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European Standard (Telecommunications series)

Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); Attachment requirements for DECT/GSM dual-mode terminal equipment

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Digital Enhanced Cordless Telecommunications (DECT), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

The present EN has been produced by 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.

The present EN 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).

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

1 Scope

The present document specifies the technical characteristics to be provided by terminal equipment which is capable of connection with a DECT radio access (see note 1) to a public telecommunications network (note 2) as well as with Global System for Mobile communications (GSM) radio access to GSM Public Land Mobile Networks (PLMN).

A DECT terminal equipment comprises two elements, referred to as a Fixed Part (FP) and a Portable Part (PP), whereas a GSM terminal equipment is comprised of a GSM Mobile Station (MS). The objective of the present document is to ensure dual-mode operation of handsets comprised of a DECT PP and a GSM MS (Phase 2). These parts may, or may not, be separable.

The basic Common Technical Regulations (CTRs) for DECT shall apply. These are the general attachment requirements (CTR 6), the requirements for telephony applications (CTR 10) and the requirements for the Generic Access Profile (GAP) (CTR 22). In addition, further CTRs may be applied such as the CTRs for DECT access to GSM PLMN (CTR 36) and/or DECT access to Integrated Services Digital Network (ISDN) (CTR 40).

The basic CTRs for GSM shall apply. These are the attachment requirements for GSM MSs; Access (CTR 19 for Phase 2 and CTR 31 for multiband operation) and the requirements for telephony (CTR 20 for Phase 2).

All the above-mentioned CTRs are the basis for type approval according to the present document together with the basic standard for Dual-Mode Terminals (DMTs), EN 301 242 [2]. The present document specifies how these CTRs are to be applied for DECT/GSM dual-mode handsets. Furthermore, the present document specifies all necessary changes and additions to these CTRs for DECT/GSM dual-mode handsets.

As dual-mode handsets are expected to undergo a rapid technical development, the present document is expected to be amended at a later stage to meet these developments.

NOTE 1: Currently there are DECT profiles for interworking with ISDN (ETS 300 434 [32] and ETS 300 822 [33], which both allow access to ISDN networks and the services therein), GSM PLMN (ETS 300 370 [1] and others, which allow access to GSM PLMN and the services therein) and GAP to fixed networks (EN 300 444 [3], GAP), focusing on speech services). These are all covered by corresponding Technical Basis for Regulation (TBRs)/CTRs. There also exists the Cordless Terminal Mobility (CTM) Access Profile (CAP) ETS 300 824 [31].

NOTE 2: In the cases of the present document, the air interface may also be the network access. For the fixed public networks the following CTRs apply:

- CTR for basic ISDN;
- CTR for primary rate ISDN, or national regulations (implementing ETS 300 001 [30]) for Public Switched Telephone Network (PSTN).

Interworking of DECT terminals to the GSM PLMN is covered by a separate DECT/GSM interworking CTR (CTR 36).

2 References

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

2.1 Normative references

[1] ETS 300 370: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); (DECT/GSM) Interworking Profile (IWP); Access and mapping (protocol/procedure description for 3,1 kHz speech service)".

[2] EN 301 242 (1998): "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM integration based on dual-mode terminals".

[3] EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

[4] ETS 300 607-1: "Digital cellular telecommunication system (Phase 2); Mobile Station (MS) conformance specification; Part 1: Conformance specification (GSM 11.10)".

[5] TBR 6: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".

[6] TBR 10: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements: Telephony applications".

[7] TBR 19: "European digital cellular telecommunications system (Phase 2); Attachment requirements for Global System for Mobile communications (GSM) mobile stations; Access".

[8] TBR 20: "European digital cellular telecommunications system (Phase 2); Attachment requirements for Global System for Mobile communications (GSM) mobile stations; Telephony".

[9] TBR 22: "Radio Equipment and Systems (RES); Attachment requirements for terminal equipment for Digital Enhanced Cordless Telecommunications (DECT) Generic Access Profile (GAP) applications".

[10] TBR 31: "Digital cellular telecommunications system (Phase 2); Attachment requirements for mobile stations in the DCS 1 800 band and additional GSM 900 band; Access".

[11] TBR 32: "Digital cellular telecommunications system (Phase 2); Attachment requirements for mobile stations in the DCS 1 800 band and additional GSM 900 band; Telephony".

[12] TBR 40: "Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment for DECT/ISDN interworking profile applications".

[13] 91/263/EEC: "Council Directive of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity" (Terminal Directive).

2.2 Informative references

[14] EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".

[15] EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical layer (PHL)".

[16] EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".

[17] EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".

[18] EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".

[19] EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".

[20] EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".

[21] EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".

[22] ETS 300 535: "Digital cellular telecommunications system (Phase 2); Functions related to Mobile Station (MS) in idle mode (GSM 03.22)".

[23] ETS 300 540: "Digital cellular telecommunications system (Phase 2); Transmission planning aspects of the speech service in the GSM Public Land Mobile Network (PLMN) system (GSM 03.50)".

[24] ETS 300 577: "Digital cellular telecommunications system (Phase 2); Radio transmission and reception (GSM 05.05)".

[25] ETR 100: "European digital cellular telecommunications system (Phase 2); Abbreviations and acronyms (GSM 01.04)".

[26] ETR 159: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); Wide area mobility using the GSM".

[27] ETR 341: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications(GSM); (DECT/GSM) Interworking Profile(IWP); Profile overview".

[28] TR 101 176: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM advanced integration of DECT/GSM dual-mode terminal equipment".

[29] TR 101 072 (1997): "Digital Enhanced Cordless Telecommunications/Global System for Mobile communications (DECT/GSM); Integration based on dual-mode terminals".

[30] ETS 300 001: "Attachments to Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN (NET 4)".

[31] ETS 300 824: "Digital Enhanced Cordless Telecommunications (DECT); Cordless Terminal Mobility (CTM); CTM Access Profile (CAP)".

[32] ETS 300 434: "Digital Enhanced Cordless Telecommunications (DECT) and Integrated Services Digital Network (ISDN) interworking for end system configuration".

[33] ETS 300 822: "Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); DECT/ISDN interworking for intermediate system configuration; Interworking and profile specification".

[34] TBR 36: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT access to GSM Public Land Mobile Networks (PLMNs) for 3,1 kHz speech applications".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the definitions given in TBR 6 [5], TBR 10 [6], TBR 19 [7], TBR 20 [8], TBR 22 [9], TBR 31 [10], TBR 32 [11] and TBR 40 [12] apply, along with those found in EN 301 242 [2].

