



HARMONISED EUROPEAN STANDARD

**ElectroMagnetic Compatibility (EMC)
standard for radio equipment and services;
Part 19: Specific conditions for Receive Only Mobile
Earth Stations (ROMES) operating in the 1,5 GHz band
providing data communications and GNSS receivers operating
~~operating~~ in the RNSS band (~~ROGNSS~~)
providing positioning, navigation,
and timing data;
Harmonised Standard ~~covering the essential requirements for~~
ElectroMagnetic Compatibility**

Reference

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Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.2] 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.1].

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 19 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

National transposition dates

Date of adoption of this EN:	12 June 2017 <u>30 August 2022</u>
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Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 January 2020 <u>May 2023</u>
Date of withdrawal of any conflicting National Standard (dow):	31 January 2021 <u>May 2024</u>

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, ~~together with ETSI EN 301 489-1 [1],~~ covers the assessment of Receive Only Mobile Earth Stations (ROMES) and Global Navigation Satellite System (GNSS) receivers operating in respect of electromagnetic compatibility.

ROMES operate in the Land Mobile Satellite Service (LMSS) space to earth bands, 1 518 MHz to 1 559 MHz, allocated by the ITU Radio Regulations [i.3]. ROMES operate as part of a satellite system providing one way data communications.

Global Navigation Satellite System (GNSS) receivers operate in either or both of the space to earth RNSS band (ROGNSS), as frequency bands of 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz defined in annex B, and associated ancillary equipment in respect of ElectroMagnetic Compatibility (EMC) as "A radiodetermination-satellite service used for the purpose of radionavigation" (article 1.43 of ITU Radio Regulations [i.3]) with the ability to receive any GNSS (e.g. Galileo, Global Positioning System (GPS), BeiDou (BDS), GLObal NAVigation Satellite System (GLONASS), Space Based Augmentation Systems (SBAS)).

Technical specifications related to the antenna port and emissions from the enclosure port of ROMES and GNSS 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 in table 1.

Table 1: Radio Technologies in Scope of the present document

Technology	ETSI Standard
<u>ROMES</u>	<u>ETSI EN 300 487 [i.4]: "Satellite Earth Stations and Systems (SES); Harmonised Standard for Receive-Only Mobile Earth Stations (ROMES) providing data communications operating in the 1,5 GHz frequency band; Radio Frequency (RF) specifications covering the essential requirements of article 3.2 of the Directive 2014/53/EU".</u>
<u>GNSS</u>	<u>ETSI EN 303 413 [i.5]: "Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU".</u>

Emissions requirements in the present document are specified for frequencies above 9 kHz.

The present document specifies the applicable test conditions, performance assessment and performance criteria for ROMES, GNSS and associated ancillary equipment.

ROMESs and GNSS can have several configurations, including:

- vehicular equipment;
- portable equipment;
- fixed equipment;
- a number of modules including a display/control interface to the user.

The performance criteria used in the present document require that the satellite communications system of which the ROMES and GNSS is a part provides reliable delivery of data or messages.

~~In case of differences (for instance concerning special conditions, definitions, abbreviations) between the present document and ETSI EN 301 489-1 [1], the provisions of the present document take precedence.~~

The environmental classification and the emission and immunity requirements used in the present document are as stated in ETSI EN 301 489-1 [1], except for any special conditions included in the present document. ~~The applicable environments referred to in ETSI EN 301 489-1 [1] where ROMES and or ROGNSS may be used should be declared by the manufacturer.~~

NOTE: The relationship between the present document and essential requirements of article 3.1(b) of Directive 2014/53/EU [i.1] 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.

