

# ETSI EN 300 176-1 V2.4.1 (2022-11)



## **Digital Enhanced Cordless Telecommunications (DECT); Test specification; Part 1: Radio**

[ETSI EN 300 176-1 V2.4.1 \(2022-11\)](https://standards.iteh.ai/catalog/standards/sist/05bb3a47-ae58-4096-9c4f-97c259e03c38/etsi-en-300-176-1-v2-4-1-2022-11)

<https://standards.iteh.ai/catalog/standards/sist/05bb3a47-ae58-4096-9c4f-97c259e03c38/etsi-en-300-176-1-v2-4-1-2022-11>

---

**Reference**REN/DECT-00365

---

---

**Keywords**DECT, radio, regulation, testing

---

**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 - APE 7112B  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° w061004871

---

**Important notice**

---

The 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 prevailing version of an ETSI deliverable is the one made publicly available in PDF format at [www.etsi.org/deliver](http://www.etsi.org/deliver).

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://standards.etsi.org/standards-search> <https://portal.etsi.org/People/CommitteeSupportStaff.aspx> 4096-9c4f-

If you find a security vulnerability in the present document, please report it through our

Coordinated Vulnerability Disclosure Program:

<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

---

**Notice of disclaimer & limitation of liability**

---

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

---

**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.

© ETSI 2022.

All rights reserved.

# Contents

Intellectual Property Rights .....	11
Foreword.....	11
Modal verbs terminology.....	12
1 Scope .....	13
2 References .....	13
2.1 Normative references .....	13
2.2 Informative references.....	14
3 Definition of terms, symbols and abbreviations.....	15
3.1 Terms.....	15
3.2 Symbols.....	18
3.3 Abbreviations .....	18
4 General .....	20
4.1 Document layout .....	20
4.1.1 Test suites .....	20
4.1.2 Test groups.....	20
4.1.3 Test cases.....	21
4.2 Presentation of equipment for testing purposes.....	21
4.2.0 General.....	21
4.2.1 Choice of model for testing (if applicable).....	21
4.2.2 Description of equipment.....	22
4.2.2.0 General .....	22
4.2.2.1 Protocol Implementation Conformance Statement (PICS) .....	22
4.2.2.2 Protocol Implementation eXtra Information for Testing (PIXIT).....	22
4.2.2.3 Environmental test conditions.....	22
4.2.3 Host connected equipment.....	22
4.2.4 Manufacturer's declaration.....	23
4.3 Applicability of tests .....	23
4.3.0 General.....	23
4.3.1 Equipment that includes only a DECT RF receiver.....	23
4.3.2 Equipment that includes a radio transmitter .....	23
4.3.3 CTAs.....	23
4.3.4 Equipment with a synchronization port .....	23
4.3.5 Equipment incorporating the IPEI (PPs only).....	23
4.3.6 All FP equipment.....	23
4.3.7 PPs with direct PP to PP communication option .....	23
4.3.8 Installation related issues .....	24
4.3.9 Equipment with combined FT and PT functionality.....	24
4.3.9.0 General.....	24
4.3.9.1 Wireless Relay Station .....	24
4.3.9.2 Direct PP to PP communication.....	24
4.3.9.3 Distributed communications .....	24
4.3.10 Equipment that is capable of using higher level modulation .....	25
4.3.11 Equipment supporting additional carriers .....	25
4.4 Interpretation of the measurement results .....	25
5 General test requirements.....	25
5.1 Test philosophy .....	25
5.2 Test site .....	26
5.2.1 Open air test site .....	26
5.2.1.1 Description .....	26
5.2.1.2 Calibration.....	27
5.2.2 Anechoic chamber .....	28
5.2.2.1 General .....	28
5.2.2.2 Description.....	28
5.2.2.3 Influence of parasitic reflections.....	31