3.2 Abbreviations

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

ARI	Access Rights Identity (see PARI, SARI and TARI)
CAP	CTM Access Profile
Cat	Category
CTM	Cordless Terminal Mobility
CTR	Common Technical Regulation
DCS	Digital Cellular System
DECT	Digital Enhanced Cordless Telecommunications
DMT	Dual-Mode Terminal
FP	Fixed Part
GAP	Generic Access Profile
GIP	DECT/GSM Interworking Profile
GSM	Global System for Mobile communications
ICS	Implementation Conformance Statement
ISDN	Integrated Services Digital Network
MS	Mobile Station
PLMN	Public Land Mobile Network
PP	Portable Part
PSTN	Public Switched Telephone Network
RFP	Radio Fixed Part
RT	Requirements Tables
SIM	Subscriber Identity Module
TBR	Technical Basis for Regulation
TD	Terminals Directive

4 Introduction and how to use the present document

The present document contains references to existing DECT and GSM TBRs. It identifies the essential requirements of these TBRs which are applicable to DECT/GSM dual-mode terminals , with any required relaxations, additions or modifications. It introduces some new essential requirements specific to DECT/GSM DMTs. It identifies the test specifications to be applied to demonstrate compliance to these existing and new essential requirements.

The present document does not cover the use of the DECT/GSM Interworking Profile (GIP) in the DECT mode of a DECT/GSM DMT. Single mode DECT PPs which implement the GIP profile are type approved according to TBR 36 [34]. Use of the GIP profile requires the support of the DECT Access Rights Identity (ARI) class D.

The present document does not permit the support of direct mode MS to MS or PP to PP communication. DECT PP to PP communication is within the scope of TBR 6 [5], and requires the support of DECT ARI class E. DECT/GSM DMTs type approved according to the present document are therefore receive first devices, in that they do not transmit on either DECT or GSM frequency bands without having detected and locked to a suitable FP or base station.

5 Requirements

The DECT/GSM DMT features, services and requirements, as defined in the DECT TBRs (TBR 6 [5], TBR 10 [6], TBR 22 [9] and TBR 40 [12]), the GSM TBRs (TBR 19 [7], TBR 20 [8], TBR 31 [10] and TBR 32 [11]) and in the DECT/GSM dual-mode Standard EN 301 242 [2], are considered to fall under the essential requirements specified in Article 4 of the Council directive 91/263/EEC [13] applying to terminal equipment, given in the following subclauses. The column Terminal Directive Category (TD Cat) identifies the applicable clauses of Article 4 of directive 91/263/EEC [13].

NOTE: This clause does not specify the exact status (e.g. mandatory or optional) of the listed features, services and requirements. This is specified in annex A.

The interpretation of TD Category column in all tables is as follows:

d falls under item (d) from Article 4 of Council directive 91/263/EEC [13];
(protection of the public telecommunications network from harm)

e falls under item (e) from Article 4 of Council directive 91/263/EEC [13];
(effective use of the radio frequency spectrum, where appropriate)

f falls under item (f) from Article 4 of Council directive 91/263/EEC [13];
(interworking of terminal equipment with public telecommunications network equipment for the purpose of establishing, modifying, charging for, holding and clearing real or virtual connection)

g falls under item (g) from Article 4 of Council directive 91/263/EEC [13].
(interworking of terminal equipment via the public telecommunications network, in justified cases)

5.1 DECT requirements

5.1.1 Application of TBR 6

All the essential requirements of TBR 6 [5], listed below, apply for DECT/GSM DMTs.

Table 1: TBR 6 [5] requirements and justifications

TBR 6 [5] Clause	DESCRIPTION	TBR JUSTIFICATION	TD Cat
7	Accuracy and stability of RF carriers	Contained in TBR 6 [5]	4e
8.3	Timing jitter: Slot-slot on the same channel	Contained in TBR 6 [5]	4e
8.5	Measurement of packet timing accuracy	Contained in TBR 6 [5]	4e
9	Transmission Burst	Contained in TBR 6 [5]	4e
10.2	Transmitted power: PP and Radio Fixed Part (RFP) with an integral antenna	Contained in TBR 6 [5]	4e
10.3	Transmitted power: PP and RFP with an external antenna connector	Contained in TBR 6 [5]	4e
11	RF carrier modulation	Contained in TBR 6 [5]	4e
12.2	Emission due to modulation	Contained in TBR 6 [5]	4e
12.3	Emission due to transmitter transients	Contained in TBR 6 [5]	4e
12.4	Emission due to intermodulation	Contained in TBR 6 [5]	4e
12.5	Spurious emission when allocated a transmit channel	Contained in TBR 6 [5]	4e
13.1	Radio receiver sensitivity	Contained in TBR 6 [5]	4e
13.2	Radio receiver reference Bit Error Ratio (BER)	Contained in TBR 6 [5]	4e
13.3	Radio receiver interference performance	Contained in TBR 6 [5]	4e
13.4	Radio receiver blocking, case 1	Contained in TBR 6 [5]	4e
13.5	Radio receiver blocking, case 2	Contained in TBR 6 [5]	4e
13.6	Receiver intermodulation performance	Contained in TBR 6 [5]	4e
13.7	Spurious emissions when not allocated a transmit channel	Contained in TBR 6 [5]	4e
15	EMC	Contained in TBR 6 [5]	4e
16	Equipment identity verification/safeguards	Contained in TBR 6 [5]	4e
17	Efficient use of radio spectrum	Contained in TBR 6 [5]	4e

5.1.2 Application of TBR 10

All the essential requirements of TBR 10 [6], listed below, apply for DECT/GSM DMTs.

