

Draft **ETSI EN 300 330-2** V1.1.1 (2000-07)

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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Short Range Devices (SRD);  
Radio equipment in the frequency range  
9 kHz to 25 MHz and inductive loop systems  
in the frequency range 9 kHz to 30 MHz;  
Part 2: Harmonized EN under article 3.2  
of the R&TTE Directive**

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## Foreword

This Candidate Harmonized European Standard (Telecommunication 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.

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [5] 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").

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

The present document is part 2 of a multi-part deliverable covering the Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz, as identified below:

Part 1: "Technical characteristics and test methods";

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

<b>Proposed national transposition dates</b>	
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

## 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.

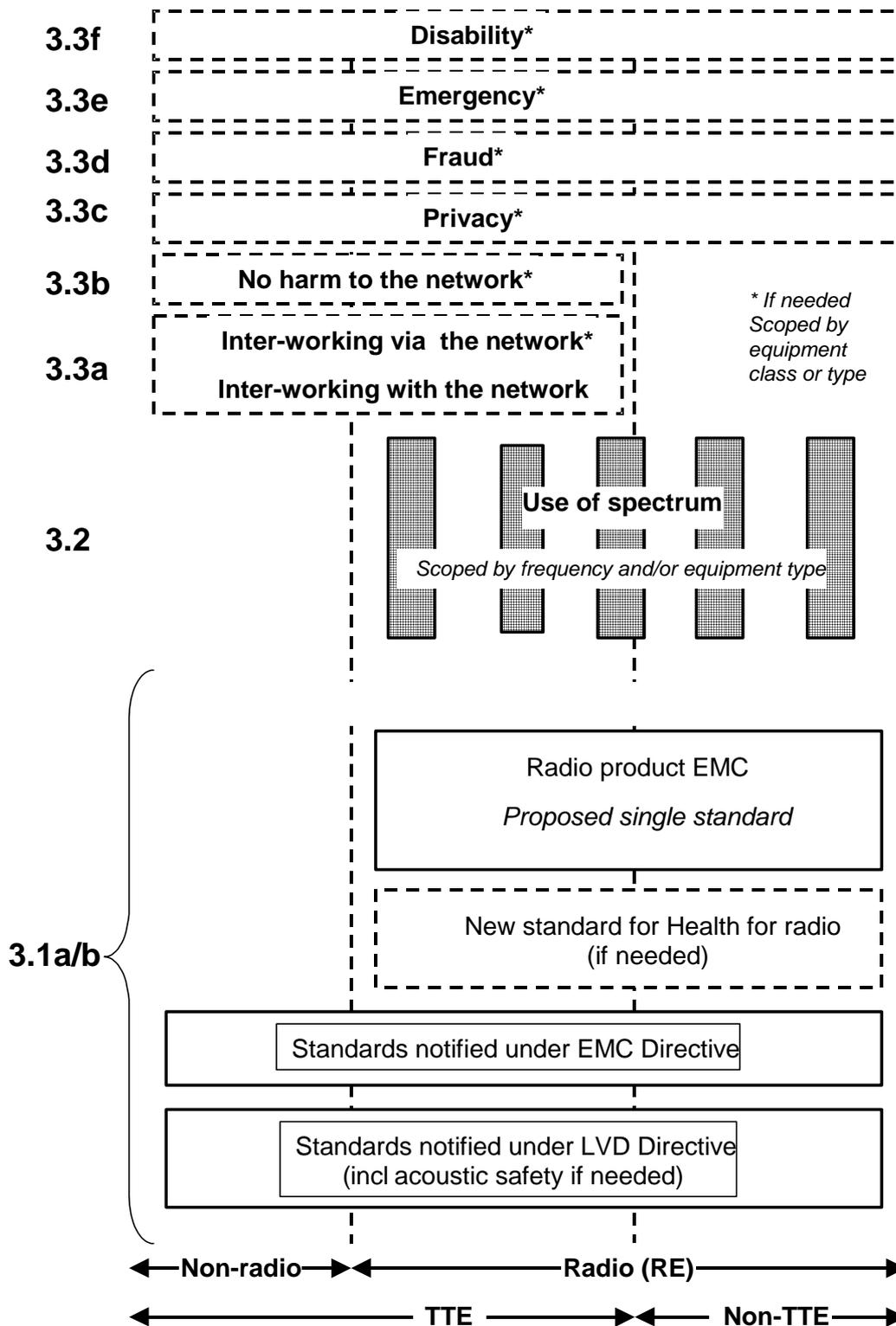


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of the figure shows the different subclauses of article 3 of the Directive.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum. 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 3.3 various horizontal boxes are shown. Their dotted lines indicate that 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 bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. The General Standard will always apply to it, and 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 is adopted by the Commission and if the equipment in question lies within the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the Directive may be covered in just the General Standard or in a set of standards that includes the General Standard.

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 under articles 3.2 and 3.3 to be added when new frequency bands are agreed or when the Commission takes decisions under article 3 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 Short Range Devices (SRDs) transmitters and receivers:

- transmitters operating in range from 9 kHz to 30 MHz with power levels ranging up to 10 mW;
- receivers operating in the range from 9 kHz to 30 MHz.

The present document applies to SRDs:

- either with a Radio Frequency (RF) output connection and specified antenna, or with an integral antenna;
- for alarms, identification systems, radio-determination, telecommand, telemetry etc. applications;
- for all types of modulation;
- with or without speech.

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 subclauses 7.2 and 7.3 are met.

