



SLOVENSKI STANDARD

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Radiofrekvenčna identifikacija - Oprema, ki deluje v pasu od 2446 MHz do 2454 MHz z močjo do največ 500 mW e.i.r.p. in do največ 4 W e.i.r.p - Harmonizirani standard za dostop do radijskega spektra

Radio Frequency Identification - Equipment operating in the band 2 446 MHz to 2 454 MHz with power levels up to a maximum of 500 mW e.i.r.p. and up to a maximum of 4 W e.i.r.p. - Harmonised Standard for access to radio spectrum

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**Radio Frequency Identification;
Equipment operating in the band 2 446 MHz to 2 454 MHz
with power levels up to a maximum of 500 mW e.i.r.p.
and up to a maximum of 4 W e.i.r.p.;
Harmonised Standard for access to radio spectrum**

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Contents

Intellectual Property Rights	8
Foreword.....	8
Modal verbs terminology.....	9
1 Scope	10
2 References	10
2.1 Normative references	10
2.2 Informative references.....	10
3 Definition of terms, symbols and abbreviations.....	11
3.1 Terms.....	11
3.2 Symbols.....	13
3.3 Abbreviations	13
4 Technical requirements specifications	14
4.0 General	14
4.1 Environmental profile.....	14
4.2 General conditions for operating	14
4.2.1 Conformance requirements.....	14
4.2.2 Designated frequencies	14
4.2.2.1 EU wide harmonised national radio interface 2 446 MHz to 2 454 MHz.....	14
4.2.2.2 National Radio Interfaces not EU wide harmonised from 2 446 MHz to 2 454 MHz	15
4.2.3 Operating conditions.....	15
4.3 Transmitter requirements	16
4.3.1 Transmitter measurement requirements.....	16
4.3.1.1 Applicability.....	16
4.3.1.2 Methods of measurement and limits for transmitter parameters	16
4.3.2 Equivalent isotropically radiated power (e.i.r.p.).....	16
4.3.2.1 Indoor and outdoor transmitters of 500 mW or less.....	16
4.3.2.1.1 Applicability	16
4.3.2.1.2 Definition.....	16
4.3.2.1.3 Limits	17
4.3.2.1.4 Conformance.....	17
4.3.2.2 Indoor transmitters of 4 W or less	17
4.3.2.2.1 Applicability.....	17
4.3.2.2.2 Definition.....	17
4.3.2.2.3 Limits	18
4.3.2.2.4 Conformance	18
4.3.3 Permitted range of operating frequencies	18
4.3.3.1 Applicability.....	18
4.3.3.2 Definition	18
4.3.3.3 Limits	18
4.3.3.4 Conformance.....	18
4.3.4 Transmitter spectrum masks	18
4.3.4.1 Applicability.....	18
4.3.4.2 Definition	19
4.3.4.3 Limits	19
4.3.4.4 Conformance.....	19
4.3.5 Unwanted emissions in the spurious domain	19
4.3.5.1 Applicability.....	19
4.3.5.2 Definition	19
4.3.5.3 Limits	19
4.3.5.4 Conformance.....	20
4.3.6 Duty cycle.....	20
4.3.6.1 Applicability.....	20
4.3.6.2 Definition	20
4.3.6.3 Limits	20

4.3.6.4	Conformance.....	20
4.3.7	Additional requirements for FHSS equipment.....	21
4.3.7.1	Applicability.....	21
4.3.7.2	Definition	21
4.3.7.3	Limits	21
4.3.7.4	Conformance.....	21
4.4	Receiver requirements	21
4.4.1	General performance criteria	21
4.4.2	Blocking or desensitization.....	21
4.4.2.1	Applicability.....	21
4.4.2.2	Definition	21
4.4.2.3	Limits	21
4.4.2.4	Conformance.....	22
4.4.3	Spurious radiations	22
4.4.3.1	Applicability.....	22
4.4.3.2	Definition	22
4.4.3.3	Limits	22
4.4.3.4	Conformance.....	22
4.4.4	Receiver sensitivity.....	22
4.4.4.1	Applicability.....	22
4.4.4.2	Definition	22
4.4.4.3	Limits	22
4.4.4.4	Conformance.....	22
4.4.5	Adjacent channel selectivity	23
4.4.5.1	Applicability.....	23
4.4.5.2	Definition	23
4.4.5.3	Limits	23
4.4.5.4	Conformance.....	23
4.4.6	Receiver spurious response rejection.....	23
4.4.6.1	Applicability.....	23
4.4.6.2	Definition	23
4.4.6.3	Limits	23
4.4.6.4	Conformance.....	23
4.4.7	Receiver maximum input signal level.....	23
4.4.7.1	Applicability.....	23
4.4.7.2	Definition	23
4.4.7.3	Limits	24
4.4.7.4	Conformance.....	24
5	Testing for compliance with technical requirements.....	24
5.0	General	24
5.1	Environmental conditions for testing	24
5.2	Presentation of equipment for testing purposes.....	24
5.2.1	General.....	24
5.2.2	Choice of model for testing	24
5.2.3	Testing of equipment with alternative power levels	25
5.2.4	Testing of equipment that does not have an external 50 Ω RF connector (integral antenna equipment)	25
5.2.4.1	Equipment with an internal permanent or temporary antenna connector or using a dedicated test fixture	25
5.2.4.2	Equipment with a temporary antenna connector	25
5.2.5	Testing of devices using duty cycle	25
5.3	Mechanical and electrical design.....	25
5.3.1	General.....	25
5.3.2	Transmitter shut-off facility	26
5.3.3	Receiver mute or squelch.....	26
5.4	Auxiliary test equipment	26
5.5	Test power source.....	26
5.5.1	General.....	26
5.5.2	External test power source	26
5.5.3	Internal test power source	26
5.6	Normal test conditions.....	27

5.6.1	Normal temperature and humidity	27
5.6.2	Normal test power source	27
5.6.2.1	Mains voltage	27
5.6.2.2	Battery power sources	27
5.6.2.3	Other power sources.....	27
5.7	Extreme test conditions	27
5.7.1	Extreme temperatures	27
5.7.1.1	Procedure for tests at extreme temperatures.....	27
5.7.1.1.1	General	27
5.7.1.1.2	Procedure for equipment designed for continuous operation	28
5.7.1.1.3	Procedure for equipment designed for intermittent operation	28
5.7.1.2	Extreme temperature ranges.....	28
5.7.2	Extreme test source voltages.....	28
5.7.2.1	Mains voltage	28
5.7.2.2	Battery power sources.....	28
5.7.2.3	Power sources using other types of batteries.....	29
5.7.2.4	Other power sources.....	29
5.8	General conditions.....	29
5.8.1	Normal test signals and test modulation	29
5.8.1.1	General	29
5.8.1.2	Normal test signals for data.....	30
5.8.2	Artificial antenna	30
5.8.3	Test fixture	30
5.8.3.1	General	30
5.8.3.2	Validation of the test-fixture in the temperature chamber.....	31
5.8.3.3	Mode of use.....	33
5.8.4	Test sites and general arrangements for radiated measurements	33
5.8.5	Measuring receiver	33
5.9	Transmitter requirements	33
5.9.1	Transmitter measurement requirements.....	33
5.9.1.1	Methods of measurement and limits for transmitter parameters	33
5.9.2	Equivalent isotropically radiated power (e.i.r.p.).....	34
5.9.2.1	Method of measurement.....	34
5.9.2.1.1	General requirements.....	34
5.9.2.1.2	Non spread spectrum transmitters with a -6 dB bandwidth of up to 20 MHz and spread spectrum transmitters with channel bandwidth of up to 1 MHz	34
5.9.2.1.3	Transmitters other than those defined in clause 5.9.2.1.2.....	35
5.9.2.1.4	Tests for indoor transmitters of 4 W.....	36
5.9.3	Permitted range of operating frequencies	36
5.9.3.1	Method of measurement.....	36
5.9.3.2	Method of measurement for equipment using FHSS modulation	37
5.9.4	Transmitter spectrum mask.....	37
5.9.4.1	Method of measurement.....	37
5.9.5	Unwanted emissions in the spurious domain	38
5.9.5.1	Method of measurement.....	38
5.9.5.1.1	General Requirements	38
5.9.5.1.2	Conducted spurious emission	39
5.9.5.1.3	Method of measurement - cabinet spurious radiation.....	39
5.9.5.1.4	Method of measurement - radiated spurious emission	40
5.9.5.1.5	Additional requirements for equipment employing FHSS modulation	41
5.9.6	Duty cycle.....	41
5.9.6.1	Method of measurement.....	41
5.9.7	Additional requirements for FHSS equipment.....	41
5.9.7.1	Method of measurement.....	41
5.9.7.1.0	General	41
5.9.7.1.1	Total number of hops and maximum separation of hops.....	41
5.9.7.1.2	Dwell time	42
5.10	Receiver requirements	42
5.10.1	General performance criteria	42
5.10.2	Blocking or desensitization.....	42
5.10.2.1	Method of measurement.....	42
5.10.2.2	Method of measurement for blocking or desensitization	42

