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Radijska oprema in sistemi (RES) - Elektromagnetna združljivost (EMC) opreme digitalnih izboljšanih brezvrvičnih telekomunikacij (DECT)

Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) for Digital Enhanced Cordless Telecommunications (DECT) equipment

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Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) for Digital Enhanced Cordless Telecommunications (DECT) equipment

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Foreword

This European Telecommunication Standard (ETS) has been produced by the European Telecommunications Standards Institute (ETSI) in response to a mandate from the European Commission issued under Council Directive 83/189/EEC (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

This ETS is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility ("the EMC Directive") (89/336/EEC as amended).

Technical specifications relevant to the EMC Directive are given in annex A.

This ETS is based on the considerations and guidance given in ETR 238.

Transposition dates	
Date of adoption:	6 June 1997
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1 Scope

This European Telecommunication Standard (ETS) covers the assessment of radio communication and ancillary equipment in respect of ElectroMagnetic Compatibility (EMC).

This ETS specifies the minimum performance and the methods of measurements of EMC on Digital Enhanced Cordless Telecommunications (DECT) radio and ancillary equipment.

This ETS specifies the applicable EMC tests, the limits, and the performance criteria for digital radio equipment as described in ETS 300 175-2 [4] and I-ETS 300 176 [5], operating in the frequency range 1 880 to 1 900 MHz, and for the associated ancillary equipment.

The environment classification used in this ETS refers to the environment classification used in the Generic Standards EN 50081-1 [1] and EN 50082-1 [2], except the vehicular environment class which refers to ISO 7637 [6], [7].

The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus at residential, commercial, light industrial and vehicular environments. The levels, however, do not cover extreme cases which may occur in any location but with a low probability of occurrence.

This ETS may not cover those cases where a potential source of interference, which is producing individually repeated transient phenomena, or a continuous phenomena, is permanently present, e.g. a radar or broadcast site in the near vicinity. In such a case it may be necessary to use special protection applied to either the source of interference, or the interfered part, or both.

Compliance of radio equipment to the requirements of this ETS does not signify compliance to any requirement related to the use of the equipment (i.e. licensing requirements).

Compliance to this ETS does not signify compliance to any safety requirements. However, it is the responsibility of the assessor of the equipment that any observation regarding the equipment becoming dangerous or unsafe as a result of the application of the tests of this ETS, should be recorded in the test report.

2 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1] EN 50081-1 (1992): "Electromagnetic compatibility - Generic emission standard. Part 1: Residential, commercial and light industry".

[2] EN 50082-1 (1992): "Electromagnetic compatibility - Generic immunity standard. Part 1: Residential, commercial and light industry".

[3] 89/336/EEC: "Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility".

[4] ETS 300 175-2 (1993): "Radio Equipment and Systems (RES) - Digital European Cordless Telecommunications (DECT) Common interface Part 2: Physical layer".

[5] I-ETS 300 176: "Radio Equipment and Systems (RES) - Digital European Cordless Telecommunications (DECT) Approval test specification".

[6] ISO 7637-1 (1990): "Road vehicles - Electrical disturbance by conduction and coupling - Part 1: Passenger cars and light commercial vehicles with nominal 12 V supply voltage - Electrical transient conduction along supply lines only".

[7] ISO 7637-2 (1990): "Road vehicles - Electrical disturbance by conduction and coupling - Part 2: Commercial vehicles with nominal 24 V supply voltage - Electrical transient conduction along supply lines only".

[8] ETS 300 175-3: "Radio Equipment and Systems (RES); Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".

[9] ITU-T Recommendation 0.153 (1988): "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[10] EN 55022 (1994): "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".

[11] CISPR 16-1 (1993): "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus".

[12] EN 61000-4-3: "Electromagnetic Compatibility (EMC) - Part 4: Testing and measurements techniques - Section 3: Radiated, radio-frequency, electromagnetic field immunity test".

[13] EN 61000-4-2: "Electromagnetic Compatibility (EMC) - Part 4: Testing and measurements techniques - Section 2: Electrostatic discharge immunity test. Basic EMC publication".

[14] EN 61000-4-4: "Electromagnetic Compatibility (EMC); Part 4: Testing and measurements techniques - Section 4: Electrical fast transient/burst immunity test. Basic EMC publication".

[15] EN 61000-4-6: "Electromagnetic Compatibility (EMC) - Part 4: Testing and measurements techniques - Section 6: Immunity to conducted disturbances induced by radio-frequency fields".

[16] EN 61000-4-11: "Electromagnetic Compatibility (EMC); Part 4: Testing and measurements techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests".

[17] EN 61000-4-5: "Electromagnetic Compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity test".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

ancillary equipment: Equipment (apparatus), used in connection with a receiver or transceiver is considered as an ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction with a receiver, or transceiver to provide additional operational and/or control features to the radio equipment (e.g. to extend control to another position or location); and

- the equipment cannot be used on a stand alone basis to provide user functions independently of a receiver or transceiver; and

- the receiver or transceiver to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

base station equipment: Used to describe DECT equipment including Fixed Parts (FP) and/or Portable Parts (PP) as defined in ETS 300 175-2 [4] which are powered via an AC power input port or a DC power input port.

