



SLOVENSKI STANDARD

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Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz; Part 1: Technical characteristics and test methods

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European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Short Range Devices (SRD);
Close Range Inductive Data Communication
equipment operating at 13,56 MHz;
Part 1: Technical characteristics and test methods**

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Contents

Intellectual Property Rights	6
Foreword.....	6
1 Scope	7
2 References	8
3 Definitions, symbols and abbreviations	8
3.1 Definitions	8
3.2 Symbols.....	9
3.3 Abbreviations	9
4 Technical requirements specifications	9
4.1 General requirements	9
4.1.1 Receiver classification	9
4.1.2 General performance criteria	10
4.2 Presentation of equipment for testing purposes.....	10
4.2.1 Choice of model for testing	10
4.2.2 Testing of equipment with alternative radiated field or power levels.....	11
4.2.3 Testing of equipment that does not have an external 50 ohm RF connector (integral antenna equipment)	11
4.2.3.1 Equipment with an internal permanent or temporary antenna connector.....	11
4.2.3.2 Equipment with a temporary antenna connector.....	11
4.2.4 On-site testing	11
4.3 Mechanical and electrical design.....	11
4.3.1 General.....	11
4.3.2 Controls	11
4.3.3 Transmitter shut-off facility	11
4.3.4 Receiver mute or squelch	12
4.3.5 CE Marking	12
4.3.5.1 Equipment identification	12
4.4 Declarations by the applicant	12
4.5 Auxiliary test equipment	12
4.6 Interpretation of the measurement results	12
5 Test conditions, power sources and ambient temperatures	13
5.1 Normal and extreme test conditions	13
5.2 Test power source.....	13
5.2.1 External test power source.....	13
5.2.2 Internal test power source	13
5.3 Normal test conditions.....	13
5.3.1 Normal temperature and humidity	13
5.3.2 Normal test power source	14
5.3.2.1 Mains voltage.....	14
5.3.2.2 Regulated lead-acid battery power sources	14
5.3.2.3 Other power sources.....	14
5.4 Extreme test conditions	14
5.4.1 Extreme temperatures	14
5.4.1.1 Procedure for tests at extreme temperatures.....	14
5.4.1.1.1 Procedure for equipment designed for continuous operation	14
5.4.1.1.2 Procedure for equipment designed for intermittent operation	14
5.4.1.2 Extreme temperature ranges.....	15
5.4.2 Extreme test source voltages.....	15
5.4.2.1 Mains voltage.....	15
5.4.2.2 Regulated lead-acid battery power sources	15
5.4.2.3 Power sources using other types of batteries.....	15
5.4.2.4 Other power sources.....	16
6 General conditions.....	16

6.1	Normal test signals and test modulation	16
6.1.1	Normal test signals for data	16
6.2	Artificial antenna	16
6.2.1	Artificial antenna for transmitters with 50 ohm impedance connector	16
6.3	Test fixture	16
6.4	Test sites and general arrangements for radiated measurements	16
6.5	Measuring receiver	17
7	Transmitter requirements	17
7.1	Transmitter carrier output levels	18
7.1.1	H-field (radiated)	18
7.1.1.1	Definition	18
7.1.1.2	Methods of measurement	18
7.1.1.3	Limits	18
7.2	Transmitter spurious emissions	19
7.2.1	Definition	19
7.2.2	Conducted spurious emissions	19
7.2.2.1	Methods of measurement (≥ 30 MHz)	19
7.2.2.2	Limits	20
7.2.3	Radiated spurious emissions	20
7.2.3.1	Methods of measurement (< 30 MHz)	20
7.2.3.2	Limits	20
7.2.4	Effective radiated spurious power	20
7.2.4.1	Methods of measurement (≥ 30 MHz)	20
7.2.4.2	Limits	21
7.3	Duty cycle	21
7.3.1	Definitions	21
7.3.2	Declaration	22
7.3.3	Duty cycle classes	22
8	Receiver requirement	22
8.1	Blocking or desensitization	22
8.1.1	Definition	22
8.1.2	Methods of measurement	22
8.1.3	Limits	23
8.2	Receiver spurious emissions	23
8.2.1	Definition	23
8.2.2	Methods of measurement	23
8.2.3	Limits	24
8.2.3.1	Radiated emissions below 30 MHz	24
8.2.3.2	Radiated and conducted emissions above 30 MHz	24
9	Measurement uncertainty	24
Annex A (normative): Radiated measurement		25
A.1	Test sites and general arrangements for measurements involving the use of radiated fields	25
A.1.1	Anechoic chamber	25
A.1.2	Anechoic chamber with a conductive ground plane	26
A.1.3	Open Area Test Site (OATS)	27
A.1.4	Test antenna	28
A.1.5	Substitution antenna	29
A.1.6	Measuring antenna	29
A.1.7	Stripline arrangement	29
A.1.7.1	General	29
A.1.7.2	Description	29
A.1.7.3	Calibration	29
A.1.7.4	Mode of use	30
A.2	Guidance on the use of radiation test sites	30
A.2.1	Verification of the test site	30
A.2.2	Preparation of the EUT	30
A.2.3	Power supplies to the EUT	30
A.2.4	Range length	30

A.2.4.1	Far-field length above 30 MHz.....	30
A.2.4.2	Near-field and Far-field length below 30 MHz.....	31
A.2.5	Site preparation	31
A.3	Coupling of signals.....	32
A.3.1	General	32
A.3.2	Data Signals.....	32
A.4	Standard test position	32
A.5	Test fixture	33
A.5.1	Description	33
A.5.2	Calibration.....	33
A.5.3	Mode of use.....	34
Annex B (normative):	Technical performance of the spectrum analyser	35
Annex C (informative):	Bibliography.....	36
History		37

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SIST EN 302 291-1 V1.1.1:2006

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

For non EU countries the present document may be used for regulatory (Type Approval) purposes.

The present document is part 1 of a multi-part deliverable covering the Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz as identified below:

Part 1: "Technical characteristics and test methods";

Part 2: "Harmonized EN under article 3.2 of the R&TTE Directive".

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National transposition dates

Date of adoption of this EN:	8 July 2005
Date of latest announcement of this EN (doa):	31 October 2005
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2006
Date of withdrawal of any conflicting National Standard (dow):	30 April 2006

1 Scope

The present document applies to Close Range Inductive Data transmitters and receivers operating at 13,56 MHz.

The present document contains the technical characteristics for radio equipment and is referencing in CEPT/ERC Recommendation 70-03 [1] and ERC Decisions.

The present document does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable. It is a specific product standard covering specific close range inductive data equipment:

- with an inductive loop antenna;
- with an antenna connection and/or with an integral antenna;
- for alarms, identification systems, telecommand, telemetry, etc.

When selecting new applications, which may have inherent safety of human life implications, manufacturers and users should pay particular attention to the potential for interference from other systems operating in the same or adjacent bands.

The present document covers fixed stations, mobile stations and portable stations. If a system includes transponders, these are measured together with the transmitter.

All types of modulation for radio devices are covered by the present document, provided the requirements of clause 7 are met.

The radio equipment, covered by the present document has a maximum radiated field strength given in table 1.

Table 1: Maximum radiated H-field at 13,56 MHz

<p>SIST EN 302 291-1 V1.1.1:2006 https://standards.iteh.ai/catalog/standards/sist/5280ade09ba3/sist-en-302-291-1-v1-1-1-2006 Radiated H-field +25 dBuA/m at 10 m</p>

On non-harmonized parameters, national administrations may impose conditions on the type of modulation, frequency, channel/frequency separations, maximum transmitter radiated field strength/maximum output current to a defined antenna, duty cycle, equipment marking and the inclusion of an automatic transmitter shut-off facility, as a condition for the issue of an individual or general licence, or as a condition for use under licence exemption.

Two types of measuring methods are defined in the present document due to the varied nature of the types of equipment used in this band. One method measures the radiated H-field and the second the radiated power.

The present document covers requirements for radiated emissions below as well as above 30 MHz.

