ETSI EN 301 843-1 V2.3.1 (2026-03)

EUROPEAN STANDARD

ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Part 1: Common technical requirements

Reference
REN/ERM-EMC-413

Keywords
EMC, maritime, radio, regulation

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 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Contents

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are 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 IPR online database.

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, 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.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Foreword

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

The present document is part 1 of a multi-part deliverable covering the ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services, as identified below:

Part 1: "Common technical requirements";

Part 2: "Specific conditions for VHF radiotelephone transmitters and receivers operating in the frequency range 156 MHz to 174 MHz";

Part 3: "Specific conditions for non-SOLAS maritime radars and river radars";

Part 4: "Specific conditions for Narrow-Band Direct-Printing (NBDP) NAVTEX receivers";

Part 5: "Specific conditions for MF/HF radiotelephone transmitters and receivers";

Part 6: "Specific conditions for Earth Stations on board Vessels operating in frequency bands above 3 GHz";

Part 7: "Specific conditions for Maritime Broadband Radiolink equipment";

Part 8: "Specific conditions for radio beacons and locating devices".

National transposition dates	
Date of adoption of this EN:	18 March 2026
Date of latest announcement of this EN (doa):	30 June 2026
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 December 2026
Date of withdrawal of any conflicting National Standard (dow):	31 December 2027

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 contains a full list of EMC requirements together with the standard test set-ups and compliance limits, that should be used by the product specific parts within the ETSI EN 301 843 series. Deviations, where applicable, from this are set out in the specific product related part.

Product dependent arrangements necessary to perform the EMC tests on dedicated types of radio equipment, and the assessment of test results, are detailed in the appropriate relevant radio technology parts of ETSI EN 301 843 series details of which can be found in the foreword of the present document.

The present document also acts as the basis for product specific parts of the ETSI EN 301 843 series. It is these product specific parts that are intended to be cited in the OJEU under article 3.1(b) of Directive 2014/53/EU [i.8].

1 Scope

The present document contains the common requirements for marine radio communications and radio determination equipment and associated ancillary equipment operating from any combination of internal batteries, DC and single phase AC, in respect of ElectroMagnetic Compatibility (EMC).

The provisions of the present document apply to marine radio equipment **not covered** in the scope of the Council Directive on marine equipment (the "Marine Equipment Directive" 2014/90/EU [i.4]).

Product dependent arrangements necessary to perform the EMC tests on dedicated types of marine radio communications and radio determination equipment, and the assessment of test results, are detailed in the appropriate product related parts of the present document.

The present document, together with the product related part, specifies the applicable EMC tests, the methods of measurement, the limits and the performance criteria for marine radio equipment and associated ancillary equipment.

In case of differences (for instance concerning special conditions, definitions, abbreviation) between the present document and the relevant product related part of the present document, the product related part takes precedence.

For the further content of the present document, the expression "radio equipment" is taken to mean marine radio communications or radio determination equipment, in each individual case.

Technical specifications related to the antenna port of radio equipment and emissions from the enclosure port of radio equipment and combinations of radio and associated ancillary equipment are not included in the present document. Such technical specifications are normally found in the relevant product standards for the effective use of the radio spectrum.

The environment classification used in the present document is maritime, as defined in EN IEC 60945 [i.3].

Marine radio communications equipment meeting the EMC requirements set out in EN IEC 61000-6-3 [i.1] and EN 61000-6-1 [i.2] is deemed to meet also the EMC requirements for the maritime environment described in EN IEC 60945 [i.3].

The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus intended to be used in the maritime environment. The levels, however, do not cover extreme cases which may occur in any location but with low probability of occurrence.

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 in the ETSI docbox.

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] EN IEC 55016-1-4:2019: "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", (produced by CENELEC).

[2] EN IEC 55016-1-1:2019: "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus", (produced by CENELEC).

[3] EN 61000-4-2:2009: "Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test", (produced by CENELEC).

[4] EN IEC 61000-4-3:2020: "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test", (produced by CENELEC).

[5] EN 61000-4-4:2012: "Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test", (produced by CENELEC).

[6] EN 61000-4-5:2014 +A1:2017: "Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test", (produced by CENELEC).

[7] EN 61000-4-6:2014: "Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields", (produced by CENELEC).

[8] EN IEC 61000-4-11:2020: "Electromagnetic compatibility (EMC) –Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase", (produced by CENELEC).

[9] EN 55016-2-3:2017/A1:2019: "Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements", (produced by CENELEC).

[10] EN 55016-2-1:2014+A1:2017: "Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements", (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.

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 may be useful in implementing an ETSI deliverable or add to the reader's understanding, but are not required for conformance to the present document.

[i.1] EN IEC 61000-6-3 (2021): "Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments", (produced by CENELEC).

[i.2] EN 61000-6-1 (2019): "Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments", (produced by CENELEC).

[i.3] EN 60945 (2002) + Corrigendum 1 (2008): "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results", (produced by CENELEC).

[i.4] Directive 2014/90/EU of the European Parliament and of the Council of 23 July 2014 on marine equipment and repealing Council Directive 96/98/EC.

[i.5] IEC 60050-161 (1990): "International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility".

[i.6] CEPT/ERC Recommendation 74-01 (2021): "Unwanted emissions in the spurious domain".

[i.7] IMO Convention: "International Convention for the Safety of Life at Sea (SOLAS)".

[i.8] 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.

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in article 2 of Directive 2014/53/EU [i.8] and the following apply:

ancillary equipment: equipment (apparatus), used in connection with a receiver, transmitter or transceiver is considered as an ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction 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); and
- the equipment cannot be used on a stand alone basis 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)

artificial antenna: non-reactive, non-radiating dummy load equal to the nominal impedance of the antenna port

NOTE: For the purpose of EMC tests, the antenna port(s) of the Equipment Under Test (EUT) are terminated with a non-radiating 50 Ω termination (artificial antenna) unless there is a requirement to apply a Radio Frequency (RF) input signal to the receiver antenna port.

Artificial Mains Network (AMN): network used to supply the mains voltage (AC or DC) and current to the Equipment Under Test (EUT)

continuous phenomena (continuous disturbance): electromagnetic disturbance, the effects of which on a particular device or equipment cannot be resolved into a succession of distinct effects

NOTE: See IEC 60050-161 [i.5].

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

enclosure port: physical boundary of the apparatus through which electromagnetic fields may radiate or impinge

NOTE: In the case of integral antenna equipment, this port is inseparable from the antenna port.

integral antenna: antenna designed to be connected directly to the equipment with or without the use of an external connector and considered to be part of the equipment

NOTE: An integral antenna may be fitted internally or externally to the equipment. An antenna which may not be removed during the tests, according to the manufacturer's statement.

mobile equipment: marine receiver, transmitter or transmitter/receiver (transceiver) intended for installation and use onboard ships

operating frequency range: range(s) of radio frequencies covered by the Equipment Under Test (EUT) without any change of units

port: particular interface, of the specified equipment (apparatus), with the electromagnetic environment

NOTE: For example, any connection point on an equipment intended for connection of cables to or from that equipment is considered as a port (see Figure 1).