

Draft **ETSI EN 301 357-2** V1.3.1 (2005-08)

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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Cordless audio devices in the range 25 MHz to 2 000 MHz;  
Consumer radio microphones and in-ear monitoring  
systems operating in the CEPT harmonized band  
863 MHz to 865 MHz;  
Part 2: Harmonized EN under article 3.2  
of the R&TTE Directive**

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Reference

REN/ERM-TG17WG3-007-2

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Keywords

audio, radio, radio MIC, regulation, testing

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Sous-Préfecture de Grasse (06) N° 7803/88

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Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

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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), 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] (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").

The present document is part 2 of a multi-part deliverable covering Cordless audio devices in the range 25 MHz to 2 000 MHz, Consumer radio microphones and in-ear monitoring systems operating in the CEPT harmonized band 863 MHz to 865 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):	18 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.

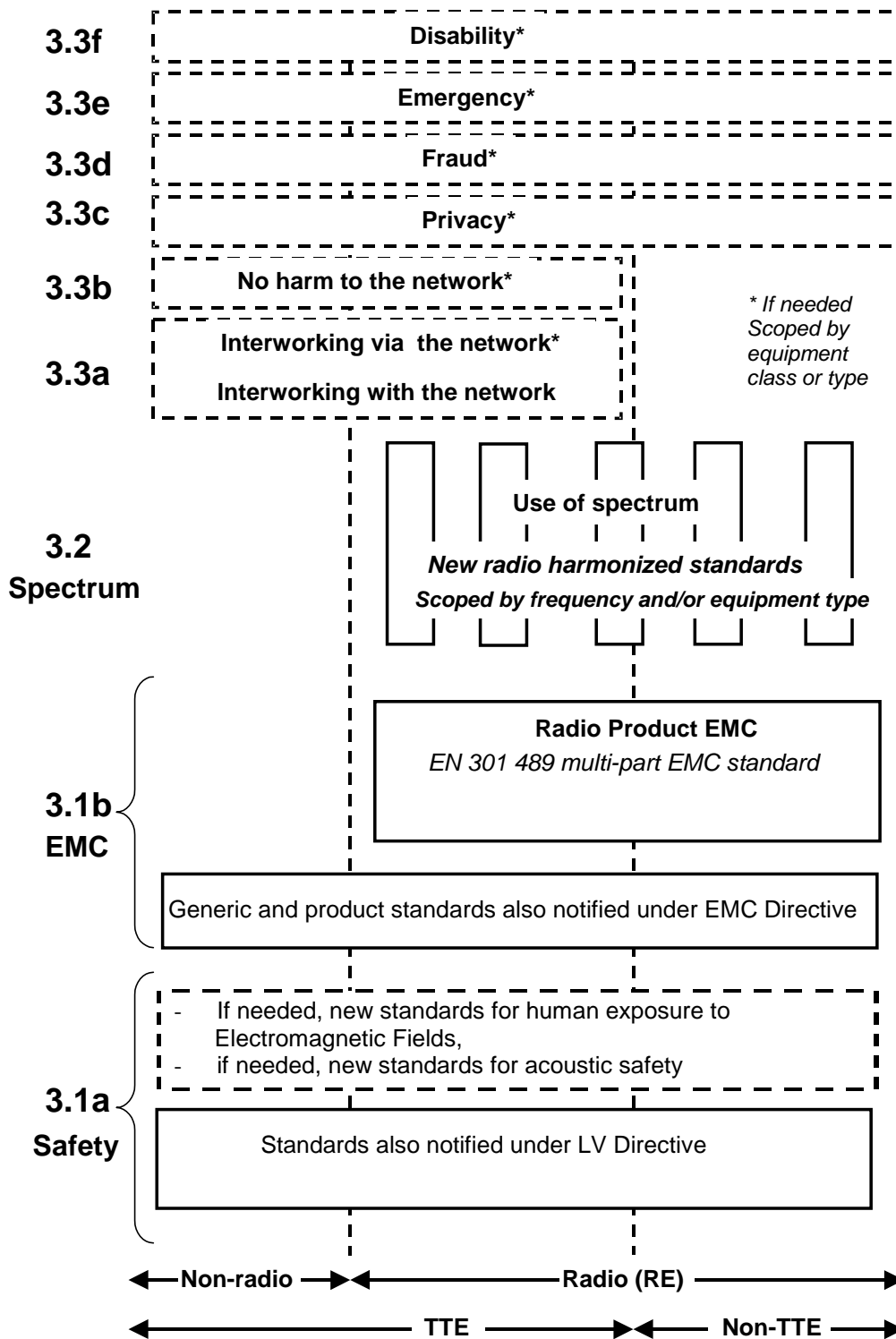


Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]

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.

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive 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. A 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.