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

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

- [1] CEPT/ERC Recommendation 70-03: "Relating to the use of Short Range Devices (SRD)".
- [2] ITU-T Recommendation O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate".
- [3] ETSI TR 100 028 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [4] CISPR 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods; Part 1: Radio disturbance and immunity measuring apparatus".
- [5] ETSI TR 102 273 (parts 2 to 4): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties".
- [6] ANSI C63.5: "American National Standard for Electromagnetic Compatibility-Radiated Emission Measurements in Electromagnetic Interference (EMI) Control-Calibration of Antennas (9 kHz to 40 GHz)".

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3 Definitions, symbols and abbreviations

3.1 Definitions

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

artificial antenna: tuned reduced-radiating dummy load equal to the nominal impedance specified by the applicant

assigned frequency band: frequency band within which the device is authorized to operate

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

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

fixed station: equipment intended for use in a fixed location

H-field test antenna: electrically screened loop or equivalent antenna, with which the magnetic component of the field can be measured

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 build-in, designed as an indispensable part of the equipment

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

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

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

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

transponder: device, that responds to an interrogation signal

3.2 Symbols

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

E	Electrical field strength
e.r.p	effective radiated power
f	frequency
f_C	carrier frequency
H	magnetic field strength
oct	octave
P	Power
PSTN	Public Switched Telephone Network
R	distance
t	time

3.3 Abbreviations

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

e.r.p.	effective radiated power
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
OATS	Open Area Test Site
PSTN	Public Switched Telephone Network
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
SRD	Short Range Device
VSWR	Voltage Standing Wave Ratio

4 Technical requirements specifications

4.1 General requirements

4.1.1 Receiver classification

The product family of short range radio devices is divided into three Equipment Classes, see table 2, each having its own set of minimum performance criteria. This classification is based upon the impact on persons in case the equipment does not operate above the specified minimum performance level.

Table 2: Receiver classification

Receiver class	Relevant receiver clauses	Risk assessment of receiver performance
1	8.1 and 8.2	Highly reliable SRD communication media; e.g. serving human life inherent systems (may result in a physical risk to a person)
2	8.1 and 8.2	Medium reliable SRD communication media e.g. causing Inconvenience to persons, which cannot simply be overcome by other means
3	8.2	Standard reliable SRD communication media e.g. Inconvenience to persons, which can simply be overcome by other means (e.g. manual)
NOTE:	With reference to the present document manufacturers are recommended to declare classification of their devices in accordance with table 2 as relevant. In particular where the equipment which may have an inherent safety of human life implications, manufacturers and users should pay particular attention to the potential for interference from other systems operating in the same or adjacent bands.	

4.1.2 General performance criteria

For the purpose of the receiver performance tests, the receiver will produce an appropriate output under normal conditions as indicated below. Where the indicated performance cannot be achieved or if it defined differently, the manufacturer shall declare and publish the performance criteria used to determine the performance of the receiver:

- after demodulation, a data signal with a bit error ratio of 10^{-2} or better; or
- after demodulation, a message acceptance ratio of 80 % or better.

4.2 Presentation of equipment for testing purposes

Each equipment submitted for testing where type approval is still in force shall fulfil the requirements of the present document on all frequencies over which it is intended to operate.

The applicant shall declare the frequency ranges, the range of operating conditions and power requirements in consultation with the Administration(s), as applicable, to establish the appropriate test conditions.

Additionally, technical documentation and operating manuals, sufficient to make the test, shall be supplied.

A test fixture for equipment with an integral antenna may be supplied by the applicant (see clause 6.3). For equipment supplied without an antenna, the connector shall be 50 ohm for artificial antenna measurements.

If an equipment is designed to operate with different radiated field strengths or power level, measurement of each transmitter parameter shall be performed, according to the present document, on samples of equipment defined in clause 4.2.1.

To simplify and harmonize the testing procedures between different testing laboratories, measurements shall be performed, according to the present document, on samples defined in clauses 4.2.1 to 4.2.4.

4.2.1 Choice of model for testing

The applicant shall provide one or more samples of the equipment, as appropriate for testing.

Stand alone equipment shall be offered by the applicant complete with any ancillary equipment needed for testing.

If an equipment has several optional features, considered not to affect the RF parameters then the tests need only to be performed on the equipment configured with that combination of features considered to be the most complex, as proposed by the applicant and agreed by the test laboratory.

Where practicable, equipment offered for testing shall provide a 50 ohm connector for conducted RF power level measurements.