The radio equipment, covered by the classification SRD is divided into several power classes based on maximum radiated field strength or power (see table 1). The power class designation is based on CEPT/ERC Recommendation 70-03 [3].

**Table 1: Maximum radiated H-field or power (e.i.r.p.)**

Power Class	Radiated H-field or power level
1	7 dB $\mu$ A/m at 10 metres
2	42 dB $\mu$ A/m at 10 metres
3	72 dB $\mu$ A/m at 10 metres (at 9 to 30 kHz, descending 3 dB/octave from 30 kHz 135 kHz)
4	38 dB $\mu$ A/m at 10 metres (at 135 kHz, descending 3 dB/octave from 135 kHz to 4,78 MHz)
5	9 dB $\mu$ A/m at 10 metres
8	10 mW

On non-harmonized parameters, national administrations may impose conditions on the type of modulation, frequency, channel/frequency separations, maximum transmitter output power/effective radiated power, 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.

The present document is intended to cover the provisions of article 3.2 of Directive 1999/5/EC (R&TTE Directive) [1] 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] may apply to equipment within the scope of the present document.

NOTE: A list of such ENs is included on the web site <http://www.newapproach.org>.

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## 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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [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] ETSI EN 300 330-1 (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 1: Technical characteristics and test methods".
- [3] CEPT/ERC Recommendation 70-03 (1997): "Relating to the use of Short Range Devices (SRD)".
- [4] ETSI ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".
- [5] 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.

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## 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], and EN 300 330-1 [2] apply.

### 3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 330-1 [2] apply.

### 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 330-1 [2] apply.

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## 4 Technical requirements specifications

### 4.1 Transmitter requirements

#### 4.1.1 Radiated field strength or power

##### 4.1.1.1 Radiated H-field

The radiated H-field, as defined in EN 300 330-1 [2], subclause 7.2.1.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.2.1.3.

This requirement applies to transmitters with an integral or dedicated antenna.

##### 4.1.1.2 RF carrier current

The RF carrier current, as defined in EN 300 330-1 [2], subclause 7.2.2.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.2.2.3.

##### 4.1.1.3 Radiated E-field

The radiated E-field, as defined in EN 300 330-1 [2], subclause 7.2.3.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.2.3.3.

#### 4.1.2 Permitted range of operating frequencies

The permitted range of operation frequencies, as defined in EN 300 330-1 [2], subclause 7.3.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.3.3.

