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ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 6: Specific conditions for Digital Enhanced Cordless Telecommunications (DECT) equipment; Harmonised Standard covering the essential requirements of article 3.1(b) of the Directive 2014/53/EU

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Foreword

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

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.2] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.1].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

The present document is part 6 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

National transposition dates	
Date of adoption of this EN:	19 July 2016
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Date of withdrawal of any conflicting National Standard (dow):	30 April 2018

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1 Scope

The present document, together with ETSI EN 301 489-1 [1], covers the assessment of Digital Enhanced Cordless Telecommunications (DECT) equipment, and associated ancillary equipment, in respect of ElectroMagnetic Compatibility (EMC).

Technical specifications related to the antenna port and emissions from the enclosure port of the radio equipment are not included in the present document. Such technical specifications are found in the relevant product standards for the effective use of the radio spectrum.

The present document specifies the applicable test conditions, performance assessment and performance criteria for Digital Enhanced Cordless Telecommunications (DECT) equipment, and associated ancillary equipment.

Definitions of types of cordless telecommunications equipment covered by the present document are given in annex B.

In case of differences (for instance concerning special conditions, definitions, abbreviations) between the present document and ETSI EN 301 489-1 [1], the provisions of the present document take precedence.

The environmental classification and the emission and immunity requirements used in the present document are as stated in ETSI EN 301 489-1 [1], except for any special conditions included in the present document.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI EN 301 489-1 (V2.1.1) (11-2016): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU".

[2] Recommendation ITU-T O.153 (10-1992): "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[3] ETSI EN 300 175-2 (V2.6.1) (07-2015): "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".

[4] ETSI EN 300 175-3 (V2.6.1) (07-2015): "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) Layer".

[5] ETSI EN 300 176-1 (V2.2.1) (10-2015): "Digital Enhanced Cordless Telecommunications (DECT); Test specification; Part 1: Radio".

[6] CENELEC EN 55024 (2010): "Information technology equipment - Immunity characteristics - Limits and methods of measurement".

[7] ETSI EN 301 406 (V2.2.0) (02-2016): "Digital Enhanced Cordless Telecommunications (DECT); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".

[8] CENELEC EN 61000-4-3 (2006), A1 (2008) and A2 (2010): "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.

[i.2] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI EN 301 489-1 [1] and the following apply:

bearer: burst of the wanted RF signal used to establish and maintain the communications link for digital modulated and operated cordless telephone and similar radio communications equipment

DECT equipment: Digital Enhanced Cordless Telecommunications (DECT) apparatus which includes one or more transceivers and/or receivers and/or parts thereof which conform to the requirements of ETSI EN 300 175-2 [3]

host equipment: any equipment which has a complete user functionality when not connected to the cordless telephone or similar radio communications equipment, and to which this radio equipment provides additional functionality, and to which connection is necessary for this radio equipment to offer functionality, and in which the transceiver part of the radio equipment is physically installed

non-speech equipment: cordless telephone or similar communications equipment intended for the provision and reception of digital data either originating from or destined to external digital speech processing circuitry or other external equipment

speech equipment: cordless telephone or similar communications equipment containing transducers such as microphones and/or loudspeakers intended for the provision and reception of acoustic audio signals

3.2 Abbreviations

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

AC	Alternative Current
BER	Bit Error Ratio
BPF	Band Pass Filter
BT	Bandwidth Time product
BW	BandWidth

CF	Carrier Frequency
CFP	Cordless Fixed Part
CPP	Cordless Portable Part
CR	Continuous phenomena applied to cordless telephone or communication Receive-only equipment
CT	Continuous phenomena applied to cordless telephone or communication Transceivers
DC	Direct Current
DECT	Digital Enhanced Cordless Telecommunications
EFTA	European Free Trade Association
EM	ElectroMagnetic
EMC	Electro Magnetic Compatibility
ERP	Ear Reference Point
EUT	Equipment Under Test
MRP	Mouth Reference Point
RF	Radio Frequency
SPL	Sound Pressure Level
TR	Transient phenomena applied to cordless telephone or communication Receive-only equipment
TT	Transient phenomena applied to cordless telephone or communication Transceivers

4 Test conditions

4.1 General

For the purposes of the present document, the test conditions of ETSI EN 301 489-1 [1], clause 4, shall apply as appropriate. Further product related test conditions for cordless telephone or communication equipment are specified in the present document, clauses 4.2 to 4.5.

4.2 Arrangements for test signals

4.2.0 General

The provisions of ETSI EN 301 489-1 [1], clause 4.2.0 shall apply.

4.2.1 Arrangements for test signals at the input of transmitters

The provisions of ETSI EN 301 489-1 [1], clause 4.2.1 shall apply with the following modification.

The transmitter part of the particular type of cordless telephone or communications equipment shall be modulated with normal test modulation as specified for that type of equipment (see clause 4.5).