5.10.2.2.1	Test Conditions.....	42
5.10.2.2.2	Conducted measurement.....	42
5.10.2.2.3	Radiated measurement.....	43
5.10.2.2.4	Measurement procedure	43
5.10.3	Spurious radiations	43
5.10.3.1	Method of measurement for spurious radiation.....	43
5.10.3.1.1	General Requirements	43
5.10.3.1.2	Method of measurement conducted spurious components	44
5.10.3.1.3	Method of measurement cabinet radiation.....	44
5.10.3.1.4	Method of measurement radiated spurious components.....	45
5.10.4	Receiver sensitivity.....	45
5.10.4.1	Method of measurement for receiver sensitivity	45
5.10.4.1.1	Test Conditions.....	45
5.10.4.1.2	Method of measurement conducted receiver sensitivity.....	45
5.10.4.1.3	Method of measurement radiated receiver sensitivity	45
5.10.4.1.4	Measurement procedure	45
5.10.5	Adjacent channel selectivity	46
5.10.5.1	Method of measurement for adjacent channel selectivity	46
5.10.5.1.1	Test conditions	46
5.10.5.1.2	Conducted measurement.....	46
5.10.5.1.3	Radiated measurement.....	46
5.10.5.1.4	Measurement procedure	46
5.10.6	Receiver spurious response rejection.....	47
5.10.6.1	Method of measurement for receiver spurious response rejection	47
5.10.6.1.1	Test conditions	47
5.10.6.1.2	Conducted measurement.....	47
5.10.6.1.3	Radiated measurement.....	47
5.10.6.1.4	Measurement procedure	48
5.10.7	Receiver maximum input signal level.....	48
5.10.7.1	Method of measurement for receiver maximum input signal level.....	48
5.10.7.1.1	Test conditions	48
5.10.7.1.2	Conducted measurement.....	48
5.10.7.1.3	Radiated measurement.....	48
5.10.7.1.4	Measurement procedure	49

Annex A (informative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU	50
-------------------------------	---	-----------

Annex B (informative):	Selection of technical parameters	52
-------------------------------	--	-----------

B.1	Introduction	52
-----	--------------------	----

Annex C (normative):	Radiated measurements	53
-----------------------------	------------------------------------	-----------

C.1	General requirements for measurements involving the use of radiated fields.....	53
-----	---	----

C.2	Test Sites	53
-----	------------------	----

C.2.0	General	53
-------	---------------	----

C.2.1	Indoor test site	54
-------	------------------------	----

C.2.2	Shielded anechoic test site.....	55
-------	----------------------------------	----

C.2.2.0	General.....	55
---------	--------------	----

C.2.2.1	Influence of parasitic reflections in anechoic chambers	55
---------	---	----

C.2.2.2	Calibration of the shielded RF anechoic chamber	55
---------	---	----

C.3	Antennas.....	58
-----	---------------	----

C.3.1	Test antenna.....	58
-------	-------------------	----

C.3.2	Substitution antenna	58
-------	----------------------------	----

C.3.3	Artificial antenna.....	58
-------	-------------------------	----

C.4	Test Practice and Auxiliary Test Equipment.....	59
-----	---	----

C.5	Measuring distance.....	59
-----	-------------------------	----

C.5.0	General	59
-------	---------------	----

C.5.1	Standard position.....	59
-------	------------------------	----

C.5.2	Auxiliary cables.....	59
Annex D (normative):	General description of measurement methods.....	60
D.0	General	60
D.1	Conducted measurements.....	60
D.2	Radiated measurements.....	60
D.3	Radiated measurement for receivers	61
Annex E (informative):	Example of implementation for restriction of 4 W RFID to in-building use only.....	62
Annex F (informative):	Selection of receiver parameters.....	64
F.0	Introduction	64
F.1	Receiver sensitivity	64
F.2	Receiver co-channel rejection	64
F.3	Receiver adjacent signal selectivity	64
F.4	Receiver spurious response rejection	64
F.5	Receiver blocking.....	64
F.6	Receiver radio-frequency intermodulation.....	65
F.7	Receiver dynamic range	65
F.8	Desensitization	65
F.9	Receiver unwanted emissions in the spurious domain	65
Annex G (informative):	Interpretation of the measurement results.....	66
Annex H (informative):	Change history	67
	History	68

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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.3] 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.7].

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.

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1 Scope

The present document specifies technical characteristics and methods of measurements for Radio Frequency IDentification (RFID) devices operating in the frequency range 2 446 MHz to 2 454 MHz with power levels up to a maximum of 500 mW e.i.r.p. and up to a maximum of 4 W e.i.r.p.

The frequency usage conditions for RFID are EU wide harmonised in the band 2 446 MHz to 2 454 MHz with a power up 500 mW e.i.r.p. according to [i.1].

NOTE 1: It should be noted that RFID systems in this frequency band with a power of 4 W e.i.r.p. have only a limited implementation status within the European Union and the CEPT countries. CEPT/ERC/REC 70-03 [i.4] provides in Appendix 1 an overview of countries where the band is implemented.

The present document contains requirements to demonstrate that the specified radio equipment both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

NOTE 2: The relationship between the present document and essential requirements of article 3.2 of Directive 2014/53/EU [i.7] is given in Annex A.

2 References

2.1 Normative references

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

- [1] [EN IEC 55016-1-1:2019](#): "Specification for radio disturbance and immunity measuring apparatus and methods; Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus".
- [2] [EN IEC 55016-1-4:2019/A1:2020](#) + [A2 \(2023\)](#): "Specification for radio disturbance and immunity measuring apparatus and methods; Part 1-4: Radio disturbance and immunity measuring apparatus - Antennas and test sites for radiated disturbance measurements".

2.2 Informative references

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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] [Commission Implementing Decision \(EU\) 2019/1345](#) of 2 August 2019 amending Decision 2006/771/EC updating harmonised technical conditions in the area of radio spectrum use for short-range devices.

- [i.2] 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.3] [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.4] [CEPT/ERC/Recommendation 70-03 \(2022\)](#): "Relating to the use of Short Range Devices (SRD)".
- [i.5] Recommendation ITU-R SM.329-13 (09/2024): "Unwanted emissions in the spurious domain".
- [i.6] [CEPT/ERC/Recommendation 74-01 \(2022\)](#): "Unwanted emissions in the spurious domain".
- [i.7] [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 (RE-Directive).
- [i.8] Recommendation ITU-T O.153 (10/1992): "Basic parameters for the measurement of error performance at bit rates below the primary rate".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

adjacent channels: two channels offset from the nominal channel by the nominal channel bandwidth

NOTE: See Figure 1.

alternate adjacent channels: two channels offset from the nominal channel by double the channel bandwidth

NOTE: See Figure 1.

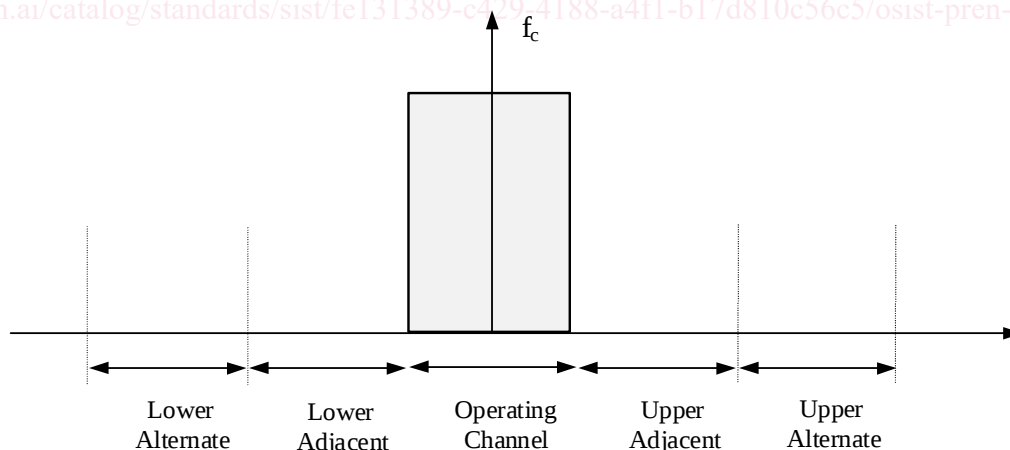


Figure 1: Adjacent and alternate adjacent channel definitions

artificial antenna: non-radiating dummy load

assigned frequency band: frequency band within which the device is authorized to operate and to perform the intended function of the equipment

chip: unit of modulation used in Direct Sequence Spread Spectrum (DSSS) modulation

chip rate: number of chips per second in DSSS

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

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

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

Direct Sequence Spread Spectrum (DSSS): form of modulation where a combination of data to be transmitted and a code sequence (chip sequence) is used to directly modulate a carrier, e.g. by phase shift keying

NOTE: The chip rate determines the occupied bandwidth.

Duty Cycle (DC): ratio expressed as a percentage, of the cumulative duration of transmissions T_{on_cum} within an observation interval T_{obs} . $DC = \left(\frac{T_{on_cum}}{T_{obs}} \right)_{F_{obs}}$ on an observation bandwidth F_{obs}

equivalent isotropically radiated power: maximum radiated power of the transmitter and its antenna

fixed station: equipment intended for use in a fixed location

Frequency Hopping Spread Spectrum (FHSS): spread spectrum technique in which the transmitter signal occupies a number of frequencies in time, each for some period of time, referred to as the dwell time

NOTE: Transmitter and receiver follow the same frequency hop pattern. The number of hop positions and the bandwidth per hop position determine the occupied bandwidth.

identification system: equipment consisting of a transmitter(s), receiver(s) (or a combination of the two) and an antenna(s) to identify objects by means of a transponder

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

mobile station: equipment normally fixed in a vehicle or used as a transportable station

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 interval of time

occupied bandwidth: width of a frequency band such that, below the lower and above the upper frequency limits the mean powers emitted are each equal to 0,5 % of the total mean power of a given emission

off-time (T_{off}): time duration between two successive transmissions

on-time (T_{on}): duration on a Transmission Operating Channel (OC)

Operating Channel (OC): frequency range in which the transmission from the equipment occurs; defined by two frequency edges values: F_{low} and F_{high}

Operating Channel Width (OCW): bandwidth between the two frequencies F_{low} and F_{high} channel

operating frequency: nominal frequency at which equipment is operated; this is also referred to as the operating centre frequency

NOTE: Equipment may be able to operate at more than one operating frequency.

operating frequency range: range of operating frequencies over which the equipment can be adjusted through tuning, switching or reprogramming

out-of-band emissions: emission on a frequency or frequencies outside the occupied bandwidth which results from the modulation process, but excluding spurious emissions

portable station: equipment intended to be carried, attached or implanted

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

radiodetermination: determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves