

STN	Družicové zemské stanice a systémy (SES). Harmonizovaná EN na zemské stanice na pohyblivých platformách (ESOMP) vysielajúce smerom k družiciam na geostacionárnej obežnej dráhe vo frekvenčných pásmach od 27,5 GHz do 30,0 GHz, vzťahujúca sa na základné požiadavky podľa článku 3.2 smernice R&TTE.	STN EN 303 979 V1.1.1 87 3979
------------	---	---

Satellite Earth Stations and Systems (SES); Harmonised EN for Earth Stations on Mobile Platforms (ESOMP) transmitting towards satellites in non-geostationary orbit in the 27,5 GHz to 29,1 GHz and 29,5 GHz to 30,0 GHz frequency bands covering the essential requirements of article 3.2 of the R&TTE Directive

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/15

Obsahuje: EN 303 979 V1.1.1:2015

122034

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, 2016
Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy
rozmnžovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

ETSI EN 303 979 V1.1.1 (2015-07)



**Satellite Earth Stations and Systems (SES);
Harmonised EN for Earth Stations on
Mobile Platforms (ESOMP) transmitting towards
satellites in non-geostationary
orbit in the 27,5 GHz to 29,1 GHz and 29,5 GHz to 30,0 GHz
frequency bands covering the essential requirements
of article 3.2 of the R&TTE Directive**

ReferenceDEN/SES-00364

Keywordsantenna, earth station, mobile, non-GSO,
regulation, satellite**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
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2015.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPP™ and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.
GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	7
Foreword.....	7
Modal verbs terminology.....	7
Introduction	7
1 Scope	9
2 References	10
2.1 Normative references	10
2.2 Informative references.....	11
3 Definitions, symbols and abbreviations	11
3.1 Definitions	11
3.2 Symbols.....	13
3.3 Abbreviations	13
4 Technical requirements specifications	14
4.1 General	14
4.1.1 Environmental profile	14
4.1.2 Operational configurations	14
4.1.3 Determination of geographic location of the ESOMP	14
4.1.4 EIRP _{Aggregate} for networks of ESOMPs.....	15
4.1.5 Presentation of equipment for testing purposes	15
4.1.6 Choice of model for testing	15
4.1.7 Mechanical and electrical design	15
4.1.7.1 General	15
4.1.7.2 Marking (equipment identification)	15
4.1.7.3 Equipment identification	15
4.2 Conformance requirements	16
4.2.1 Off-axis spurious radiation	16
4.2.1.1 Justification	16
4.2.1.2 Specification.....	16
4.2.1.3 Conformance tests.....	17
4.2.2 On-axis spurious radiation	17
4.2.2.1 Justification	17
4.2.2.2 Specification.....	17
4.2.2.2.1 "Carrier-on" radio state.....	17
4.2.2.2.2 "Carrier-off" and "Emissions disabled" radio states	17
4.2.2.3 Conformance tests.....	17
4.2.3 epdf Limits.....	18
4.2.3.1 Justification	18
4.2.3.2 Specification.....	18
4.2.3.3 Conformance tests.....	18
4.2.4 Uplink Power Control Specification	18
4.2.5 Carrier suppression	18
4.2.5.1 Justification	18
4.2.5.2 Specification.....	18
4.2.5.3 Conformance tests.....	18
4.2.6 Antenna pointing and polarization alignment	18
4.2.6.1 Antenna pointing accuracy.....	18
4.2.6.1.1 Purpose	18
4.2.6.1.2 Pointing accuracy specification	18
4.2.6.1.3 On-axis cross polarization isolation specification	19
4.2.6.1.4 Conformance tests	19
4.2.6.2 Antenna Pointing Error Detection.....	19
4.2.6.2.1 Purpose	19
4.2.6.2.2 Pointing error detection specification	19

4.2.6.2.3	Polarization angle alignment specification	19
4.2.6.2.4	Conformance tests	20
4.2.7	Cessation of emissions	20
4.2.7.1	Justification	20
4.2.7.2	Specification.....	20
4.2.7.2.1	Specification 1: Mode of cessation of emissions	20
4.2.7.2.2	Specification 2: Conditions under which the ESOMP shall cease emissions	20
4.2.7.2.3	Specification 3: Cessation of emissions	21
4.2.7.2.4	Specification 4: Fault conditions	21
4.2.7.3	Conformance tests	21
4.2.8	Identification of the ESOMP	21
4.2.8.1	Justification	21
4.2.8.2	Specification.....	21
4.2.8.3	Conformance tests	21
4.2.9	Control and Monitoring Functions (CMFs)	22
4.2.9.1	ESOMP States.....	22
4.2.9.1.1	General	22
4.2.9.1.2	CMF state diagram	23
4.2.9.2	Processor monitoring	24
4.2.9.2.1	Justification	24
4.2.9.2.2	Specification	24
4.2.9.2.3	Conformance tests	24
4.2.9.3	Transmit subsystem monitoring	25
4.2.9.3.1	Justification	25
4.2.9.3.2	Specification	25
4.2.9.3.3	Conformance tests	25
4.2.9.4	Power-on/Reset	25
4.2.9.4.1	Justification	25
4.2.9.4.2	Specification	25
4.2.9.4.3	Conformance tests	25
4.2.9.5	Control Channel (CC) and Response Channel (RC)	25
4.2.9.5.1	Justification	25
4.2.9.5.2	Specification	25
4.2.9.5.3	Conformance tests	26
4.2.9.6	Network control commands	26
4.2.9.6.1	Justification	26
4.2.9.6.2	Specification.....	26
4.2.9.6.3	Conformance tests	27
4.2.9.7	Initial burst transmission	27
4.2.9.7.1	Justification	27
4.2.9.7.2	Specification	27
4.2.9.7.3	Conformance tests	27
4.2.9.8	Inhibition of transmissions	27
4.2.9.8.1	Justification	27
4.2.9.8.2	Specification	27
4.2.9.8.3	Conformance tests	27
5	Testing for compliance with technical requirements.....	28
5.1	Environmental conditions for testing	28
5.2	Essential radio test suites.....	28
6	Test methods for all aspects of the ESOMP	28
6.1	General	28
6.1.1	General requirements	28
6.1.2	Interpretation of measurement results	28
6.1.3	Measuring receiver	29
6.2	Off-axis spurious radiation	30
6.2.1	General.....	30
6.2.2	Test method	30
6.2.2.1	General	30
6.2.2.2	Multi-carrier operation	31
6.2.3	Measurements up to 1 000 MHz	31

6.2.3.1	Test site	31
6.2.3.2	Measuring receivers	31
6.2.3.3	Procedure	31
6.2.4	Measurements above 1 000 MHz	32
6.2.4.1	General	32
6.2.4.2	Identification of the significant frequencies of spurious radiation	32
6.2.4.2.1	Test site.....	32
6.2.4.2.2	Procedure.....	32
6.2.4.3	Measurement of radiated power levels of identified spurious radiation.....	32
6.2.4.3.1	Test site.....	32
6.2.4.3.2	Procedure.....	33
6.2.4.4	Measurement of conducted spurious radiation at the antenna flange.....	34
6.2.4.4.1	Test site.....	34
6.2.4.4.2	Procedure.....	34
6.3	On-axis spurious radiation.....	35
6.3.1	Test method	35
6.3.1.1	General	35
6.3.1.2	Test site	35
6.3.1.3	Method of measurement.....	35
6.3.1.3.1	General	35
6.3.1.3.2	Method of measurement at the antenna flange	35
6.3.1.3.3	Method of measurement for an EUT with antenna.....	37
6.4	epfd limits.....	38
6.5	Carrier suppression.....	38
6.5.1	Test method	38
6.6	Antenna pointing	38
6.6.1	General.....	38
6.6.2	Test method	38
6.7	Polarization angle alignment capability	39
6.7.1	General.....	39
6.7.2	Test method	39
6.8	Cessation of emissions of the ESOMP	39
6.8.1	General.....	39
6.8.2	Test Method.....	39
6.8.2.1	Required documentation	39
6.8.2.2	Cessation of emissions from the "Transmission enabled" state	39
6.8.2.3	Cessation of emission from the "Transmission disabled" state	40
6.8.2.4	Cessation of emission from the "Initial Phase" state.....	40
6.8.2.4.1	EUTs transmitting initial bursts.....	40
6.8.2.4.2	EUTs not transmitting initial bursts.....	40
6.8.2.5	"Single action" means of cessation of emissions.....	41
6.8.2.6	Fault conditions.....	41
6.9	Identification of ESOMP.....	42
6.9.1	Test arrangement	42
6.9.2	Test method	42
6.10	Control and monitoring functions	42
6.10.1	General.....	42
6.10.2	Test arrangement	42
6.10.3	Processor monitoring- Test method.....	42
6.10.4	Transmit subsystem monitoring-Test method.....	42
6.10.5	Power-on/Reset-Test method.....	43
6.10.6	Control Channel and Response Channel -Test method.....	43
6.10.7	Network Control commands-Test method.....	44
6.10.8	Initial burst transmission-Test method.....	45
6.10.9	Inhibition of transmission-Test method	45
Annex A (normative):	HS Requirements and conformance Test specifications Table (HS-RTT).....	47
Annex B (informative):	Linear Polarization Alignment Error Calculation	49
Annex C (normative):	Radiated measurement.....	50

C.1	Test sites and general arrangements for measurements involving the use of radiated fields	50
C.1.1	General	50
C.1.2	Anechoic Chamber	50
C.1.3	Anechoic Chamber with a conductive ground plane	51
C.1.4	Open Area Test Site (OATS)	52
C.1.5	Minimum requirements for test sites for measurements above 18 GHz.....	53
C.1.6	Test antenna.....	53
C.1.7	Substitution antenna	54
C.1.8	Measuring antenna	54
C.2	Guidance on the use of radiation test sites	54
C.2.1	General	54
C.2.2	Verification of the test site	54
C.2.3	Preparation of the EUT.....	54
C.2.4	Power supplies to the EUT	54
C.2.5	Range length.....	55
C.2.6	Site preparation	55
C.3	Coupling of signals.....	56
C.3.1	General	56
C.4	Standard test methods.....	56
C.4.1	General	56
C.4.2	Calibrated setup.....	56
C.4.3	Substitution method.....	56
Annex D (normative):	Conducted measurements	58
Annex E (informative):	General Requirements for RF Cables.....	59
Annex F (informative):	RF Waveguides	60
Annex G (informative):	Bibliography.....	61
History		62

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES).

The present document has been produced by ETSI in response to mandate M/284 issued from the European Commission issued under Directive 98/34/EC [i.1] as amended by Directive 98/48/EC [i.5].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonised Standard under the Directive 1999/5/EC [i.2].

The requirements relevant to Directive 1999/5/EC [i.2] are summarized in annex A.

For non EEA countries the present document may be used for regulatory (type approval) purposes.

National transposition dates	
Date of adoption of this EN:	6 July 2015
Date of latest announcement of this EN (doa):	31 October 2015
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2016
Date of withdrawal of any conflicting National Standard (dow):	30 April 2017

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 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 [i.2]. The modular structure is shown in ETSI EG 201 399 [i.3].

The present document is largely based on ETSI EN 303 978 [i.7], for ESOMPs operating with GSO satellites.

The present document may also be applicable to the frequency bands 30,0 GHz to 31,0 GHz (Earth-to-space) and 20,2 GHz to 21,2 GHz (space-to-Earth) subject to national regulation.

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

Annex B (informative) provides information on Linear Polarization Alignment Error Calculation.

Annex C (normative) provides specifications concerning radiated measurements.

Annex D (normative) provides specifications concerning conducted measurements.

Annex E (informative) provides general information concerning RF cables.

Annex F (informative) provides information concerning RF waveguides.

Annex G (informative) Bibliography covers other supplementary information.

1 Scope

The present document applies to Earth Stations on Mobile Platforms (ESOMP), which have the following characteristics.

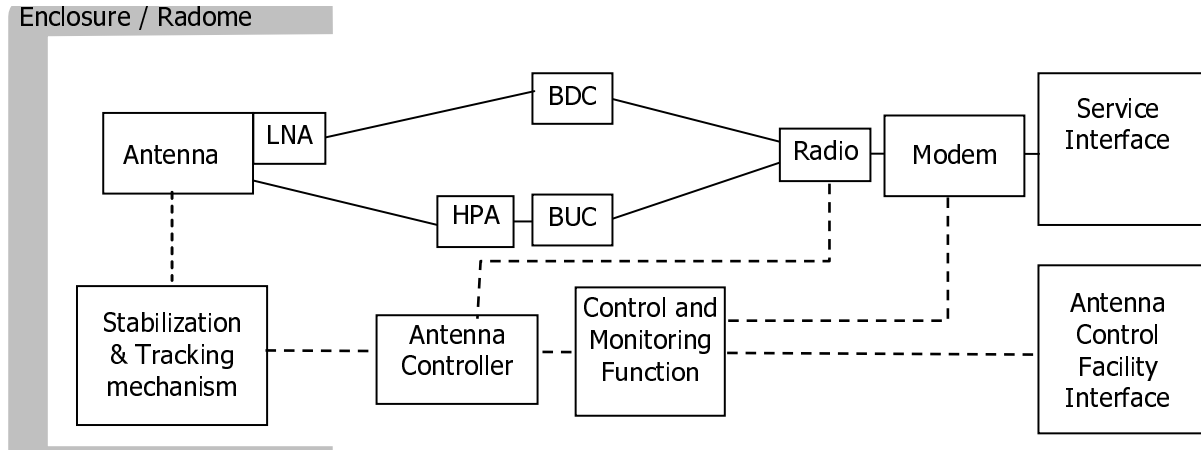


Figure 1: ESOMP System Overview

- The ESOMP is designed for both mobile and stationary operation.
- The ESOMP operates on various mobile platforms such as trains, maritime vessels, aircraft and other vehicles and, therefore, may be subject to occasional disturbances and interruptions in the satellite link.
- The ESOMP is operating as part of a satellite network (e.g. star, mesh or point-to-point) used for the distribution and/or exchange of information.
- The ESOMP is comprised of all the equipment, electrical and mechanical, from the antenna itself to the interface with other communications equipment on a mobile platform (usually referred to as the terrestrial interface).
- The ESOMP comprises of one or more emitters and the system overview given in figure 1 should be interpreted accordingly.
- The transmit and receive frequencies are shown in table 1.

Table 1: Frequency bands

	Frequency Bands/frequencies
Transmit (Earth-to-space)	27,5 GHz to 29,1 GHz and 29,5 GHz to 30,0 GHz
Receive (space-to-Earth)	17,30 GHz to 20,20 GHz

- The ESOMP transmits within the frequency range from 27,5 GHz to 29,1 GHz and 29,5 GHz to 30,0 GHz, which is a band allocated to the Fixed Satellite Services (FSS) (Earth-to-space) among other services. National regulations will specify the bands available for the operation of the ESOMP. Such regulations may designate some parts of the frequency range 27,5 GHz to 29,1 GHz to terrestrial services such as the Fixed Service. However, the operation of the ESOMP may be permitted under national regulations in the 29,50 GHz to 30,00 GHz band since this band is allocated on a primary basis to the Fixed-Satellite Service.
- The ESOMP receives in one or more frequencies within the range from 17,30 GHz to 20,20 GHz (FSS).
- The ESOMP uses linear or circular polarization.
- The ESOMP operates through non-geostationary satellites.
- The ESOMP is designed for unattended operation.

- The ESOMP is controlled and monitored by a Network Control Facility (NCF). This function may be performed centrally (e.g. for a network of ESOMPs with a central hub) or it could be performed within the ESOMP for autonomous control. The NCF is outside the scope of the present document.
- The ESOMP operating in the 27,5 GHz to 28,6 GHz and 29,5 GHz to 30 GHz bands: epfd limits given in Article 22 of the ITU Radio Regulations [i.6] apply for the ESOMPs operating with the NGSO system for the protection of the GSO networks (see No 22.5D of the ITU RR).
- ESOMP operating in the 28,6 GHz to 29,1 GHz band: No 9.11A of the ITU RR applies to the NGSO network of the ESOMP, meaning that the NGSO will be required to coordinate with earlier filed GSO networks or NGSO systems (See No. 5.523A of the ITU RR).

The present document applies to the ESOMP with its ancillary equipment and its various telecommunication ports, and when operated within the boundary limits of the operational environmental profile as declared by the applicant and when installed as required by the applicant's declaration or in the user documentation.

The present document is intended to cover the provisions of Directive 1999/5/EC [i.2] (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: Operational requirements are defined by national administrations and by relevant ECC Decisions.

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 Directive 1999/5/EC [i.2] (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

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 reference 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] ETSI TR 100 028 (all parts) (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [2] ETSI TR 102 273 (all parts) (V1.2.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties".
- [3] ANSI C63.5 (2006): "American National Standard for Calibration of Antennas Used for Radiated Emission Measurements in Electro Magnetic Interference".
- [4] CISPR 16-1-1 Ed.3.0 (2010): "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus".
- [5] CISPR 16-1-4 Ed.3.0 (2010): "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-4: Radio disturbance and immunity measuring apparatus - Antennas and test sites for radiated disturbance measurements".

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 reference 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] 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.2] 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).
- [i.3] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the Radio & Telecommunication Terminal Equipment Directive 1999/5/EC (R&TTE) and a first guide on the impact of the Radio Equipment Directive 2014/53/EU (RED) on Harmonized Standards".
- [i.4] ETSI TS 103 052: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiated measurement methods and general arrangements for test sites up to 100 GHz".
- [i.5] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.
- [i.6] ITU Radio Regulations (edition 2012).
- [i.7] ETSI EN 303 978 (V1.1.2): "Satellite Earth Stations and Systems (SES); Harmonized EN for Earth Stations on Mobile Platforms (ESOMP) transmitting towards satellites in geostationary orbit in the 27,5 GHz to 30,0 GHz frequency bands covering the essential requirements of article 3.2 of the R&TTE Directive".

koniec náhľadu – text ďalej pokračuje v platenej verzii STN