

Draft **ETSI EN 303 659** V1.0.0 (2024-11)



**Short Range Devices (SRD) in Data Networks;
Radio equipment to be used in the frequency ranges
865 MHz to 868 MHz and 915 MHz to 919,4 MHz;
Harmonised Standard for access to radio spectrum**

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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 Standardisation Request deliverable Approval Procedure (SRdAP)

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.1] 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.

Proposed national transposition dates	
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Introduction

The present document covers devices to be deployed in the framework of Commission implementing decision (EU) 2022/172 [i.5] within the frequency range 915 MHz to 919,4 MHz frequency band and Commission implementing decision (EU) 2022/180 [i.3] within the 865 MHz to 868 MHz frequency band (band 47b), Those devices are also covered by ERC Recommendation 70-03 [i.4] Annex 2 bands c1, c3 and c4.

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1 Scope

The present document specifies technical characteristics and methods of measurements for Short Range Devices (SRD) in data networks; radio equipment to be used in the frequency bands 865 MHz to 868 MHz and 915,0 MHz to 919,4 MHz.

The present document covers types of devices NAP, master NAP, NN and TN operating indoor and outdoor. These types are specified in clause 4.2.2 together with related permitted e.r.p.

NOTE 1: The availability of the frequency bands in European Union and CEPT countries can be obtained from the EFIS (<https://efis.cept.org/>) and is also listed in Appendices 1 and 3 of ERC/REC 70-03 [i.4].

NOTE 2: It should be noted that, in some countries, part or all of the band 915,0 MHz to 919,4 MHz may be unavailable, for networked and/or network based short range devices. See National Radio Interfaces (NRI) as relevant for additional guidance.

NOTE 3: For 25 mW equipment, 917,4 MHz to 919,4 MHz is the core harmonised band according to EC DEC 2022/172 [i.5].

NOTE 4: The relationship between the present document and 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.

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The following referenced documents are necessary for the application of the present document.

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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] [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.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 of harmonised technical conditions in the area of radio spectrum use for short-range devices.
- [i.4] [ERC Recommendation 70-03](#): "Relating to the use of Short Range Devices (SRD)", June 2024.
- [i.5] [Commission Implementing Decision \(EU\) 2022/172 of 7 February 2022](#) amending Implementing Decision (EU) 2018/1538 on the harmonisation of radio spectrum for use by short-range devices within the 874-876 and 915-921 MHz frequency bands.
- [i.6] Recommendation ITU-T O.153 (10/92): "Basic parameters for the measurement of error performance at bit rates below the primary rate".
- [i.7] CISPR 16 (parts 1-1 and 1-4 (2010) part 1-5 (2014)): "Specification for radio disturbance and immunity measuring apparatus and methods; Part 1: Radio disturbance and immunity measuring apparatus".
- [i.8] 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.9] 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.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 100 028 (all parts) (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.12] ETSI EG 203 336: "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.13] [ERC Recommendation 74-01](#): "Unwanted emissions in the spurious domain", May 2019.
- [i.14] [ECC Report 261](#): "Short Range Devices in the frequency range 862-870 MHz".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

Adaptive Power Control (APC): mechanism to change the transmitter power in accordance with its link budget requirements

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

NOTE: See Figure 1.

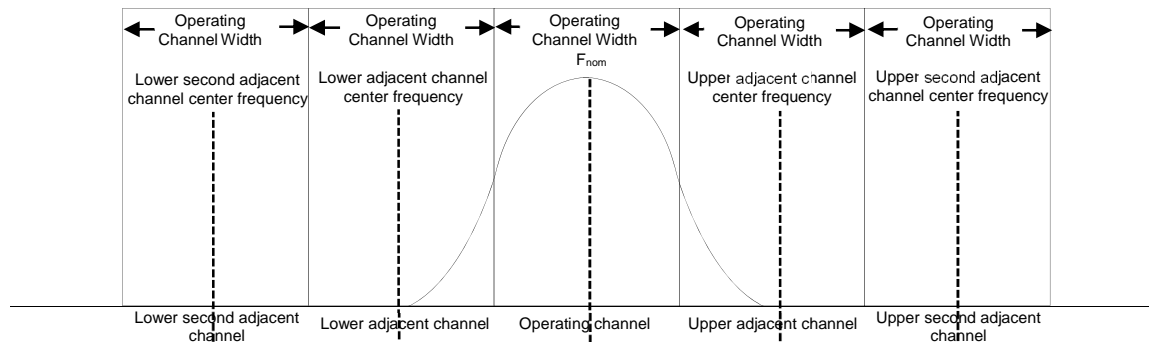


Figure 1: Adjacent and second adjacent channels definitions

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

blocking: measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given performance criteria 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

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

data network: group of wirelessly communicating SRDs composed of a network access point and one or more terminal nodes and/or network nodes

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

NOTE 1: See Figure 3.

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

effective radiated power (e.r.p.): power radiated in the direction of the maximum field strength under specified conditions of measurement

fixed equipment: equipment intended for use in a fixed position

integral antenna: permanent fixed antenna, which may be built-in, designed as an indispensable part of the equipment

master NAP: NAP which enables the operation of nomadic and/or mobile devices

NOTE: Nomadic and mobile network nodes and nomadic and mobile terminal nodes are under the control of a master NAP in the frequency range of 915 MHz to 919,4 MHz and of 917,4 MHz to 919,4 MHz in Europe [i.4] and [i.5].

master NAP control means: means used by a master NAP to enable the operation of nomadic and/or mobile devices

mean power: power supplied to a load (e.g. antenna) averaged over an interval of time sufficiently long compared with the lowest frequency encountered in the modulation envelope

mobile equipment: equipment in operation while moving

Network Access Point (NAP): fixed terrestrial SRD connecting one or more terminal nodes and/or network nodes to an external network or service

network control information: data intended to construct or maintain a data network

network data: application data carried over a data network

Network Node (NN): SRD generating and/or consuming and/or forwarding network control information and/or network data

nomadic equipment: equipment for which the location may change but is stationary while in use

nominal operating frequency: frequency at the mid-point of the Operating Channel

observation bandwidth (F_{obs}): bandwidth in which the energy of an equipment is considered for the purposes of assessing transmission timings

observation period (T_{obs}): reference period of time

Occupied BandWidth (OBW): width of a frequency range such that, below the lower and above the upper frequency edges, the mean powers emitted are each equal to 0,5 % of the total mean power of a given emission

NOTE 1: The lower and upper frequency edges values of occupied bandwidth are denoted as $FOBW_{low}$ and $FOBW_{high}$.

NOTE 2: See Figure 2.

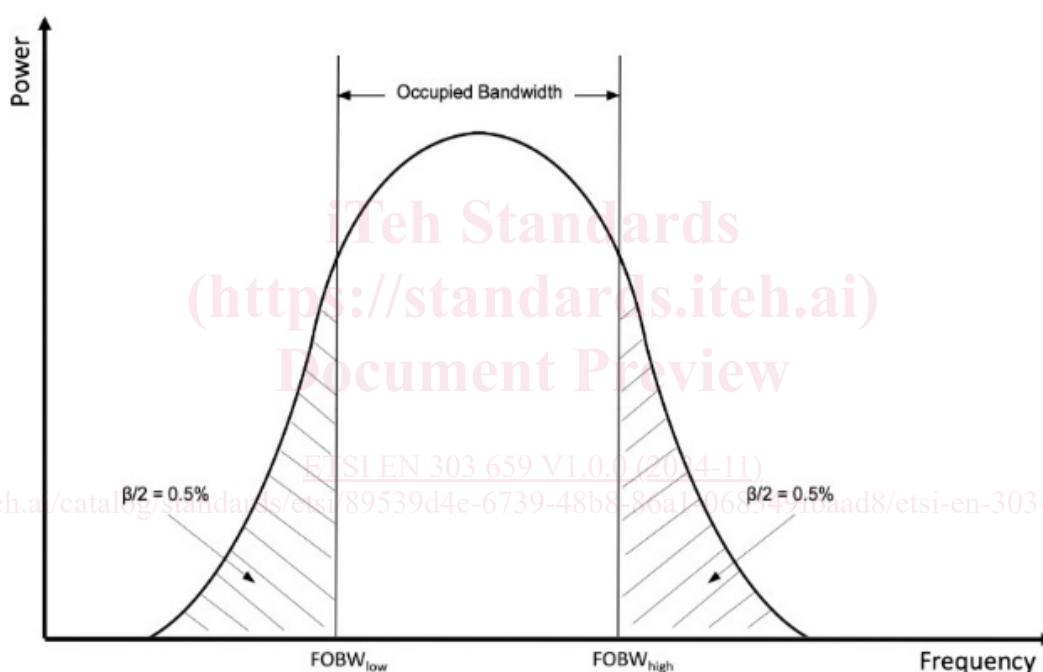


Figure 2: Emission's occupied bandwidth

Operating Channel (OC): frequency range in which the transmission or the reception occurs

NOTE: The lower and the upper frequency edges values of OC are denoted as FOC_{low} and FOC_{high} .

Operating Channel Width (OCW): width between the two frequencies FOC_{low} and FOC_{high}

Permitted Frequency Band (PFB): frequency band or sub-band within which the equipment is authorized to transmit and to perform its intended function

radiated measurements: measurements which involve the absolute measurement of a radiated field

Receiver Operating Frequency Band (RxOFB): contiguous frequency range within which the equipment is authorized to receive

receiver spurious radiations: components from the receiver at any frequency, radiated by the equipment and antenna

receiver sensitivity: the minimum level of the signal at the receiver input, at the nominal operating frequency of the receiver, which produces a specified level of performance