



**Portable Very High Frequency (VHF)
radiotelephone equipment for the
maritime mobile service operating in the VHF bands
with integrated handheld class H DSC;
Harmonised Standard covering the essential requirements
of articles 3.2 and 3.3(g) of Directive 2014/53/EU**

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Contents

Intellectual Property Rights	8
Foreword.....	8
Modal verbs terminology.....	8
1 Scope	9
2 References	9
2.1 Normative references	9
2.2 Informative references.....	10
3 Definitions, symbols and abbreviations	10
3.1 Definitions.....	10
3.2 Symbols.....	11
3.3 Abbreviations	11
4 General and operational requirements.....	11
4.0 Conformance	11
4.1 Construction	11
4.2 Controls and indicators.....	12
4.3 Microphone and loudspeaker	13
4.4 Safety precautions	13
4.5 Labelling.....	13
5 Technical requirements	13
5.0 Conformance	13
5.1 Switching time.....	13
5.2 Class of emission and modulation characteristics	14
5.3 Battery capacity.....	14
5.4 DSC functionality.....	14
6 General conditions of measurement	14
6.1 Arrangements for RF connections to the equipment	14
6.1.1 RF connections to integral antenna equipment	14
6.1.2 RF connection to equipment with a detachable antenna	14
6.2 Arrangements for test signals applied to the receiver input.....	14
6.3 Squelch	15
6.4 Normal test modulation	15
6.5 Artificial antenna.....	15
6.6 Arrangements for test signals applied to the transmitter input	15
6.7 Test channels	15
6.8 Test conditions, power sources and ambient temperatures.....	15
6.8.1 Normal and extreme test conditions.....	15
6.8.2 Test power source	15
6.9 Normal test conditions.....	16
6.9.1 Normal temperature and humidity	16
6.9.2 Normal power sources	16
6.9.2.1 Battery power source.....	16
6.9.2.2 Other power sources.....	16
6.10 Extreme test conditions	16
6.10.0 General.....	16
6.10.1 Extreme temperatures	16
6.10.2 Extreme values of test power sources	16
6.10.2.1 Battery power source.....	16
6.10.2.2 Other power sources.....	16
6.11 Procedure for tests at extreme temperatures	17
6.12 Reference Bandwidths for emission measurements	17
7 Environmental tests	17
7.1 Procedure.....	17

7.2	Performance check	17
7.3	Drop test	17
7.3.1	Definition	17
7.3.2	Method of measurement	18
7.3.3	Requirement	18
7.4	Temperature tests	18
7.4.1	Definition	18
7.4.2	Dry heat	18
7.4.2.1	Definition	18
7.4.2.2	Method of measurement	18
7.4.2.3	Requirement	18
7.4.3	Damp heat	19
7.4.3.1	Definition	19
7.4.3.2	Method of measurement	19
7.4.3.3	Requirement	19
7.4.4	Low temperature cycle	19
7.4.4.1	Definition	19
7.4.4.2	Method of measurement	19
7.4.4.3	Requirement	19
8	Transmitter	20
8.0	General	20
8.1	Frequency error	20
8.1.1	Definition	20
8.1.2	Method of measurement	20
8.1.3	Limits	20
8.2	Carrier power	20
8.2.1	Definitions	20
8.2.2	Method of measurement	20
8.2.3	Limits, Normal and extreme test conditions	20
8.3	Frequency deviation	21
8.3.1	Definition	21
8.3.2	Maximum permissible frequency deviation	21
8.3.2.1	Method of measurement	21
8.3.2.2	Limits	21
8.3.3	Reduction of frequency deviation at modulation frequencies above 3 kHz	21
8.3.3.1	Method of measurement	21
8.3.3.2	Limits	21
8.4	Sensitivity of the modulator, including microphone	22
8.4.1	Definition	22
8.4.2	Method of measurement	22
8.4.3	Limits	22
8.5	Audio frequency response	22
8.5.1	Definition	22
8.5.2	Method of measurement	23
8.5.3	Limit	23
8.6	Audio frequency harmonic distortion of the emission	24
8.6.1	Definition	24
8.6.2	Method of measurement	24
8.6.2.0	General	24
8.6.2.1	Normal test conditions	24
8.6.2.2	Extreme test conditions	24
8.6.3	Limits	24
8.7	Adjacent channel power	24
8.7.1	Definition	24
8.7.2	Method of measurement	24
8.7.3	Limits	25
8.8	Conducted spurious emissions conveyed to the antenna	25
8.8.1	Definition	25
8.8.2	Method of measurement	25
8.8.3	Limit	25
8.9	Cabinet radiation and conducted spurious emissions other than those conveyed to the antenna	25

