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Maritime Broadband Radiolink operating within the bands 5 852 MHz to 5 872 MHz and/or 5 880 MHz to 5 900 MHz for ships and off-shore installations engaged in coordinated activities; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

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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.4] 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.

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
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

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 measurements for maritime mobile broadband radiocommunication systems (MBR) radio equipment intended to operate in the 5,8 GHz band.

Table 1: Radiocommunications service frequency bands

	Radiocommunications service frequency bands
Transmit	5 852 MHz to 5 900 MHz
Receive	5 852 MHz to 5 900 MHz

The present document applies to systems utilizing integral electronically phase steered antennae applicable for communications between vessels and between vessels and platforms engaged in coordinated off-shore activities.

The present document covers the essential requirements of article 3.2 of Directive 2014/53/EU [i.1] under the conditions identified 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 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] Recommendation ITU-T E.161 (02-2001): "Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network".

[2] Recommendation ITU-T O.153 (10-1992): "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[3] ISO 25862:2009: "Ships and marine technology -- Marine magnetic compasses, binnacles and azimuth reading devices".

[4] ETSI TS 103 052 (V1.1.1) (03-2011): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiated measurement methods and general arrangements for test sites up to 100 GHz".

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] 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] ETSI TR 100 028-2 (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2".

[i.3] ETSI TR 100 028 (V1.4.1) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

[i.4] 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 Symbols and abbreviations

3.1 Symbols

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

C_F	Minimum number of frames
dB_c	Level (dB) below carrier
dBm	Level (dB) relative to 1 mW
N	Number of transmitted bits
ppm	parts per million (10^{-6})
Q	Q factor is a resonator parameter
V	Volt

3.2 Abbreviations

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

ac	alternating current
BER	Bit Error Rate
CRC	Cyclic Redundancy Check
dc	direct current
EC	European Commission
EFTA	European Free Trade Association
EIRP	Equivalent Isotropically Radiated Power
EN	European Norm
ERP	Effective Radiated power
EU	European Union
EUT	Equipment Under Test
FER	Frame Error Rate
ISO	International Organization for Standardization
ITU-T	International Telecommunication Union - Telecommunication standardization sector
LHCP	Left Hand Circular Polarization
MBR	Maritime Broadband Radiolink
RF	Radio Frequency
TR	Technical Report
TS	Technical Specification

4 General and operational requirements

4.0 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the manufacturer, but as a minimum, shall be that specified in the test conditions contained in the present document. The equipment shall comply with all the technical requirements of the present document which are identified as applicable in annex A at all times when operating within the boundary limits of the declared operational environmental profile.

4.1 Construction

The mechanical and electrical construction and finish of the equipment shall conform in all respects to good engineering practice, and the equipment shall be suitable for use on board ships.

All controls shall be of sufficient size to enable the usual control functions to be easily performed and the number of controls should be the minimum necessary for simple and satisfactory operation.

For the purpose of conformance testing, relevant technical documentation shall be supplied with the equipment.

The equipment shall be capable of operating on single frequency channels.

The MBR shall be equipped with an automatic mechanism for reducing the power level to the level necessary to achieve acceptable Bit Error Rate (BER).

It shall not be possible to transmit while any frequency synthesizer used within the transmitter is out of lock.

4.2 Controls and indicators

The equipment shall have a channel selector and shall indicate the channel at which the installation is set. The channel designator shall be legible irrespective of the external lighting conditions.

Where an input panel on the equipment for entering the digits 0 - 9 is provided, this shall conform to Recommendation ITU-T E.161 [1].

The equipment shall have the following additional controls and indicators:

- an on/off switch for the entire installation with a visual indication that the installation is in operation;
- a means for reducing the brightness of the equipment illumination to zero;
- a visual indication that the equipment is transmitting.

The equipment shall also meet the following requirements:

- the user shall not have access to any control which, if wrongly set, might impair the technical characteristics of the equipment.

4.3 Safety precautions

Measures shall be taken to protect the equipment against the effects of overcurrent or overvoltage.

Measures shall be taken to prevent damage to the equipment if the electrical power source produces transient voltage variations and to prevent any damage that might arise from an accidental reversal of polarity of the electrical power source.

Means shall be provided for earthing exposed metallic parts of the equipment.

All components and wiring in which the dc or ac voltage (other than radio-frequency voltage) produce, singly or in combination, peak voltages in excess of 50 V shall be protected against any accidental access and shall be automatically isolated from all electrical power sources if the protective covers are removed. Alternatively, the equipment shall be constructed in such a way as to prevent access to components operating at such voltages unless an appropriate tool is used such as a nut-spanner or screwdriver. Conspicuous warning labels shall be affixed both inside the equipment and on the protective covers.

The information in any volatile memory device shall be protected from interruptions in the power supply of up to 60 s duration.

4.4 Labeling

All controls, instruments, indicators and ports shall be clearly labelled.

Details of the power supply from which the equipment is intended to operate shall be clearly indicated on the equipment.

The transmitter may operate with high emitted radio power and the antenna shall be labelled with the minimum safe distance from the antenna.

The compass safe distance as defined in ISO 25862 [3] (Method B) shall be stated on the equipment or in the technical manual.

4.5 Frequencies

The equipment shall be capable of operating on the frequencies 5 862 MHz and/or 5 890 MHz.

4.6 Polarization

The equipment shall operate with vertical or left hand circular polarization (LHCP).

4.7 Antenna gain

The antenna gain shall be declared by the equipment manufacturer.

4.8 Self-monitoring

The MBR equipment shall be self-monitoring and should a malfunction be detected which could cause harmful interference, the MBR shall automatically cease its transmissions.

4.9 Adaptive transmitter power control

The MBR equipment shall have a transmitter power adaptive control where the output power of the transmitter is automatically reduced to the lowest necessary level.

The adaptive transmitter power control shall be able to reduce the MBR output power by at least 25 dB.

5 General conditions of measurements

5.1 Test site and general arrangements for measurements

Measurements of all equipment with integral antenna shall be done by radiated measurements.

Descriptions of the anechoic chamber and radiated measurement arrangements are included in ETSI TS 103 052 [4].