Table 2: TBR 10 [6] requirements and justifications

TBR 10 [6] Item	DESCRIPTION	TBR JUSTIFICATION	TD Cat
7.6	Speech Coding Scheme	Contained in TBR 10 [6]	4g
7.7	PP sending frequency response	Contained in TBR 10 [6]	4g
7.8	PP receiving frequency response	Contained in TBR 10 [6]	4g
7.9.2.1	SLR_H	Contained in TBR 10 [6]	4g
7.9.2.2	RLR_H	Contained in TBR 10 [6]	4g
7.10	User controlled volume control in the PP	Contained in TBR 10 [6]	4g
7.11	PP talker sidetone masking rating	Contained in TBR 10 [6]	4g
7.12	Listener SideTone (LST)	Contained in TBR 10 [6]	4g
7.13	Terminal Coupling Loss (TCLw) of a PP	Contained in TBR 10 [6]	4g
7.15	Stability loss - fixed geometry	Contained in TBR 10 [6]	4g
7.16	Stability loss variable geometry	Contained in TBR 10 [6]	4g
7.17	Sending distortion	Contained in TBR 10 [6]	4g
7.18	Receiving distortion	Contained in TBR 10 [6]	4g
7.19	Side tone distortion	Contained in TBR 10 [6]	4g
7.20	Out of band (sending)	Contained in TBR 10 [6]	4g
7.21	Out of band (receiving)	Contained in TBR 10 [6]	4g
7.22	Sending noise	Contained in TBR 10 [6]	4g
7.23	Sending noise (narrow band)	Contained in TBR 10 [6]	4g
7.24	Receiving noise	Contained in TBR 10 [6]	4g
7.25	Sampling Frequency Level (Receiving)	Contained in TBR 10 [6]	4g
7.28	PP Delay	Contained in TBR 10 [6]	4g
7.31	Variation of Gain with Input level - sending	Contained in TBR 10 [6]	4g
7.32	Variation of Gain with Input level - receiving	Contained in TBR 10 [6]	4g

5.1.3 Application of TBR 22

All of the essential requirements of TBR 22 [9] apply to DECT/GSM DMTs. They are not listed here as a DECT/GSM DMT has no impact on their application.

5.1.4 Application of TBR 40

For DMTs which are declared to support a DECT/ISDN Interworking profile, all of the essential requirements of the profile concerned in TBR 40 [12] apply. They are not listed here as a DECT/GSM DMT has no impact on their application.

5.2 GSM requirements

5.2.1 Application of TBR 19

All the essential requirements of TBR 19 [7] apply for DECT/GSM DMTs.

Table 3: TBR 19 [7] requirements and justifications

ETS 300 607-1 [4] Item	Description	TBR Justification	TD Cat
11.1.1	Verification of support and non-support of services (MT)	Contained in TBR 19 [7]	f
11.1.2	Verification of support and non-support of services (MO)	Contained in TBR 19 [7]	f
11.2	Verification of support of the single numbering scheme	Contained in TBR 19 [7]	f
11.3	Verification of non-support of services. (Advice of Charge Charging, AOCC)	Contained in TBR 19 [7]	d, f
11.4	Verification of non-support of services. (Call Hold)	Contained in TBR 19 [7]	f
11.5	Verification of non-support of services. (Multi Party)	Contained in TBR 19 [7]	f
11.6	Verification of non-support of feature. (Fixed dialling number)	Contained in TBR 19 [7]	d, f
11.7	IMEI security	Contained in TBR 19 [7]	d
12.1.1	Conducted spurious emissions - MS allocated a channel	Contained in TBR 19 [7]	e
12.1.2	Conducted spurious emissions - MS in idle mode	Contained in TBR 19 [7]	e
12.2.1	Radiated spurious emissions - MS allocated a channel	Contained in TBR 19 [7]	e
12.2.2	Radiated spurious emissions - MS in idle mode	Contained in TBR 19 [7]	e
13.1	Transmitter - Frequency error and phase error	Contained in TBR 19 [7]	e
13.2	Transmitter - Frequency error under multipath and interference conditions	Contained in TBR 19 [7]	e
13.3-1	Transmitter output power and burst timing - MS with permanent antenna connector	Contained in TBR 19 [7]	e
13.3-2	Transmitter output power and burst timing - MS with integral antenna	Contained in TBR 19 [7]	e
13.4	Transmitter - Output RF spectrum	Contained in TBR 19 [7]	e
14.1.1.1	Receiver / Bad Frame Indication - TCH/FS - Random RF input	Contained in TBR 19 [7]	e
14.1.1.2	Receiver / Bad Frame Indication - TCH/FS - Frequency hopping and downlink DTX	Contained in TBR 19 [7]	e
14.1.2.1	Receiver / Bad Frame Indication - TCH/HS - Random RF input	Contained in TBR 19 [7]	e
14.1.2.2	Receiver / Bad Frame Indication - TCH/HS - Frequency hopping and downlink DTX	Contained in TBR 19 [7]	e
14.2.1	Receiver / Reference sensitivity - TCH/FS	Contained in TBR 19 [7]	f
14.2.2	Receiver / Reference sensitivity - TCH/HS	Contained in TBR 19 [7]	f
14.2.3	Receiver / Reference sensitivity - FACCH/F	Contained in TBR 19 [7]	f
14.2.4	Receiver / Reference sensitivity - FACCH/H	Contained in TBR 19 [7]	f
14.2.5	Receiver / Reference sensitivity - full rate data channels	Contained in TBR 19 [7]	f
14.2.6	Receiver / Reference sensitivity - half rate data channels	Contained in TBR 19 [7]	f

(continued)

Table 3 (concluded): TBR 19 [7] requirements and justifications

ETS 300 607-1 [4] Item	Description	TBR Justification	TD Cat
14.3	Receiver / Usable receiver input level range	Contained in TBR 19 [7]	e
14.4.1	Co-channel rejection - TCH/FS	Contained in TBR 19 [7]	e
14.4.2	Co-channel rejection - TCH/HS (speech frames)	Contained in TBR 19 [7]	f
14.4.4	Co-channel rejection - FACCH/F	Contained in TBR 19 [7]	f
14.4.5	Co-channel rejection - FACCH/H	Contained in TBR 19 [7]	f
14.5.1	Adjacent channel rejection - speech channels	Contained in TBR 19 [7]	e
14.5.2	Adjacent channel rejection - control channels	Contained in TBR 19 [7]	f
14.6.1	Intermodulation rejection - speech channels	Contained in TBR 19 [7]	e
14.6.2	Intermodulation rejection - control channels	Contained in TBR 19 [7]	f
14.7.1	Blocking and spurious response - speech channels	Contained in TBR 19 [7]	e
14.7.2	Blocking and spurious response - control channels	Contained in TBR 19 [7]	f
14.8.1	AM suppression - speech channels	Contained in TBR 19 [7]	f
14.8.2	AM suppression - control channels	Contained in TBR 19 [7]	f

All other essential requirements of TBR 19 [7] also apply - they are not listed here as dual-mode DECT/GSM terminals do not influence their application.

5.2.2 Application of TBR 20

All the essential requirements of TBR 20 [8], listed below, apply for DECT/GSM DMTs.

Table 4: TBR 20 [8] requirements and justifications

ETS 300 607-1 [4] Item	Description	TBR Justification	TD Cat
14.4.3	Co channel rejection - TCH/HS (SID frames)	Contained in TBR 20 [8]	g
30.1	Sending sensitivity / frequency response	Contained in TBR 20 [8]	g
30.2	Sending loudness rating	Contained in TBR 20 [8]	g
30.3	Receiving sensitivity / frequency response	Contained in TBR 20 [8]	g
30.4	Receiving loudness rating	Contained in TBR 20 [8]	g
30.5.1	Side Tone Masking Rating (STMR)	Contained in TBR 20 [8]	g
30.5.2	Listener Side Tone Rating (LSTR)	Contained in TBR 20 [8]	g
30.6.1	Telephone acoustic coupling loss (TAL) - Echo loss (EL)	Contained in TBR 20 [8]	g
30.6.2	Telephone acoustic coupling loss (TAL) - Stability margin	Contained in TBR 20 [8]	g
30.7.1	Distortion - Sending	Contained in TBR 20 [8]	g
32.1	Testing of speech transcoding functions / Full Rate Downlink speech transcoding	Contained in TBR 20 [8]	g

(continued)

Table 4 (concluded): TBR 20 [8] requirements and justifications

ETS 300 607-1 [4] Item	Description	TBR Justification	TD Cat
32.2	Full Rate Downlink receiver DTX functions	Contained in TBR 20 [8]	g
32.3	Full Rate Uplink speech transcoding	Contained in TBR 20 [8]	g
32.4	Full Rate Uplink transmitter DTX functions	Contained in TBR 20 [8]	g
32.5.4	Full Rate Speech channel transmission delay - Downlink processing delay	Contained in TBR 20 [8]	g
32.5.5	Full Rate General test of transparency of MMI inputs - Downlink coding delay	Contained in TBR 20 [8]	g
32.5.6	Full Rate General test of transparency of MMI inputs - Uplink processing delay	Contained in TBR 20 [8]	g
32.5.7	Full Rate General test of transparency of MMI inputs - Uplink coding delay	Contained in TBR 20 [8]	g
32.6	Testing of speech transcoding functions / Half Rate Downlink speech transcoding	Contained in TBR 20 [8]	g
32.7	Half Rate Downlink receiver DTX functions	Contained in TBR 20 [8]	g
32.8	Half Rate Uplink speech transcoding	Contained in TBR 20 [8]	g
32.9	Half Rate Uplink transmitter DTX functions	Contained in TBR 20 [8]	g
32.10.4	Half rate speech channel transmission delay / downlink processing delay	Contained in TBR 20 [8]	g
32.10.5	Half rate speech channel transmission delay / downlink coding delay	Contained in TBR 20 [8]	g
32.10.6	Half rate speech channel transmission delay / uplink processing delay	Contained in TBR 20 [8]	g
32.10.7	Half rate speech channel transmission delay / uplink coding delay	Contained in TBR 20 [8]	g

5.2.3 Application of TBR 31

All the essential requirements of TBR 31 [10] apply for DECT/GSM DMTs which support Digital Cellular System (DCS) 1800 service.

Table 5: TBR 31 [10] requirements and justifications

ETS 300 607-1 [4] Item	DESCRIPTION	TBR JUSTIFICATION	TD Cat
11.1.1	Verification of support and non-support of services (MT)	Contained in TBR 31 [10]	f
11.1.2	Verification of support and non-support of services (MO)	Contained in TBR 31 [10]	f
11.2	Verification of support of the single numbering scheme	Contained in TBR 31 [10]	f
11.3	Verification of non-support of services. (Advice of Charge Charging, AOCC)	Contained in TBR 31 [10]	d, f
11.4	Verification of non-support of services. (Call Hold)	Contained in TBR 31 [10]	f
11.5	Verification of non-support of services. (Multi Party)	Contained in TBR 31 [10]	f
11.6	Verification of non-support of feature. (Fixed dialling number)	Contained in TBR 31 [10]	d, f
11.7	IMEI security	Contained in TBR 31 [10]	d
12.1.1	Conducted spurious emissions - MS allocated a channel	Contained in TBR 31 [10]	e
12.1.2	Conducted spurious emissions - MS in idle mode	Contained in TBR 31 [10]	e
12.2.1	Radiated spurious emissions - MS allocated a channel	Contained in TBR 31 [10]	e
12.2.2	Radiated spurious emissions - MS in idle mode.	Contained in TBR 31 [10]	e
13.1	Transmitter - Frequency error and phase error	Contained in TBR 31 [10]	e
13.2	Transmitter - Frequency error under multipath and interference conditions	Contained in TBR 31 [10]	e
13.3-1	Transmitter output power and burst timing - MS with permanent antenna connector	Contained in TBR 31 [10]	e
13.3-2	Transmitter output power and burst timing - MS with integral antenna	Contained in TBR 31 [10]	e
13.4	Transmitter - Output RF spectrum	Contained in TBR 31 [10]	e
13.5	Intermodulation attenuation	Contained in TBR 31 [10]	e
14.1.1.1	Receiver / Bad Frame Indication - TCH/FS - Random RF input	Contained in TBR 31 [10]	e
14.1.1.2	Receiver / Bad Frame Indication - TCH/FS - Frequency hopping and downlink DTX	Contained in TBR 31 [10]	e
14.1.2.1	Receiver / Bad Frame Indication - TCH/HS - Random RF input	Contained in TBR 31 [10]	e
14.1.2.2	Receiver / Bad Frame Indication - TCH/HS - Frequency hopping and downlink DTX	Contained in TBR 31 [10]	e
14.2.1	Receiver / Reference sensitivity - TCH/FS	Contained in TBR 31 [10]	f
14.2.2	Receiver / Reference sensitivity - TCH/HS	Contained in TBR 31 [10]	f
14.2.3	Receiver / Reference sensitivity - FACCH/F	Contained in TBR 31 [10]	f
14.2.4	Receiver / Reference sensitivity - FACCH/H	Contained in TBR 31 [10]	f
14.2.5	Receiver / Reference sensitivity - full rate data channels	Contained in TBR 31 [10]	f
14.2.6	Receiver / Reference sensitivity - half rate data channels	Contained in TBR 31 [10]	f