8.9.1	Definitions	25
8.9.2	Method of measurement	26
8.9.3	Limits.....	27
8.10	Residual modulation of the transmitter	27
8.10.1	Definition.....	27
8.10.2	Method of measurement	27
8.10.3	Limit	27
8.11	Transient frequency behaviour of the transmitter.....	27
8.11.1	Definitions	27
8.11.2	Method of measurement	28
8.11.3	Limits.....	31
8.12	Frequency error (demodulated DSC signal).....	31
8.12.1	Definition.....	31
8.12.2	Method of measurement	31
8.12.3	Limits.....	31
8.13	Modulation index for DSC	31
8.13.1	Definition.....	31
8.13.2	Method of measurement	31
8.13.3	Limits.....	31
8.14	Modulation rate for DSC.....	31
8.14.1	Definition.....	31
8.14.2	Method of measurement	32
8.14.3	Limits.....	32
8.15	Testing of free channel transmission on DSC channel 70.....	32
8.15.1	Definition.....	32
8.15.2	Method of measurement	32
8.15.3	Requirement.....	32
9	Receiver.....	33
9.1	Harmonic distortion and rated audio frequency output power.....	33
9.1.1	Definition.....	33
9.1.2	Methods of measurement.....	33
9.1.3	Limits.....	33
9.2	Audio frequency response	33
9.2.1	Definition.....	33
9.2.2	Method of measurement	33
9.2.3	Limits.....	34
9.3	Maximum usable sensitivity.....	34
9.3.1	Definition.....	34
9.3.2	Method of measurement	35
9.3.3	Limits.....	35
9.4	Co-channel rejection.....	35
9.4.1	Definition.....	35
9.4.2	Method of measurement	35
9.4.3	Limit	35
9.5	Adjacent channel selectivity.....	36
9.5.1	Definition.....	36
9.5.2	Method of measurement	36
9.5.3	Limits.....	36
9.6	Spurious response rejection.....	36
9.6.1	Definition.....	36
9.6.2	Method of measurement	36
9.6.3	Limit	37
9.7	Intermodulation response	37
9.7.1	Definition.....	37
9.7.2	Method of measurement	37
9.7.3	Limit	37
9.8	Blocking or desensitization	37
9.8.1	Definition.....	37
9.8.2	Method of measurement	38
9.8.3	Limit	38
9.9	Conducted spurious emissions	38

9.9.1	Definition.....	38
9.9.2	Method of measurement	38
9.9.3	Limit	38
9.10	Radiated spurious emissions.....	38
9.10.1	Definition.....	38
9.10.2	Method of measurements.....	39
9.10.3	Limit	39
9.11	Receiver noise and hum level.....	40
9.11.1	Definition.....	40
9.11.2	Method of measurement	40
9.11.3	Limit	40
9.12	Squelch operation.....	40
9.12.1	Definition.....	40
9.12.2	Method of measurement	40
9.12.3	Limits.....	41
9.13	Squelch hysteresis	41
9.13.1	Definition.....	41
9.13.2	Method of measurement	41
9.13.3	Limit	41
10	DSC Signalling.....	41
10.1	Test Method.....	41
10.2	Display	41
10.3	GNSS receiver.....	42
10.4	Individual DSC calls	42
10.5	All ships calls	42
10.6	DSC call functionality.....	42
10.7	DSC message composition.....	42
10.8	Prioritized wait	42
10.9	Alarms	42
10.10	Standby.....	42
10.11	GNSS fix - sending distress.....	42
10.12	Tasks - sending distress	42
10.13	Display - sending distress.....	42
10.14	Distress button sub procedure	43
10.15	Void.....	43
10.16	Updating position	43
10.17	Handling received DSC messages - sending distress	43
10.18	Alarms - sending distress	43
10.19	Determining subsequent communications - sending distress	43
10.20	Automated tuning - sending distress	43
10.21	Cancelling the distress alert.....	43
10.22	Acknowledgements - sending distress.....	43
10.23	Termination - sending distress.....	43
10.24	Warnings - sending distress.....	43
10.25	Tasks - receiving distress	44
10.26	Display - receiving distress	44
10.27	Handling received DSC messages - receiving distress.....	44
10.28	Alarms - receiving distress	44
10.29	Determining subsequent communications - receiving distress.....	44
10.30	Automated tuning - receiving distress	44
10.31	Acknowledgements - receiving distress	44
10.32	Termination - receiving distress	44
10.33	Warnings - receiving distress	44
10.34	Tasks - sending non distress.....	44
10.35	Display - sending non distress.....	44
10.36	Handling received DSC messages - sending non distress	45
10.37	Alarms - sending non distress.....	45
10.38	Automated tuning - sending non distress	45
10.39	Delayed acknowledgements - sending non distress.....	45
10.40	Termination - sending non distress.....	45
10.41	Warnings - sending non distress.....	45

10.42	Tasks - receiving non distress.....	45
10.43	Display - receiving non distress	45
10.44	Handling received DSC messages - receiving non distress.....	45
10.45	Alarms - receiving non distress	45
10.46	Automated tuning - receiving non distress	45
10.47	Acknowledgements - receiving non distress	45
10.48	Termination - receiving non distress	46
10.49	Warnings - receiving non distress	46
10.50	Communication automated procedure.....	46
10.51	Tasks - communication	46
10.52	Display - communication	46
10.53	Handling received DSC messages - communication.....	46
10.54	Tuning of the receiver and transmitter - communication	46
10.55	Termination - communication	46
10.56	Tasks of handling incoming calls while engaged.....	46
10.57	Termination of automated procedures.....	46
10.58	Actions after termination of an automated procedure	46
10.59	Putting automated procedures on hold	47
10.60	Controlling non-terminated automated procedures on hold	47
11	Testing for compliance with technical requirements.....	47
11.1	Environmental conditions for testing	47
11.2	Interpretation of the measurement results	47
Annex A (informative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU.....	49
Annex B (normative):	Measuring receiver for adjacent channel power measurement.....	52
B.1	Power measuring receiver specification.....	52
B.1.0	General	52
B.1.1	IF filter	52
B.1.2	Attenuation indicator.....	53
B.1.3	Rms value indicator.....	53
B.1.4	Oscillator and amplifier.....	53
Annex C (informative):	DSC test calls.....	54
C.1	Interoperability tests.....	54
Annex D (informative):	Change History	55
History		56

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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.8] 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.5].

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 tables A.1 and A.2 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 states the minimum technical characteristics and methods of measurement required for portable Very High Frequency (VHF) radiotelephones with integrated handheld class H DSC operating in certain frequency bands allocated to the maritime mobile service using either 25 kHz channels or 25 kHz and 12,5 kHz channels. The present document does not cover requirements for the integrated GNSS receiver providing locating function.

The present document also specifies technical characteristics, methods of measurement and required test results.