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# 1 Scope

The present document covers the minimum characteristics considered necessary in order to make the best use of the available frequencies. It does not necessarily include all the characteristics that may be required by a user, nor does it necessarily represent the optimum performance achievable.

Cordless audio devices covered within the present document are considered by definition short-range devices, the power limits for frequency bands will be found in the current version of CEPT/ERC/REC 70-03 [2], annex 13 (or national regulations).

The present document applies to cordless audio, consumer radio microphones and in-ear monitoring equipment using either 300 kHz bandwidth with analogue modulation or 300 kHz, 600 kHz or 1 200 kHz digital FDMA modulation and low power Band2 FM transmitters. The frequency bands for this equipment may differ from country to country as specified in their national regulations. All equipment is intended to be used with integral antennas.

ElectroMagnetic Compatibility (EMC) requirements are covered by EN 301 489-9 [3].

The types of equipment covered by the present document are as follows:

- cordless headphones;
- cordless loudspeakers;
- consumer radio microphones;
- in-ear monitoring;
- in-vehicle cordless;
- personal cordless;
- broadband multi-channel audio systems;
- low power band 2 transmitters.

The present document is intended to cover the provisions 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] will 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 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] CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".
- [3] ETSI EN 301 489-9 (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 9: Specific conditions for wireless microphones, similar Radio Frequency (RF) audio link equipment, cordless audio and in-ear monitoring devices".
- [4] ETSI ETR 028 (2<sup>nd</sup> edition): "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.
- [6] ETSI EN 301 357-1 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Cordless audio devices in the range 25 MHz to 2 000 MHz; Consumer radio microphones and in-ear monitoring systems operating in the CEPT harmonized band 863 MHz to 865 MHz; Part 1: Technical characteristics and test methods".

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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 R&TTE Directive [1] and EN 301 357-1 [6] apply.

### 3.2 Symbols

For the purposes of the present document, the symbols given in EN 301 357-1 [6] apply.

### 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 301 357-1 [6] apply.



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## 4 Functional characteristics

### 4.1 Controls

Those controls that, if maladjusted, might increase the interfering potentialities of the equipment shall only be accessible by partial or complete disassembly of the device and requiring the use of tools.

### 4.2 Marking

The equipment shall be marked in a visible place. This marking shall be legible, tamper-proof and durable. The marking shall be according to the R&TTE Directive [1].

### 4.3 Transmitter requirements

#### 4.3.1 Rated RF power, transmitter occupied bandwidth, frequency error and transmitter timeout

This clause only applies to Band 2 transmitters.

The rated RF power, transmitter occupied bandwidth, frequency error and transmitter timeout, as defined in EN 301 357-1 [6], clause 8.2.1, shall not exceed the limits in EN 301 357-1, clause 8.2.1.4.

#### 4.3.2 Radiated spurious emissions and cabinet radiation

This clause only applies to Band 2 transmitters.

The radiated spurious emissions and cabinet radiation as defined in EN 301 357-1 [6], clause 8.2.2, shall not exceed the limits in EN 301 357-1 [6], clause 8.2.2.3.

#### 4.3.3 Frequency error

This clause does not apply to Band 2 transmitters.

The frequency error, as defined in EN 301 357-1 [6], clause 8.3.1, shall not exceed the limits in EN 301 357-1 [6], clause 8.3.3, table 1.

#### 4.3.4 Carrier power

This clause does not apply to Band 2 transmitters.

The carrier power, as defined in EN 301 357-1 [6], clause 8.4.1, shall not exceed the limits in EN 301 357-1 [6], clause 8.4.3, table 3.

#### 4.3.5 Channel bandwidth

This clause does not apply to Band 2 transmitters.

The channel bandwidth, as defined in EN 301 357-1 [6], clause 8.5.1, shall not exceed the limits in EN 301 357-1 [6], clause 8.5.4, table 5, figures 3 and 4.

### 4.3.6 Radiated spurious emissions and cabinet radiation

This clause does not apply to Band 2 transmitters.

The radiated spurious emissions and cabinet radiation, as defined in EN 301 357-1 [6], clause 8.6.1, shall not exceed the limits in EN 301 357-1 [6], clause 8.6.3, table 6.

## 4.4 Receiver requirements

### 4.4.1 Radiated spurious emissions and cabinet radiation

The radiated spurious emissions and cabinet radiation, as defined in EN 301 357-1 [6], clause 9.1.1, shall not exceed the limits in EN 301 357-1 [6], clause 9.1.5, table 8.

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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

The test conditions shall be as declared by the manufacturer. The test procedures shall be as specified in EN 301 357-1 [6] clauses 6.2, 6.4.1.1 and 6.4.2.

##### 5.1.1.2 Test power source

The test power source shall meet the requirements of EN 301 357-1 [6], clause 6.2.

