included in the relevant HSs but the blocking signal specified in these HSs is not CW, but a wideband signal that reflects a real deployment scenario. As was stated in the above, the blocking signals specified in the HSs are wideband signals. For the purpose of analysing the impact of intermodulation interference on receivers, wideband signals could be thought of as consisting of multiple ideal CW signals. While a CW signal causes blocking by gain compression in the receiver, a wideband signal, like an LTE signal causes gain compression and intermodulation products resulting in spectral re-growth, and these spectral re-growth can be considered as intermodulation products of multiple CW signals, see plot below showing spectral re-growth for a 10 MHz wideband block, 3rd and 5th order intermodulation products. 
5.3.4.2.2	Receiver adjacent band selectivity	Receiver adjacent band selectivity can be part of multiple signal selectivity because attenuation of the interfering signal will require linear signal processing in the	This is covered by alternative parameters.	This is covered by receiver blocking and adjacent channel requirements already included in the ENs.

Clause in ETSI EG 203 336 [i.3]	Parameter Name	Definition as per ETSI EG 203 336 [i.3]	Included in the present document?	Technical Justification for absence
		receiver even if the specified interferer is a constant envelope signal.		
5.3.6.1	Receiver dynamic range	Receiver dynamic range is defined as the range of the minimum and maximum input signal levels over which a receiver functions at a specified performance level.	NO	For satellite receivers, front-end dynamic range is irrelevant as the highest signal they receive is very low due to the distance from the satellite.
5.3.6.2	Reciprocal mixing	Reciprocal mixing results from noise sidebands of the Local Oscillator (LO) mixing with unwanted signals producing unwanted noise at the frequency of the receiver which may result in degraded receiver sensitivity.	This is covered by alternative parameters.	The phenomenon of reciprocal mixing is due to the unwanted signals mixing with the LO phase noise and causing receiver degradation, similar to the blocking effect, therefore, TC-SES believes that this case is covered by the receiver blocking requirement already included in the HSs, and there is no technical justification for inclusion in these HSs.
5.3.2.3	Desensitization	Desensitization is a degradation of receiver sensitivity caused by the presence of a large unwanted signal. The term is most commonly applied when an unwanted signal is present in the receiver which is above a receiver's linear "dynamic range" resulting in desensitization, for example by the process of gain compression. It should be noted that gain compression can occur in any stage of the receiver.	This is covered by alternative parameters.	This is an effect of interference and not a cause and is therefore already covered by blocking, see above explanation about blocking and receiver radio-frequency intermodulation.
5.3.5	Receiver unwanted emissions in the spurious domain	This is the limit for unwanted emissions in the spurious domain referenced at the antenna port.	This is covered by the equipment's unwanted emission requirements.	The unwanted emission requirement from the receiver in the spurious domain is already included in the unwanted emission requirements of the equipment.

Annex E (informative): Maximum measurement uncertainty

The measurements described in the present document are based on the following assumptions:

- the measured value related to the corresponding limit is 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 is included in the test report.

Table E.1 shows the recommended values for the maximum measurement uncertainty figures.

Table E.1: Maximum measurement uncertainty

Measurement parameter	Uncertainty
Radio frequency	±10 kHz
RF power	±0,75 dB
Conducted spurious	±4 dB
Antenna gain	±2 dB
Radiated spurious	±6 dB

Annex F (informative): Bibliography

- ITU Radio Regulations.
- Recommendation ITU-R SM.329-7: "Spurious emissions".

Annex G (informative): Change history

Version	Information about changes
2.2.0	Changes in receiver blocking characteristics requirements, addition of an annex on applicability of parameters given in ETSI Guide EG 203 226 and editorial changes to comply with latest Drafting Rules.

History

Document history		
Edition 1	June 1996	Publication as ETSI ETS 300 487
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