SLOVENSKI STANDARD
oSIST prEN 303 851 V1.0.0:2025

01-marec-2025

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

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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.

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):	18 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.

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

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.

[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

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 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.

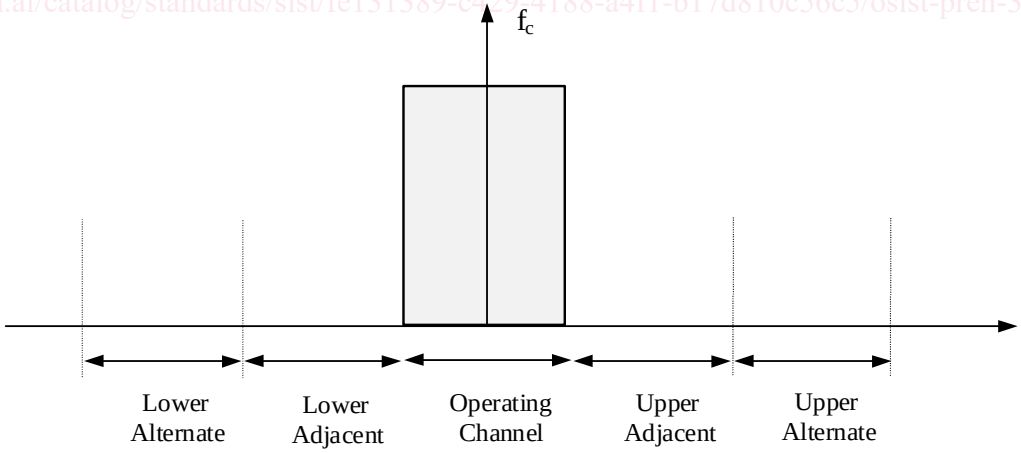

Figure 1: Adjacent and alternate adjacent channel definitions

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}. $DC = \left(\frac{T_{on\_cum}}{T_{obs}}\right)_{Fobs}$ 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 (Toff): time duration between two successive transmissions

on-time (Ton): 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