(continued)

Table 5 (concluded): TBR 31 [10] requirements and justifications

ETS 300 607-1 [4] Item	DESCRIPTION	TBR JUSTIFICATION	TD Cat
14.3	Receiver / Usable receiver input level range	Contained in TBR 31 [10]	e
14.4.1	Co-channel rejection - TCH/FS	Contained in TBR 31 [10]	e
14.4.2	Co-channel rejection - TCH/HS (speech frames)	Contained in TBR 31 [10]	f
14.4.4	Co-channel rejection - FACCH/F	Contained in TBR 31 [10]	f
14.4.5	Co-channel rejection - FACCH/H	Contained in TBR 31 [10]	f
14.5.1	Adjacent channel rejection - speech channels	Contained in TBR 31 [10]	e
14.5.2	Adjacent channel rejection - control channels	Contained in TBR 31 [10]	f
14.6.1	Intermodulation rejection - speech channels	Contained in TBR 31 [10]	e
14.6.2	Intermodulation rejection - control channels	Contained in TBR 31 [10]	f
14.7.1	Blocking and spurious response - speech channels	Contained in TBR 31 [10]	e
14.7.2	Blocking and spurious response - control channels	Contained in TBR 31 [10]	f
14.8.1	AM suppression - speech channels	Contained in TBR 31 [10]	f
14.8.2	AM suppression - control channels	Contained in TBR 31 [10]	f

All other essential requirements of TBR 31 [10] also apply - they are not listed here as dual-mode DECT/GSM terminals do not influence their application. This includes those essential requirements contained in clause 6 of TBR 31 [10], which apply under the conditions described in TBR 31 [10].

5.2.4 Application of TBR 32

All the essential requirements of TBR 32 [11], listed below, apply for DECT/GSM DMTs which support DCS 1800 service.

Table 6: TBR 32 [11] requirements and justifications

ETS 300 607-1 [4] Item	Description	TBR Justification	TD Cat
14.4.3	Co channel rejection - TCH/HS (SID frames)	Contained in TBR 32 [11]	g
30.1	Sending sensitivity / frequency response	Contained in TBR 32 [11]	g
30.2	Sending loudness rating	Contained in TBR 32 [11]	g
30.3	Receiving sensitivity / frequency response	Contained in TBR 32 [11]	g
30.4	Receiving loudness rating	Contained in TBR 32 [11]	g
30.5.1	Side Tone Masking Rating (STMR)	Contained in TBR 32 [11]	g
30.5.2	Listener Side Tone Rating (LSTR)	Contained in TBR 32 [11]	g
30.6.1	Telephone acoustic coupling loss (TAL) - Echo loss (EL)	Contained in TBR 32 [11]	g
30.6.2	Telephone acoustic coupling loss (TAL) - Stability margin	Contained in TBR 32 [11]	g
30.7.1	Distortion - Sending	Contained in TBR 32 [11]	g
32.1	Testing of speech transcoding functions / Full Rate Downlink speech transcoding	Contained in TBR 32 [11]	g
32.2	Full Rate Downlink receiver DTX functions	Contained in TBR 32 [11]	g
32.3	Full Rate Uplink speech transcoding	Contained in TBR 32 [11]	g
32.4	Full Rate Uplink transmitter DTX functions	Contained in TBR 32 [11]	g
32.5.4	Full Rate Speech channel transmission delay - Downlink processing delay	Contained in TBR 32 [11]	g
32.5.5	Full Rate General test of transparency of MMI inputs - Downlink coding delay	Contained in TBR 32 [11]	g
32.5.6	Full Rate General test of transparency of MMI inputs - Uplink processing delay	Contained in TBR 32 [11]	g
32.5.7	Full Rate General test of transparency of MMI inputs - Uplink coding delay	Contained in TBR 32 [11]	g
32.6	Testing of speech transcoding functions / Half Rate Downlink speech transcoding	Contained in TBR 32 [11]	g
32.7	Half Rate Downlink receiver DTX functions	Contained in TBR 32 [11]	g
32.8	Half Rate Uplink speech transcoding	Contained in TBR 32 [11]	g
32.9	Half Rate Uplink transmitter DTX functions	Contained in TBR 32 [11]	g
32.10.4	Half rate speech channel transmission delay / downlink processing delay	Contained in TBR 32 [11]	g
32.10.5	Half rate speech channel transmission delay / downlink coding delay	Contained in TBR 32 [11]	g
32.10.6	Half rate speech channel transmission delay / uplink processing delay	Contained in TBR 32 [11]	g
32.10.7	Half rate speech channel transmission delay / uplink coding delay	Contained in TBR 32 [11]	g

5.3 Additional DECT/GSM dual-mode requirements

In addition to the requirements listed above, the following DECT/GSM dual-mode specific requirements apply:

Table 7: Requirements and justifications

EN 301 242 [2] Item	DESCRIPTION	TBR JUSTIFICATION	TD Cat
5.2.2.2	Protection Against Excessive Signalling due to Automatic Mode Selection	Excessive switching and registration between DECT and GSM networks will cause excessive signalling, which will tie up network resources	d, f
4, 5.2.2.3	DMT operates at mode change like single mode terminal on power up/down	Failure to notify network on power down or change of mode, where network requires such notification, may harm network and cause terminal not to be reachable when switched back to that mode.	d, f

6 Test specification

6.1 Introduction

The basic approach to type approval testing of DECT/GSM DMTs is to treat the terminal as, in effect, two terminals, one DECT, the other GSM, and to apply the existing tests for each in the corresponding mode of operation.

In certain cases, it is necessary and worthwhile to perform particular tests during the operation of background scanning, if this feature is supported.

Therefore, the approach taken in the following clause is to identify which tests are to be performed according to the mode of operation supported by the terminal. Additional tests are also specified, where required.

6.2 Applying DECT test specifications

Unless otherwise stated, the following test specifications shall be applied while the DECT/GSM DMT is manually switched to DECT mode.

Where the following clauses indicate that a DECT test is to be performed while background scanning for GSM is active, any test modes, protocols or loopback, required in order to execute that test on a single mode DECT PP, shall be supported while background scanning for GSM is active.