#### 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 301 357-1 [6], clauses 5.1.1 to 5.1.9.2.

#### 5.1.3 Transmitter test suites

##### 5.1.3.1 Frequency error

The test specified in EN 301 357-1 [6], clause 8.2.1 shall be carried out for Band 2 FM Transmitters.

The test specified in EN 301 357-1 [6], clause 8.3 shall be carried out for general cordless audio devices.

##### 5.1.3.2 Carrier power

The test specified in EN 301 357-1 [6], clause 8.2.1 shall be carried out for Band 2 FM Transmitters.

The test specified in EN 301 357-1 [6], clause 8.4 shall be carried out for general cordless audio devices.

##### 5.1.3.3 Channel bandwidth

The test specified in EN 301 357-1 [6], clause 8.2.1 shall be carried out for Band 2 FM Transmitters.

The test specified in EN 301 357-1 [6], clause 8.5 shall be carried out for general cordless audio devices.

#### 5.1.3.4 Spurious emissions and cabinet radiation

The test specified in EN 301 357-1 [6], clause 8.2.2 shall be carried out for Band 2 FM Transmitters.

The test specified in EN 301 357-1 [6], clause 8.6 shall be carried out for general cordless audio devices.

#### 5.1.4 Receiver test suites

##### 5.1.4.1 Spurious emissions

The test specified in EN 301 357-1 [6], clauses 9.1.2, 9.1.3 and 9.1.4 shall be carried out.

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## 6 Interpretation of the measurement results

### 6.1 Compliance assessment when measurement uncertainty is equal to or less than maximum acceptable uncertainty

The interpretation of the results when comparing measurement values with specification limits shall be as follows:

- a) When the measured value does not exceed the limit value, the equipment under test meets the requirements of the standard.
- b) When the measured value exceeds the limit value, the equipment under test does not meet the requirements of the standard.
- c) The measurement uncertainty calculated by the test technician carrying out the measurement shall be recorded in the test report.
- d) The measurement uncertainty calculated by the test technician may be a maximum value for a range of values of measurement, or may be the measurement uncertainty for the specific measurement undertaken. The method used shall be recorded in the test report.

### 6.2 Compliance assessment when measurement uncertainty is greater than maximum acceptable uncertainty

The interpretation of the results when comparing measurement values with specification limits shall be as follows:

- a) When the measured value plus the difference between the maximum allowable measurement uncertainty and the measurement uncertainty calculated by the test technician does not exceed the limit value, the equipment under test meets the requirements of the standard.
- b) When the measured value plus the difference between the maximum allowable measurement uncertainty and the measurement uncertainty calculated by the test technician exceeds the limit value, the equipment under test does not meet the requirements of the standard.
- c) The measurement uncertainty calculated by the test technician carrying out the measurement shall be recorded in the test report.
- d) The measurement uncertainty calculated by the test technician may be a maximum value for a range of values of measurement, or may be the measurement uncertainty for the specific measurement undertaken. The method used shall be recorded in the test report.

## 6.3 Maximum allowable measurement uncertainties

Table 1 gives the maximum allowable measurement uncertainties applicable to measured parameters unless otherwise stated.

**Table 1: Maximum allowable measurement uncertainty**

Parameter	Uncertainty
RF frequency	$< \pm 1 \times 10^{-7}$
Audio Output power	$< \pm 0,5$ dB
Radiated RF power	$< \pm 6$ dB
Conducted RF power variations using a test fixture	$< \pm 0,75$ dB
Maximum frequency deviation: - within 300 Hz and 6 kHz of audio frequency - within 6 kHz and 25 kHz of audio frequency	$< \pm 5$ % $< \pm 3$ dB
Deviation limitation	$< \pm 5$ %
Radiated emission of transmitter, valid up to 12,75 GHz	$< \pm 6$ dB
Radiated emission of receiver, valid up to 12,75 GHz	$< \pm 6$ dB
Transmitter switch off time	$< \pm 5$ %

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 1 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): Bibliography

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).

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).

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

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

Language	EN title
Czech	
Danish	
Dutch	
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Cordless audio devices in the range 25 MHz to 2 000 MHz; Consumer radio microphones and in-ear monitoring systems operating in the CEPT harmonized band 863 MHz to 865 MHz; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive
Estonian	
Finnish	
French	
German	
Greek	
Hungarian	
Icelandic	
Italian	
Latvian	
Lithuanian	
Maltese	
Norwegian	
Polish	
Portuguese	
Slovak	
Slovenian	
Spanish	
Swedish	

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## History

<b>Document history</b>		
V1.1.1	July 1999	Publication as EN 301 357
V1.1.1	August 2000	Publication
V1.2.1	June 2001	Publication
V1.3.1	August 2005	Public Enquiry PE 20051230: 2005-08-31 to 2005-12-30