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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 (V2.2.0) (~~03-20173~~) (11-2019): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU for ElectroMagnetic Compatibility".
- [2] ~~ITU R Radio Regulations (2016).~~

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] 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.2] 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.3] ~~ITU Radio Regulations (2016).~~
- [i.4] ~~ETSI EN 300 487 (V2.1.2) (11-2016): "Satellite Earth Stations and Systems (SES); Harmonised Standard for Receive-Only Mobile Earth Stations (ROMES) providing data communications operating in the 1.5 GHz frequency band; Radio Frequency (RF) specifications covering the essential requirements of article 3.2 of the Directive 2014/53/EU".~~
- [i.5] ~~ETSI EN 303 413 (V1.2.1) (04-2021): "Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonised Standard for access to radio spectrum".~~

~~3~~ Definitions

3 Definition of terms, symbols and abbreviations

3.1 ~~Definitions~~ Terms

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

~~**stand-by mode of operation:** mode of operation in which the~~ **ancillary equipment:** electrical or electronic equipment that is intended to be used with a receiver

NOTE: It is considered as an ancillary equipment if:

- the equipment is intended for use with a receiver 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; and
- the receiver to which it is connected, is capable of providing some intended operation such as receiving calls without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

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.

Equipment Under Test (EUT): equipment subject to the performance requirements of the present document

fixed equipment: equipment intended for use in a fixed location and fitted with one or more antennas

live sky signal: signal received from actual existing satellites

portable equipment: radio equipment intended for portable use and powered by integral batteries or battery

NOTE: Devices will typically be handheld.

stand-alone radio equipment: equipment that is intended primarily as communications equipment and that is normally used on a stand-alone basis

vehicular equipment: radio equipment intended for installation and use in a vehicle, and powered by the main battery of the vehicle

3.2 Symbols

Void.

3.3 Abbreviations

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

CR	Continuous phenomena applied to ROMES and ROGNSS
AC	Alternating Current
BDS	BeiDou - Chinese satellite navigation system
dB	decibel
DC	Direct Current
EMC	ElectroMagnetic Compatibility

EUT	Equipment Under Test
<u>GHz</u>	<u>Gigahertz</u>
GNSS	Global Navigation Satellite System
<u>GPS</u>	<u>Global Positioning System</u>
<u>kHz</u>	<u>Kilohertz</u>
LMSS	Land Mobile Satellite Service
<u>MFCN</u>	<u>Mobile Fixed Communications Network</u>
<u>MHz</u>	<u>Megahertz</u>
<u>Pmin</u>	<u>Minimum power required to establish a communication link</u>
RF	Radio Frequency
RNSS	Radio-Navigation Satellite Service
ROGNSS	Receive Only Global Navigation Satellite System
ROMES	Receive Only Mobile Earth Station
TR	Transient phenomena applied to ROMES and ROGNSS
<u>RX</u>	<u>Receiver</u>
<u>SBAS</u>	<u>Space Based Augmentation System</u>
<u>SES</u>	<u>Satellite Earth System</u>

4 Test conditions

4.1 General

The manufacturer should at the time of submission of the equipment for test, supply the applicable environments, referred to in ETSI EN 301 489-1 [1], where ROMES, and or GNSS may be used.

For emission and immunity tests the test modulation, test arrangements, etc., as specified in the present document, clauses 4.1 to 4.5, shall apply.

In the following clauses, the ~~The~~ Equipment Under Test (EUT) is the ROMES ~~and (ROGNSS)~~ or GNSS receiver, together with the selected configuration of any applicable ancillary equipment.

4.2 Arrangements for test signals

4.2.0 General

The provisions test configuration and mode of ETSI EN 301 489-1 [1], clause 4.2 operation shall apply represent the intended use and shall be recorded.

4.2.1 Arrangements for test signals at the input of ROMES and ROGNSSGNSS receivers

The provisions of ETSI EN 301 489-1 [1], clause 4.2.3 shall apply with the following modifications.

The manufacturer may, at the time of submitting the ROMES and ROGNSS for testing, supply, if necessary, a/an appropriate test fixture and a/or message generator to generate capable of generating the wanted input signal may be supplied with the ROMES or GNSS receiver to facilitate testing.

The wanted RF ~~Alternatively,~~ the wanted signal may be presented to the EUT via a live sky signal from outdoors.

For radiated immunity, the level of the wanted signal at the input signal level for ROMES and ROGNSS, modulated with the normal test modulation of the receiver or the enclosure port of the EUT, shall be set to a value significantly 20 dB (± 3 dB) above the threshold sensitivity but below the overload characteristics of the ROMES and ROGNSS (the threshold sensitivity and overload characteristic shall be specified by the manufacturer).

