



SLOVENSKI STANDARD
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Radio Equipment and Systems (RES); Short Range Devices (SRDs); Technical characteristics and test methods for radio equipment to be used in the 1 GHz to 25 GHz frequency range

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33.060.20	Sprejemna in oddajna oprema	Receiving and transmitting equipment
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Technical characteristics and test methods
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in the 1 GHz to 25 GHz frequency range**

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Foreword

This Interim European Telecommunication Standard (I-ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Every I-ETS prepared by ETSI is a voluntary standard. This I-ETS contains text concerning type approval of the equipment to which it relates. This text should be considered as guidance and does not make this I-ETS mandatory.

Proposed announcement date	
Date of adoption of this I-ETS:	13 October 1995
Date of latest announcement of this I-ETS (doa):	31 March 1996

Introduction

This I-ETS was drafted on the assumption that type test measurements, performed in an accredited test laboratory, will be accepted by the various national regulatory authorities in order to grant type approval, provided the national regulatory requirements are met. This is in compliance with CEPT/ERC Recommendation 01-06 [1].

Clauses 1 and 3 provide a general description on the types of equipment covered by this I-ETS and the definitions and abbreviations used. Clause 4 provides a guide as to the number of samples required in order that type tests may be carried out and any markings on the equipment which the manufacturer should provide.

Clauses 5 and 6 provide a description on the test conditions.

Clauses 7 and 8 provide the limits of the parameters which are required to be tested. These limits have been chosen to minimise harmful interference to other equipment and services. It also provides details on how the equipment should be tested and the conditions which should be applied.

Clause 9 states the maximum measurement uncertainty values.

Annex A provides normative specifications concerning radiated measurements.

Annex B provides normative description of measurement methods.

Annex C provides information on specific applications covered by this I-ETS.

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1 Scope

This Interim European Telecommunication Standard (I-ETS) covers the minimum characteristics considered necessary for Short Range Devices (SRDs) in order to make the best use of the available frequencies.

This I-ETS does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable.

This I-ETS applies to SRDs:

- either with a Radio Frequency (RF) output connection and specified antenna, or with an integral antenna;
- for alarms, identification systems, radiodetermination, telecommand, telemetry etc. applications;
- for all types of modulation;
- with or without speech;
- operating on radio frequencies between 1 and 25 GHz, with peak power levels up to 2 W equivalent isotropically radiated power (eirp).

This I-ETS also applies to Low Power Devices (LPDs), as defined in CEPT Recommendation T/R 01-04 [2].

This I-ETS is based upon CEPT Recommendations T/R 01-04 [2], T/R 22-04 [3] and T/R 60-01 [4]. It is a general standard which may be superseded by specific standards covering specific applications.

This I-ETS covers fixed stations, mobile stations and portable stations. If the system includes a transponder, this should be measured together with the transmitter.

For regulatory purposes the equipment is divided into three main classes based on frequency range and maximum radiated output power eirp (see table 1).

Table 1: Maximum radiated peak power (eirp)

Class	Frequency (GHz)		
	> 1,0 to 5,0	> 5,0 to 20,0	> 20,0
I	10 mW	25 mW	100 mW
II (note)	500 mW		
III	2 W		

NOTE: This class is only applicable for reflective transponder systems using the bands according to CEPT Recommendation T/R 60-01 [4].

For non-harmonized parameters, national administrations may impose conditions on the type of modulation, channel/frequency separations, maximum eirp, equipment marking and the inclusion of an automatic transmitter shut-off facility, as a condition of the issue of an individual or general licence or as a condition of use under licence exemption. The extreme temperature ranges are fixed and are given in subclause 5.4.1.2.

In order to permit the greatest freedom of design of equipment, whilst protecting other radio services from interference, a balance is required between the permitted range of frequencies on which the equipment may be used, and its frequency stability and modulation characteristics. This I-ETS does not specify the operating frequencies or system bandwidths, these parameters will be covered by national regulations, since these parameters are not harmonised. However, the method to determine the permitted range of operating frequencies is to be found in subclause 7.2 of this I-ETS. This range of frequencies should be stated in the test report.

The performance of the equipment submitted for type testing should be representative of the performance of the corresponding production model. In order to avoid any ambiguity in that assessment, this I-ETS contains instructions for the presentation of equipment for type testing purposes (see subclause 4.1) conditions of testing (see clause 5) and measurement methods, (see clauses 7 and 8).

This I-ETS does not cover requirements for radiated emissions below 25 MHz.

Additional standards or specifications may be required for equipment such as that intended for direct connection to the Public Switched Telephone Network (PSTN).

2 Normative references

This I-ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this I-ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] CEPT/ERC Recommendation 01-06: "Procedure for mutual recognition of type testing and type approval for radio equipment".
- [2] CEPT Recommendation T/R 01-04: "Use of low power devices (LPD) using integral antennas and operating in harmonized frequency bands".
- [3] CEPT Recommendation T/R 22-04: "Harmonisation of frequency bands for Road Transport Information systems (RTI)".
- [4] CEPT Recommendation T/R 60-01: "Low-power radiolocation equipment for detecting movement and for alert".
- [5] EN 55022: "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".
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- [6] CISPR 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus".
- [7] ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of this I-ETS, the following definitions apply:

alarm: The use of radio communication for indicating an alarm condition at a distant location.

assigned frequency band: The frequency band within which the device is authorised to operate.

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

chip rate: The number of chips per second.

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

fixed station: Equipment intended for use in a fixed location.

Frequency Hopping Spread Spectrum (FHSS): A 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. Transmitter and receiver follow the same frequency hop pattern. The number of hop positions and the bandwidth per hop position determine the occupied bandwidth.

integral antenna: An antenna, with or without a connector, designed as an indispensable part of the equipment.

mobile station: Equipment normally fixed in a vehicle.

portable station: Equipment intended to be carried, attached or implanted.

operating frequency: The nominal frequency at which equipment is operated; this is also referred to as the operating centre frequency. Equipment may be able to operate at more than one operating frequency.

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

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

radiodetermination: The 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.

spread spectrum: A modulation technique in which the energy of a transmitted signal is spread throughout a large portion of the frequency spectrum.

telecommand: The use of radio communication for the transmission of signals to initiate, modify or terminate functions of equipment at a distance.

telemetry: The use of radio communication for indicating or recording data at a distance.

transponder: A device which responds to an interrogation signal.

wideband: Equipments to be used in a non-channelized continuous frequency band, or to be used in a channelized frequency band using more than one consecutive channel.

3.2 Symbols

For the purposes of this I-ETS, the following symbols apply:

E	field strength
E ₀	reference field strength (see annex A)
R	distance (see annex A)
R ₀	reference distance (see annex A)
λ	wavelength

3.3 Abbreviations

For the purposes of this I-ETS, the following abbreviations apply:

dBi	gain in decibels relative to an isotropic antenna
DSSS	Direct Sequence Spread Spectrum
eirp	equivalent isotropically radiated power
ERC	European Radiocommunication Committee
FHSS	Frequency Hopping Spread Spectrum
ISM	Industrial, Scientific and Medical

NOTE: This I-ETS includes the following designated ISM frequency bands: