Final draft ETSI EN 300 220-2 V3.3.1 (2025-01)

Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz with power levels ranging up to 500 mW e.r.p.; Part 2: Harmonised Standard for access to radio spectrum for non specific radio equipment

Reference
REN/ERM-TG28-566

Keywords
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Foreword

This final 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 Vote phase of the ETSI Standardisation Request deliverable Approval Procedure (SRdAP).

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.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.

For non EU countries the present document may be used for regulatory (Type Approval) purposes.

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):	36 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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Introduction

The present document is part 2 of a multi-part deliverable covering Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz.

Compared to earlier versions, the concept of wanted channel is replaced by Operating Channel for all equipment, equipment transmitting analog voice are not anymore excluded from the scope, a clarification has been made regarding the maximum occupied bandwidth requirement which is now split into two different requirements: occupied bandwidth and transmitter frequency stability in order to clearly separate the impact of Tx frequency drift on the transmitted signal, from the spectrum broadening due to modulation. Out of band transmission masks have also been split into two different requirements, one spectrum mask applying to the operating channel and a separate spectrum mask applying to the permitted frequency band. Adjacent channel power limits have been reviewed as a discrepancy in values was corrected. New receiver requirements have been added according to the ETSI EG 203 336 [i.4] on Rx parameters. Some of these parameters were previously only applicable to specific life critical application with extremely high receiver performances also called Receiver Category 1. Although the requirements are now applied generally, the limits have been adapted to non specific SRD category. Tests for timing compliance of equipment using polite spectrum access have been added.

The intended use of radio equipment is provided in equipment documentation according to article 10 of the Radio Equipment Directive 2014/53/EU [i.2].

The present document is structured as follows:

- Clause 2 provides references.
- Clause 3 provides definitions of terms, symbols and abbreviations used.
- Clause 4 provides operating conditions and technical requirements specification.
- Clause 5 provides testing for compliance with technical requirements.
- Annex A (informative) provides the relationship between the present document and the essential requirements of Directive 2014/53/EU [i.2].
- Annex B (normative): EU wide harmonised national radio interfaces from 25 MHz to 1 000 MHz.
- Annex C (normative): National Radio Interfaces not EU wide harmonised.
- Annex D (normative): Test sites and arrangements for radiated measurement.
- Annex E (normative): Test fixture.
- Annex F (informative): Guideline for operating channel.
- Annex G (informative): Properties of EUT.
- Annex H (informative): Maximum measurement uncertainty.
- Annex I (informative): Selection of technical parameters.
- Annex J (informative): Bibliography.
- Annex K (informative): Change history.

1 Scope

The present document specifies technical requirements, limits and test methods for Short Range Devices in the non-specific category operating in the frequency range 25 MHz to 1 000 MHz.

The non specific SRD category is defined by the EU Commission Decision 2019/1345/EU [i.3] as:

"The non-specific short-range device category covers all kinds of radio devices, regardless of the application or the purpose, which fulfil the technical conditions as specified for a given frequency band. Typical uses include telemetry, telecommand, alarms, data transmissions in general and other applications".

These radio equipment types are capable of transmitting up to 500 mW effective radiated power and operating indoor or outdoor.

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

Not applicable.

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] CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)", June 2024.

[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 (EU) 2022/180 of 8 February 2022 amending Decision 2006/771/EC as regards the update ofharmonised technical conditions in the area of radio spectrum use for short-range devices.

[i.4] 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".

[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] ECC Report 200: "Co-existence studies for proposed SRD and RFID applications in the frequency band 870-876 MHz and 915-921 MHz", September 2013.

[i.7] Recommendation ITU-T O.153 (10/92): "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[i.8] EN IEC 55016-1-1 (2020): "Specification for radio disturbance and immunity measuring apparatus and methods; Part 1-1: Radio disturbance and immunity measuring apparatus".

[i.9] ETSI TR 100 028 (all parts) (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

[i.10] ETSI TR 102 273-2 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 2: Anechoic chamber".

[i.11] ETSI TR 102 273-3 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 3: Anechoic chamber with a ground plane".

[i.12] ETSI TR 102 273-4 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 4: Open area test site".

[i.13] CEPT/ERC/REC 74-01: "Unwanted emissions in the spurious domain", May 2022.

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in Radio Equipment Directive [i.2], and the following apply:

ACKnowledgement (ACK): brief communication (burst) from a message responder to a message initiator confirming successful reception of the message

Adaptive Frequency Agility (AFA): capability of an equipment to dynamically change the operating channel within its available frequencies for proper operation.

NOTE 1: For the purpose of the present document, non-overlapping channels are assumed.

NOTE 2: Dynamic change of a channel can be triggered by sensing an occupied channel (e.g. CCA), etc.

adjacent channel: frequency range equal to the width of the operating channel immediately above or immediately below the operating channel

NOTE: See Figure 1.

adjacent channel selectivity: measure of the capability of the receiver to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted signal which differs in frequency from the wanted signal by an amount equal to the OCW

alternate channel: frequency range equal to the width of the operating channel spaced twice the OCW away

NOTE: See Figure 1.

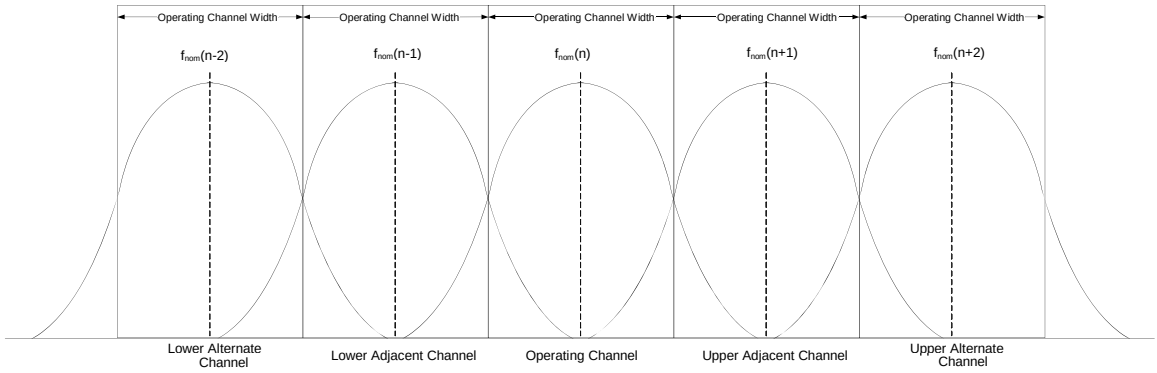


Figure 1: Adjacent and alternate channels definitions

blocking: measure of the capability of a receiver to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted input signal at any frequency other than those of the spurious responses frequencies or of the adjacent channels

channel spacing: separation, in Hertz, between adjacent nominal operating frequencies

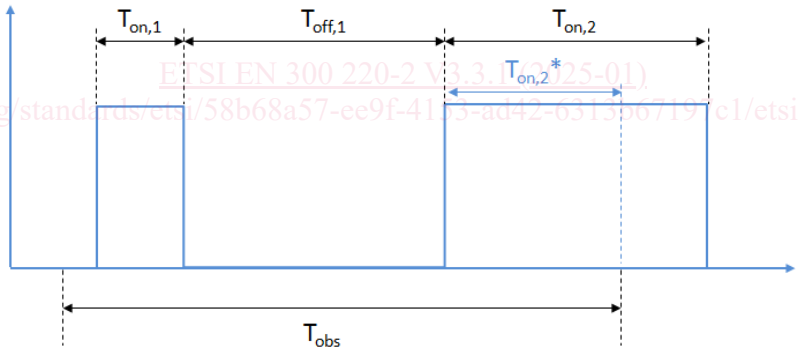
Clear Channel Assessment (CCA): procedure of sensing the operating channel to determine whether or not it is occupied by a transmission

conducted measurements: measurements which are made using a direct 50 Ω connection to the equipment under test

continuous transmission: transmission without interruption for the period of the test

cumulative on time (T_{on_cum}): sum of T_{on}, within T_{obs}

NOTE: See Figure 2.



In this example: $T_{on\_cum} = T_{on,1} + T_{on,2}$

Figure 2: Illustration for Cumulative On-Time

dedicated antenna: removable antenna supplied and tested with the radio equipment, designed as an indispensable part of the equipment

deferral time: random time a transmission is deferred before a retry to CCA when a channel was not free

disregard time ($T_{disregard}$): time interval between two separate radio emissions in an operating channel below which they are considered a single continuous transmitted burst.

NOTE 1: See Figure 4.

NOTE 2: The value used for $T_{disregard}$ is a property of the EUT (see Annex G).

NOTE 3: For FHSS equipment, $T_{disregard}$ applies between emissions in different hopping channels.