DECT equipment: Apparatus which includes one or more transceivers and/or receivers and/or parts thereof which conform to the requirements of ETS 300 175-2 [4].

host equipment: Any equipment which has a complete user functionality when not connected to the DECT radio equipment, and to which the DECT radio equipment provides additional functionality, and to which connection is necessary for the DECT radio equipment to offer functionality.

integral antenna: An antenna designed to be connected to the equipment without the use of an external connector and considered to be part of the equipment. An integral antenna may be fitted internally or externally to the equipment.

manufacturer: The legal entity responsible under the terms of the Council Directive 89/336/EEC [3] for placing the product on the market.

mobile equipment: DECT equipment powered by a vehicular power supply.

port: A particular interface of the specified equipment (apparatus) with the electro-magnetic environment.

portable equipment: DECT equipment powered by an internal battery.

NOTE: More than one of the equipment classifications may apply to certain equipment, as described in subclause 5.2, dependent upon the manufacturer's declaration of normal intended use.

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

BER	Bit Error Ratio
BPF	Band Pass Filter
BW	Band Width
CF	Carrier Frequency
BER	Bit Error Ratio
CR	Continuous phenomena applied to DECT Receive-only equipment
CT	Continuous phenomena applied to DECT Transceivers
DECT	Digital Enhanced Cordless Telecommunications
EMC	ElectroMagnetic Compatibility
ERP	Ear Reference Point
EUT	Equipment Under Test
FP	Fixed Part
LISN	Line Impedance Stabilization Network
MRP	Mouth Reference Point
PP	Portable Part
RF	Radio Frequency
SPL	Sound Pressure Level
TR	Transient phenomena applied to DECT Receive-only equipment
TT	Transient phenomena applied to DECT Transceivers

4 General test conditions

4.1 Test conditions

The equipment shall be tested under normal test conditions contained in the relevant product and basic standards or in the information accompanying the equipment, which are within the manufacturer's declared range of humidity, temperature, and supply voltage.

The test conditions shall be recorded in the test report.

The test configuration shall be as close to normal intended use as possible, and shall be recorded in the test report.

Whenever the Equipment Under Test (EUT) is provided with a detachable antenna, the EUT shall be tested with the antenna fitted in a manner typical of normal intended use.

For DECT equipment parts for which connection to a host equipment is necessary to offer functionality the test configuration shall be as defined in subclause 5.4.

4.2 Arrangements for test signals at the input of the transceiver

4.2.1 Loop back data

The normal test modulation shall be transmitted by the test system and looped back in the radio equipment, as described in ETS 300 175-3 [8] and I-ETS 300 176 [5].

4.2.2 Speech equipment

Audio input signals may be connected to the EUT either by a non-metallic acoustic tube or, if provided, electrical connections. The DECT equipment shall not be modified to provide any electrical connection ports for the purposes of this test. Suitable test arrangements for the acoustic tube are described in I-ETS 300 176 [5].

4.3 Normal test modulation

For all types of DECT equipment the wanted input signal shall be a Radio Frequency (RF) carrier set to the nominal centre frequency of one of the DECT RF channels, using gaussian shaped frequency-shift keying (BT = 0,5) and modulated with a 1 152 kbit/s bit sequence.

The encoding of the bit sequence shall conform to the encoding specified in ETS 300 175-2 [4] and ETS 300 175-3 [8].

The parts of the data sequence that shall transmit a bit sequence conforming to the D-M2 pattern as specified in ITU-T Recommendation 0.153 [9] are those which are looped back according to the loop back test message described in ETS 300 175-3 [8].

The burst timings of this carrier shall conform to the limits specified in ETS 300 175-2 [4].

4.4 Connection of test signals for transceivers

4.4.1 RF connection

Where the equipment incorporates an external antenna connector, the wanted signal to establish communications shall be delivered to that connector by a coaxial cable. Adequate measures shall be taken to minimize the effect of unwanted currents on the external conductor of the coaxial cable at the point of entry to the equipment.

The source of the wanted input signal shall be located outside of the test environment.

Where the equipment does not incorporate an external RF connector i.e. integral antenna equipment, the wanted signal to establish communications shall be delivered from the equipment to an antenna located within the test environment. Adequate measures shall be taken to protect the measuring equipment from the effect of all the radiated fields within the test environment.

4.5 Connection of test signals for receiver-only equipment

4.5.1 RF connection

Where the equipment incorporates an external antenna connector, the wanted signal to establish communications shall be presented to that connector by a coaxial cable. Adequate measures shall be taken to minimize the effect of unwanted currents on the external conductor of the coaxial cable at the point of entry to the equipment.