5.2.2.4	Calibration and mode of use.....	31
5.2.3	Stripline coupler.....	31
5.2.3.0	General.....	31
5.2.3.1	Description.....	31
5.2.3.2	Calibration.....	31
5.2.3.3	Mode of use.....	31
5.3	Standard position.....	32
5.4	Test antenna of the LT.....	32
5.5	Substitution antenna.....	32
5.6	Test fixture.....	32
5.6.1	Description.....	32
5.6.1.0	General.....	32
5.6.1.1	Calibration of the test fixture for the measurement of transmitter characteristics.....	33
5.6.1.2	Calibration of the test fixture for the measurement of receiver characteristics.....	33
5.6.1.3	Mode of use.....	34
5.6.2	Equipment with a temporary or internal permanent antenna connector.....	34
5.6.2.0	General.....	34
5.6.2.1	Equipment with a temporary antenna connector.....	34
5.7	Indoor test site.....	35
5.7.0	General.....	35
5.7.1	Description.....	35
5.7.2	Test for parasitic reflections.....	36
5.7.3	Calibration and mode of use.....	36
5.8	Lower Tester (LT).....	36
5.8.1	Description.....	36
5.8.2	Connections between the EUT and the LT.....	37
5.8.3	Functions and abilities.....	37
5.8.4	Signal generation uncertainty.....	38
5.8.4.0	General.....	38
5.8.4.1	Modulated DECT-like carrier.....	38
5.8.4.2	CW interferers.....	38
5.8.4.3	DECT RF signal.....	38
5.8.4.4	Test modulation signals.....	38
5.8.5	Measurement uncertainty.....	38
5.9	Upper Tester (UT).....	39
5.9.1	Description of the UT.....	39
5.9.2	The test standby mode.....	39
5.9.3	Test messages.....	39
5.9.4	Dummy setting when EUT is a RFP and it is in test stand-by mode.....	40
5.10	Description of the lower tester FT and PT.....	40
5.11	General test methods.....	40
5.11.1	General.....	40
5.11.2	Sampling the RF signal.....	40
5.11.2.1	Introduction.....	40
5.11.2.2	Sampling method.....	40
5.11.3	Determining the reference position.....	40
5.11.3.0	General.....	40
5.11.3.1	Case 1: EUTs that cannot transmit.....	41
5.11.3.2	Case 2: EUTs that can transmit.....	41
5.11.4	Bit Error Rate (BER) and Frame Error Ratio (FER) measurements.....	41
5.12	Test setup.....	41
5.12.0	General.....	41
5.12.1	Test setup 1.....	41
5.12.2	Test setup 2.....	41
5.12.3	Test setup 3.....	42
5.12.4	Test setup 4.....	43
5.12.5	Void.....	43
5.13	Test arrangements for intermodulation measurements.....	43
5.13.1	PT to PT arrangement.....	43
5.13.2	FT to FT arrangement.....	44
5.13.3	FT to PT arrangement.....	44

6	Test conditions, power sources and ambient temperatures .....	45
6.1	General .....	45
6.2	Nominal test conditions .....	45
6.3	Extreme test conditions .....	46
6.4	Test power source - general requirements .....	47
6.5	Nominal test power source .....	47
6.5.1	Mains voltage .....	47
6.5.2	Regulated lead acid battery power sources .....	47
6.5.3	Nickel cadmium or nickel metal hydride battery .....	47
6.5.4	Other power sources .....	47
6.6	Extreme test power source .....	48
6.6.1	Mains voltage .....	48
6.6.2	Regulated lead acid battery power sources .....	48
6.6.3	Nickel cadmium or nickel metal hydride battery .....	48
6.6.4	Other power sources .....	48
6.7	Testing of host connected equipment and plug-in cards .....	48
6.7.0	Approaches .....	48
6.7.1	Alternative A: composite equipment .....	48
6.7.2	Alternative B: use of a test jig and three hosts .....	49
7	Accuracy and stability of RF carriers .....	49
7.0	Requirements .....	49
7.1	Definition .....	49
7.2	Test environment .....	50
7.3	Method of measurement .....	50
7.4	Verdict criteria when the EUT is a RFP .....	51
7.5	Verdict criteria when the EUT is a PP .....	51
8	Accuracy and stability of timing parameters .....	51
8.0	Requirements .....	51
8.0.1	General .....	51
8.0.2	Limits .....	51
8.0.2.1	Reference timer accuracy and stability .....	51
8.0.2.2	RFP transmission jitter .....	51
8.0.2.3	PP reference timer synchronization .....	52
8.1	Slot structure definitions .....	52
8.2	Definition of the position of p0 .....	52
8.3	Measurement of packet timing jitter .....	52
8.3.1	Test environment .....	52
8.3.2	Method of measurement .....	53
8.3.3	Verdict criteria .....	53
8.4	Measurement of the reference timing accuracy of a RFP .....	53
8.4.1	Test environment .....	53
8.4.2	Method of measurement .....	53
8.4.3	Verdict criteria .....	54
8.5	Measurement of packet transmission accuracy of a PP .....	54
8.5.1	Test environment .....	54
8.5.2	Method of measurement .....	54
8.5.3	Verdict criteria .....	55
9	Transmission burst .....	55
9.0	Requirements .....	55
9.0.1	General .....	55
9.0.2	Limits .....	55
9.0.2.1	Transmitter attack time .....	55
9.0.2.2	Transmitter release time .....	55
9.0.2.3	Minimum power .....	55
9.0.2.4	Maximum power .....	56
9.0.2.5	Maintenance of transmission after packet end .....	56
9.0.2.6	Transmitter idle power output .....	56
9.1	Definitions .....	56
9.1.0	Introduction .....	56
9.1.1	Physical packets .....	56