The source of the wanted input signal, modulated with normal test modulation (see clause 4.5), shall be located outside the test environment and P_{min} for the signal EUT. For all other tests the level used of the wanted signal, required to establish a communication link, shall be chosen to be a value significantly above the threshold sensitivity but below the overload characteristics representative of the ROMES and ROGNSS (the threshold sensitivity and overload characteristic shall be specified by the manufacturer). Adequate measures shall be taken to protect the measuring equipment from the effect of the test environment EUT intended use.

NOTE: A simple method to establish the required communication link is establish link, reduce power to point of link failure then increase by 20 dB.

4.2.2 Arrangements for test signals at the output of ROMES and ROGNSS/GNSS receivers

The provisions of ETSI EN 301 489-1 [1], clause 4.2.4 shall apply with the following modifications.

~~For the~~The performance check of the ROMES and GNSS device shall be checked before and after the test it shall be possible to assess the performance of the ROMES and ROGNSS from the assessment using one or more of the following:

- ~~presented messages and/or the~~;
- satellite information;
- ~~call received alert signal(s) of the ROMES and ROGNSS.~~

~~During the spot frequency test of the immunity test with radiated RF electromagnetic fields (ETSI EN 301 489-1 [1], clause 9.2) the call received alert signal output of the ROMES and ROGNSS/GNSS receiver shall be coupled to the outside of the test environment and it shall be possible to assess to enable the performance of the equipment from the call received alert signal(s) of the ROMES and ROGNSS to be assessed.~~

4.3 Exclusion bands

4.3.0 General

The provision of ETSI EN 301 489-1 [1], clause 4.3.1 shall apply with the following modifications:

- ~~the receiver exclusion band as defined below shall apply;~~
- ~~there~~There shall be no exclusion bands for the ancillary equipment.
- The receiver exclusion bands as defined in clause 4.3.1 shall apply.

4.3.1 Receiver exclusion bands

4.3.1.1 General

The receiver exclusion band is the band of frequencies over which no tests of radiated immunity of a receiver are made.

4.3.1.2 GNSS exclusion bands

The exclusion band for immunity testing of equipment operating in the 1 559 MHz to 1 610 MHz band shall be:

- lower limit of exclusion band = 1 492 MHz (-67 MHz of the lowest band edge frequency of the)
- upper limit of exclusion band = 1 706 MHz (+96 MHz of the highest band edge frequency)

NOTE 1: The lower frequency is based on the presence of a MFCN below 1 492 MHz. The upper limit is based on the bandwidth of a GNSS transmission of 32 MHz and a value of $n=3$ from ETSI EN 301 489-1 [1], clause 4.3.3. This receiver exclusion band includes the lower frequency blocking test frequencies specified in the relevant product standards for the effective use of the complete receiver radio spectrum.

The exclusion band for immunity testing of the EUT minus 5 % of that equipment operating in the 1 164 MHz to 1 300 MHz band shall be:

lower frequency.

- The upper limit of exclusion band = 1 100 MHz (-64 MHz of the lowest band edge frequency of the)
- upper limit of exclusion band = 1 364 MHz (+64 MHz of the highest band edge frequency)

NOTE 2: This is based on the bandwidth of a GNSS transmission of 32 MHz and a value of n=2 from ETSI EN 301 489-1 [1], clause 4.3.3. This receiver exclusion band is the upper frequency of the complete receive band of the EUT plus 5 % of that upper frequency includes the blocking test frequencies specified in the relevant product standards for the effective use of the radio spectrum.

4.3.1.3 ROMES Exclusion Bands

The receiver exclusion band is the band of frequencies over which no tests of radiated immunity are conducted.

