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Harmonized European Standard (Telecommunications series)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Level Probing Radar (LPR) equipment operating in the frequency ranges 6 GHz to 8,5 GHz, 24,05 GHz to 26,5 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Reference

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Foreword

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

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) [i.1] laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [i.2] of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive").

For non EEA countries the present document may be used for regulatory (type approval) purposes.

The requirements relevant to Directive 1999/5/EC [i.2] are summarised in annex A.

The present document is part 2 of a multi-part deliverable covering Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Level Probing Radar (LPR) equipment operating in the frequency ranges 6 GHz to 8,5 GHz, 24,05 GHz to 26,5 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz, as identified below:

Part 1: "Technical characteristics and test methods";

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

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

Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive [i.2]. The modular structure is shown in EG 201 399 [i.4].

1 Scope

The present document specifies the requirements for Level Probing Radar (LPR) applications based on pulse RF, FMCW, or similar wideband techniques.

LPR radio equipment types are capable of operating in all or part of the frequency bands as specified in table 1.

Table 1: Frequency bands designated to Level Probing Radars (LPR)

	Frequency Bands/frequencies (GHz)
Transmit and Receive	6 to 8,5
Transmit and Receive	24,05 to 26,5
Transmit and Receive	57 to 64
Transmit and Receive	75 to 85

Table 1 shows a list of the frequency bands as designated to Level Probing Radars in the draft CEPT ECC Decision on harmonised deployment conditions for industrial Level Probing Radars (LPR) [i.3] as known at the date of publication of the present document.

LPRs are used in many industries concerned with process control to measure the amount of various substances (mostly liquids or granulates). LPRs are used for a wide range of applications such as process control, custody transfer measurement (government legal measurements), water and other liquid monitoring, spilling prevention and other industrial applications. The main purposes of using LPRs are:

- to increase reliability by preventing accidents;
- to increase industrial efficiency, quality and process control;
- to improve environmental conditions in production processes.

LPR always consist of a combined transmitter and receiver and are used with an integral or dedicated antenna. The LPR equipment is for professional applications to which installation and maintenance are performed by professionally trained individuals only.

NOTE: LPR antennas are always specific directive antennas and no LPR omnidirectional antennas are used. This is also important in order to limit the illuminated surface area as well as to control and limit the scattering caused by the edges of the surface.

The scope is limited to LPRs operating as Short Range Devices.

The LPR applications in the present document are not intended for communications purposes.

2 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 reference document (including any amendments) applies.

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

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

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

[1] ETSI EN 302 729-1(V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Level Probing Radar (LPR) equipment operating in the frequency ranges 6 GHz to 8,5 GHz, 24,05 GHz to 26,5 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz; Part 1: Technical characteristics and test methods".

2.2 Informative references

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] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

[i.2] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

[i.3] Draft CEPT ECC Decision of [Day Month Year] on harmonised deployment conditions for industrial Level Probing Radars (LPR) in frequency bands 6-8.5 GHz, 24.05-26.5 GHz, 57-64 GHz and 75-85 GHz.

[i.4] ETSI EG 201 399 (V2.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [i.2] and EN 302 729-1 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 302 729-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 302 729-1 [1] apply.

4 Technical requirements specifications

4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the supplier. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile.

4.2 Conformance requirements

4.2.1 Transmitter requirements

4.2.1.1 Frequency band of operation

The frequency band of operation, as defined in EN 302 729-1 [1], clause 7.1.1, shall not exceed the limits in EN 302 729-1 [1], clause 7.1.3.

4.2.1.2 Maximum value of mean power spectral density (within main beam)

The maximum value of mean power spectral density as defined in 302 729-1 [1], clause 7.2.1, shall not exceed the limits in EN 302 729-1 [1], clause 7.2.3.

4.2.1.3 Maximum value of peak power

The maximum value of peak power as defined in 302 729-1 [1], clause 7.3.1, shall not exceed the limits in EN 302 729-1 [1], clause 7.3.3.