4.2.1.1 Speech equipment

Audio input signals may be provided to the EUT either by a non-metallic acoustic tube or, if provided, electrical connections. The equipment shall not be modified to provide any electrical connection ports for the purposes of EMC tests only. Suitable test arrangements for the acoustic tube are described in CENELEC EN 55024 [6].

4.2.1.2 Non-speech equipment

Digital (data) input signals shall be supplied to the EUT by electrical connection to the modulation input port via an appropriate connecting cable, test jig, or host equipment (see clauses 5.2.1 and 5.2.2).

4.2.2 Arrangements for test signals at the output of transmitters

The provisions of ETSI EN 301 489-1 [1], clause 4.2.2 shall apply.

4.2.3 Arrangements for test signals at the input of receivers

The provisions of ETSI EN 301 489-1 [1], clause 4.2.3 shall apply.

The receiver part or standalone receiver of the particular type of cordless telephone or communications equipment shall be provided with the appropriate wanted RF signal modulated as specified for that type of equipment (see clause 4.5).

4.2.4 Arrangements for test signals at the output of receivers

The provisions of ETSI EN 301 489-1 [1], clause 4.2.4 shall apply.

4.2.5 Arrangements for testing transmitter and receiver together (as a system)

The provisions of ETSI EN 301 489-1 [1], clause 4.2.5 shall apply.

The normal test modulation shall be transmitted by the test system and looped back in the radio equipment, as described in ETSI EN 300 175-3 [4] and ETSI EN 300 176-1 [5]. Further, the output of the radio equipment under test shall be monitored by the test system.

4.3 RF exclusion band of radio communications equipment

4.3.1 Introduction

The provision of ETSI EN 301 489-1 [1], clause 4.3.1 shall apply.

4.3.2 Exclusion band for transmitters or the transmitter part of transceivers

4.3.2.1 General

The relevant requirements are based on DECT technology and not on additional technical capabilities of the DECT equipment. The exclusion band for transmitters is directly related to the emissions due to transmitter transient requirement of the DECT system. The relevant requirements and details are found in the harmonised standard ETSI EN 301 406 [7], clause 5.3.6.3.

Because the used channel cannot be fixed or predicted during measurements, the transmitter exclusion bands have to be defined at both edges of the allocated frequency band.

4.3.2.2 Channelized Systems

The exclusion band shall be from 1 874,016 MHz to 1 905,320 MHz (+7,776 MHz from the carrier close to the upper band edge and -7,776 MHz from the carrier close to the lower band edge of the allocated band).

NOTE: The value of 7,776 MHz above is derived using the formula in clause 4.3.3.1 of ETSI EN 301 489-1 [1] where the value of n is 4,5.

4.3.3 Exclusion band for receivers or the receiver part of transceivers

The exclusion band for receivers and receiver sections of transceivers is the band of frequencies over which no immunity tests with radiated RF are made.

The following requirements are based on the measurement procedure and the DECT technology but not on additional technical capabilities of the DECT equipment:

- The exclusion band shall be from 1 829 MHz to 1 951 MHz (+51 MHz from the upper band edge and -51 MHz from the lower band edge of the allocated band).

NOTE: The value of 51 MHz above is caused by channel independent effects, so the receiver exclusion band is based on the band edge frequencies. Because of the equipment used to perform the measurement in ETSI EN 301 406 [7], clause 4.5.7.4, a handover (change of channel and/or timeslot) is not possible. Therefore a ±51 MHz exclusion band for receivers is needed.

4.4 Narrow band responses on receivers or receivers which are part of transceivers

The provision of ETSI EN 301 489-1 [1], clause 4.4 shall apply with the following modifications.

No immunity tests shall be carried out on frequencies of identified narrow band responses i.e. spurious responses, of the receiver parts of cordless telephone and similar communications equipment.

For DECT receivers, the identification criteria for narrow band responses are an increase of the speech output signal level for speech equipment, or an increase in the Bit Error Ratio (BER) of the looped back data from the EUT for non-speech equipment.

The nominal frequency offset to be used for the identification of narrowband responses shall be ±2 MHz for the first part of the identification procedure, and ±2,5 MHz for its second part.

4.5 Normal test modulation

The provision of ETSI EN 301 489-1 [1], clause 4.5 shall apply with the following modifications.

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 ETSI EN 300 175-2 [3] and ETSI EN 300 175-3 [4].

The parts of the data sequence that shall transmit a bit sequence conforming to the D-M2 pattern as specified in Recommendation ITU-T O.153 [2] are those which are looped back according to the loop back test message described in ETSI EN 300 175-3 [4].

The burst timings of this carrier shall conform to the limits specified in ETSI EN 300 175-2 [3].

5 Performance assessment

5.1 General

The provision of ETSI EN 301 489-1 [1], clause 5.1 shall apply.

5.2 Arrangements for the assessment of host dependant equipment and plug-in cards

5.2.0 Two alternative approaches

For equipment parts for which integration with a host equipment is necessary in order to offer functionality, two alternative approaches defined in clauses 5.2.1 and 5.2.2 may be used. The manufacturer shall declare which alternative shall be used.