The exclusion band for immunity testing of equipment operating in the 1 518 MHz to 1 559 MHz band shall be:

- lower limit of exclusion band = 1 492 MHz (-26 MHz of the lowest band edge frequency)
- upper limit of exclusion band = 1 627 MHz (+68 MHz of the highest band edge frequency)

NOTE: The lower frequency is based on the presence of MFCN below 1 492 MHz. The upper limit is based on the bandwidth of ROMES transmission of 34 MHz and a value of n=2 from ETSI EN 301 489-1 [1], clause 4.3.3. This receiver exclusion band includes the blocking test frequencies specified in the relevant product standards for the effective use of the radio spectrum.

4.3.1.4 Combined Equipment GNSS & ROMES

When equipment is designed to perform both GNSS and ROMES receive functions with shared hardware, the exclusion band shall be the union of the GNSS and the ROMES exclusion bands:

- lower limit of exclusion band = 1 492 MHz (-26 MHz of the lowest band edge frequency for the ROMES component)
- upper limit of exclusion band = 1 706 MHz (+96 MHz of the highest band edge frequency for the GNSS component)

4.3.1.5 Exclusion Bands Summary

Table 2 provides a summary of exclusion bands for all GNSS and ROMES equipment.

Table 2: Exclusion Bands Summary

<u>System</u>	<u>Frequency Band</u>	<u>RX Exclusion Band</u>	
		<u>Lower limit of exclusion band</u>	<u>Upper limit of exclusion band</u>
<u>GNSS</u>	<u>1 164 MHz to 1 300 MHz</u>	<u>1 100 MHz</u>	<u>1 364 MHz</u>
<u>GNSS</u>	<u>1 559 MHz to 1 610 MHz</u>	<u>1 492 MHz</u>	<u>1 706 MHz</u>
<u>ROMES</u>	<u>1 518 MHz to 1 559 MHz</u>	<u>1 492 MHz</u>	<u>1 627 MHz</u>
<u>Combined Equipment GNSS & ROMES (see note)</u>	<u>1 518 MHz to 1 610 MHz</u>	<u>1 492 MHz</u>	<u>1 706 MHz</u>

NOTE: Combined GNSS and ROMES equipment is only used in the 1 518 MHz to 1 610 MHz band.

4.4 Narrow band responses of receivers

The provision of ETSI EN 301 489-1 [1], clause 4.4 shall apply.

Responses on receivers occurring during the immunity tests at discrete frequencies which are narrow band responses (spurious responses), are identified by the following method.

If during the test the immunity RF test signal causes non-compliance of the receiver with the specified performance criteria (see clause 6), it is necessary to evaluate whether this non-compliance is due to a narrow band response or a wideband phenomenon. Therefore, the frequency of the test signal is increased by an amount equal to twice the nominal 6 dB bandwidth of the IF filter immediately preceding the demodulator of the receiver, or if appropriate, the bandwidth over which the equipment is intended to operate, as declared by the manufacturer. The test is repeated with the frequency of the test signal decreased by the same amount. If the receiver is then in either or both frequency offset cases in compliance with the specified performance criteria, the response is considered as a narrow band response. If the receiver still does not comply with the specified performance criteria, this may be due to the fact that the offset has made the frequency of the unwanted signal correspond to the frequency of another narrow band response. Under these circumstances the procedure is repeated with an increase and decrease of the frequency of the test signal adjusted two and a half times the bandwidth referred to above. If the receiver still does not comply with the specified performance criteria in either or both frequency offset cases, the phenomena is considered wide band and therefore an EMC problem and the equipment fails the test.

For immunity tests, narrow band responses shall be disregarded.

4.5 Normal test modulation

The test modulation signal to be used for the calling function shall be a signal representing selective messages generated by a signal generator. The, so that the EUT receives a correctly representative modulated signal generator may be supplied by.

The wanted signals required to establish a communications link shall be representative of the manufacturer's EUT's intended use.

5 Performance assessment

5.1 General

At the time of submission of the equipment for test, the information required in ETSI EN 301 489-1 [1], annex C and the following should be recorded in the test report:

- the operating frequency range(s) of the equipment and where applicable band(s) of operation;
- the host equipment to be combined with the radio equipment for testing;
- the normal test modulation and the format.