##### 4.1.2 a Spurious emissions

###### 4.1.2.1 Conducted spurious emissions below 30 MHz

The conducted spurious emissions below 30 MHz, as defined in EN 300 330-1 [2], subclause 7.4.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.4.2.2.

###### 4.1.2.2 Conducted spurious emissions above 30 MHz

The conducted spurious emissions above 30 MHz, as defined in EN 300 330-1 [2], subclause 7.4.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.4.2.4, table 6.

###### 4.1.2.3 Radiated spurious emissions below 30 MHz

The radiated spurious emissions below 30 MHz, as defined in EN 300 330-1 [2], subclause 7.4.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.4.3.2, table 7.

This requirement applies to all transmitters.

###### 4.1.2.4 Radiated spurious power above 30 MHz

The radiated spurious emissions above 30 MHz, as defined in EN 300 330-1 [2], subclause 7.4.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.4.4.2, table 8.

This requirement applies to all transmitters.

### 4.1.3 Void

### 4.1.4 Duty cycle

The duty cycle, as defined in EN 300 330-1 [2], subclause 7.5.1, shall not exceed the limits in EN 300 330-1 [2], subclause 7.5.3, table 9.

This requirement applies to all transmitters.

## 4.2 Receiver requirements

### 4.2.1 Adjacent channel selectivity - in band

The adjacent channel selectivity in-band, as defined in EN 300 330-1 [2], subclause 8.1.1, shall not exceed the limits in EN 300 330-1 [2], subclause 8.1.3, table 10.

This requirement applies to equipment class 1 receivers, as defined in EN 300 330-1 [2], subclauses 4.1.1 and 8.1.

### 4.2.2 Blocking or desensitization

The blocking or desensitization, as defined in EN 300 330-1 [2], subclause 8.2.1, shall not exceed the limits in EN 300 330-1 [2], subclause 8.2.3, table 11.

This requirement applies to equipment class 1 and equipment class 2 receivers, as defined in EN 300 330-1 [2], subclause 4.1.1.

### 4.2.3 Receiver spurious radiations

#### 4.2.3.1 Radiated emissions below 30 MHz

The spurious radiations below 30 MHz, as defined in EN 300 330-1 [2], subclause 8.3.1, shall not exceed the limits in EN 300 330-1 [2], subclause 8.3.3.1, table 12.

This requirement applies to all receivers.

#### 4.2.3.2 Radiated emissions above 30 MHz

The spurious radiations above 30 MHz, as defined in EN 300 330-1 [2], subclause 8.3.1, shall not exceed the limits in EN 300 330-1 [2], subclause 8.3.3.2.

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## 5 Testing for compliance with technical requirements

### 5.1 Essential radio test suites

#### 5.1.1 Environmental conditions for testing

##### 5.1.1.1 Normal and extreme test-conditions

Type tests shall be made under normal test conditions, and also, where stated, under extreme test conditions.

The test conditions and procedures shall be as specified in EN 300 330-1 [2], subclauses 5.3 to 5.4.

### 5.1.1.2 Test power source

The test power source shall meet the requirements of EN 300 330-1 [2], subclause 5.2.

### 5.1.2 Choice of samples for test suites

Measurement shall be performed, according to the present document, on samples of equipment defined in EN 300 330-1 [2], subclauses 4.2.1 to 4.2.4.

### 5.1.3 Transmitter test suites

#### 5.1.3.1 Effective radiated H-field, carrier current or radiated power

Either:

- The test specified in EN 300 330-1 [2], subclause 7.2.1.2 shall be carried out;

This test suite applies for class 1 transmitters with an integral or dedicated antenna and class 2 transmitters with a customized antenna.

or

- The test specified in EN 300 330-1 [2], subclause 7.2.2.2 shall be carried out;

This test suite applies for class 3 transmitters supplied without antenna.

or

- The test specified in EN 300 330-1 [2], subclause 7.2.3.2 shall be carried out;

This test suite applies for class 4 transmitters with an integral or dedicated antenna.