If a user of the DMT is able to modify the rate at which background scanning for GSM is performed, then all DECT tests which are indicated below to be performed while background scanning for GSM is active, shall be performed while the DMT is set to scan for at its highest selectable scan rate for GSM.

NOTE: A DMT which is manually switched to DECT will not normally perform background scanning for GSM, although this is not prohibited. A DMT which is performing background scanning for GSM will normally be set to automatic switching mechanism, be in the DECT mode, but with GSM as the preferred mode. There may be other circumstances under which the DMT will be in DECT mode, background scanning for GSM.

6.2.1 DMT never background scans for GSM

IF the DMT does not support background scanning for a GSM network while it is registered to a DECT FP (items A.3/7 and A.3/10 not supported in Requirements Tables (RT) in annex A),

THEN all type approval tests which normally apply to a DECT PP shall be applied without change while the DMT is manually switched to DECT mode. This includes all applicable tests contained in TBR 6 [5], TBR 10 [6], TBR 22 [9], and if the DMT supports a DECT/ISDN Interworking profile, TBR 40 [12].

The EMC requirements as applicable to DECT PPs, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met without change while the DMT is manually switched to DECT mode.

6.2.2 DMT supports background scanning for GSM while idle in DECT mode

IF the DMT supports background scanning for a GSM network while it is in DECT mode and is idle, (item A.3/7 supported in the RT in annex A), but does not support background scanning for GSM during active communication in DECT mode (item A.3/10 not supported in the RT in annex A),

THEN all type approval tests which normally apply to a DECT PP shall be applied while the DMT is manually switched to DECT mode. This includes all applicable tests contained in TBR 6 [5], TBR 10 [6], TBR 22 [9], and if the DMT supports a DECT/ISDN Interworking profile, TBR 40 [12].

The EMC emissions requirements as applicable to DECT PPs while idle, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is in DECT mode, and performing periodic background scanning for a GSM network.

The EMC emissions requirements as applicable to DECT PPs in active communication, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met by the DMT.

NOTE: For automatic switching DMTs which perform background scanning for GSM only when idle in DECT mode, all DECT EMC emissions testing can be performed while the DMT is set to automatic switching, with GSM as preferred mode, but no suitable GSM network available.

The EMC immunity requirements as applicable to DECT PPs, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is manually switched to DECT mode.

6.2.3 DMT supports background scanning for GSM while idle or in active communication in DECT mode

IF the DMT supports background scanning for a GSM network while it is in DECT mode and is idle and while in active communication in DECT mode, (items A.3/7 and A.3/10 supported in RT in annex A),

THEN all type approval tests which normally apply to a DECT PP shall be applied while the DMT is manually switched to DECT mode, except for receiver tests. This includes all applicable tests contained in TBR 6 [5], except subclauses 13.1, 13.2, 13.3, 13.4, 13.5, 13.6 and TBR 10 [6], TBR 22 [9], and if the DMT supports a DECT/ISDN Interworking profile, TBR 40 [12].

TBR 6 [5] tests contained within subclauses 13.1, 13.2, 13.3, 13.4, 13.5 and 13.6 shall be applied while the DMT is in DECT mode, and performing periodic background scanning for a GSM network.

The EMC emissions requirements as applicable to DECT PPs, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is in DECT mode, and performing periodic background scanning for a GSM network.

The EMC immunity requirements as applicable to DECT PPs, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is manually switched to DECT mode.

6.3 Applying GSM test specifications

Unless otherwise stated, the following test specifications shall be applied while the DECT/GSM DMT is manually switched to GSM.

Where the following clauses indicate that a GSM test is to be performed while background scanning for DECT is active, any test modes, protocols or loopback, required in order to execute that test on a single mode GSM MS, shall be supported while background scanning for DECT is active.

If a user of the DMT is able to modify the rate at which background scanning for DECT is performed, then all GSM tests which are indicated below to be performed while background scanning for DECT is active, shall be performed while the DMT is set to scan for at its highest selectable scan rate for DECT.

NOTE: A DMT which is manually switched to GSM will not normally perform background scanning for DECT, although this is not prohibited. A DMT which is performing background scanning for DECT will normally be set to automatic switching mechanism, be in the GSM mode, but with DECT as the preferred mode. There may be other circumstances under which the DMT will be in GSM mode, background scanning for DECT.

6.3.1 DMT never background scans for DECT

IF the DMT does not support background scanning for a DECT FP while the DMT is in GSM mode, (items A.3/8 and A.3/11 not supported in RT in annex A),

THEN all type approval tests which normally apply to a GSM MS shall be applied while the DMT is manually switched to GSM mode. This includes all applicable tests contained in TBR 19 [7], TBR 20 [8], TBR 31 [10] and TBR 32 [11].

The EMC requirements as applicable to GSM MSs, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is manually switched to GSM mode.

6.3.2 DMT supports background scanning for DECT while idle in GSM mode

IF the DMT supports background scanning for a DECT FP while it is in GSM mode and is idle, (item A.3/8 supported in the RT in annex A), but does not support background scanning for DECT during active communication (item A.3/11 not supported in the RT in annex A),

THEN all type approval tests which normally apply to a GSM MS shall be applied while the DMT is manually switched to GSM mode. This includes all applicable tests contained in TBR 19 [7], TBR 20 [8], TBR 31 [10] and TBR 32 [11].

The EMC emissions requirements as applicable to GSM MSs while idle, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is in GSM mode, and performing periodic background scanning for a DECT FP.

The EMC emissions requirements as applicable to GSM MSs in active communication, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met by the DMT.

NOTE: For automatic switching DMTs which perform background scanning for DECT only when idle in GSM mode, all GSM EMC emissions testing can be performed while the DMT is set to automatic switching, with DECT as preferred mode, but no suitable DECT FP available.

The EMC immunity requirements as applicable to GSM MSs, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is manually switched to GSM mode.

6.3.3 DMT supports background scanning while idle or in active communication

IF the DMT supports background scanning for a DECT FP while it is in GSM mode while idle or while in active communication, (items A.3/8 and A.3/11 supported in RT in annex A),

THEN all type approval tests which normally apply to a GSM MS shall be applied while the DMT is manually switched to GSM mode, except for Receiver tests. This includes all applicable tests contained in TBRs 19 and 31, except tests 14.1.1.1, 14.1.1.2, 14.2.1, 14.2.3, 14.3, 14.4.1, 14.4.4, 14.5.1, 14.5.2, 14.6.1, 14.6.2, 14.7.1, 14.7.2, 14.8.1, 14.8.2, TBR 20 [8] and TBR 32 [11].

