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Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) – Naprave kratkega dosega (SRD), ki uporabljajo ultra širokopasovno (UWB) tehnologijo – Oprema za sledenje, ki deluje v frekvenčnem območju od 6 GHz do 9 GHz – 1. del: Tehnične karakteristike in preskusne metode

Electromagnetic compatibility and Radio spectrum Matters (ERM) – Short Range Devices (SRD) using Ultra WideBand (UWB) technology – Location Tracking equipment operating in the frequency range from 6 GHz to 9 GHz – Part 1: Technical characteristics and test methods

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

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 Short Range Devices (SRD) using Ultra WideBand (UWB) technology; Location Tracking equipment operating in the frequency range from 6 GHz to 9 GHz, as identified below:

Part 1: "Technical characteristics and test methods";

Part 2: "Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".

Clauses 1 and 3 provide a general description on the types of equipment covered by the present document 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 provider shall provide.

Clauses 5 and 6 give guidance on the test and general conditions for testing of the device.

Clause 7 gives the interpretation of results and maximum measurement uncertainty values.

Clause 8 specifies the transmitter spectrum utilization parameters which are required to be measured. The clauses provide details on how the equipment should be tested and the conditions which should be applied.

Clause 9 specifies the receiver spectrum utilization parameters which are required to be measured. The clauses provide details on how the equipment should be tested and the conditions which should be applied.

Annex A (normative) provides specifications concerning radiated measurements.

Annex B (normative) provides information on the spectrum analyser specification.

Annex C (normative) provides information on additional design requirements for equipment covered by the present document.

Annex D (informative) bibliography covers other supplementary information

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):	6 months after doa

1 Scope

The present document specifies the requirements for Ultra Wide Band location tracking equipment operating in all or part of the frequency range from 6 GHz to 9 GHz.

It covers Ultra Wide Band location tracking tags which are attached to people or objects and are tracked using a fixed infrastructure. Equipment covered by the present document is fitted with an integral or dedicated antenna. Equipment covered by the present document shall not be used aboard an aircraft, aboard a ship, or at a fixed outdoor location.

The present document applies for indoor applications only

The present document contains the technical characteristics and test methods for location tracking equipment in accordance with the ECC Decision of 24 March 2006 [1]. It does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable.

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] ECC Decision of 24 March 2006 on the harmonized conditions for devices using Ultra-Wideband (UWB) technology in Bands below 10.6 GHz.

[2] ETSI TR 100 028 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

[3] CISPR 16: "Specification for radio disturbance and immunity measuring apparatus and methods".

[4] ETSI TR 102 273 (all parts): "Electromagnetic compatibility and Radio Spectrum Matters (ERM): Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties".

[5] ANSI C63.5 (2004): "American National Standard for Electromagnetic Compatibility-Radiated Emission Measurements in Electromagnetic Interference (EMI) Control-Calibration of Antennas (9 kHz to 40 GHz)".

[6] Void.

[7] ETSI TR 102 070-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide to the application of harmonized standards to multi-radio and combined radio and non-radio equipment; Part 2: Effective use of the radio frequency spectrum".

[8] CENELEC EN 55022: "Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

integral antenna: antenna designed to be connected to the equipment without the use of a standard connector and considered to be part of the equipment

NOTE: An integral antenna may be fitted internally or externally to the equipment.

provider: manufacturer, or his authorized representative or the person responsible for placing on the market

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

pulse: radiated short transient ultra-wideband signal whose time duration is nominally the reciprocal of its -10 dB bandwidth

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

3.2 Symbols

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

dB	decibel
R	distance
λ	wavelength

3.3 Abbreviations

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

e.i.r.p.	equivalent isotropic radiated power
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
LNA	Low Noise Amplifier
PRF	Pulse Repitition Frequency
R&TTE	Radio and Telecommunications Terminal Equipment
RBW	Resolution BandWidth
RF	Radio Frequency
rms	root-mean-square
SNR	Signal to Noise Ratio
SRD	Short Range Device
TX	Transmitter
UWB	Ultra Wide Band
VBW	Video BandWidth
VSWR	Voltage Standing Wave Ratio

4 Technical requirement specifications

4.1 General requirements

Equipment supplied for testing against this standard shall be fitted with either an integral antenna or a dedicated antenna.

4.2 Presentation of equipment for testing purposes

Each equipment submitted for testing shall fulfil the requirements of the present document on all frequencies over which it is intended to operate.

To simplify and harmonize the testing procedures between the different testing laboratories, measurements shall be performed, according to the present document, on samples of equipment defined in clauses 4.2.1 to 4.2.1.2 (see also annex C).

These clauses are intended to give confidence that the requirements set out in the present document have been met without the necessity of performing measurements on all frequencies.

4.2.1 Choice of model for testing

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

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

4.2.1.1 Auxiliary test equipment

All necessary test signal sources, setting up instructions and other product information shall accompany the equipment when it is submitted for testing.

4.2.1.2 Declarations by the provider

The provider shall declare the necessary information regarding the equipment with respect to all technical requirements set by the present document.

4.3 Mechanical and electrical design

4.3.1 General

The equipment submitted by the provider or his representative, shall be designed, constructed and manufactured in accordance with good engineering practice, and with the aim of minimizing harmful interference to other equipment and services.

4.3.2 Controls

Those controls, which, if maladjusted, may increase the interfering potential of the equipment, shall not be easily accessible to the user.

4.3.3 Transmitter shut-off facility

If the equipment is equipped with an automatic transmitter shut-off facility, it shall be possible to disable this feature for the purposes of testing. See clause 8.

4.3.4 Marking

The equipment shall be marked in a visible place. This marking shall be legible and durable. In cases where the equipment is too small to carry the marking, it is sufficient to provide the relevant information in the users manual.

4.3.4.1 Equipment identification

The marking shall include as a minimum:

- the name of the manufacturer or his trademark;
- the type designation. This is the manufacturer's numeric or alphanumeric code or name that is specific to a particular equipment.

4.3.4.2 Additional information for the user

The following additional information shall be included in the users manual:

- statements (as per the ECC Decision of 24 March 2006 [1]) that the UWB transmitter equipment should not be used:
    - aboard an aircraft;
    - aboard a ship;
    - at a fixed outdoor location.

4.4 Other device emissions

The equipment may contain digital circuit elements, radio circuit elements and other elements whose performance is not covered by the present document. These elements of the equipment shall meet the appropriate performance requirements for those components, as specified in other standards.

For example, a UWB device which may be connected to an office IT network should meet at least the requirements of this standard (for the elements of the device concerned with radio communications), and the requirements of a standard for EMC compatibility of IT equipment, such as EN 55022 [8] (for the elements of the device which are not concerned with radio communications but are considered to be IT equipment).

NOTE: For further information on this topic see TR 102 070-2 [7].

5 Test conditions, power sources and ambient temperatures

5.1 Normal and extreme test conditions

Testing shall be performed under normal test conditions.

The test conditions and procedures shall be as specified in clauses 5.2 to 5.4.

5.2 Test power source

The equipment shall be tested using the appropriate test power source as specified in clauses 5.2.1 or 5.2.2. Where equipment can be powered using either external or internal power sources, then equipment shall be tested using the external test power source as specified in clause 5.2.1 then repeated using the internal power source as specified in clause 5.2.2.

The test power source used shall be recorded and stated.