4.2.1.4 LPR antenna characteristics

The LPR antenna characteristics as defined in 302 729-1 [1], clause 7.4.1, shall not exceed the limits and restrictions in EN 302 729-1 [1], clause 7.4.3.

4.2.1.5 Range of modulation parameters

The range of modulation parameters as defined in EN 302 729-1 [1], clause 7.5 and its normative annex F shall apply and be declared by the provider.

4.2.1.6 Other emissions

The other emissions as defined in 302 729-1 [1], clause 7.6.1, shall not exceed the limits in EN 302 729-1 [1], clause 7.6.3.

4.2.1.7 Mitigation techniques

One or more mitigation techniques as defined in 302 729-1 [1], clause 7.7, shall be used. The manufacturer shall provide sufficient information for determining compliance with the LPR emission limits in clauses 7.2.3 and 7.3.3 of EN 302 729-1 [1] when using these mitigation techniques.

5 Testing for compliance with technical requirements

5.1 Environmental conditions for testing

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile.

Where technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions (within the boundary limits of the declared operational environmental profile) to give confidence of compliance for the affected technical requirements.

5.2 Interpretation of measurement results

The interpretation of the measurement results specified in EN 302 729-1 [1], clause 4.9, shall apply.

5.3 Conformance radio test suites

The essential radio test suites referred to in annex III of the R&TTE Directive [i.2] are included in the following conformance radio test suite.

5.3.1 Normal and extreme test-conditions

The test conditions shall be as declared by the manufacturer.

The test procedures shall be as specified in EN 302 729-1 [1], clause 5.3.

5.3.2 Test power source

The test power source shall meet the requirements of EN 302 729-1 [1], clause 5.2.

5.3.3 Choice of samples for test suites

Measurement shall be performed, according to the present document, on samples of equipment defined in EN 302 729-1 [1], clauses 4.1 and 4.2.

5.3.4 Transmitter test suites

5.3.4.1 Frequency band of operation

The test specified in EN 302 729-1 [1], clause 7.1.2 shall be carried out.

5.3.4.2 Maximum value of mean power spectral density (within main beam)

The test specified in EN 302 729-1 [1], clause 7.2.2 shall be carried out.

5.3.4.3 Maximum value of peak power

The test specified in EN 302 729-1 [1], clause 7.3.2 shall be carried out.

5.3.4.4 LPR antenna characteristics

The test specified in EN 302 729-1 [1], clause 7.4.2 shall be carried out.

5.3.4.5 Other emissions

The test specified in EN 302 729-1 [1], clause 7.6.2 shall be carried out under the condition that it can be demonstrated that an emission falls into the other emissions category as described in EN 302 729-1 [1], clause 7.6.

5.3.4.6 Mitigation techniques

For the automatic power control, if implemented, the test specified in EN 302 729-1 [1], clause 7.7.5.2 shall be carried out.

Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT)

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A.1 serves a number of purposes, as follows:

- it provides a statement of all the requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it provides a statement of all the test procedures corresponding to those requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
  - Unconditional: meaning that the requirement applies in all circumstances; or
  - Conditional: meaning that the requirement is dependent on the manufacturer having chosen to support optional functionality defined within the schedule;
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
  - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
  - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)

Harmonized Standard EN 300 729-2 The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive						
Requirement			**Requirement Conditionality**		**Test Specification**	
No	**Description**	**Reference: Clause No**	**U/C**	**Condition**	**E/O**	**Reference: Clause No**
1	Frequency band of operation	4.2.1.1	U		E	5.3.4.1
2	maximum value of mean power spectral density	4.2.1.2	U		E	5.3.4.2
3	maximum value of peak power	4.2.1.3	U		E	5.3.4.3
4	LPR antenna characteristics	4.2.1.4	U		E	5.3.4.4
5	Range of modulation parameters	4.2.1.5	U		X	
6	Other emissions	4.2.1.6	C	Applies only if other emissions can be clearly demonstrated	E	5.3.4.5
7	Mitigation techniques	4.2.1.7	C	One or more mitigation techniques shall be applied	E	5.3.4.6 for APC
					X	