

STN	Technické vlastnosti a metódy merania rádiových telefónnych zariadení VHF na všeobecné komunikácie a príslušné zariadenia triedy D digitálneho selektívneho volania (DSC) Harmonizovaná norma pre prístup k rádiovému spektru a pre funkcie pre pohotovostné služby	STN EN 301 025 V2.3.1 87 1025
------------	--	---

VHF radiotelephone equipment for general communications and associated equipment for Class "D" Digital Selective Calling (DSC);
Harmonised Standard for access to radio spectrum and for features for emergency services

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 05/22

Obsahuje: EN 301 025 V2.3.1:2021

134811

ETSI EN 301 025 V2.3.1 (2021-12)



HARMONISED EUROPEAN STANDARD

**VHF radiotelephone equipment for general communications
and associated equipment for Class "D"
Digital Selective Calling (DSC);
Harmonised Standard for access to radio spectrum and
for features for emergency services**

Reference

REN/ERM-TGMAR-608

KeywordsDSC, harmonised standard, maritime, radio, traffic,
VHF**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

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2021.
All rights reserved.

Contents

Intellectual Property Rights	9
Foreword.....	9
Modal verbs terminology.....	10
1 Scope	11
2 References	11
2.1 Normative references	11
2.2 Informative references.....	12
3 Definition of terms, symbols and abbreviations.....	12
3.1 Terms.....	12
3.2 Symbols.....	13
3.3 Abbreviations	13
4 General and operational requirements.....	13
4.1 General	13
4.2 Composition	14
4.3 Controls and indicators.....	14
4.4 Display	14
4.5 Handset and loudspeaker.....	15
4.6 Labelling.....	15
4.7 GNSS receiver antenna	15
5 General technical requirements	15
5.1 Warm up.....	15
5.2 Switching time.....	15
5.3 DSC operation	15
5.3.1 General.....	15
5.4 Multiple watch facilities	15
5.4.1 General.....	15
5.4.2 Scanning provisions.....	16
5.4.3 Test for Priority Channel Scanning Procedure.....	16
5.5 Availability of position data	16
5.5.1 General.....	16
5.5.2 Test for DSC Radios with a GNSS position data interface only.....	17
5.5.3 Test for DSC Radios with an integrated GNSS receiver only	17
5.5.4 Test for DSC Radios with an integrated GNSS receiver and a GNSS position data interface.....	17
6 General conditions of measurement	17
6.1 Arrangements for test signals applied to the receiver input.....	17
6.2 Squelch.....	18
6.3 Transmission time limitation	18
6.4 Normal test modulation	18
6.5 Artificial antenna.....	18
6.6 Arrangements for test signals applied to the transmitter input	18
6.7 Test channels	18
6.8 Generation and examination of the digital selective call signal	18
6.9 Standard test signals for DSC.....	19
6.10 Determination of the symbol error ratio in the output of the receiving part.....	19
6.11 Arrangements for monitoring the receiver output	19
6.12 Test conditions, power sources, and ambient temperatures.....	19
6.12.1 Normal and extreme test conditions.....	19
6.12.2 Test power source	19
6.13 Normal test conditions.....	20
6.13.1 Normal temperature and humidity	20
6.13.2 Normal power sources	20
6.13.2.1 Battery power source.....	20
6.13.2.2 Other power sources.....	20