9.1.2	Transmitted power .....	56
9.1.3	Normal Transmitted Power (NTP).....	56
9.1.4	Transmitter attack time .....	57
9.1.5	Transmitter release time.....	57
9.1.6	Minimum power .....	57
9.1.7	Maximum power.....	57
9.1.8	Maintenance of transmission after packet end.....	57
9.1.9	Transmitter idle power output.....	57
9.1.10	Nominal transceiver definition .....	57
9.1.11	$P_{NTP}$ definition.....	58
9.1.12	Multi-transceiver systems .....	58
9.2	Test environment.....	58
9.3	Method of measurement .....	58
9.4	Verdict criteria.....	58
10	Transmitted power.....	59
10.0	Requirements.....	59
10.0.1	General.....	59
10.0.2	Limits.....	59
10.0.3	Conformance.....	59
10.0.4	Multi-transceiver systems .....	59
10.1	Definitions .....	59
10.1.1	PP and RFP with an integral antenna.....	59
10.1.2	PP and RFP with external connections for all antennas.....	60
10.1.3	PP and RFP with both integral and external antennas .....	60
10.2	PP and RFP with an integral antenna .....	60
10.2.1	Test environment .....	60
10.2.2	Method of measurement .....	60
10.2.2.0	General .....	60
10.2.2.1	Measurement of NTP .....	60
10.2.2.2	Measurement of antenna gain .....	60
10.2.2.3	Determination of EIRP.....	61
10.2.3	Verdict criteria for all EUTs .....	61
10.3	PP and RFP with external antenna connection(s).....	61
10.3.1	Test environment .....	61
10.3.2	Method of measurement .....	62
10.3.3	Verdict criteria for all EUTs .....	62
11	RF carrier modulation .....	62
11.0	Requirements.....	62
11.0.1	General.....	62
11.0.2	Limits.....	62
11.1	Test environment.....	63
11.2	Method of measurement, parts 1 and 2.....	63
11.2.0	General.....	63
11.2.1	Part 1.....	63
11.2.2	Part 2.....	64
11.3	Method of measurement, parts 3 and 4.....	64
11.3.0	General.....	64
11.3.1	Part 3.....	64
11.3.2	Part 4.....	65
11.4	Verdict criteria for part 1 .....	65
11.5	Verdict criteria for part 2.....	65
11.6	Verdict criteria for part 3.....	65
11.7	Verdict criteria for part 4.....	65
12	Unwanted RF power radiation .....	67
12.1	General test conditions .....	67
12.2	Emissions due to modulation.....	67
12.2.0	Definition.....	67
12.2.1	Requirements .....	67
12.2.2	Test environment .....	67
12.2.3	Method of measurement .....	67

