

ETSI EN 300 674-2-2 V1.1.1 (2004-08)

Candidate Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Road Transport and Traffic Telematics (RTTT);
Dedicated Short Range Communication (DSRC)
transmission equipment (500 kbit/s / 250 kbit/s) operating in
the 5,8 GHz Industrial, Scientific and Medical (ISM) band;
Part 2: Harmonized EN under article 3.2
of the R&TTE Directive;
Sub-part 2: Requirements for the On-Board Units (OBU)**



Reference

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Contents

| | |
|--|-----------|
| Intellectual Property Rights | 4 |
| Foreword..... | 4 |
| Introduction | 5 |
| 1 Scope | 7 |
| 2 References | 7 |
| 3 Definitions, symbols and abbreviations | 8 |
| 3.1 Definitions | 8 |
| 3.2 Symbols..... | 8 |
| 3.3 Abbreviations | 8 |
| 4 Technical requirements specifications | 8 |
| 4.1 Environmental conditions..... | 8 |
| 4.1.1 Environmental profile | 8 |
| 4.1.2 Power supply | 8 |
| 4.2 Conformance requirements | 9 |
| 4.2.1 Transmitter..... | 9 |
| 4.2.1.1 Maximum equivalent isotropically radiated power | 9 |
| 4.2.1.2 Frequency error | 9 |
| 4.2.1.3 Transmitter spectrum mask | 9 |
| 4.2.1.4 Unwanted emissions..... | 9 |
| 4.2.2 Receiver spurious emissions | 9 |
| 5 Testing for compliance with technical requirements..... | 9 |
| 5.1 Environmental conditions for testing | 9 |
| 5.2 Essential radio test suites..... | 9 |
| 5.2.1 Transmitter..... | 9 |
| 5.2.1.1 Maximum equivalent isotropically radiated power | 9 |
| 5.2.1.2 Frequency error | 9 |
| 5.2.1.3 Transmitter spectrum mask | 9 |
| 5.2.1.4 Unwanted emissions..... | 10 |
| 5.2.2 Receiver spurious emissions | 10 |
| 5.3 Interpretation of results and measurement uncertainty..... | 10 |
| Annex A (normative): The EN Requirements Table (EN-RT) | 11 |
| Annex B (informative): Bibliography | 12 |
| Annex C (informative): The EN title in the official languages | 13 |
| History | 14 |

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Foreword

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

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) 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 [1] 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") [1].

The present document is part 2, sub-part 2 of a multi-part deliverable covering Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band, as identified below:

Part 1: "General characteristics and test methods for Road Side Units (RSU) and On-Board Units (OBU)";

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

Sub-part 1: "Requirements for the Road Side Units (RSU)";

Sub-part 2: "Requirements for the On-Board Units (OBU)";

Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A.

| National transposition dates | |
|--|-----------------|
| Date of adoption of this EN: | 2 April 2004 |
| Date of latest announcement of this EN (doa): | 31 July 2004 |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 31 January 2005 |
| Date of withdrawal of any conflicting National Standard (dow): | 31 January 2006 |

Introduction

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [1]. Each standard is a module in the structure. The modular structure is shown in figure 1.

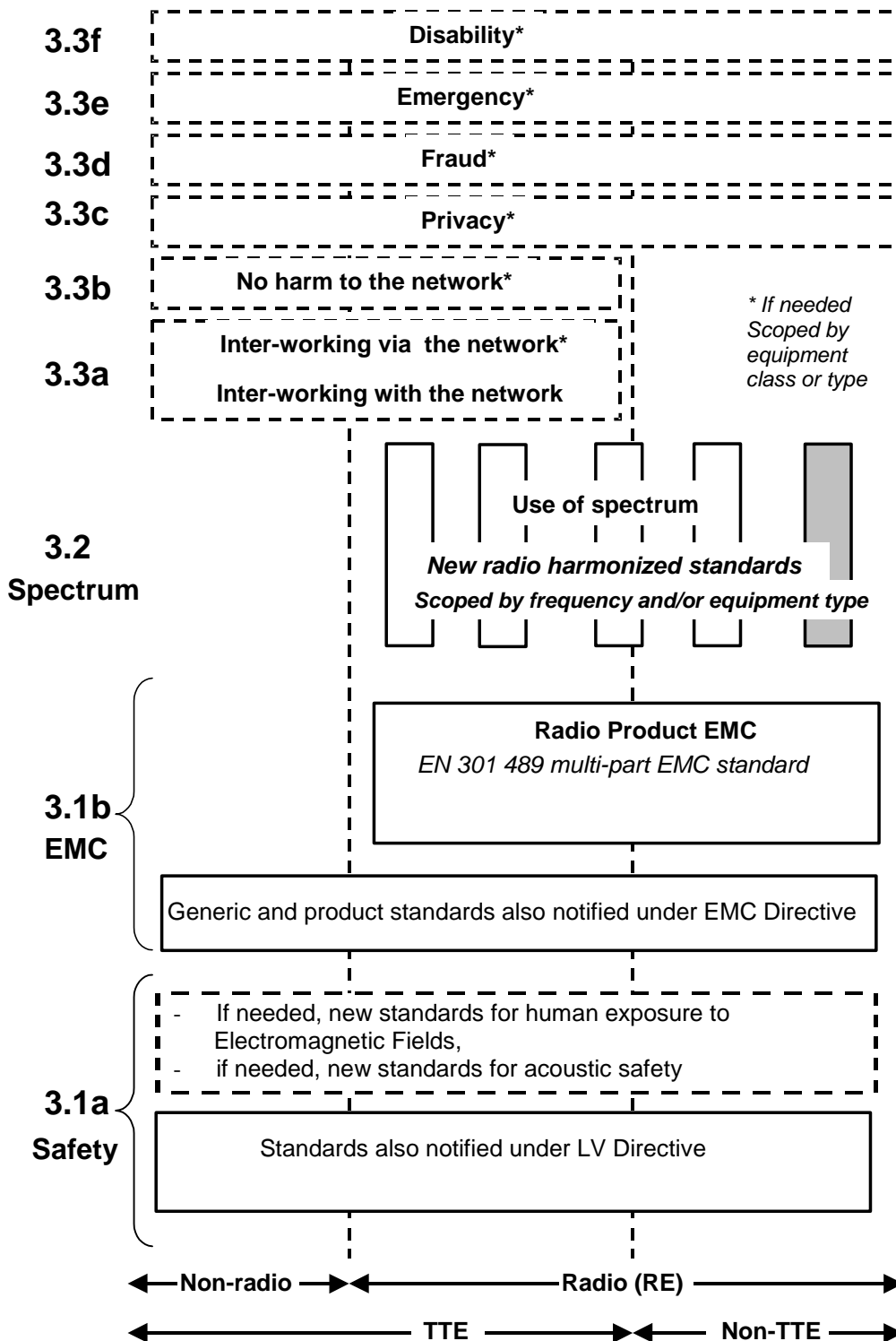


Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]

The left hand edge of the figure 1 shows the different clauses of article 3 of the R&TTE Directive [1].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.1b the diagram shows EN 301 489, the multi-part product EMC standard for radio used under the EMC Directive [2].

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive [3] and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. Particular equipment may be radio equipment, telecommunications terminal equipment or both. A radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement under the R&TTE Directive [1] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [1] may be covered in a set of standards.

The modularity principle has been taken because:

- it minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment;
- it provides scope for standards to be added:
 - under article 3.2 when new frequency bands are agreed; or
 - under article 3.3 should the Commission take the necessary decisions without requiring alteration of standards that are already published;
- it clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

1 Scope

The present document applies to Road Transport and Traffic Telematics (RTTT) systems

- with a Radio Frequency (RF) output connection and specified antenna or with an integral antenna;
- for data transmission only;
- operating on radio frequencies in the 5,725 GHz to 5,875 GHz Industrial, Scientific and Medical (ISM) frequency band.

The applicability of the present document covers only the On Board Units (OBUs).

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.

The present document complies with ECC/DEC/(02)01 [5] and CEPT/ERC/REC 70-03 [6]. It is a specific standard covering various RTTT applications.

The present document applies to the following radio equipment types operating in all or in part of the following service frequency bands given in table 1:

Table 1: Frequency bands and centre frequencies f_{TX} allocated for DSRC

| | Pan European Service Frequencies | National Service Frequencies |
|-----------|---|---|
| Channel 1 | 5,795 GHz to 5,800 GHz, $f_{TX} = 5,7975$ GHz | |
| Channel 2 | 5,800 GHz to 5,805 GHz, $f_{TX} = 5,8025$ GHz | |
| Channel 3 | | 5,805 GHz to 5,810 GHz, $f_{TX} = 5,8075$ GHz |
| Channel 4 | | 5,810 GHz to 5,815 GHz, $f_{TX} = 5,8125$ GHz |

The present document is intended to cover the provisions of Directive 1999/5/EC [1] (R&TTE Directive) article 3.2, which states that "... radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of article 3 of the R&TTE Directive [1] will apply to equipment within the scope of the present document.

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] 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).
- [2] Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).

- [3] Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).
- [4] ETSI EN 300 674-1 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band; Part 1: General characteristics and test methods for Road Side Units (RSU) and On-Board Units (OBU)".
- [5] ECC/DEC/(02)01: "ECC Decision of 15 March 2002 on the frequency bands to be designated for the co-ordinated introduction of Road Transport and Traffic Telematic Systems".
- [6] CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".

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 [1], EN 300 674-1 [4] and the following apply:

environmental profile: range of environmental conditions under which equipment within the scope of EN 300 674-2-2 is required to comply with the provisions of EN 300 674-2-2

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 674-1 [4] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 674-1 [4] apply.

4 Technical requirements specifications

4.1 Environmental conditions

4.1.1 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 provider. 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.

4.1.2 Power supply

All the characteristics and essential requirements applying to OBUs shall be fulfilled within the range of all declared operational conditions of the power supply.

Power supply may be e.g. a built in battery, an external battery or a stabilized power supply.

4.2 Conformance requirements

4.2.1 Transmitter

4.2.1.1 Maximum equivalent isotropically radiated power

The maximum e.i.r.p. shall not exceed the limits specified in clause 7.2.4 of EN 300 674-1 [4].

4.2.1.2 Frequency error

The frequency error shall not exceed the limits specified in clause 7.2.5 of EN 300 674-1 [4].

4.2.1.3 Transmitter spectrum mask

The transmitter spectrum mask shall not exceed the limits specified in clause 7.2.6 of EN 300 674-1 [4].

4.2.1.4 Unwanted emissions

The transmitter unwanted emissions, i.e. spurious and out-of-band emissions, shall not exceed the limits specified in clause 7.2.7 of EN 300 674-1 [4].

4.2.2 Receiver spurious emissions

The receiver spurious emissions shall not exceed the limits specified in clause 7.2.8 of EN 300 674-1 [4].

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 Essential radio test suites

5.2.1 Transmitter

5.2.1.1 Maximum equivalent isotropically radiated power

The test defined in clause 10.4 of EN 300 674-1 [4] shall be carried out.

5.2.1.2 Frequency error

The test defined in clause 10.5 of EN 300 674-1 [4] shall be carried out.

5.2.1.3 Transmitter spectrum mask

The test defined in clause 10.6 of EN 300 674-1 [4] shall be carried out.

5.2.1.4 Unwanted emissions

The test defined in clause 10.7 of EN 300 674-1 [4] shall be carried out.

5.2.2 Receiver spurious emissions

The test defined in clause 10.8 of EN 300 674-1 [4] shall be carried out.

5.3 Interpretation of results and measurement uncertainty

Clause 11 of EN 300 674-1 [4] shall apply.

Annex A (normative): The EN Requirements Table (EN-RT)

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the EN-RT proforma in this annex so that it can be used for its intended purposes and may further publish the completed EN-RT.

The EN Requirements Table (EN-RT) serves a number of purposes, as follows:

- it provides a tabular summary of all the requirements;
- it shows the status of each EN-R, whether it is essential to implement in all circumstances (Mandatory), or whether the requirement is dependent on the provider having chosen to support a particular optional service or functionality (Optional). In particular it enables the EN-Rs associated with a particular optional service or functionality to be grouped and identified;
- when completed in respect of particular equipment it provides a means to undertake the static assessment of conformity with the EN.

Table A.1: EN Requirements Table (EN-RT) for OBUs

| EN Reference | | EN 300 674-2-2 | | Comment |
|---|-----------|---|----------------|---------|
| No. | Reference | EN-R (see note 1) | Status | |
| Transmitter | | | | |
| 1 | 4.2.1.1 | Maximum equivalent isotropically radiated power | M (see note 2) | |
| 2 | 4.2.1.2 | Frequency error | M (see note 2) | |
| 3 | 4.2.1.3 | Transmitter spectrum mask | M (see note 2) | |
| 4 | 4.2.1.4 | Unwanted emissions | M (see note 2) | |
| Receiver | | | | |
| 5 | 4.2.2 | Receiver spurious emissions | M (see note 3) | |
| NOTE 1: These EN-Rs are justified under article 3.2 of the R&TTE Directive. | | | | |
| NOTE 2: Mandatory for a transmitter. | | | | |
| NOTE 3: Mandatory for a receiver. | | | | |

Key to columns:

| | |
|------------------|--|
| No. | Table entry number; |
| Reference | Clause reference number of conformance requirement within the present document; |
| EN-R | Title of conformance requirement within the present document; |
| Status | Status of the entry as follows: |
| M | Mandatory, shall be implemented under all circumstances; |
| O | Optional may be provided, but if provided shall be implemented in accordance with the requirements; |
| O.n | this status is used for mutually exclusive or selectable options among a set. The integer "n" shall refer to a unique group of options within the EN-RT. A footnote to the EN-RT shall explicitly state what the requirement is for each numbered group. For example, "It is mandatory to support at least one of these options", or, "It is mandatory to support exactly one of these options". |
| Comments | To be completed as required. |

Annex B (informative): Bibliography

- 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.
- ETSI EN 301 489: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".

Annex C (informative): The EN title in the official languages

| Language | EN title |
|------------|--|
| Czech | |
| Danish | |
| Dutch | |
| English | Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive; Sub-part 2: Requirements for the On-Board Units (OBU) |
| Estonian | |
| Finnish | |
| French | |
| German | |
| Greek | |
| Hungarian | |
| Icelandic | |
| Italian | |
| Latvian | |
| Lithuanian | |
| Maltese | |
| Polish | Kompatybilność Elektromagnetyczna i Zagadnienia Widma Radiowego (ERM) - Transport drogowy i telematyka trafiku (RTTT) - Wydzielona łączność małego zasięgu (DSRC), urządzenia transmisyjne (500 kbit/s / 250 kbit/s) pracujące w paśmie częstotliwości 5,8 GHz wydzielonym do zastosowania przemysłowego, naukowego i medycznego (ISM) - Część 2-2: Zharmonizowana EN zapewniająca spełnienie zasadniczych wymagań zgodnie z artykułem 3.2 dyrektywy R&TTE. Wymagania dotyczące zespołów instalowanych na pojeździe (OBU). |
| Portuguese | |
| Slovak | |
| Slovenian | |
| Spanish | |
| Swedish | |

History

| Document history | | |
|-------------------------|---------------|--|
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| V1.1.1 | August 2004 | Publication |
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