

ETSI EN 303 659 V1.1.1 (2025-02)



**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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Contents

Intellectual Property Rights	9
Foreword.....	9
Modal verbs terminology.....	10
Introduction	10
1 Scope	11
2 References	11
2.1 Normative references	11
2.2 Informative references.....	11
3 Definition of terms, symbols and abbreviations.....	12
3.1 Terms.....	12
3.2 Symbols.....	15
3.3 Abbreviations	16
4 Technical requirements specifications	17
4.1 Environmental profile.....	17
4.2 General conditions for operating	17
4.2.1 Wanted performance criteria.....	17
4.2.2 Types and Operating Frequency Bands	17
4.2.3 Operating conditions.....	18
4.3 All equipment conformance requirements	18
4.3.1 Unwanted emissions in the spurious domain	18
4.3.1.1 Applicability.....	18
4.3.1.2 Description	19
4.3.1.2.1 Spectrum mask in the transmitter spurious domain.....	19
4.3.1.2.2 Unwanted emissions for all other modes.....	19
4.3.1.3 Limits	19
4.3.1.4 Conformance.....	19
4.4 Transmitter conformance requirements.....	20
4.4.1 Effective radiated power	20
4.4.1.1 Applicability.....	20
4.4.1.2 Description.....	20
4.4.1.3 Limits	20
4.4.1.4 Conformance.....	20
4.4.2 Maximum occupied bandwidth.....	20
4.4.2.1 Applicability.....	20
4.4.2.2 Description	20
4.4.2.3 Limits	20
4.4.2.4 Conformance.....	20
4.4.3 Frequency Error	21
4.4.3.1 Applicability.....	21
4.4.3.2 Description	21
4.4.3.3 Limits	21
4.4.3.4 Conformance.....	21
4.4.4 Transmitter Signal at the edges of the Transmitter Operating Frequency Band	21
4.4.4.1 Applicability.....	21
4.4.4.2 Description	21
4.4.4.3 Limits	21
4.4.4.4 Conformance.....	22
4.4.5 Transient power	22
4.4.5.1 Applicability.....	22
4.4.5.2 Description	22
4.4.5.3 Reference limits	22
4.4.5.4 Conformance.....	22
4.4.6 Spectrum mask in the transmitter out-of-band domain.....	22
4.4.6.1 Applicability.....	22

4.4.6.2	Description	22
4.4.6.3	Limits	23
4.4.6.4	Conformance	23
4.4.7	Adjacent Channel Power	23
4.4.7.1	Applicability	23
4.4.7.2	Description	24
4.4.7.3	Limits	24
4.4.7.4	Conformance	24
4.4.8	Spectrum mask at permitted frequency band edges	24
4.4.8.1	Applicability	24
4.4.8.2	Description	24
4.4.8.3	Limits	25
4.4.8.4	Conformance	25
4.4.9	Duty Cycle	25
4.4.9.1	Applicability	25
4.4.9.2	Description	25
4.4.9.3	Limit	25
4.4.9.4	Conformance	26
4.4.10	Adaptive power control	26
4.4.10.1	Applicability	26
4.4.10.2	Description	26
4.4.10.3	Limits	26
4.4.10.4	Conformance	26
4.4.11	Transmitter behaviour under low-voltage conditions	26
4.4.11.1	Applicability	26
4.4.11.2	Description	26
4.4.11.3	Limits	27
4.4.11.4	Conformance	27
4.5	Receiver conformance requirements	27
4.5.1	Receiver sensitivity	27
4.5.1.1	Applicability	27
4.5.1.2	Description	27
4.5.1.3	Limits	27
4.5.1.4	Conformance	27
4.5.2	Adjacent channel selectivity	27
4.5.2.1	Applicability	27
4.5.2.2	Description	28
4.5.2.3	Limits	28
4.5.2.4	Conformance	28
4.5.3	Spurious response rejection	28
4.5.3.1	Applicability	28
4.5.3.2	Description	28
4.5.3.3	Limits	28
4.5.3.4	Conformance	28
4.5.4	Blocking	28
4.5.4.1	Applicability	28
4.5.4.2	Description	29
4.5.4.3	Limits	29
4.5.4.4	Conformance	29
4.5.5	Receiver maximum input signal level	29
4.5.5.1	Applicability	29
4.5.5.2	Description	29
4.5.5.3	Limits	29
4.5.5.4	Conformance	29
4.6	Functional requirements	30
4.6.1	Network Access Point	30
4.6.1.1	Applicability	30
4.6.1.2	Description	30
4.6.1.3	Limits	30
4.6.1.4	Conformance	30
4.6.2	Under the control of a Master NAP	30
4.6.2.1	Applicability	30