TBR 19 [7] and TBR 31 [10] tests 14.1.1.1, 14.1.1.2, 14.2.1, 14.2.3, 14.3, 14.4.1, 14.4.4, 14.5.1, 14.5.2, 14.6.1, 14.6.2, 14.7.1, 14.7.2, 14.8.1, 14.8.2 shall be applied while the DMT is in GSM mode, and performing periodic background scanning for a DECT FP.

The EMC emissions requirements as applicable to GSM MSs, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is in GSM mode, and performing periodic background scanning for a DECT FP.

The EMC immunity requirements as applicable to GSM MSs, contained in the relevant standards under the EMC directive, 89/336/EEC, shall be met while the DMT is manually switched to GSM mode.

6.4 Dual-mode specific test specifications

6.4.1 Protection of GSM network against excessive signalling

6.4.1.1 Test purpose

The purpose of this test is to verify that the DMT complies with the requirements in subclause 5.2.2.2 of EN 301 242 [2]. These requirements are designed to protect a GSM network or a DECT FP against excessive signalling by limiting the frequency of mode changes as a result of background scanning of automatic mode selection terminals. The requirement is that the DMT shall not change from DECT to GSM mode as a result of background scanning more than twice every 8 minutes.

6.4.1.2 Selection criteria

This test case shall apply to all DMTs which support automatic mode selection mechanism, and which support background scanning for a GSM network, while in DECT mode with GSM as preferred mode (items A.2/2, A.3/7 and/or A.3/10 supported in RT in annex A.)

6.4.1.3 Test method

The DMT shall contain valid GSM and DECT identities for a GSM network or network simulator, and a DECT FP, to both of which it is subscribed.

1) The DMT is powered up;
2) the GSM network simulator is kept de-activated, or its signal is blocked;
3) the DECT FP is activated;
4) GSM is selected as the preferred mode on the DMT;
5) the DMT is observed to lock and register to the DECT FP;
6) the GSM network simulator is activated;
7) the DMT is observed to lock and register to the GSM network simulator or network as a result of background scanning - a timer is started;
8) the GSM network simulator is immediately de-activated, or its signal is blocked;
9) the DMT is observed to lock and register to the DECT FP as a result of loss of GSM signal;
10) the GSM network simulator is activated;
11) the DMT is observed to lock and register to the GSM network simulator or network as a result of background scanning;
12) the GSM network simulator is immediately de-activated, or its signal is blocked;
13) the DMT is observed to lock and register to the DECT FP as a result of loss of GSM signal;
14) the GSM network simulator is activated;
15) the behaviour of the DMT is observed until 7 minutes 30 seconds have elapsed since step 7.

NOTE: It is possible to perform this test by hand, using a stopwatch. If a screened room is used, it is not necessary to use a GSM network simulator. Equally, it is possible to fully automate this test, using DECT and GSM protocol test tools which provide timestamps.

6.4.1.4 Verdict criteria

If, at step 15, the DMT is observed to lock and register to the GSM network simulator or network before 7 minutes 30 seconds have expired since step 7, the verdict shall be FAIL.

If, at step 15, the DMT does not lock and register to the GSM network simulator before 7 minutes 30 seconds have expired since step 7, the verdict shall be PASS.

If it is not possible to perform steps 7 to 15 within 7 minutes 30 seconds due to the slow background scanning performed by the DMT, the verdict shall be PASS.

6.4.2 Protection of DECT FP against excessive signalling

6.4.2.1 Test purpose

The purpose of this test is to verify that the DMT complies with the requirements in sub-clause 5.2.2.2 of EN 301 242 [2]. These requirements are designed to protect a GSM network or a DECT FP against excessive signalling by limiting the frequency of mode changes as a result of background scanning of automatic mode selection terminals. The requirement is that the DMT shall not change from GSM to DECT mode as a result of background scanning more than twice every 8 minutes.

6.4.2.2 Selection criteria

This test case shall apply to all DMTs which support automatic mode selection mechanism, and which support background scanning for a DECT FP, while in GSM mode with DECT as preferred mode (items A.2/2, A.3/8 and/or A.3/11 supported in RT in annex A.)

6.4.2.3 Test method

The DMT shall contain valid GSM and DECT identities for a GSM network or network simulator, and a DECT FP, to both of which it is subscribed.

1) The DMT is powered up;
2) the DECT FP is kept de-activated, or its signal is blocked;
3) the GSM network simulator is activated;
4) DECT is selected as the preferred mode on the DMT;
5) the DMT is observed to lock and register to the GSM network simulator;
6) the DECT FP is activated;
7) the DMT is observed to lock and register to the DECT FP as a result of background scanning - a timer is started;
8) the DECT FP is immediately de-activated, or its signal is blocked;
9) the DMT is observed to lock and register to the GSM network simulator as a result of loss of DECT signal;
10) the DECT FP is activated;
11) the DMT is observed to lock and register to the DECT FP as a result of background scanning;
12) the DECT FP is immediately de-activated, or its signal is blocked;
13) the DMT is observed to lock and register to the GSM network simulator as a result of loss of DECT signal;

14) the DECT FP is activated;

15) the behaviour of the DMT is observed until 7 minutes 30 seconds have elapsed since step 7.

NOTE: It is possible to perform this test by hand, using a stopwatch. Any GSM network, for which the DMT has a valid subscription, can be used Equally, it is possible to fully automate this test, using DECT and GSM protocol test tools which provide timestamps.

6.4.2.4 Verdict criteria

If, at step 15, the DMT is observed to lock and register to the DECT FP before 7 minutes 30 seconds have expired since step 7, the verdict shall be FAIL.

If, at step 15, the DMT does not lock and register to the DECT FP before 7 minutes 30 seconds have expired since step 7, the verdict shall be PASS.

If it is not possible to perform steps 7 to 15 within 7 minutes 30 seconds due to the slow background scanning performed by the DMT, the verdict shall be PASS.

6.4.3 Attach/detach on mode change

6.4.3.1 Test purpose

The purpose of this test is to verify that the requirements of clause 4 and of subclause 5.2.2.3 are met, in that the DMT sends a detach message to the GSM network when it switches mode to DECT, when the GSM network signals its requirement for detach on switch off. The purpose is also to verify that correct attach procedures are performed when the DMT switches mode from DECT to GSM, when the GSM network signals its requirement for attach/location update.

