

9`Y\_fca U[ bYfbUnXfi y`^j cgh]b`nUXYj Yj`nj Yn]`n`fUX]`g\_`ja`gdY\_fca`fØFAŁĚ  
HY\ b] bY\_UfU\_hf]gh\_Y]b`dfYg\_i gbYa YfcXY`nUUbUc[ bYVfYnj fj ] bY  
ý]fc\_cdUgcj bYUj X]c`bUdfUj Yž\_]i dcfUV`Uc`j [ fUYbY`UbhYbY]b`XYi`^c`j  
žY\_j Yb bYa`cVa c`f` , \*` `A<n`Xc` , \*` )`A<nž\_] [ U`Y`df]dcfc ]U`cbZfYbWU79DH

ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Technical characteristics and test methods for analogue cordless wideband audio devices using integral antennas operating in the CEPT recommended 863 MHz to 865 MHz frequency range

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**Ta slovenski standard je istoveten z: EN 301 357 Version 1.1.1**

**ICS:**

33.060.99	Druga oprema za radijske komunikacije	Other equipment for radiocommunications
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

**SIST EN 301 357 V1.1.1:2003** **en**

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# ETSI EN 301 357 V1.1.1 (1999-07)

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*European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Technical characteristics and test methods  
for analogue cordless wideband audio devices  
using integral antennas operating in the CEPT recommended  
863 MHz to 865 MHz frequency range**

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**Reference**

DEN/ERM-RP08-0307 (ckc00ico.PDF)

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**Keywords**

radio, testing

**ETSI**

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Association à but non lucratif enregistrée à la  
Sous-Prefecture de Grasse (06) N° 7803/88

<https://standards.etsi.org/standards-search.html>  
64316b095546/sist-en-301-357-v1-1-1-2003

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## Foreword

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

Every EN prepared by ETSI is a voluntary standard. The present document may contain text concerning conformance testing of the equipment to which it relates. This text should be considered as guidance only and does not make the present document mandatory.

Annex A provides normative specifications concerning radiated measurements.

Annex B provides a graphic representation of the equipment and frequencies for the testing of single and multi frequency equipment.

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National transposition dates	
Date of adoption of this EN:	25 June 1999
Date of latest announcement of this EN (doa):	30 September 1999
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2000
Date of withdrawal of any conflicting National Standard (dow):	31 March 2000

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## Introduction

In preparing the present document, much attention has been given to assure a low interference probability, while at the same time allowing a maximum flexibility and service to the end-user.

The present document provides the necessary parameters for equipment to obtain common approval throughout Europe. Common technical specifications and harmonized frequency allocations are expected to reduce the present problems of interference and illegal use.

The present document is a type-testing standard based on spectrum utilization parameters and does not include performance characteristics that may be required by the user or requirements for interfacing equipment.

The present document is intended to specify the minimum performance and the methods of measurement of, wideband cordless audio equipment as specified in the scope. In-ear monitoring equipment may be tested to either EN 300 422 [8] for equipment with maximum occupied bandwidth < 200 kHz or the present document for equipment with maximum occupied bandwidth < 300 kHz with due consideration of power and operating frequency.



Type test measurements should be performed in one of the accredited test laboratories, accepted by the various national regulatory authorities in order to grant type approval, provided the national regulatory requirements are met. This is in compliance with CEPT/ERC/REC 01-06 [1] and CEPT/ERC/DEC (97) 10 [2].

In addition, national administrations may accept a "certificate of conformity" based on a type test report. If equipment available on the market is required to be checked, it should be tested in accordance with the methods of measurement specified in the present document.

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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.

The present document applies to wideband cordless audio and in-ear monitoring equipment operating in the CEPT recommended band 863 MHz to 865 MHz using analogue frequency modulation. In some countries this equipment may be used in other frequency bands as specified in their national regulations.

The present document does not apply to wideband cordless audio or in-ear monitoring systems employing digital modulation, Time Division Multiple Access (TDMA), frequency hopping and spread spectrum or similar forms of modulation.

