

ETSI EN 301 489-6 V2.1.1 (2016-11)



**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**

Reference

REN/ERM-EMC-327

KeywordsDECT, EMC, harmonised standard, radio,
regulation**ETSI**

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important noticeThe present document can be downloaded from:
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2016.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPP™ and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.
GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	7
3 Definitions and abbreviations.....	7
3.1 Definitions.....	7
3.2 Abbreviations	7
4 Test conditions	8
4.1 General	8
4.2 Arrangements for test signals	8
4.2.0 General.....	8
4.2.1 Arrangements for test signals at the input of transmitters.....	8
4.2.1.1 Speech equipment	8
4.2.1.2 Non-speech equipment.....	8
4.2.2 Arrangements for test signals at the output of transmitters.....	8
4.2.3 Arrangements for test signals at the input of receivers	9
4.2.4 Arrangements for test signals at the output of receivers	9
4.2.5 Arrangements for testing transmitter and receiver together (as a system)	9
4.3 RF exclusion band of radio communications equipment.....	9
4.3.1 Introduction.....	9
4.3.2 Exclusion band for transmitters or the transmitter part of transceivers.....	9
4.3.2.1 General	9
4.3.2.2 Channelized Systems	9
4.3.3 Exclusion band for receivers or the receiver part of transceivers	9
4.4 Narrow band responses on receivers or receivers which are part of transceivers.....	10
4.5 Normal test modulation	10
5 Performance assessment.....	10
5.1 General	10
5.2 Arrangements for the assessment of host dependant equipment and plug-in cards.....	10
5.2.0 Two alternative approaches	10
5.2.1 Alternative A: composite equipment	11
5.2.2 Alternative B: use of a test jig and three hosts.....	11
5.3 Assessment procedures.....	11
5.3.1 Loss of user control functions or stored user defined data.....	11
5.3.2 Audio breakthrough.....	11
5.4 Ancillary equipment.....	12
5.5 Equipment classification	13
6 Performance criteria	13
6.1 General	13
6.2 Performance criteria for Continuous phenomena of Transceivers (CT).....	13
6.3 Performance criteria for Transient phenomena applied to Transceivers (TT).....	13
6.4 Performance criteria for Continuous phenomena applied to Receive-only equipment (CR)	14
6.5 Performance criteria for Transient phenomena applied to Receive-only equipment (TR)	14
6.6 Performance criteria for ancillary equipment tested on a standalone basis	14
7 Applicability overview	14
7.1 Emission.....	14
7.1.1 General.....	14
7.1.2 Special conditions	14
7.2 Immunity	14

7.2.1	General.....	14
7.2.2	Special conditions.....	15
8	Methods of measurement and limits for EMC emissions	15
9	Test methods and levels for immunity tests	15
9.1	Test configuration.....	15
9.2	Radio frequency electromagnetic field (80 MHz to 6 000 MHz).....	15
9.2.1	General.....	15
9.2.2	Test method	15
9.2.3	Performance criteria.....	15
Annex A (normative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU	16
Annex B (normative):	Definitions of cordless telecommunications equipment in the scope of the present document.....	18
B.1	Digital Enhanced Cordless Telecommunications (DECT) equipment.....	18
Annex C (informative):	Bibliography.....	19
History		20

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org>).

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.

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
Date of latest announcement of this EN (doa):	31 October 2016
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2017
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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

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.

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 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 $\pm 2,5$ 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.

5.2.1 Alternative A: composite equipment

A combination of the radio equipment part and a specific type of host equipment may be used for assessment according to the present document.

Where more than one such combination is intended, each combination shall be tested separately.

Where a specific combination of host equipment and a radio equipment part is tested as a composite system for compliance, repeat testing shall not be required for:

- those other combinations of hosts and radio equipment parts which are based on substantially similar host models in the circumstance that the variations in mechanical and electrical properties between such host models are unlikely to significantly influence the intrinsic immunity and unwanted emissions of the radio equipment part;
- the radio equipment part which cannot be used without mechanical, electrical, or software modification in variations of host equipment different from those represented by the units for which compliance to the present document has been demonstrated.

5.2.2 Alternative B: use of a test jig and three hosts

Where the radio equipment part is intended for use with a variety of host equipment, the manufacturer shall supply a suitable test jig to enable compliance with the present document to be assessed.

The test jig shall be designed such that alteration of the radio equipment part's intrinsic immunity and unwanted emissions is minimized.

Where connection between the radio equipment part and the host equipment control and/or power ports is by cables, optical fibres, or other similar means, this connection to the host shall be considered as a suitable test jig.

The test jig shall allow the radio equipment part to be powered and stimulated in a way representative of the way in which it would be powered and stimulated when connected to or inserted into the host equipment.

In addition to tests using the test jig the radio equipment part shall be tested in conjunction with three different hosts equipment. These hosts shall be provided by the manufacturer and shall be selected from the list of compatible hosts published by the manufacturer, as part of the user documentation supplied with the radio equipment part.

5.3 Assessment procedures

5.3.1 Loss of user control functions or stored user defined data

The test system shall set up a communications link in the same manner as the Equipment Under Test's (EUT) normal intended use.

Any user defined data fields in the memory or storage of the EUT shall be filled in a way representative of normal intended use.

The assessment procedure shall verify that the communications link is maintained and that there is no loss of user control functions declared by the manufacturer or loss of the stored user defined data.

5.3.2 Audio breakthrough

This test is used to assess the effect of continuous EMC phenomena on the analogue speech circuits of the equipment so fitted.

The test system shall be arranged as shown in figure 1 such that the level of the output signals from the EUT's speech channels can be recorded on suitable test instruments, though not necessarily in each channel simultaneously. For a Cordless Portable Part (CPP) with an acoustic transducer this will require the measurement of Sound Pressure Level (SPL). Pick-up of extraneous background noise by the EUT's speech transducer (microphone) shall be minimized.

Prior to the test sequence, the reference level of the speech output signal shall be recorded on the test instrumentation as shown in figure 2. For a CPP with an acoustic speech transducer this shall be equivalent to 0 dBPa at 1 kHz, applied to the ear reference point in the receive path, and -5 dBPa at 1 kHz applied to the mouth reference point. For a Cordless Fixed Part (CFP) with analogue speech circuits and other implementations of the equipment with analogue speech circuits, the reference level shall be equivalent to these acoustic signals.

At each test frequency, the level of the acoustic output signal relative to the reference level shall be measured.

Where it is necessary to interface to the acoustic transducers of the EUT care shall be taken to ensure that the disturbance to the EM field is minimized. The use of a non-metallic acoustic coupler as described in CENELEC EN 55024 [6] is recommended.

The precise arrangements shall be recorded in the test report.

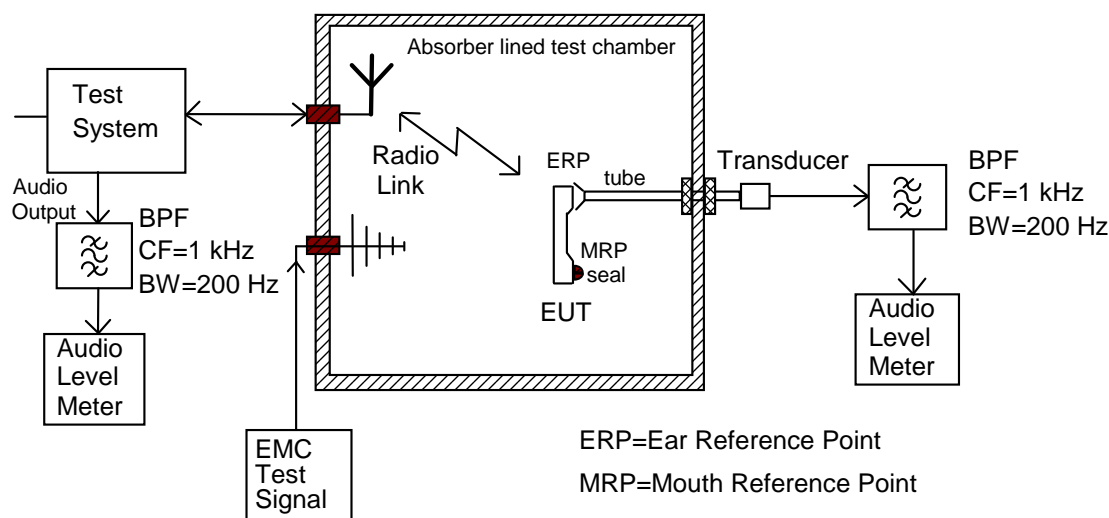
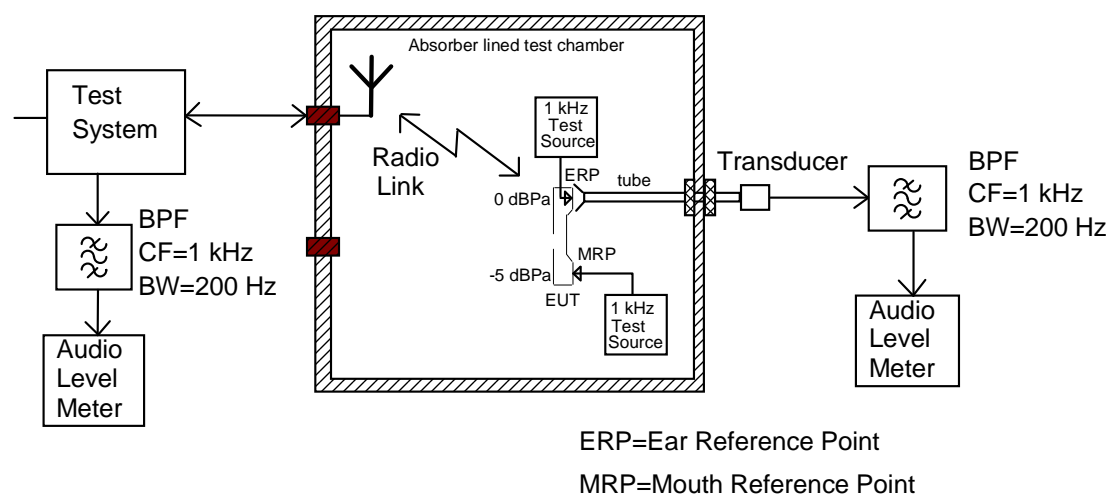


Figure 1: Audio breakthrough measurement, test set-up



NOTE: The EUT is in position during calibration of the uplink, but not during calibration of the downlink.

Figure 2: Audio breakthrough measurement, calibration set-up

5.4 Ancillary equipment

The provision of ETSI EN 301 489-1 [1], clause 5.4 shall apply.

5.5 Equipment classification

The provision of ETSI EN 301 489-1 [1], clause 5.5 shall apply with the following modifications:

- Cordless telephone and communications equipment and/or ancillary equipment or combinations thereof declared as capable of being powered for intended use by the main battery of a vehicle shall additionally be considered as equipment for vehicular use.
- Cordless telephone and communications equipment and/or ancillary equipment or combinations thereof declared as capable of being powered for intended use by an AC mains network shall additionally be considered as equipment for fixed use, although the input/output arrangements of the equipment and the performance criteria may remain as for the original class, as appropriate.

NOTE: The above information is necessary because both corresponding parts of cordless telephone and similar communications equipment - handset or plug-in card and base station - are usually intended for "fixed use" at a distinct location. When such corresponding parts of equipment also are intended for use e.g. in coaches or buses, then the EMC requirements for mobile equipment apply additionally. The same consideration belongs to plug-in cards requiring adequate host equipment powered by the AC mains. In this case the EMC requirements for base station equipment apply to the combination of the plug-in card and host as well.

6 Performance criteria

6.1 General

The manufacturer shall declare, also for recording in the test report, the primary functions to be checked during and after the conclusion of EMC tests.

The equipment shall meet the minimum performance criteria as specified in clauses 6.2, 6.3, 6.4 and 6.5 and additionally the primary functions as declared by the manufacturer.

6.2 Performance criteria for Continuous phenomena of Transceivers (CT)

At the conclusion of each individual exposure in a test sequence, the EUT shall continue to operate with no user noticeable loss of the communications link.

At the conclusion of the total test comprising the series of individual exposures the EUT shall continue to operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communications link shall have been maintained (see clause 5.3.1).

Where the EUT is capable of transmission, tests shall be performed to ensure that unintentional transmission does not occur.

6.3 Performance criteria for Transient phenomena applied to Transceivers (TT)

At the conclusion of each individual exposure in a test sequence, the EUT shall continue to operate with no user noticeable loss of the communications link.

At the conclusion of the total test comprising the series of individual exposures the EUT shall continue to operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communications link shall have been maintained (see clause 5.3.1).

Where the EUT is capable of transmission, tests shall be performed to ensure that unintentional transmission does not occur.

6.4 Performance criteria for Continuous phenomena applied to Receive-only equipment (CR)

The primary functions shall be verified during each individual exposure in the test sequence.

If the equipment contains analogue speech circuits the speech output signal level shall be at least 35 dB less than the previously recorded reference level. This shall be verified by the procedure in clause 5.3.2. The assessment of BER is not used.

At the conclusion of the test, the EUT shall continue to operate as intended with no loss of user control functions or stored data, and the communications link shall have been maintained. This shall be verified by checking the primary functions.

6.5 Performance criteria for Transient phenomena applied to Receive-only equipment (TR)

At the conclusion of each exposure the EUT shall continue to operate with no user noticeable loss of the communications link.

At the conclusion of the total test comprising the series of individual exposures the EUT shall continue to operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communications link shall have been maintained. This shall be verified by checking the primary functions.

6.6 Performance criteria for ancillary equipment tested on a standalone basis

The provision of ETSI EN 301 489-1 [1], clause 6.4 shall apply.

7 Applicability overview

7.1 Emission

7.1.1 General

ETSI EN 301 489-1 [1], table 1 contains the applicability of EMC emission measurements to the relevant ports of radio and/or associated ancillary equipment.

These requirements in table 1 of ETSI EN 301 489-1 [1] cover the essential requirements defined in article 3.1(b) of Directive 2014/53/EU [i.1].

7.1.2 Special conditions

No special conditions shall apply to radio equipment in the scope of the present document.

7.2 Immunity

7.2.1 General

ETSI EN 301 489-1 [1], table 2, contains the applicability of EMC immunity measurements to the relevant ports of radio and/or associated ancillary equipment.

These requirements in table 2 of ETSI EN 301 489-1 [1] cover the essential requirements defined in article 3.1(b) of Directive 2014/53/EU [i.1].

7.2.2 Special conditions

No special conditions shall apply to radio equipment in the scope of the present document.

8 Methods of measurement and limits for EMC emissions

The provisions of ETSI EN 301 489-1 [1], clause 8 shall apply.

9 Test methods and levels for immunity tests

9.1 Test configuration

The provisions of ETSI EN 301 489-1 [1], clause 9.1 shall apply.

9.2 Radio frequency electromagnetic field (80 MHz to 6 000 MHz)

9.2.1 General

The provision of ETSI EN 301 489 1 [1], clause 9.2.1 shall apply.

9.2.2 Test method

The provision of ETSI EN 301 489 1 [1], clause 9.2.2 shall apply with the following modifications:

- The test method shall be in accordance with EN 61000-4-3 [8].

The following requirements and evaluation of test results shall apply:

- the test level shall be 3 V/m (measured unmodulated). The test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 000 Hz. If the wanted signal is modulated at 1 000 Hz, then an audio signal of 400 Hz shall be used. The audio signal may be replaced by a signal of another frequency slightly different (e.g. 1 030 Hz) in order to avoid coherency influences caused by the fixed relation between audio (1 000 Hz) and DECT burst repetition (100 Hz);
- the test shall be performed over the frequency range 80 MHz to 6 000 MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers (see clause 4.3), as appropriate;
- in the frequency range 80 MHz to 6 000 MHz for receivers and transmitters the stepped frequency increments shall be 1 % frequency increment of the momentary used frequency;
- responses on receivers occurring at discrete frequencies, which are narrow band responses, shall be disregarded from the test (see ETSI EN 301 489 1 [1], clause 4);
- the frequencies selected and used during the test shall be recorded in the test report.

9.2.3 Performance criteria

The provision of ETSI EN 301 489 1 [1], clause 9.2.3 shall apply.

Annex A (normative): Relationship between the present document and the essential requirements of Directive 2014/53/EU

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.

Table A.1: Relationship between the present document and the essential requirements of Directive 2014/53/EU

Harmonised Standard ETSI EN 301 489-6				
The following requirements are relevant to the presumption of conformity under the article 3.1(b) of Directive 2014/53/EU [i.1]				
Requirement			Requirement Conditionality	
No	Description	Reference: Clause No	U/C	Condition
1	Enclosure of ancillary equipment measured on a standalone basis	Clause 8.2 in ETSI EN 301 489-1 [1]	U	
2	DC power input/output ports	Clause 8.3 in ETSI EN 301 489-1 [1]	C	Only where equipment has DC power input and/or output ports with a cable length greater than 3m or from a vehicle power supply
3	AC mains power input/output ports	Clause 8.4 in ETSI EN 301 489-1 [1]	C	Only where equipment has AC mains power input and/or output ports
4	Harmonic current emission (AC mains input port)	Clause 8.5 in ETSI EN 301 489-1 [1]	C	Only where equipment has AC mains power input ports
5	Voltage fluctuations and flicker (AC mains input ports)	Clause 8.6 in ETSI EN 301 489-1 [1]	C	Only where equipment has AC mains power input ports
6	Wired network ports	Clause 8.7 in ETSI EN 301 489-1 [1]	C	Only where equipment has wired network ports
7	Radio frequency electromagnetic field (80 MHz to 6 000 MHz)	Clause 9.2 in ETSI EN 301 489-1 [1]	U	Clause 9.2.2 of this document additionally allows a shift of the test frequency in order to avoid coherency influences caused by the fixed relation between audio and DECT burst repetition
8	Electrostatic discharge	Clause 9.3 in ETSI EN 301 489-1 [1]	U	
9	Fast transients common mode	Clause 9.4 in ETSI EN 301 489-1 [1]	U	
10	Radio frequency common mode	Clause 9.5 in ETSI EN 301 489-1 [1]	U	
11	Transients and surges in the vehicular environment	Clause 9.6 in ETSI EN 301 489-1 [1]	C	Only where equipment is connected to vehicle power supply
12	Voltage dips and interruptions	Clause 9.7 in ETSI EN 301 489-1 [1]	C	Only where equipment has AC mains power input ports
13	Surges, line to line and line to ground	Clause 9.8 in ETSI EN 301 489-1 [1]	C	Only where equipment has AC mains power input ports and/or wired network ports

Key to columns:

Requirement:

No A unique identifier for one row of the table which may be used to identify a requirement.

Description A textual reference to the requirement.

Clause Number Identification of clause(s) defining the requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

U/C Indicates whether the requirement shall be unconditionally applicable (U) or is conditional upon the manufacturers claimed functionality of the equipment (C).

Condition Explains the conditions when the requirement shall or shall not be applicable for a requirement which is classified "conditional".

Presumption of conformity stays valid only as long as a reference to the present document is maintained in the list published in the Official Journal of the European Union. Users of the present document should consult frequently the latest list published in the Official Journal of the European Union.

Other Union legislation may be applicable to the product(s) falling within the scope of the present document.

Annex B (normative): Definitions of cordless telecommunications equipment in the scope of the present document

B.1 Digital Enhanced Cordless Telecommunications (DECT) equipment

The present document applies to DECT equipment and associated ancillary equipment using radio transmission according to the DECT radio standards.

E.g. DECT equipment and associated ancillary equipment providing:

- wireless access to telephone subscriber lines and/or similar speech and data transmission purposes within private networks in the residential, commercial and light industrial environments; or
- fixed wireless access to public networks (including gateways);
- point to point data transmissions.

DECT equipment may comprise of either handset transceivers and base transceivers as defined in ETSI EN 300 175-3 [4], or radio base transceivers and subscriber radio terminal equipment for fixed wireless access.

Annex C (informative): Bibliography

ETSI EG 203 336: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".

History

Document history		
V1.1.1	September 2000	Publication
V1.2.1	August 2002	Publication
V1.3.1	August 2008	Publication
V1.4.4	May 2015	Publication
V2.1.0	April 2016	EN Approval Procedure AP 20160717: 2016-04-18 to 2016-07-18
V2.1.1	November 2016	Publication