12.2.4	Verdict criteria .....	68
12.3	Emissions due to transmitter transients .....	68
12.3.0	Requirements .....	68
12.3.0.1	General .....	68
12.3.0.2	Limits .....	68
12.3.1	Definition .....	69
12.3.2	Test environment .....	69
12.3.3	Method of measurement .....	69
12.3.4	Verdict criteria .....	70
12.4	Emissions due to intermodulation .....	70
12.4.0	Requirements .....	70
12.4.0.1	General .....	70
12.4.0.2	Limits .....	70
12.4.1	Definition .....	70
12.4.2	Test environment .....	70
12.4.3	Method of measurement .....	70
12.4.4	Verdict criteria .....	71
12.5	Spurious emissions when allocated a transmit channel .....	71
12.5.0	Requirements .....	71
12.5.0.1	General .....	71
12.5.0.2	Limits .....	71
12.5.1	Definition .....	72
12.5.2	Radiated emissions .....	72
12.5.2.1	Test environment .....	72
12.5.2.2	Method of measurement .....	72
12.5.2.3	Verdict criteria .....	73
12.5.3	Conducted spurious emissions when the EUT has a permanent external antenna connector .....	73
12.5.3.1	Test environment .....	73
12.5.3.2	Method of measurement .....	73
12.5.3.3	Verdict criteria .....	73
13	Radio receiver testing .....	74
13.1	Radio receiver sensitivity .....	74
13.1.0	Requirements .....	74
13.1.0.1	General .....	74
13.1.0.2	Limits .....	74
13.1.1	Definition .....	74
13.1.2	Test environment .....	74
13.1.3	Method of measurement .....	74
13.1.4	Verdict criteria .....	75
13.2	Radio receiver reference BER and FER .....	75
13.2.0	Requirements .....	75
13.2.0.1	General .....	75
13.2.0.2	Limits .....	75
13.2.1	Definition .....	75
13.2.2	Test environment .....	75
13.2.3	Method of measurement .....	75
13.2.4	Verdict criteria .....	76
13.3	Radio receiver interference performance .....	76
13.3.0	Requirements .....	76
13.3.0.1	General .....	76
13.3.0.2	Limits .....	76
13.3.1	Definition .....	76
13.3.2	Test environment .....	76
13.3.3	Method of measurement .....	76
13.3.4	Verdict criteria .....	77
13.4	Radio receiver blocking case 1: owing to signals occurring at the same time but on other frequencies .....	77
13.4.0	Requirements .....	77
13.4.0.1	General .....	77
13.4.0.2	Limits .....	77
13.4.1	Definition .....	77
13.4.2	Test environment .....	77

13.4.3	Method of measurement .....	78
13.4.4	Verdict criteria .....	79
13.5	Radio receiver blocking case 2: owing to signals occurring at a different time .....	79
13.5.0	Requirements .....	79
13.5.0.1	General .....	79
13.5.0.2	Limits .....	79
13.5.1	Definition .....	79
13.5.2	Test environment .....	79
13.5.3	Method of measurement .....	80
13.5.4	Verdict criteria .....	80
13.6	Receiver intermodulation performance .....	80
13.6.0	Requirements .....	80
13.6.0.1	General .....	80
13.6.0.2	Limits .....	80
13.6.1	Definition .....	81
13.6.2	Test environment .....	81
13.6.3	Method of measurement .....	81
13.6.4	Verdict criteria .....	81
13.7	Spurious emissions when the PP has no allocated transmit channel .....	82
13.7.0	Requirements .....	82
13.7.0.1	General .....	82
13.7.0.2	Limits .....	82
13.7.0.2.1	Out of band .....	82
13.7.0.2.2	In the DECT band .....	82
13.7.1	Definition .....	82
13.7.2	Test environment .....	82
13.7.3	Method of measurement .....	82
13.7.4	Verdict criteria (outside the DECT band) .....	83
13.7.5	Verdict criteria (inside the DECT band) .....	83
14	Intersystem synchronization (FP only) .....	83
14.0	Requirements .....	83
14.1	Description .....	83
14.2	Test environment .....	83
14.3	Wired synchronization ports .....	83
14.3.1	FP as a master .....	83
14.3.1.1	Method of measurement .....	83
14.3.1.2	Verdict criteria .....	84
14.3.2	FP as a slave .....	84
14.3.2.1	Method of measurement .....	84
14.3.2.2	Verdict criteria .....	85
14.4	GPS synchronization .....	85
14.4.1	FP with integrated Global Positioning System (GPS) synchronization .....	85
14.4.1.1	Method of measurement .....	85
14.4.1.2	Verdict criteria .....	85
14.4.2	External GPS synchronization device .....	86
14.4.2.1	Method of measurement .....	86
14.4.2.2	Verdict criteria .....	86
15	EMC .....	86
16	Equipment identity testing .....	86
16.0	General .....	86
16.1	PP .....	86
16.2	FP .....	87
17	Efficient use of the radio spectrum .....	87
17.1	Channel selection .....	87
17.2	Channel confirmation .....	87
17.2.1	For the PT .....	87
17.2.2	For the FT .....	87
17.3	Channel release .....	88
17.4	General .....	88



17.5	Channel selection and confirmation for DECT ULE .....	88
17.5.1	General.....	88
17.5.2	For the PT .....	88
17.5.3	For the FT .....	89
17.6	Test Methods for channel selection.....	89
17.6.1	Test environment .....	89
17.6.2	FT Test Setup.....	89
17.6.2.1	General .....	89
17.6.2.2	FT Method of Measurement.....	90
17.6.2.3	FT Verdict Criteria.....	90
17.6.3	PT Test Setup.....	90
17.6.3.1	General .....	90
17.6.3.2	PT Method of Measurement.....	91
17.6.3.3	PT Verdict Criteria.....	91
17.6.4	Channel Release.....	91
17.6.4.1	General .....	91
17.6.4.2	Method of Measurement .....	92
17.6.4.3	Channel Release Verdict Criteria .....	92
18	WRS testing.....	93
18.0	General .....	93
18.1	Testing as a PP .....	93
18.2	Testing as an RFP.....	93
18.3	Additional requirements .....	94
18.3.1	General.....	94
18.3.2	Conformance.....	98
18.3.2.1	General .....	98
18.3.2.2	Testing as a PP .....	98
18.3.2.3	Testing as an RFP .....	98
18.3.2.4	Additional requirements.....	98
19	Requirements for PPs with direct PP to PP communication mode .....	99
19.0	General .....	99
19.1	Setting the EUT in direct communications mode.....	99
19.2	When the EUT has not initiated a call.....	99
19.3	When the EUT initiates a call.....	99
19.4	Manufacturer's declarations.....	100
20	Distributed communications.....	100
20.0	General .....	100
20.1	Testing as a PP .....	100
20.2	Testing as an RFP.....	100
20.3	Conformance .....	101
21	Higher level modulation options .....	101
21.0	Requirements.....	101
21.1	Activation of higher level modulations when EUT is in test stand-by mode .....	102
21.2	Conformance .....	102
<b>Annex A (informative): Procedures for test fixture calibration and for measurement of radiated spurious emissions .....</b>		<b>103</b>
A.1	Calibration of test fixture for receiver measurements .....	103
A.1.0	General .....	103
A.1.1	Method of measurement.....	103
A.2	Radiated measurements.....	105
A.2.1	General .....	105
A.2.2	Radiated spurious emissions.....	105
A.2.2.1	Definition.....	105
A.2.2.2	Method of measurement .....	106
A.2.3	Cabinet radiation .....	107
A.2.3.1	Definition.....	107
A.2.3.2	Method of measurement .....	108