#### 5.1.3.2 Permitted frequency range of the modulation bandwidth:

- The test specified in EN 300 330-1 [2], subclause 7.3.2 shall be carried out.

This test suite applies to all transmitters.

#### 5.1.3.3 Spurious emissions

Either:

- The tests specified in EN 300 330-1 [2], subclause 7.4.2.1, EN 300 330-1 [2], subclause 7.4.2.3 and EN 300 330-1 [2], subclause 7.4.4.1 shall be carried out;

or

- The test specified in EN 300 330-1 [2], subclause 7.4.3.1 and EN 300 330-1 [2], subclause 7.4.4.1 shall be carried out.

This test suite applies to all transmitters.

## 5.2 Other test specifications

The requirements in subclause 4.2 have been set on the assumption that the test specifications in table 2 will be used to verify the performance of equipment.

**Table 2: Receiver test specifications**

Subclause	Performance requirement	Subclause of EN 300 330-1 [2] containing the test method
4.2.3	Spurious radiations	8.3.2
4.2.1	Adjacent channel selectivity - in band	8.1.2
4.2.3	Blocking or desensitization	8.2.2

### 5.2.1 Receiver test suites

### 5.2.2 Spurious radiations

The tests specified in EN 300 330-1 [2], subclause 8.3.2 shall be carried out. This test suite applies to all receivers.

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## 6 Interpretation of measurement results

The interpretation of the results recorded in the test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit shall be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be separately included in the test report;
- the value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in table 3.

**Table 3: Measurement uncertainty**

RF frequency	$\pm 1 \times 10^{-7}$
RF power, conducted	$\pm 1$ dB
Conducted emission of receivers	$\pm 1$ dB
Radiated emission of transmitter	$\pm 6$ dB
Radiated emission of receiver	$\pm 6$ dB
Temperature	$\pm 1$ degree
Humidity	$\pm 5$ %

For the test methods, according to the present document the uncertainty figures shall be calculated according to the methods described in the ETR 028 [4] and shall correspond to an expansion factor (coverage factor)  $k = 1,96$  or  $k = 2$  (which provide confidence levels of respectively 95 % and 95,45 % in case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 3 is based on such expansion factors.

The particular expansion factor used for the evaluation of the measurement uncertainty shall be stated

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## Annex A (informative): Subclauses of the present document relevant for compliance with the essential requirements of relevant EC Council Directives

### A.1 Compliance with 99/5/EC (R&TTE Directive) article 3.3e

The subclauses noted are necessary to ensure access to emergency services. At the time of publication, this has not been invoked as an essential requirement of the Council Directive 1999/5/EC (R&TTE Directive) [1] for equipment covered by the present document.

**Table A.1: Subclauses of the present document relevant to ensure access to emergency services**

Clause/sub-clause number and title		Corresponding article of the R&TTE Directive	Qualifying remarks
4.2.1	Adjacent channel selectivity - in band	3.3 e	Applies to Equipment Class 1 receivers
4.2.2	Blocking or desensitization	3.3 e	Applies to Equipmwnnt Class 1 & 2 receivers

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### A.2 Compliance with 99/5/EC (R&TTE Directive) article 3.3f

The subclauses noted are necessary to facilitate the use of equipment by users with a disability. At the time of publication, this has not been invoked as an essential requirement of the Council Directive 1999/5/EC (R&TTE Directive) [1] for equipment covered by the present document.

**Table A.2: Subclauses of the present document relevant in order to facilitate the use of equipment by users with a disability**

Clause/sub-clause number and title		Corresponding article of the R&TTE Directive	Qualifying remarks
.4.2.1	Adjacent channel selectivity - in band	3.3 f	Applies to Equipment Class 1 receivers
4.2.2	Blocking or desensitization	3.3 f	Applies to Equipment Class 1 & 2 receivers

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## History

<b>Document history</b>			
V1.1.1	July 2000	Public Enquiry	PE 20001117: 2000-07-19 to 2000-11-17