4.6.2.2	Description	30
4.6.2.3	Limits	30
4.6.2.4	Conformance	31
4.6.3	Master NAP	31
4.6.3.1	Applicability	31
4.6.3.2	Description	31
4.6.3.3	Limits	31
4.6.3.4	Conformance	31
5	Testing for compliance with technical requirements	31
5.1	Environmental conditions for testing	31
5.1.1	General considerations	31
5.1.2	Normal test conditions	31
5.1.2.1	Normal temperature and humidity for the tests	31
5.1.2.2	Normal power source for the tests	32
5.1.2.2.1	Mains voltage	32
5.1.2.2.2	Battery power sources	32
5.1.3	Extreme conditions for the tests	32
5.1.3.1	Extreme temperatures range	32
5.1.3.2	Extreme test source voltage	32
5.1.3.2.1	Mains voltage	32
5.1.3.2.2	Lead-acid battery power sources	32
5.1.3.2.3	Other power sources	32
5.1.3.3	Test conditions	32
5.2	General considerations for testing	33
5.2.0	General considerations	33
5.2.1	Presentation of the EUT for testing purposes	33
5.2.1.1	Choice of model for testing	33
5.2.1.1.1	General considerations	33
5.2.1.1.2	EUT with an external RF connector	34
5.2.1.1.3	EUT without an external RF connector	34
5.2.2	Test power source	34
5.2.2.1	General considerations	34
5.2.2.2	External test power source	35
5.2.2.3	Internal test power source	35
5.2.3	Thermal test conditions	35
5.2.4	Conducted measurements	35
5.2.5	Radiated measurements	35
5.2.6	Applicable measurement methods	35
5.2.7	Test signals	36
5.2.8	Measuring receiver	37
5.2.8.1	General considerations	37
5.2.8.2	Reference Bandwidth	37
5.2.9	Signal Threshold	38
5.3	All equipment conformance requirements	38
5.3.1	Unwanted emissions in the spurious domain	38
5.3.1.1	Test conditions for the spectrum mask in the transmitter spurious domain	38
5.3.1.2	Test conditions for Rx and all other modes	39
5.3.1.3	Measurement procedure	39
5.3.1.3.1	Radiated measurement	39
5.3.1.3.2	Conducted measurement	41
5.3.1.3.3	Measurement of emissions identified during the pre-scan	42
5.4	Conformance methods of measurement for transmitters	43
5.4.1	Effective radiated power	43
5.4.1.1	General	43
5.4.1.2	Radiated measurement procedure	43
5.4.1.2.1	Test conditions	43
5.4.1.2.2	Measurement procedure	43
5.4.1.3	Conducted measurement procedure	44
5.4.1.3.1	Test conditions	44
5.4.1.3.2	Measurement procedure	44
5.4.2	Maximum occupied bandwidth	44

5.4.2.1	Test conditions	44
5.4.2.2	Radiated measurement	44
5.4.2.3	Conducted measurement	44
5.4.2.4	Measurement procedure	45
5.4.3	Frequency error	46
5.4.3.1	Test conditions	46
5.4.3.2	Radiated measurement	46
5.4.3.3	Conducted measurement	46
5.4.3.4	Measurement procedure for D-M1 test signal	46
5.4.3.5	Measurement procedure for other test signal	47
5.4.4	Transmitter Signal at the edges of the TxOFB	47
5.4.4.1	Test condition	47
5.4.4.2	Radiated measurement	48
5.4.4.3	Conducted measurement	48
5.4.4.4	Measurement procedure	48
5.4.5	Transient power	48
5.4.5.1	General	48
5.4.5.2	Radiated measurement	49
5.4.5.3	Conducted measurement	49
5.4.5.4	Measurement procedure	49
5.4.6	Spectrum mask in the transmitter out-of-band domain	50
5.4.6.1	Test conditions	50
5.4.6.2	Radiated measurement	50
5.4.6.3	Conducted measurement	50
5.4.6.4	Measurement procedure	50
5.4.7	Adjacent channel power	51
5.4.7.1	Test conditions	51
5.4.7.2	Radiated measurement	51
5.4.7.3	Conducted measurement	51
5.4.7.4	Measurement procedure	51
5.4.8	Transmitter spectrum mask at permitted frequency band edges	52
5.4.8.1	Test conditions	52
5.4.8.2	Radiated measurement	52
5.4.8.3	Conducted measurement	52
5.4.8.4	Measurement procedure	52
5.4.9	Duty cycle	53
5.4.9.1	Test conditions	53
5.4.9.2	Radiated measurement	53
5.4.9.3	Conducted measurement	53
5.4.9.4	Measurement procedure	53
5.4.10	Adaptive power control	54
5.4.10.1	Test conditions	54
5.4.10.2	Radiated measurement	54
5.4.10.3	Conducted measurement	54
5.4.10.4	Measurement procedure	54
5.4.11	Transmitter behaviour under low voltage conditions	55
5.4.11.1	Test conditions	55
5.4.11.2	Radiated measurement	55
5.4.11.3	Conducted measurement	55
5.4.11.4	Measurement procedure	56
5.5	Conformance methods of measurement for receivers	56
5.5.1	Receiver sensitivity	56
5.5.1.1	Test conditions	56
5.5.1.2	Radiated measurement	56
5.5.1.3	Conducted measurement	56
5.5.1.4	Measurement procedure	56
5.5.2	Adjacent channel selectivity	57
5.5.2.1	Test conditions	57
5.5.2.2	Radiated measurement	57
5.5.2.3	Conducted measurement	58
5.5.2.4	Measurement procedure	58
5.5.3	Blocking and spurious response rejection	59

5.5.3.1	Test conditions	59
5.5.3.2	Radiated measurement	59
5.5.3.3	Conducted measurement	60
5.5.3.4	Measurement procedure	60
5.5.4	Receiver maximum input signal level.....	61
5.5.4.1	Test conditions	61
5.5.4.2	Radiated measurement	61
5.5.4.3	Conducted measurement	61
5.5.4.4	Measurement procedure	62
5.6	Conformance test suites for functional requirements	62
5.6.1	General test conditions.....	62
5.6.2	Network access point.....	63
5.6.2.1	Test conditions	63
5.6.2.2	Measurement Procedure.....	63
5.6.3	Under the control of a Master NAP	64
5.6.3.1	Test conditions	64
5.6.3.2	Radiated measurement	64
5.6.3.3	Conducted measurement	65
5.6.3.4	Measurement procedure	65
5.6.4	Master NAP	66
5.6.4.1	Test conditions	66
5.6.4.2	Radiated measurement	66
5.6.4.3	Conducted measurement	67
5.6.4.4	Measurement procedure	67
5.7	Interpretation of the measurement results	68

Annex A (informative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU	69
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Annex B (normative):	Test sites and arrangements for radiated measurement	71
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B.1	Introduction	71
B.2	Radiation test sites.....	71
B.2.1	Open Area Test Site	71
B.2.2	Semi Anechoic Room.....	72
B.2.3	Fully Anechoic Room	73
B.2.4	Measurement Distance	75
B.3	Antennas.....	75
B.3.1	General considerations	75
B.3.2	Measurement antenna.....	75
B.3.3	Substitution antenna	75
B.4	Guidance on the use of radiation test sites	76
B.4.1	General considerations	76
B.4.2	Power supplies for the battery powered EUT.....	76
B.4.3	Site preparation	76
B.5	Coupling of signals.....	77
B.5.1	General considerations	77
B.5.2	Data Signals.....	77
B.6	Measurement procedures for radiated measurement.....	77
B.6.1	General considerations	77
B.6.2	Radiated measurements in an OATS or SAR.....	77
B.6.3	Radiated measurements in a FAR	78
B.6.4	Substitution measurement	78
B.6.5	Radiated measurement methods for receivers	78
B.7	Guidance for testing technical requirements	79
B.7.1	General	79
B.7.2	Radio test suites and corresponding test sites.....	79

Annex C (normative):	Test Fixture	80
-----------------------------	---------------------------	-----------

C.1	Description of test-fixture	80
C.2	Validation of the test-fixture in the temperature chamber.....	81
C.3	Mode of use.....	82
Annex D (normative):	T_{On} measurements.....	83
D.1	Measurement procedure	83
D.2	T _{disregard} procedure	83
Annex E (normative):	Types and restrictions - set 1	85
Annex F (informative):	Types and restrictions - set 2	87
Annex G (informative):	Maximum measurement uncertainty	88
Annex H (informative):	Guideline for Operating Channel.....	89
H.1	Operating channel calculation	89
H.2	Operating channel illustrations.....	89
Annex I (informative):	Properties of EUT	92
I.1	Rights to copy.....	92
I.2	EUT Properties	92
Annex J (informative):	Selection of technical parameters.....	93
Annex K (informative):	Applications of the masks given in clauses 4.3.1, 4.4.6 and 4.4.8.....	96
Annex L (informative):	Change history	99
History		100

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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.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.

National transposition dates	
Date of adoption of this EN:	19 February 2025
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Date of withdrawal of any conflicting National Standard (dow):	30 November 2026

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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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

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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.

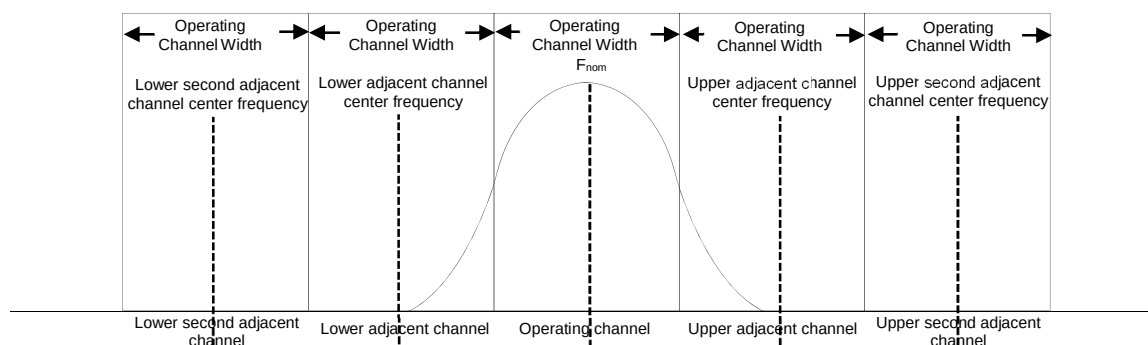


Figure 1: Adjacent and second adjacent channels definitions

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 $\text{FOBW}_{\text{high}}$.

NOTE 2: See Figure 2.

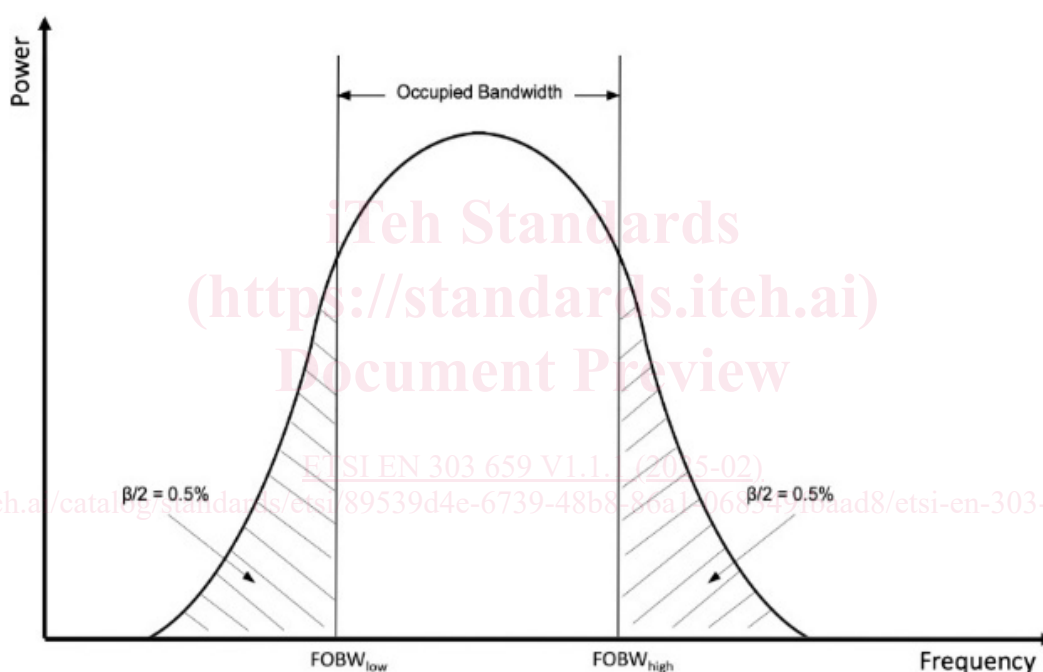


Figure 2: Emission's occupied bandwidth

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