The present document covers the essential requirements of articles 3.2 and 3.3(g) of Directive 2014/53/EU [i.5] 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 <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] ITU Radio Regulations (2016), appendix 18: "Table of transmitting frequencies in the VHF maritime mobile band".
- [2] Recommendation ITU-T E.161 (2001): "Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network".
- [3] Recommendation ITU-R M.493-14 (2015): "Digital selective-calling system for use in the maritime mobile service".
- [4] ETSI EN 300 225 (V1.5.1) (12-2015): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical characteristics and methods of measurement for survival craft portable VHF radiotelephone apparatus".
- [5] Recommendation ITU-R M.1084-5 (2012): "Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service".
- [6] ETSI EN 300 338-5 (V1.2.0) (11-2016) : "Technical characteristics and methods of measurement for equipment for generation, transmission and reception of Digital Selective Calling (DSC) in the maritime MF, MF/HF and/or VHF mobile service; Part 5: Handheld VHF Class H DSC".
- [7] CENELEC EN 61108 (all parts) (1998 - 2003 - 2004 - 2010): "Maritime navigation and radiocommunication equipment and systems - Global navigation satellite systems (GNSS)".
- [8] CENELEC EN 60529:1991/A2:2013: "Degrees of protection provided by enclosures (IP Code)".
- [9] 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

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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] ETSI TS 101 570-5 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Interoperability Testing for Maritime Digital Selective Calling (DSC) Radios; Part 5: Handheld VHF Class D Test Descriptions".
- [i.2] Recommendation ITU-R M.541-10 (2015): "Operational procedures for the use of digital selective-calling equipment in the maritime mobile service".
- [i.3] Recommendation ITU-T O.41 (1994): "Psophometer for use on telephone-type circuits".
- [i.4] Recommendation ITU-R SM.332-4 (1978): "Selectivity of receivers".
- [i.5] 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.6] ETSI TR 100 028-1 (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1".
- [i.7] 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.8] 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 following terms and definitions apply:

block: to inhibit a function by making it inaccessible from the user interface

detachable antenna: antenna fixed to the equipment by means of an antenna connector and detachable by the user

G3E: phase-modulation (frequency modulation with a pre-emphasis of 6 dB/octave) for speech

integral antenna: antenna that is permanently fixed to the equipment and not detachable by the user

modulation index: ratio between the frequency deviation and the modulation frequency

performance check: check of:

- the transmitter carrier power and frequency; and
- receiver sensitivity

3.2 Symbols

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

dBa Relative to 2×10^{-5} Pa

3.3 Abbreviations

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

ad	amplitude difference
AIS	Automatic Identification System
CSP	Channel SPacing
DC	Direct Current
DSC	Digital Selective Calling
EFTA	European Free Trade Association
emf	electromotive force
EU	European Union
EUT	Equipment Under Test
fd	frequency difference
FM	Frequency Modulation
FSK	Frequency Shift Keying
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
IF	Intermediate Frequency
ITU-R	International Telecommunication Union - Radiocommunication Sector
ITU-T	International Telecommunication Union - Telecommunication Sector
MPFD	Maximum Permissible Frequency Deviation
RBW	Reference BandWidth
RF	Radio Frequency
rms	root mean square
RT	Radio Telephony
SINAD	(Signal + Noise + Distortion)/(Noise + Distortion)
VHF	Very High Frequency

4 General and operational requirements

4.0 Conformance

The manufacturer shall declare that compliance to the requirements of clause 4 is achieved and shall provide relevant documentation.

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.

All parts of the equipment to be checked during inspection or maintenance operations shall be readily accessible. The components shall be readily identifiable.

Technical documentation shall be supplied with the equipment.

The VHF maritime mobile service uses both single-frequency and two-frequency channels. For two-frequency channels there shall be a separation of 4,6 MHz between the transmitting frequency and the receiving frequency (see ITU Radio Regulations appendix 18 [1]).

