ETSI EN 301 843-7 V1.1.1 (2017-11)

ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Harmonised Standard for electromagnetic compatibility; Part 7: Specific conditions for Maritime Broadband Radiolink equipment

Reference

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Keywords

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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.3] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

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

The present document is part 7 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:	17 October 2017
Date of latest announcement of this EN (doa):	31 January 2018
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 2018
Date of withdrawal of any conflicting National Standard (dow):	31 July 2019

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 301 843-1 [1], covers the assessment of Maritime Broadband Radiolink equipment (MBR) for the maritime mobile service, and ancillary equipment in respect of ElectroMagnetic Compatibility (EMC).

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

The present document specifies the applicable test conditions, performance assessment, and performance criteria for MBR equipment for the maritime mobile service, and the associated ancillary equipment.

In case of differences (for instance concerning special conditions, definitions, abbreviations) between the present document and ETSI EN 301 843-1 [1], the provisions of the present document take precedence.

The electromagnetic environment used in the present document to develop the technical specifications encompasses the electromagnetic environment on board ships as identified in IEC EN 60945 [i.1].

NOTE: The relationship between the present document and essential requirements of article 3.1b of Directive 2014/53/EU [i.2] is given in annex A.

2 References

2.1 Normative references

References are specific, identified by date of publication and/or edition number or version number. Only the cited version 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 301 843-1 (V2.2.1) (11-2017): "ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Harmonised Standard for electromagnetic compatibility; Part 1: Common technical requirements".

[2] Recommendation ITU-T O.153 (1992): "Basic parameters for the measurement of error performance at bit rates below the primary rate".

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] IEC EN 60945 (2002) + Corrigendum 1 (2008): "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".

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

[i.3] 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.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI EN 301 843-1 [1] apply.

3.2 Symbols

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

emf	electromotive force
rms	root mean square

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI EN 301 843-1 [1] and the following apply:

BER	Bit Error Rate
EMC	ElectroMagnetic Compatibility
EN	European Norm
EUT	Equipment Under Test
MBR	Maritime Broadband Radiolink
RF	Radio Frequency

4 Test conditions

4.0 Test conditions requirements

For the purposes of the present document, the test conditions of ETSI EN 301 843-1 [1], clause 4, shall apply as appropriate. Further product related test conditions for MBR are specified in the present document.

4.1 General

The provisions of ETSI EN 301 843-1 [1], clause 4.1 shall apply with the following modifications.

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

The test shall be carried out at a point within the specified normal operating environmental range of temperature and humidity with the equipment connected to the normal power supply voltage.

4.2 Arrangements for test signals

4.2.0 General

The provisions of ETSI EN 301 843-1 [1], clause 4.2 shall apply.

4.2.1 Arrangements for test signals at the input of the transmitter

The provisions of ETSI EN 301 843-1 [1], clause 4.2.1 shall apply.

4.2.2 Arrangements for test signals at the output of the transmitter

The provisions of ETSI EN 301 843-1 [1], clause 4.2.2 shall apply.

4.2.3 Arrangements for test signals at the input of the receiver

The provisions of ETSI EN 301 843-1 [1], clause 4.2.3 shall apply with the following modifications:

In the 3rd paragraph of clause 4.2.3, the last sentence: "This antenna shall be connected to the external RF signal source by a coaxial cable", should be replaced with: "The wanted RF signal shall be generated by an MBR transmitter".

4.2.4 Arrangements for test signals at the output of the receiver

The provisions of ETSI EN 301 843-1 [1], clause 4.2.4 shall apply as appropriate.

4.2.5 Arrangements for testing transmitter and receiver together (as a system)

The provisions of ETSI EN 301 843-1 [1], clause 4.2.5 shall apply as appropriate.

4.3 Exclusion bands

The provisions of ETSI EN 301 843-1 [1], clause 4.3 are not applicable.

4.4 Narrow band responses on receivers

The provisions of ETSI EN 301 843-1 [1], clause 4.4 shall apply

4.5 Normal test modulation

The provisions of ETSI EN 301 843-1 [1], clause 4.5 shall apply as applicable using an MBR message consisting of a pseudo-random bit sequency of at least 8 192 payload bits according to Recommendation ITU-T O.153 [2]. The bit modulation rate over the air shall be 10 Mb/s. The message contains a header targeting the targeted receiver identity.

5 Performance assessment

5.1 General

The provisions of ETSI EN 301 843-1 [1], clause 5.1 shall apply.

5.2 Equipment which can provide a continuous communication link

The provisions of ETSI EN 301 843-1 [1], clause 5.2 shall apply.

5.3 Equipment which does not provide a continuous communication link

The provisions of ETSI EN 301 843-1 [1], clause 5.3 shall apply.

5.4 Ancillary equipment

The provisions of ETSI EN 301 843-1 [1], clause 5.4 shall apply.

5.5 Equipment classification

Maritime mobile broadband radiolink equipment belong solely to the category of mobile marine radio equipment as defined in ETSI EN 301 843-1 [1], clause 3.1.

6 Performance criteria

6.0 General

The provisions of ETSI EN 301 843-1 [1], clause 6 shall apply.

The equipment shall meet the special performance criteria set out in clauses 6.1 to 6.4, as appropriate.

6.1 Performance criteria A for continuous phenomena applied to transmitters and receivers

The provisions of ETSI EN 301 843-1 [1], clause 6.1 shall apply.

6.2 Performance criteria B for transient phenomena applied to transmitters and receivers

The provisions of ETSI EN 301 843-1 [1], clause 6.2 shall apply with the following modifications.

During the test sequence, degradation or loss of function or performance which is self-recoverable is allowed, but the EUT shall not unintentionally transmit or change actual operating state or stored data.

6.3 Performance criteria C applied to power supply failure

The provisions of ETSI EN 301 843-1 [1], clause 6.3 shall apply.

6.4 Performance check

The provisions of ETSI EN 301 843-1 [1], clause 6.4 shall apply. The performance check consists of transmitting and receiving the test signal 2 and measuring the BER. The signal level at the receiving antenna shall be above - 80 dBm and the receiver BER shall be better than 10^{-5}.

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

The provisions of ETSI EN 301 843-1 [1], clause 6.5 shall apply.

6.6 Performance criteria for ancillary equipment tested on a stand alone basis

The provisions of ETSI EN 301 843-1 [1], clause 6.6 shall apply.

7 Applicability overview

7.1 Emission

ETSI EN 301 843-1 [1], table 1, contains the applicability of EMC emission measurements to the relevant ports of marine radio and/or associated ancillary equipment.

7.2 Immunity

7.2.1 General

ETSI EN 301 843-1 [1], table 2, contains the applicability of EMC immunity measurements to the relevant ports of marine radio and/or associated ancillary equipment.

7.2.2 Special conditions

The following special conditions set out in table 1 shall apply in addition to the immunity test methods and performance criteria used in ETSI EN 301 843-1 [1], clause 9. The wanted signal shall be generated by an MBR transmitter modulated as described in clause 4.5.

Table 1: Special conditions for EMC immunity tests

Reference to clauses in ETSI EN 301 843-1 [1]	Special product-related conditions, additional to or modifying the test conditions in ETSI EN 301 843-1 [1], clause 9
9.2.2: Test method; Radio frequency electromagnetic field	**Wanted RF input signal for the receiver under test:** A wanted receiver RF input level of -80 dBm shall be used during the test.
9.5.2: Test method; Radio frequency, Common mode	**Wanted RF input signal for the receiver under test:** A wanted receiver RF input level of -80 dBm shall be used during the test.

8 Methods of measurement and limits for EMC emissions

8.1 Test configuration

The provisions of ETSI EN 301 843-1 [1], clause 8.1 shall apply.