6.14	Extreme test conditions	20
6.14.1	Extreme temperatures	20
6.14.2	Extreme values of test power sources	20
6.14.2.1	Battery power source.....	20
6.14.2.2	Other power sources.....	20
6.15	Procedure for tests at extreme temperatures	20
6.16	Reference Bandwidths for emission measurements	21
7	Environmental tests	21
7.1	Introduction	21
7.2	Procedure.....	21
7.3	Performance check	21
7.4	Vibration test.....	22
7.4.1	Definition.....	22
7.4.2	Method of measurement	22
7.4.3	Requirement.....	22
7.5	Temperature tests	22
7.5.1	Definition.....	22
7.5.2	Dry heat	22
7.5.2.1	Definition	22
7.5.2.2	Method of measurement.....	23
7.5.2.3	Requirement.....	23
7.5.3	Damp heat.....	23
7.5.3.1	Definition	23
7.5.3.2	Method of measurement.....	23
7.5.3.3	Requirement.....	23
7.5.4	Low temperature.....	23
7.5.4.1	Definition	23
7.5.4.2	Method of measurement.....	23
7.5.4.3	Requirement.....	23
8	Transmitter	24
8.1	Frequency error	24
8.1.1	Definition.....	24
8.1.2	Method of measurement	24
8.1.3	Limits.....	24
8.2	Carrier power.....	24
8.2.1	Definition.....	24
8.2.2	Method of measurement	24
8.2.3	Limits.....	24
8.2.3.1	Normal test conditions	24
8.2.3.2	Extreme test conditions	25
8.3	Frequency deviation	25
8.3.1	Definition.....	25
8.3.2	Maximum permissible frequency deviation.....	25
8.3.2.1	Method of measurement.....	25
8.3.2.2	Limits	25
8.3.3	Reduction of frequency deviation at modulation frequencies above 2,55 kHz.....	25
8.3.3.1	Method of measurement.....	25
8.3.3.2	Limits	25
8.4	Sensitivity of the modulator, including microphone	26
8.4.1	Definition.....	26
8.4.2	Method of measurement	26
8.4.3	Limits.....	26
8.5	Audio frequency response	27
8.5.1	Definition.....	27
8.5.2	Method of measurement	27
8.5.3	Limit	27
8.6	Audio frequency harmonic distortion of the emission.....	28
8.6.1	Definition.....	28
8.6.2	Method of measurement	28
8.6.2.1	General	28

8.6.2.2	Normal test conditions	28
8.6.2.3	Extreme test conditions	28
8.6.3	Limits.....	28
8.7	Adjacent channel power	28
8.7.1	Definition.....	28
8.7.2	Method of measurement	28
8.7.3	Limits.....	29
8.8	Conducted spurious emissions conveyed to the antenna	29
8.8.1	Definition.....	29
8.8.2	Method of measurement	29
8.8.3	Limit	29
8.9	Cabinet radiation and conducted spurious emissions other than those conveyed to the antenna	30
8.9.1	Definitions	30
8.9.2	Method of measurement	30
8.9.3	Limits.....	31
8.10	Transient frequency behaviour of the transmitter.....	31
8.10.1	Definitions	31
8.10.2	Method of measurement	31
8.10.3	Limits.....	34
8.11	Residual modulation of the transmitter	34
8.11.1	Definition.....	34
8.11.2	Method of measurement	34
8.11.3	Limit	34
8.12	Frequency error (demodulated DSC signal).....	34
8.12.1	Definition.....	34
8.12.2	Method of measurement	34
8.12.3	Limits.....	35
8.13	Modulation index for DSC	35
8.13.1	Definition.....	35
8.13.2	Method of measurement	35
8.13.3	Limits.....	35
8.14	Modulation rate for DSC.....	35
8.14.1	Definition.....	35
8.14.2	Method of measurement	35
8.14.3	Limits.....	35
8.15	Free channel transmission on DSC channel 70	35
8.15.1	Definition.....	35
8.15.2	Method of measurement	36
8.15.3	Requirement.....	36
8.16	Protection of the transmitter	36
8.16.1	Definition.....	36
8.16.2	Method of measurement	36
8.16.3	Limits.....	36
9	Radiotelephone receiver.....	37
9.1	Harmonic distortion and rated audio-frequency output power	37
9.1.1	Definition.....	37
9.1.2	Methods of measurement.....	37
9.1.3	Limits.....	37
9.2	Audio frequency response	37
9.2.1	Definition.....	37
9.2.2	Method of measurement	37
9.2.3	Limits.....	38
9.3	Maximum usable sensitivity.....	38
9.3.1	Definition.....	38
9.3.2	Method of measurement	38
9.3.3	Limits.....	39
9.4	Co-channel rejection.....	39
9.4.1	Definition.....	39
9.4.2	Method of measurement	39
9.4.3	Limit	39
9.5	Adjacent channel selectivity.....	39

9.5.1	Definition.....	39
9.5.2	Method of measurement	40
9.5.3	Limits.....	40
9.6	Spurious response rejection.....	40
9.6.1	Definition.....	40
9.6.2	Method of measurement	40
9.6.3	Limit	40
9.7	Intermodulation response	41
9.7.1	Definition.....	41
9.7.2	Method of measurement	41
9.7.3	Limit	41
9.8	Blocking or desensitization	41
9.8.1	Definition.....	41
9.8.2	Method of measurement	41
9.8.3	Limit	42
9.9	Spurious emissions	42
9.9.1	Definition.....	42
9.9.2	Method of measuring the power level	42
9.9.3	Limit	42
9.10	Receiver radiated spurious emissions.....	42
9.10.1	Definition.....	42
9.10.2	Method of measurements.....	42
9.10.3	Limit	43
9.11	Receiver residual noise level.....	43
9.11.1	Definition.....	43
9.11.2	Method of measurement	43
9.11.3	Limit	43
9.12	Squelch operation.....	44
9.12.1	Definition.....	44
9.12.2	Method of measurement	44
9.12.3	Limits.....	44
9.13	Squelch hysteresis	44
9.13.1	Definition.....	44
9.13.2	Method of measurement	45
9.13.3	Limit	45
9.14	Multiple watch characteristic	45
9.14.1	Definition.....	45
9.14.2	Method of measurement	45
9.14.3	Limits.....	45
9.15	Receiver Dynamic range	46
9.15.1	Definition.....	46
9.15.2	Method of measurement	46
9.15.3	Limits.....	46
10	Receiver for DSC decoder.....	46
10.1	Maximum usable sensitivity.....	46
10.1.1	Definition.....	46
10.1.2	Method of measurement	46
10.1.3	Limits.....	46
10.2	Co-channel rejection.....	47
10.2.1	Definition.....	47
10.2.2	Method of measurement	47
10.2.3	Limits.....	47
10.3	Adjacent channel selectivity.....	47
10.3.1	Definition.....	47
10.3.2	Method of measurement	47
10.3.3	Limits.....	47
10.4	Spurious response and blocking immunity.....	48
10.4.1	Definition.....	48
10.4.2	Method of measurement	48
10.4.3	Limits.....	48
10.5	Intermodulation response	48

10.5.1	Definition.....	48
10.5.2	Method of measurement	48
10.5.3	Limits.....	48
10.6	Dynamic range	49
10.6.1	Definition.....	49
10.6.2	Method of measurement	49
10.6.3	Limit	49
10.7	Simultaneous reception	49
10.7.1	Definition.....	49
10.7.2	Method of measurement	49
10.7.3	Limits.....	49
10.8	DSC Signalling.....	49
10.8.1	Display.....	49
10.8.2	Watchkeeping receiver	50
10.8.3	Individual DSC calls.....	50
10.8.4	All ships calls.....	50
10.8.5	DSC call functionality	50
10.8.6	DSC message composition	50
10.8.7	Prioritized wait.....	50
10.8.8	Alarms	50
10.8.9	Standby	50
10.8.10	Sending distress automated requirements	50
10.8.11	Display- sending distress	50
10.8.12	Distress button sub procedure.....	50
10.8.13	Transmission of the alert attempt.....	51
10.8.14	Updating position.....	51
10.8.15	Handling received DSC messages - sending distress.....	51
10.8.16	Alarms - sending distress.....	51
10.8.17	Determining subsequent communications - sending distress.....	51
10.8.18	Automated tuning - sending distress.....	51
10.8.19	Cancelling the distress alert	51
10.8.20	Acknowledgements - sending distress	51
10.8.21	Termination - sending distress.....	51
10.8.22	Warnings - sending distress	51
10.8.23	Tasks - receiving distress.....	51
10.8.24	Display - receiving distress.....	52
10.8.25	Handling received DSC messages - receiving distress	52
10.8.26	Alarms - receiving distress	52
10.8.27	Determining subsequent communications - receiving distress	52
10.8.28	Automated tuning - receiving distress	52
10.8.29	Acknowledgements - receiving distress.....	52
10.8.30	Termination - receiving distress.....	52
10.8.31	Warnings - receiving distress.....	52
10.8.32	Tasks - sending non distress	52
10.8.33	Display - sending non distress	52
10.8.34	Handling received DSC messages - sending non distress.....	52
10.8.35	Alarms - sending non distress	53
10.8.36	Automated tuning - sending non distress.....	53
10.8.37	Delayed acknowledgements - sending non distress	53
10.8.38	Termination - sending non distress	53
10.8.39	Warnings - sending non distress	53
10.8.40	Tasks - receiving non distress	53
10.8.41	Display - receiving non distress.....	53
10.8.42	Handling received DSC messages - receiving non distress	53
10.8.43	Alarms - receiving non distress.....	53
10.8.44	Automated tuning - receiving non distress	53
10.8.45	Acknowledgements - receiving non distress.....	53
10.8.46	Termination - receiving non distress.....	54
10.8.47	Warnings - receiving non distress.....	54
10.8.48	Communication automated procedure	54
10.8.49	Tasks - communication.....	54
10.8.50	Display - communication.....	54