The equipment shall incorporate an integrated GNSS receiver. Manufacturers shall provide evidence that the GNSS device complies with the applicable part of CENELEC 61108 series [7], i.e. part 1 for a GPS receiver, part 2 for a GLONASS receiver and part 3 for a Galileo receiver.

The equipment shall have minimum protection levels of IP54 as specified in clauses 5 and 6 of CENELEC EN 60529 [8].

The equipment shall be capable of operating on single frequency and two-frequency channels with manual control (simplex).

The equipment shall be of a colour which distinguishes it from the portable VHF equipment specified in ETSI EN 300 225 [4].

The equipment shall be able to operate on appropriate channels defined in ITU Radio Regulations, appendix 18 [1], noting in particular footnotes m) and e).

Additional VHF channels for maritime use outside those defined by Appendix 18 to the Radio Regulations may also be provided where permitted by relevant administrations. These channels shall be clearly identified for use as relating to the relevant administration(s) and accessed through a positive action(s) for enabling use of these channel(s) but means shall be provided to block any or all of these additional channels if required by the relevant administration(s).

If 12,5 kHz channels are implemented in the equipment it shall be in accordance with annex 4 of Recommendation ITU-R M.1084-5 [5].

The equipment shall be so designed that use of channel 70 for purposes other than DSC is prevented (see Recommendations ITU-R M.493-14 [3] and M.541-10 [i.2]), and that use of channels AIS1 and AIS2 for purposes other than AIS is prevented.

Scan or multiple watch may be provided but means shall be provided to block or unblock these functions.

If the equipment is fitted with an auxiliary antenna connector, simultaneous connection of both the auxiliary antenna and the normal antenna shall be prevented.

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

It shall not be possible to transmit during channel switching operations.

4.2 Controls and indicators

The equipment shall have a channel selector and shall indicate the designator, as shown in ITU Radio Regulations, appendix 18 [1], of the channel at which the equipment is set. The channel designator shall be legible irrespective of the external lighting conditions.

Channel 16 shall be distinctively marked. Selection of channel 16, shall be preferably by readily accessible means (e.g. a distinctively marked key). Selection of channel 16 by any means shall automatically set the transmitter output power to maximum. This power level may subsequently be reduced by manual user control if required.

Where an input panel on the equipment for entering the digits 0 to 9 is provided, this shall conform to Recommendation ITU-T E.161 [2].

The equipment shall have the following additional controls and indicators:

- on/off switch for the equipment with a visual indication that the equipment is in operation;
- a manual, non-locking push to talk switch to operate the transmitter with a visual indication that the transmitter is activated and facilities to limit the transmission time to a maximum of 5 minutes. A short audible alarm and a visual indication may be provided to show when the transmission will be automatically terminated within the next 10 s. It shall be possible to reoperate the push to talk switch and reactivate the transmitter after a 10 s period;
- a switch for reducing transmitter output power to no more than 1 W where the RF output power is more than 1 W;
- an audio frequency power volume control;

- a squelch control;
- a visual indication that the transmitter is activated.

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 Microphone and loudspeaker

The equipment shall be fitted with an integral microphone and an integral loudspeaker.

During transmission the receiver output shall be muted.

4.4 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 that might arise from an accidental reversal of polarity of the electrical power source.

No damage to the equipment shall occur when the antenna terminals are placed on open circuit or short circuit while transmitting for a period of at least 5 minutes in each case.

In order to provide protection against damage due to the build-up of static voltages at the antenna terminals, there shall be a dc path from the antenna terminals to chassis not exceeding 100 k Ω .

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

4.5 Labelling

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

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

The compass safe distance shall be stated on the equipment.

5 Technical requirements

5.0 Conformance

The manufacturer shall declare that compliance to the requirements of clause 5 is achieved and shall provide relevant documentation.

5.1 Switching time

The channel switching arrangement shall be such that the time necessary to change over from using one of the channels to using any other channel does not exceed 5 s.

The time necessary to change over from transmission to reception or vice versa, shall not exceed 0,3 s.