<b>Annex B (informative):</b>	<b>Procedure for measurement of conducted spurious emissions .....</b>	<b>109</b>
B.1	Conducted spurious emissions .....	109
B.1.1	Definition .....	109
B.1.2	Method of measurement .....	109
<b>Annex C (normative):</b>	<b>Test Support Profile (TSP).....</b>	<b>110</b>
C.1	Introduction .....	110
C.2	Standardized symbols for the status column .....	110
C.3	Capabilities of PP (EUT) under test .....	111
C.3.1	Services .....	111
C.3.2	Messages .....	111
C.3.3	Message parameters .....	113
C.3.4	Procedure support.....	117
C.3.5	CSF multiplexing functions.....	117
C.3.6	Timer and counter support.....	118
C.4	Capabilities of FP (EUT) under test .....	119
C.4.1	Services .....	119
C.4.2	Messages .....	119
C.4.3	Message parameters .....	121
C.4.4	Procedure support.....	125
C.4.5	CSF multiplexing functions.....	125
C.4.6	Timer and counter support.....	126
<b>Annex D (normative):</b>	<b>Measurement of BER and FER.....</b>	<b>127</b>
<b>Annex E (informative):</b>	<b>Procedures for the measurement of synchronization loss at the EUT by the LT .....</b>	<b>128</b>
E.1	Description .....	128
E.2	Method .....	128
<b>Annex F (informative):</b>	<b>Guidelines for installation related issues .....</b>	<b>129</b>
F.0	General .....	129
F.1	Antennas with directivity .....	129
F.2	DECT frame synchronization.....	129
F.2.0	General .....	129
F.2.1	Guidance for installation of frame synchronized DECT systems.....	130
F.2.1.1	GPS synchronization.....	130
F.2.1.2	Wired synch port synchronization .....	130
F.2.1.3	Requirements for DECT air synchronization.....	131
<b>Annex G (informative):</b>	<b>Maximum measurement uncertainty.....</b>	<b>132</b>
<b>Annex H (informative):</b>	<b>Bibliography.....</b>	<b>133</b>
<b>Annex I (informative):</b>	<b>Change History .....</b>	<b>134</b>
History .....		135

# Intellectual Property Rights

## Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are 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 Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, 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.

## Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

# Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Digital Enhanced Cordless Telecommunications (DECT).

The present document contains text pertaining to testing of the Digital Enhanced Cordless Telecommunications (DECT) Common Interface [1] to [4] and [i.11] to [i.14]. Such text should be considered as guidance to approval (or licensing) authorities.

The present document covers DECT, DECT Evolution and DECT ULE as defined by the multi-part technical specification ETSI EN 300 175 (see [1] to [4] and [i.11] to [i.14]) and by the multi-part specification ETSI TS 102 939 (see [i.20] and [i.21]).

The present document is part 1 of a multi-part deliverable covering the test specification for Digital Enhanced Cordless Telecommunications (DECT), as identified below:

**Part 1:** "Radio";

Part 2: "Audio and speech".

National transposition dates	
Date of adoption of this EN:	31 October 2022
Date of latest announcement of this EN (doa):	31 January 2023
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 2023
Date of withdrawal of any conflicting National Standard (dow):	31 July 2023

---

## 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.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

[ETSI EN 300 176-1 V2.4.1 \(2022-11\)](#)

<https://standards.iteh.ai/catalog/standards/sist/05bb3a47-ae58-4096-9c4f-97c259e03c38/etsi-en-300-176-1-v2-4-1-2022-11>

---

# 1 Scope

The present document specifies tests applicable to all Digital Enhanced Cordless Telecommunications (DECT) equipment accessing the DECT frequency band 1 880 MHz to 1 900 MHz and including provisions for testing other or extended frequency bands as described in ETSI EN 300 175-1 [i.11] and ETSI EN 300 175-2 [1]. Part 2 of the present multi-part deliverable [i.15] specifies tests applicable to DECT speech and audio transmission using a collection of speech codecs, including Recommendation ITU-T G.726 [i.7] ADPCM codec, Recommendation ITU-T G.722 [i.8] "7 kHz codec", "MPEG-4 codec" [i.10], LC3plus [i.24] and others.

The aims of the present document are to ensure:

- efficient use of frequency spectrum;
- no harm done to any connected network and its services;
- no harm done to other radio networks and services;
- no harm done to other DECT equipment or its services;
- interworking of terminal equipment via the public network.

The tests of ETSI EN 300 176 are split into two parts:

- the present document (part 1) covers testing of radio frequency parameters, security elements and those DECT protocols that facilitate the radio frequency tests and efficient use of frequency spectrum;
- part 2 [i.15] describes testing of speech and audio requirements between network interface and DECT PT, or between a DECT CI air interface and alternatively a DECT PT or FT. Part 2 is not applicable to terminal equipment specially designed for the disabled (e.g. with amplification of received speech as an aid for the hard-of-hearing).

DECT terminal equipment consists of the following elements:

- a) Fixed Part (FP);
- b) Portable Part (PP);
- c) Cordless Terminal Adapter (CTA);
- d) Wireless Relay Station (WRS) (FP and PP combined);
- e) Hybrid Part (HyP) (a PP with capability to act as a FP to provide PP to PP communication).

Details of the DECT Common Interface may be found in ETSI EN 300 175-1 [i.11], ETSI EN 300 175 parts 2 to 3 [1] to [2], ETSI EN 300 175-4 [i.12], ETSI EN 300 175 parts 5 to 6 [3] to [4], and ETSI EN 300 175 parts 7 to 8 [i.13] to [i.14]. Further details of the DECT system may be found in the ETSI Technical Report ETSI TR 101 178 [i.1]. Information about ULE may be found in the ETSI Technical Specifications ETSI TS 102 939-1 [i.20] and ETSI TS 102 939-2 [i.21].

---

## 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 <https://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 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".
- [2] ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [3] ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- [4] ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- [5] Recommendation ITU-T V.11: "Electrical characteristics for balanced double-current interchange circuits operating at data signalling rates up to 10 Mbit/s".
- [6] Recommendation ITU-T O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate".
- [7] ETSI EN 300 700: "Digital Enhanced Cordless Telecommunications (DECT); Wireless Relay Station (WRS)".

## 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] ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A High Level Guide to the DECT Standardization".
- [i.2] Void.
- [i.3] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS)".
- [i.4] ETSI TS 102 527-1: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 1: Wideband speech".
- [i.5] ETSI TS 102 527-2: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 2: Support of transparent IP packet data".
- [i.6] ETSI TS 102 527-3: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 3: Extended Wideband speech services".
- [i.7] Recommendation ITU-T G.726 (1990): "40, 32, 24, 16 kbit/s Adaptive Differential Pulse Code Modulation (ADPCM)".
- [i.8] Recommendation ITU-T G.722: "7 kHz audio - coding within 64 kbit/s".
- [i.9] ETSI TS 102 527-4: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 4: Light Data Services; Software Update Over The Air (SUOTA), content downloading and HTTP based applications".

- [i.10] ISO/IEC JTC1/SC29/WG11 (MPEG): International Standard ISO/IEC 14496-3:2005/AMD 1:2007: "Information Technology - Coding of audio-visual objects - Part 3: Audio; AMENDMENT 1: Low Delay AAC profile".
- [i.11] ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- [i.12] ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- [i.13] ETSI EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
- [i.14] ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech and audio coding and transmission".
- [i.15] ETSI EN 300 176-2: "Digital Enhanced Cordless Telecommunications (DECT); Test specification; Part 2: Audio and speech".
- [i.16] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".
- [i.17] Void.
- [i.18] Council Directive 2004/108/EC of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.
- [i.19] ETSI EN 301 406-1: "Digital Enhanced Cordless Telecommunications (DECT); Harmonised Standard for access to radio spectrum; Part 1: DECT, DECT Evolution and DECT ULE".
- [i.20] ETSI TS 102 939-1: "Digital Enhanced Cordless Telecommunications (DECT); Ultra Low Energy (ULE); Machine to Machine Communications; Part 1: Home Automation Network (phase 1)".
- [i.21] ETSI TS 102 939-2: "Digital Enhanced Cordless Telecommunications (DECT); Ultra Low Energy (ULE); Machine to Machine Communications; Part 2: Home Automation Network (phase 2)".
- [i.22] ETSI TR 100 028: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.23] 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.24] ETSI TS 103 634: "Digital Enhanced Cordless Telecommunications (DECT); Low Complexity Communication Codec plus (LC3plus)".

---

## 3 Definition of terms, symbols and abbreviations

### 3.1 Terms

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

**antenna diversity:** feature that implies that the Radio Fixed Part (RFP) is able to select for each bearer independently different antenna properties such as gain, polarization, coverage patterns, and other features that may affect the practical coverage

NOTE: A typical example is space diversity, provided by two vertically polarized antennas separated by 10 cm to 20 cm.