5.2 Ancillary equipment

The provision of ETSI EN 301 489-1 [1], clause_5-4 shall apply with the following modification.

6 Performance criteria

#6.0 Introduction

Only the EUT has several optional features or configurations, tests shall be performed on the minimum representative configuration of the EUT.

In all cases, the minimum configuration of the EUT as marketed, shall comply with the EMC requirements of performance criteria specified in the present document.

The manufacturer shall keep on record information about the ancillary equipment intended for use with the EUT and make this information available to the user.

In addition to the information requested from the manufacturer in or in ETSI-EN 301 489-1-[1], clause 5.1, the manufacturer shall keep on record the following information:

the optional features of the equipment and the actual features] where referenced shall apply.

The equipment shall meet the minimum performance criteria as specified in clauses 6.1 and 6.2 as appropriate.

For the purpose of the equipment which are assessed for the performance or degradation present document two categories of performance- criteria apply:

- 5.2 Equipment which can provide a Performance criteria for continuous communications link phenomena.

The provision of ETSI EN 301 489 1 [1], clause 5.2 shall apply.

~~5.3 Equipment which does not provide a continuous communications link~~

The provision of ETSI EN 301 489 1 [1], clause 5.3 shall apply.

~~5.4 Ancillary equipment~~

The provision of ETSI EN 301 489 1 [1], clause 5.4 shall apply.

~~5.5 Equipment classification~~

The provision of ETSI EN 301 489 1 [1], clause 5.5 shall apply.

- Performance criteria for transient phenomena.

~~6.16 Performance criteria~~

~~6.1 General performance criteria~~

If the EUT is of a non-specialized nature or the EUT is combined with an ancillary equipment, the test modulation, test arrangements, etc. as required in clause 4 shall apply.

The EUT, for all immunity tests according to the present document, except the spot frequency test of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489 1 [1], clause 9.2), shall be assessed for:

- ~~the storage of messages in the memory of the EUT at the start of the test;~~
- ~~unintentional responses of the EUT during the test;~~
- ~~the maintenance of the EUT memory assessed at the conclusion of the test;~~
- ~~the ability to receive and store messages at the conclusion of the test.~~

For the spot frequency test of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489 1 [1], clause 9.2) the EUT shall be assessed by monitoring the accuracy of the call received alert signal.

~~6.2 Performance criteria for Continuous phenomena applied to ROMES and ROGNSS receivers (CR)~~

For the EUT, excluding spot frequency tests as part of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489 1 [1], clause 9.2):

- ~~the general performance criteria set out in clause 6.1;~~

- ~~during the test no false calls shall occur;~~

~~at the conclusion of the test comprising the series of individual exposures the EUT. During the test, the equipment shall operate as intended with no loss of functions or, e.g. not unintentionally change its operating state and not unintentionally change critical stored data (messages), as declared by the manufacturer.~~

~~For the spot frequency test as part of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489-1 [1], clause 9.2) the EUT shall be assessed by monitoring the accuracy of the call received alert signal.~~

~~After the test, the equipment shall operate as intended, e.g. have no loss of function and have no loss of critical stored data.~~

6.32 Performance criteria for Transient phenomena applied to ROMES and ROGNSS receivers (TR)

For the EUT:

- ~~the general performance criteria set out in clause 6.1;~~
- ~~during After the test no false calls, functions shall occur;~~
- ~~at the conclusion of the test comprising the series of individual exposures, the EUT be self-recoverable and the equipment shall operate as intended with no loss of function and/or stored data (messages), as declared by the manufacturer.~~

6.4 Performance criteria for equipment which does not provide a continuous communication link

~~The provision of ETSI EN 301 489-1 [1], clause 6.3 shall apply with the following modifications.~~

~~For EUTs of a specialized nature and/or ancillary equipment tested on a stand-alone basis the manufacturer shall define the method of test to determine the acceptable level of performance or degradation of performance during and/or after the test. Under these circumstances the manufacturer will also provide the following information:~~

- ~~the primary functions of the equipment to be tested during and after EMC stress;~~
- ~~the intended functions of the EUT which shall be in accordance with the documentation accompanying the equipment;~~
- ~~the pass/failure criteria for the equipment;~~
- ~~the method of observing a degradation of performance of the equipment.~~