10.8.51	Handling received DSC messages - communication	54
10.8.52	Tuning of the receiver and transmitter - communication.....	54
10.8.53	Termination - communication.....	54
10.8.54	Tasks of handling incoming calls while engaged	54
10.8.55	Termination of automated procedures	54
10.8.56	Actions after termination of an automated procedure.....	54
10.8.57	Putting automated procedures on hold.....	55
10.8.58	Controlling non-terminated automated procedures on hold.....	55
11	Testing for compliance with technical requirements.....	55
11.1	Test conditions, power supply and ambient temperatures.....	55
Annex A (informative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU	56
Annex B (normative):	Measuring receiver for adjacent channel power measurement.....	60
B.1	Power measuring receiver specification.....	60
B.1.1	General	60
B.1.2	IF filter	60
B.1.3	Attenuation indicator.....	61
B.1.4	r.m.s. value indicator	61
B.1.5	Oscillator and amplifier.....	61
Annex C (informative):	Maximum measurement uncertainty	62
Annex D (informative):	Checklist	63
Annex E (informative):	Change History	64
History		65

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 Web server (<https://ipr.etsi.org/>).

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™** and **LTE™** 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 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.5] 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.3].

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.

National transposition dates	
Date of adoption of this EN:	21 December 2021
Date of latest announcement of this EN (doa):	31 March 2022
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2022
Date of withdrawal of any conflicting National Standard (dow):	30 September 2023

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.

1 Scope

The present document specifies technical characteristics and methods of measurements for VHF radiotelephone with the following characteristics:

- operating in the channels and frequencies specified in the ITU Radio Regulations appendix 18 [1] as applicable, allocated to the maritime mobile service;
- using either 25 kHz or 12,5 kHz channels and associated equipment for DSC - class D;
- capable of operating on single frequency and two-frequency channels with manual control (simplex);
- supporting dual frequency simplex operation only;
- using phase modulation, G3E (frequency modulation with pre-emphasis of 6 dB/octave) for speech, and G2B for DSC signalling.

Full duplex operation is not supported.

The present document does not provide technical requirements for conformance with the essential requirements of Directive 2014/53/EU [i.3] for any integrated GNSS receiver providing locating function.

NOTE 1: Additional VHF channels for maritime use outside those defined by appendix 18 to the ITU Radio Regulations [1] may also be provided where permitted by administration.

NOTE 2: The relationship between the present document and essential requirements of article 3.2 and article 3.3(g) of Directive 2014/53/EU [i.3] 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.

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 (2020).
- [2] ETSI EN 300 338-3 (V1.3.1) (06-2020): "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 3: Class D DSC".
- [3] Recommendation ITU-R M.493-15 (01/2019): "Digital selective-calling system for use in the maritime mobile service".
- [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".
- [5] Recommendation ITU-T O.41 (1994): "Psophometer for use on telephone-type circuits".

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] IMO Circular MSC/Circ-803: "Participation of non-SOLAS ships in the Global Maritime Distress and Safety System (GMDSS)".
- [i.2] Recommendation ITU-R SM.332-4 (07/78): "Selectivity of receivers".
- [i.3] 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.4] IEC 60945 (4th Edition 08-2002): "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".
- [i.5] 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.6] ETSI EG 203 336 (V1.2.1): "Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".

koniec náhľadu – text ďalej pokračuje v platenej verzii STN