EN 300 422 [8] applies to consumer radio microphones operating in the CEPT recommended band 863 MHz to 865 MHz with a maximum power level of 10mW.

Electromagnetic Compatibility (EMC) requirements are covered by ETS 300 445 [7].

The present document may be used by accredited test laboratories for type testing of the equipment. The performance of the equipment submitted for type testing should be representative of the performance of the corresponding production models.

The present document contains instructions for the presentation of equipment for type testing purposes.

Power limits recommended in the present document have been chosen to allow maximum simultaneous re-usage of frequency allocations. National regulations on power output may apply up to the limits quoted in table 1.

**Table 1**

Equipment	max effective radiated power (erp)
Wideband cordless audio	10 mW
In-ear monitoring	10 mW
In-vehicle cordless	2 mW
Personal cordless	1 mW

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

- cordless headphones;
- cordless loudspeakers;
- in-ear monitoring;
- in-vehicle cordless;
- personal cordless.

## 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] CEPT/ERC/REC 01-06: "Procedure for mutual recognition of type testing and type approval for radio equipment".
- [2] CEPT/ERC/DEC (97) 10: "ERC Decision of 30 June 1997 on the mutual recognition of conformity assessment procedures including marking of radio equipment and radio terminal equipment".
- [3] ITU-R Recommendation BS.559-2: "Objective measurement of radio-frequency protection ratios in LF, MF and HF broadcasting".
- [4] IEC 60244: "Methods of measurement for radio transmitters".
- [5] ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics"
- [6] CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".
- [7] ETS 300 445 (including Amendment 1): "Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) standard for wireless microphones and similar Radio Frequency (RF) audio link equipment".
- [8] EN 300 422 (V1.2): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical characteristics and test methods for wireless microphones in the 25 MHz to 3 GHz frequency range".

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

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

**integral antenna:** permanent fixed antenna, which may be built-in, designed as an indispensable part of the equipment

**artificial antenna:** tuned reduced-radiating dummy load equal to the nominal impedance specified by the applicant

**radiated measurements:** measurements that involve the absolute measurement of a radiated electromagnetic field

**channel bandwidth:** frequency band of defined width including safety margin for operation on adjacent channels, located symmetrically around the carrier frequency

**port:** any connection point on or within the Equipment Under Test (EUT) intended for the connection of cables to or from that equipment

## 3.2 Symbols

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

$\lambda$	wavelength in metres
$\mu\text{F}$	microFarad
$\mu\text{W}$	microWatt
dBc	dB relative to the carrier level
E	field strength
$E_o$	reference field strength (see annex A)
fc	carrier frequency
fo	operating frequency
GHz	GigaHertz
kHz	kiloHertz
MHz	MegaHertz
mW	milliWatt
nW	nanoWatt
R	distance (see annex A)
$R_o$	reference distance (see annex A)

## 3.3 Abbreviations

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

ac	alternating current
B	Channel Bandwidth
BN	Necessary Bandwidth
dc	direct current
erp	effective radiated power
EUT	Equipment Under Test
HF	High Frequency
LF	Low Frequency
MF	Medium Frequency
RBW	Resolution BandWidth
RF	Radio Frequency
SRD	Short Range Devices
TDMA	Time Division Multiple Access
Tx	Transmitter
VBW	Video BandWidth

---

## 4 Functional characteristics

### 4.1 Cordless wideband audio

Cordless wideband audio equipment encompasses radio linked headphones and loudspeakers. The transmitters may be installed in a building, fitted in a vehicle or body worn. The term cordless is also used to describe infra red and other non RF "wireless" links, but in the context of the present document it is restricted to RF operating systems only. Stereo equipment can be designed for required channel bandwidths of 200 kHz or less but only with a high cost penalty, however consumer wideband (multichannel) audio equipment and stereo equipment using Zenith-GE pilot tone systems need to declare wider bandwidths as defined in this part of the present document.

Other equipment that may be connected to cordless audio equipment shall fulfil the standards applicable to that equipment (if any).