
Standard elektromagnetne združljivosti (EMC) za radijsko opremo in storitve - 12. del: Posebni pogoji za satelitske terminale z zelo majhno antensko odprtino, interaktivne satelitske zemeljske postaje, ki delujejo v frekvenčnih pasovih 4 GHz in 30 GHz fiksnih satelitskih storitev (FSS) - Harmonizirani standard za elektromagnetno združljivost

ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 12: Specific conditions for Very Small Aperture Terminal, Satellite Interactive Earth Stations operated in the frequency ranges between 4 GHz and 30 GHz in the Fixed Satellite Service (FSS) - Harmonised Standard for ElectroMagnetic Compatibility

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Ta slovenski standard je istoveten z: ETSI EN 301 489-12 V3.1.2 (2021-03)

ICS:

33.060.30	Radiorelejni in fiksni satelitski komunikacijski sistemi	Radio relay and fixed satellite communications systems
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

oSIST prEN 301 489-12 V3.1.2:2021 **en**

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Draft ETSI EN 301 489-12 V3.1.2 (2021-03)



**ElectroMagnetic Compatibility (EMC)
standard for radio equipment and services;
Part 12: Specific conditions for Very Small Aperture
Terminal, Satellite Interactive Earth Stations operated
in the frequency ranges between 4 GHz and 30 GHz
in the Fixed Satellite Service (FSS);
Harmonised Standard for ElectroMagnetic Compatibility**

Reference

REN/ERM-EMC-404

Keywords

earth station, EMC, FSS, harmonised standard, radio, regulation, satellite, SNG, testing, VSAT

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	7
3 Definition of terms, symbols and abbreviations.....	8
3.1 Terms.....	8
3.2 Symbols.....	8
3.3 Abbreviations	8
4 Test conditions	9
4.1 General	9
4.2 Arrangements for test signals	9
4.2.0 General.....	9
4.2.1 Arrangements for test signals at the input of transmitters.....	10
4.2.2 Arrangements for test signals at the output of transmitters.....	10
4.2.3 Arrangements for test signals at the input of receivers	10
4.2.4 Arrangements for test signals at the output of receivers	10
4.3 Exclusion bands.....	10
4.3.1 Exclusion band for transmitters or the transmitter part of transceivers.....	10
4.3.2 Exclusion band for receivers or the receiver part of transceivers	10
5 Performance assessment.....	10
5.1 General	10
5.2 Equipment configuration(s).....	11
5.3 Equipment classification	11
6 Performance criteria	12
6.0 General	12
6.1 Performance criteria for Continuous phenomena applied to the EUT.....	12
6.2 Performance criteria for Transient phenomena applied to a class A EUT.....	12
6.3 Performance criteria for Transient phenomena applied to a class B EUT.....	12
7 Requirements.....	12
7.1 Emission.....	12
7.1.1 General.....	12
7.1.2 Special conditions	13
7.2 Immunity	13
7.2.1 General.....	13
7.2.2 Special conditions	14
Annex A (informative): Relationship between the present document and the essential requirements of Directive 2014/53/EU	16
Annex B (informative): Definitions of Satellite Earth Stations (ES) within the scope of the present document.....	18
B.0 General	18
B.1 Transmit only and Transmit and receive Ku band VSATs	18
B.2 Receive-only Ku band VSATs.....	18
B.3 Transmit only and Transmit and receive C band VSATs.....	19
B.4 Receive-only C band VSATs	19

B.5	Satellite News Gathering (SNG) Ku band Transportable Earth Stations (TESs).....	20
B.6	Satellite Interactive Terminals (SITs)	20
B.7	Satellite User Terminals (SUTs) transmitting in the frequency range 29,5 GHz to 30,0 GHz	21
B.8	Satellite User Terminals (SUTs) transmitting in the frequency range 27,5 GHz to 29,5 GHz	22
B.9	Satellite Earth Station on Trains (EST) transmitting in the frequency range 14,0 GHz to 14,5 GHz....	22
B.10	Earth Stations On Mobile Platforms (ESOMP) transmitting in the frequency range 27,5 GHz to 30,0 GHz	23
Annex C (informative):	Bibliography	25
Annex D (informative):	Change history	26
History		27

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Foreword

This draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.6] 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.5].

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.

The present document is part 12 of a multi-part deliverable. Full details of the entire series can be found in part 1 [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
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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).

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1 Scope

The present document specifies technical characteristics and methods of measurement for the Earth Stations (ESs) operating in the frequency ranges between 3,625 GHz and 30 GHz in the Fixed Satellite Service (FSS) bands, and associated ancillary equipment in respect of ElectroMagnetic Compatibility (EMC).

Technical specifications related to the antenna port and emissions from the enclosure port of the Earth Stations (ESs) are not included in the present document. Such technical specifications are found in the relevant product standards for the effective use of the radio spectrum, see table 1.

Table 1: Radio Technologies in scope of the present document

Technology	ETSI Standard
VSAT for Transmit-only, transmit/receive or receive-only satellite Earth Stations operating in the 10,70 GHz to 14,50 GHz frequency bands	ETSI EN 301 428 [i.7]
ES for Satellite News Gathering Transportable Earth Stations (SNG TESS) operating in the 10,70 GHz to 14,50 GHz frequency bands	ETSI EN 301 430 [i.8]
VSAT for Transmit-only, transmit-and-receive, receive-only satellite Earth Stations operating in the 3,625 GHz to 6,425 GHz frequency bands	ETSI EN 301 443 [i.9]
ES for Satellite Interactive Terminals (SIT) and Satellite User Terminals (SUT) transmitting towards satellites in geostationary orbit in the 19,70 GHz to 30,0 GHz frequency bands	ETSI EN 301 459 [i.10]
ES for Satellite User Terminals (SUT) transmitting towards satellites in geostationary orbit in the 17,70 GHz to 29,5 GHz frequency bands	ETSI EN 301 360 [i.11]
ES for Earth Stations On Mobile Platforms (ESOMP) transmitting towards satellites in geostationary orbit, operating in the 17,70 GHz to 30,0 GHz frequency bands	ETSI EN 303 978 [i.12]

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Definitions of the type of Earth Stations (ESs) operating in the frequency ranges between 3,625 GHz and 30 GHz in the Fixed Satellite Service (FSS) covered by the present document are given in annex B. The environmental classification used in the present document are as stated in ETSI EN 301 489-1 [1].

NOTE: The relationship between the present document and essential requirements of article 3.1(b) of Directive 2014/53/EU [i.5] 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 <https://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] ETSI EN 301 489-1 (V2.2.3) (11-2019): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility".
- [2] EN 61000-3-3 (2013) + A1 (2019): "Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection", (produced by CENELEC).

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.

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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] Void.
- [i.2] Void.
- [i.3] ERC/DEC(00)08: "ERC Decision of 19 October 2000 on the use of the band 10.7 - 12.5 GHz by the fixed service and Earth stations of the broadcasting-satellite and fixed-satellite Service (space-to-Earth)".
- [i.4] Void.
- [i.5] 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.6] 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.7] ETSI EN 301 428: "Satellite Earth Stations and Systems (SES); Harmonized Standard for Very Small Aperture Terminal (VSAT); Transmit-only, transmit/receive or receive-only satellite earth stations operating in the 11/12/14 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
<https://standards.iteh.ai/catalog/standards/sist/1850abc1-61a5-446f-ada8-8144b3d159b7/osist-pr-en-301-489-12-v3-1-2-2021>
- [i.8] ETSI EN 301 430: "Satellite Earth Stations and Systems (SES); Harmonised Standard for Satellite News Gathering Transportable Earth Stations (SNG TES) operating in the 11 GHz to 12 GHz/13 GHz to 14 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.9] ETSI EN 301 443: "Satellite Earth Stations and Systems (SES); Harmonised Standard for Very Small Aperture Terminal (VSAT); Transmit-only, transmit-and-receive, receive-only satellite earth stations operating in the 4 GHz and 6 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.10] ETSI EN 301 459: "Satellite Earth Stations and Systems (SES); Harmonised Standard for Satellite Interactive Terminals (SIT) and Satellite User Terminals (SUT) transmitting towards satellites in geostationary orbit, operating in the 29,5 GHz to 30,0 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.11] ETSI EN 301 360: "Satellite Earth Stations and Systems (SES); Harmonised Standard for Satellite Interactive Terminals (SIT) and Satellite User Terminals (SUT) transmitting towards satellites in geostationary orbit, operating in the 27,5 GHz to 29,5 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.12] ETSI EN 303 978: "Satellite Earth Stations and Systems (SES); Harmonised Standard for Earth Stations on Mobile Platforms (ESOMP) transmitting towards satellites in geostationary orbit, operating in the 27,5 GHz to 30,0 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.13] ITU Radio Regulations (2020).

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 301 489-1 [1] and the following apply:

ancillary equipment: electrical or electronic equipment, that is intended to be used with a receiver or transmitter

NOTE 1: It is considered as an ancillary equipment if:

- the equipment is intended for use with a receiver or transmitter to provide additional operational and/or control features to the radio equipment (e.g. to extend control to another position or location);
- the ancillary equipment cannot be used without being connected to radio equipment to provide user functions independently of a receiver or transmitter; and
- the receiver or transmitter, 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).

NOTE 2: An example of ancillary equipment would be a docking station for radio equipment whose interface is dedicated to a particular product or range of products.

carrier-off state: state in which the ES is authorized to transmit, and when it does not transmit any signal, either authorized by a Centralized Control and Monitoring Functions (CCMF) or a Network Control Facility (NCF) when designed for unattended operation or by local control when designed for attended operation

NOTE: The existence of a carrier-off state depends on the system of transmission used. For ES designed for continuous transmission mode there may be no carrier-off state.

carrier-on state: state in which the ES is authorized to transmit, and when it transmits a signal, either authorized by a CCMF or a NCF when designed for unattended operation or by local control when designed for attended operation

critical stored data: data that is essential for an EUT to perform a primary function in accordance with that EUT's specification

NOTE: This may include data previously stored by the user.

drive equipment: equipment used to enable the EUT to operate as intended during the test process

terrestrial port: a port for interconnecting earth-based equipments

transmission disabled state: state in which the ES is not authorized to transmit either by a CCMF or a NCF respectively when designed for unattended operation or by local control when designed for attended operation

3.2 Symbols

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

P_{\min} minimum power required to establish a communication link

3.3 Abbreviations

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

AC	Alternating Current
AMSS	Aeronautical Mobile Satellite Service
BSS	Broadcast Satellite Service
CCMF	Centralized Control and Monitoring Functions
CEPT	European Conference of Postal and Telecommunications administrations

DC	Direct Current
EFTA	European Free Trade Association
EIRP	Equivalent Isotropically Radiated Power
EMC	ElectroMagnetic Compatibility
EME	Externally Mounted Equipment
ES	Earth Station
ESOMP	Earth Stations On Mobile Platforms
EST	Earth Station on Trains
EUT	Equipment Under Test
FS	Fixed Services
FSS	Fixed Satellite Service
IME	Internally Mounted Equipment
kV	kilo Volt
LMSS	Land Mobile Satellite Service
LNB	Low Noise Block converter
MMSS	Marine Mobile Satellite Service
MSS	Mobile Satellite Service
NCF	Network Control Facility
QTMA	Quality of Transmission Measurement Apparatus
RF	Radio Frequency
SIT	Satellite Interactive Terminals
SNG	Satellite News Gathering
SUT	Satellite User Terminals
TES	Transportable Earth Station
VSAT	Very Small Aperture Terminal

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4 Test conditions

4.1 General

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For the purposes of the present document, the test conditions of ETSI EN 301 489-1 [1], clause 4 shall apply with the following additions. Further product type related test conditions for Earth Stations are specified in the present document.

For Earth Stations with or without ancillary equipment, and/or various terrestrial ports, the selection of test configurations shall be determined. The assessment shall include sufficient representative configurations of the ES to adequately exercise the equipment. These configurations shall be recorded in the test report.

In clauses 4.2 and 4.3, the Equipment Under Test (EUT) is an ES with the selected configuration of ancillary equipment.

4.2 Arrangements for test signals

4.2.0 General

The provisions of ETSI EN 301 489-1 [1], clause 4.2.0 shall apply with the following additions.

In order to measure the system emissions and electromagnetic immunity under operational conditions, the following arrangements shall be provided:

- a) a drive equipment to put the ES terminal in its normal operating mode, and providing the ES with a receive signal to emulate the operational conditions of reception. This equipment shall control the EUT, when it is capable of transmission, so that it switches between the transmission disabled, carrier-on and carrier-off states;
- b) a Quality of Transmission Measurement Apparatus (QTMA).