~~The assessment of the performance or the degradation of performance which shall be carried out during and/or at the conclusion of the tests, shall be simple, but at the same time give adequate proof that the primary functions of the equipment are operational shall have no loss of critical stored data.~~

7 Applicability overview

7.1 Emission

7.1.1 General

~~ETSI EN 301 489-1 [1], table 1, Table 3 contains the applicability of EMC emission measurements to the relevant ports of radio and/or associated ancillary equipment.~~

Table 3: Emission requirements

Phenomenon	Port	Applicability			Reference clause
		Fixed equipment	Vehicular equipment	Portable equipment	
radiated emission	enclosure of ancillary equipment	applicable	applicable	applicable	ETSI EN 301 489-1 [1], clause 8.2
conducted emission	DC power input/output	applicable	applicable	not applicable	7.1.2
conducted emission	AC mains input/output	applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], clause 8.4
conducted emission	wired network	applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], clause 8.7

Portable equipment, or combinations of equipment, capable of being powered for intended use by the main battery of a vehicle shall additionally be considered as vehicular equipment.

Portable or vehicular equipment, or combinations of equipment, capable of being powered for intended use by AC mains shall additionally be considered as fixed equipment.

7.1.2 Special conditions

The following special conditions set out in table 44, relate to the emission test methods used in ETSI EN 301 489-1 [1], clause 8.

Table 44: Special conditions for EMC emission measurements

Reference to clauses in ETSI EN 301 489-1 [1]	Special product-related conditions, additional to or modifying the test conditions in ETSI EN 301 489-1 [1], clause 8
8.1 Test configuration; Methods of measurement and limits for EMC emissions 8.3 DC power input/output	The message memory shall be loaded with recognizable messages. The requirements of ETSI EN 301 489-1 [1] clause 8.3 shall be applied where the cable length exceeds 3 m or when connected to a vehicle power supply.

7.2 Immunity

7.2.1 General

~~ETSI EN 301 489-1 [1], table 2, Table 5~~ contains the applicability of EMC immunity measurements to the relevant ports of radio and/or associated ancillary equipment.

7.2.2 ~~Special conditions~~

~~The following special conditions set out in table 2, relate to the immunity test methods and performance criteria used in ETSI EN 301 489-1 [1], clause 9.~~

Table 2: Special conditions for EMC immunity tests

Reference to clauses in ETSI EN 301 489-1 [1]	Special product-related conditions, additional to or modifying the test conditions in ETSI EN 301 489-1 [1], clause 9
9.1 Test configuration; Test methods and levels for immunity tests	<p>The message memory shall be loaded with recognizable messages. The EUT shall operate in stand-by mode of operation, except for the spot frequency test as part of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489-1 [1], clause 9.2) where repetitive calls shall be coupled to the input of the receiver.</p> <ul style="list-style-type: none"> for the immunity tests of ancillary equipment, without a separate pass/fail criteria, an EUT coupled to the ancillary equipment shall be used to judge whether the ancillary equipment passes or fails.
9.2.2 Test method; Radio frequency electromagnetic field	<p>Spot frequency test: A spot frequency test shall additionally be performed at:</p> <ul style="list-style-type: none"> 80 MHz; 104 MHz; 136 MHz; 165 MHz; 200 MHz; 260 MHz; 330 MHz; 430 MHz; 560 MHz; 715 MHz \pm 1 MHz; a spot frequency test shall be performed at 920 MHz \pm 1 MHz using a test level of 3 V/m (measured unmodulated) 100 % modulated by 200 Hz pulses of equal mark to space ratio.

Table 5: Immunity test requirements

Phenomenon	Port	Applicability			Reference clause	Performance Criteria clause
		Fixed Equipment	Vehicular equipment	Portable equipment		
RF electromagnetic field (80 MHz to 6 000 MHz)	enclosure	applicable	applicable	applicable	ETSI EN 301 489-1 [1], 9.2.1 and 9.2.2	6.1
electrostatic discharge	enclosure	applicable	applicable	applicable	ETSI EN 301 489-1 [1], 9.3.1 and 9.3.2	6.2
fast transients common mode	signal, wired network and control	applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], 9.4.1 and 9.4.2	6.2
	DC power	applicable	not applicable	not applicable		6.2
	AC power	applicable	not applicable	not applicable		6.2
RF common mode 0,15 MHz to 80 MHz	signal, wired network and control	applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], 9.5.1 and 9.5.2	6.1
	DC power	applicable	not applicable	not applicable		6.1
	AC power	applicable	not applicable	not applicable		6.1
Vehicular transients and surges	DC power input	not applicable	applicable	not applicable	ETSI EN 301 489-1 [1], 9.6.1 and 9.6.2	6.2
voltage dips and interruptions	AC mains power input	applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], 9.7.1 and 9.7.2	6.2
surges, line to line and line to ground	AC mains power input	applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], 9.8.1 and 9.8.2	6.2
	wired network	applicable	not applicable	not applicable		6.2

Portable equipment, or combinations of equipment, capable of being powered for intended use by the main battery of a vehicle shall additionally be considered as vehicular equipment.

Portable or vehicular equipment, or combinations of equipment, capable of being powered for intended use by AC mains shall additionally be considered as fixed equipment.

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.2i.2] 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.1].

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 301 489-19				
Requirement			Requirement Conditionality	
No	Description	Reference: Clause No	U/C	Condition
1	Emissions: Enclosure of ancillary equipment measured on a stand alone basis	ETSI EN 301 489-1 [1], clause 8.2	U	
2	Emissions: DC power input/output ports	7.1 and ETSI EN 301 489-1 [1], clause 8.3	G	Only where equipment has DC power input and/or output ports with a cable length greater than 3 m or from a vehicle power supply
3	Emissions: AC mains power input/output ports	7.1 and ETSI EN 301 489-1 [1], clause 8.4	G	Only where equipment has AC mains power input and/or output ports
4	Emissions: Harmonic current emission (AC mains input port)	7.1 and ETSI EN 301 489-1 [1], clause 8.5	G	Only where equipment has AC mains power input ports
5	Emissions: Voltage fluctuations and flicker (AC mains input ports)	7.1 and ETSI EN 301 489-1 [1], clause 8.6	G	Only where equipment has AC mains power input ports
6	Emissions: Wired network ports	7.1 and ETSI EN 301 489-1 [1], clause 8.7	G	Only where equipment has wired network ports
7	Immunity: Radio frequency electromagnetic field (80 MHz to 6 000 MHz)	7.2 and ETSI EN 301 489-1 [1], clause 9.2	U	
8	Immunity: Electrostatic discharge	7.2 and ETSI EN 301 489-1 [1], clause 9.3	U	
9	Immunity: Fast transients common mode	7.2 and ETSI EN 301 489-1 [1], clause 9.4	G	Only where equipment has AC mains power input ports or DC power ports or wired network ports with cables longer than 3 m
10	Immunity: Radio frequency common mode	7.2 and ETSI EN 301 489-1 [1], clause 9.5	G	Only where equipment has AC mains power input ports or DC power ports or wired network ports with cables longer than 3 m
11	Immunity: Transients and surges in the vehicular environment	7.2 and ETSI EN 301 489-1 [1], clause 9.6	G	Only where equipment is fitted to a vehicle power supply
12	Immunity: Voltage dips and interruptions	7.2 and ETSI EN 301 489-1 [1], clause 9.7	G	Only where equipment has AC mains power input ports
13	Immunity: Surges, line to line and line to ground	7.2 and ETSI EN 301 489-1 [1], clause 9.8	G	Only where equipment has AC mains power input ports and/or wired network ports

Harmonised Standard ETSI EN 301 489-19					
Requirement				Requirement Conditionality	
No	Description	Essential requirements of Directive	Clause(s) of the present document	U/C	Condition
1	Emissions: Enclosure of ancillary equipment measured on a stand-alone	3.1(b)	7.1	U	
2	Emissions: DC power input/output ports	3.1(b)	7.1	C	Only where equipment has DC power input and/or output ports with a cable length greater than 3 m or from a vehicle power supply.
3	Emissions: AC mains power input/output ports	3.1(b)	7.1	C	Only where equipment has AC mains power input and/or output ports.
4	Emissions: Wired network ports	3.1(b)	7.1	C	Only applies to fixed equipment.
5	Immunity: Radio frequency electromagnetic field (80 MHz to 6 000 MHz)	3.1(b)	7.2	U	
6	Immunity: Electrostatic discharge	3.1(b)	7.2	U	
7	Immunity: Fast transients common mode	3.1(b)	7.2	C	Only applies to fixed equipment.
8	Immunity: Radio frequency common mode	3.1(b)	7.2	C	Only applies to fixed and/or vehicular equipment.
9	Immunity: Transients and surges in the vehicular environment	3.1(b)	7.2	C	Only applies to vehicular equipment.
10	Immunity: Voltage dips and interruptions	3.1(b)	7.2	C	Only where equipment has AC mains power input ports.
11	Immunity: Surges, line to line and line to ground	3.1(b)	7.2	C	Only applies to fixed equipment.

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-Number(s) of the present document

_____ 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 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):~~

~~Definitions of ROMES and GNSS receivers operating in the RNSS band within the scope of the present document~~

~~B.1 Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band~~

~~The present document applies to ROMES which operate in the Land Mobile Satellite Service (LMSS) space-to-earth bands, 1 525 MHz to 1 544 MHz and 1 555 MHz to 1 559 MHz, allocated by the ITU R Radio Regulations [2]. The~~

~~Annex B (informative):~~

~~Void~~

~~ROMES operate as part of a satellite system providing one-way data communications.~~

~~B.2 GNSS Receivers operating in the RNSS band~~

~~The present document applies to Receive Only Global Navigation Satellite System (GNSS) operating as part of one or more radionavigation satellite service (RNSS) systems in the RNSS frequency bands given in table B.1.~~

~~**Table B.1: Radionavigation-satellite service (RNSS) frequency bands**~~

RNSS frequency bands	Comments
1 164 MHz to 1 300 MHz	space-to-Earth
1 559 MHz to 1 610 MHz	space-to-Earth

~~The ROGNSS receives radio signals from one or more GNSS for the purpose of radiodetermination of the position, velocity, and/or other characteristics of an object, or the obtaining of information relating to those parameters, by means of the propagation properties of radio waves. RNSS is defined as "A radiodetermination satellite service used for the purpose of radionavigation" (article 1.43 of ITU Radio Regulations [2]).~~

Annex C (informative):

Bibliography

- ~~ETSI ETS 300 487: "Satellite Earth Stations and Systems (SES); Receive-Only Mobile Earth Stations (ROMESs) operating in the 1,5 GHz band providing data communications; Radio Frequency (RF) specifications".~~
 - ~~ETSI EN 303 413: "Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) Receiver; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 to 1 610 MHz frequency bands".~~
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Annex D (informative):

Change history

Version	Information about changes
2.1.0	Addition of GNSS receivers
2.1.1	<u>Bringing into line with latest ETSI EN 301 489-1</u>
2.1.2	<u>Changes and simplification following EMC#57</u>
2.1.3	<u>Changes following EMC#58</u>
2.1.4	<u>Changes following Remote Consensus</u>

History

Document history		
V1.1.1	December 2000	Publication
V1.2.1	November 2002	Publication
V2.1.0	March 2017	EN Approval Procedure AP 20170611: 2017-03-13 to 2017-06-12
V2.1.1	April 2019	Publication
<u>V2.2.0</u>	<u>September 2020</u>	<u>EN Approval Procedure AP 20201217: 2020-09-18 to 2020-12-17</u>
<u>V2.2.1</u>	<u>July 2022</u>	<u>Vote V 20220830: 2022-07-01 to 2022-08-30</u>
<u>V2.2.1</u>	<u>September 2022</u>	<u>Publication</u>