6.4.3.2 Selection criteria

This test shall apply to all DMTs.

6.4.3.3 Test method

TBR 19 [7] (if GSM 900 is supported) or TBR 31 [10] (if DCS 1800 is supported) test 26.2.2 shall be executed, but wherever the MS is required to be switched off, the mode of the DMT shall be manually changed to DECT. Wherever the MS is required in subclause 26.2.2 to be switched on, the mode of the DMT shall be manually changed to GSM.

6.4.3.4 Verdict criteria

The DMT shall pass 26.2.2 of TBR 19 [7] or TBR 31 [10] using the method described in subclause 6.4.3.3 above.

6.5 Overview tables of test case selection

The following tables provide an overview of the selection of test cases for the four most common terminal types. They apply the selection rules given in subclauses 6.2, 6.3 and 6.4 above. They do not forbid other terminal types or configurations being tested according to the selection rules given above.

6.5.1 Overview table of DECT test case selection

The following table lists all the groups of DECT tests, according to the type of DMT being tested, together with the mode in which the test is to be performed. In the DMT type row, the associated items in the RT in annex A are indicated.

Table 8: DECT test case selection

DMT type: / Test:	Manual Mode Selection, No Background Scanning (B/S) (A.2/1)	Automatic Mode Selection, No B/S (A.2/2)	Automatic Mode Selection, B/S for GSM when idle (A.2/2 & A.3/7)	Automatic Mode Selection, B/S for GSM always (A.2/2 & A.3/7 & A.3/10)
TBR 6 [5] (no Receiver tests)	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT
TBR 6 [5] Receiver tests	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT	Auto. switched to DECT, B/S in operation
TBR 10 [6]	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT
TBR 22 [9]	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT
TBR 40 [12]	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT
EMC Emissions	Manually switched to DECT	Manually switched to DECT	Auto. switched to DECT, B/S in operation	Auto. switched to DECT, B/S in operation
EMC Immunity	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT
TBR 39 6.4.1	Not Applicable	Not Applicable	Auto. switched to DECT, B/S in operation	Auto. switched to DECT, B/S in operation
TBR 39 6.4.3	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT	Manually switched to DECT

6.5.2 Overview table of GSM test case selection

The following table lists all the groups of GSM tests, according to the type of DMT being tested, together with the mode in which the test is to be performed. In the DMT type row, the associated items in the RT in annex A are indicated.

Table 9: GSM test case selection

DMT type: / Test:	Manual Mode Selection, No Background Scanning (B/S) (A.2/1)	Automatic Mode Selection, No B/S (A.2/2)	Automatic Mode Selection, B/S for DECT when idle (A.2/2 & A.3/8)	Automatic Mode Selection, B/S for DECT always (A.2/2 & A.3/8 & A.3/11)
TBR 19 [7] /TBR 31 [10] (no Receiver tests)	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM
TBR 19 [7] /TBR 31 [10] Receiver tests	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM	Auto. switched to GSM, B/S in operation
TBR 20 [8] /TBR 32 [11]	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM
EMC Emissions	Manually switched to GSM	Manually switched to GSM	Auto. switched to GSM, B/S in operation	Auto. switched to GSM, B/S in operation
EMC Immunity	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM
TBR 39 6.4.2	Not Applicable	Not Applicable	Auto. switched to GSM, B/S in operation	Auto. switched to GSM, B/S in operation
TBR 39 6.4.3	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM	Manually switched to GSM

Annex A (normative): Requirements Tables (RT)

A.1 Introduction

The TBR-RT tables indicate which features and procedures are Mandatory, Optional or Conditional. The features and procedures are referenced via an existing profile Implementation Conformance Statement (ICS) document.

The following table headers are applicable to TBR-RT.

Item is a number unique in the table to be used for references.

Reference references to EN 301 242 [2], the DECT/GSM dual-mode specification, unless otherwise specified.

Status contains the status required for implementation conforming to the present document.

Support is the column for the manufacturer's statement of whether the particular item is supported by the implementation.

The interpretation of status columns in all tables is as follows:

m mandatory - the capability is required to be supported.

o optional - the capability may be supported or not.

n/a not applicable - in the given context, it is impossible to use the capability.

x prohibited (excluded) - there is a requirement not to use this capability in the given context.

o.i qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer which identifies an unique group of related optional items and the logic of their selection which is defined immediately following the table.

ci conditional - the requirement on the capability ("m", "o", "x" or "n/a") depends on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table or which is defined in the general condition table below.

i out-of-scope - this capability is outside the scope of the given specification, and hence irrelevant and not subject to conformance testing. This status is in particular applicable for data fields which are reserved for future use. The structure of such fields has to be supported, but the value is undefined and thus to be ignored.

If a procedure, message/frame, information element or timer/constant are not explicitly listed in any of the following tables these shall be considered as i.

A.2 Major capabilities

A.2.1 Mode of operation

Table A.1: Modes supported

Item	Entity name	Reference: EN 301 242 [2]	Status	Support
1	DECT Mode Supported	4	m	
2	GSM Mode Supported	3.1, 4	c101	
3	DCS 1800 Mode Supported	3.1, 4	c102	

c101: If A.1/3 then o, else m
c102: If A.1/2 then o, else m

A.2.2 Mode selection mechanism

Table A.2: Mode selection mechanism supported

Item	Call Control features	Reference: EN 301 242 [2]	Status	Support
1	Manual Mode Selection	5.2.1	m	
2	Automatic Mode Selection	5.2.1	o	

A.2.3 Mode selection details

Table A.3: Mode selection details

Item	Call Control features	Reference: EN 301 242 [2]	Status	Support
1	Preferred Mode Can Be Changed by User	5.2.1	c301	
2	Mode Selection Mechanism can be changed at any time when not in active communication	5.2.1	c301	
3	Mode can be changed at any time when not in active communication while in Manual Mode Selection	5.2.1	m	
4	Display Indicates Mode Currently in Use	5.2.1	m	
5	Automatic Switching Terminal selects DECT Mode at switch on with no Subscriber Identity Module (SIM) inserted	5.2.2.1	c301	
6	Automatic Mode Selection Performed as Required	5.2.2.2	c301	
7	DMT performs background scanning for GSM when registered and idle in DECT Mode	5.2.2.2.1	o	
8	DMT performs background scanning for DECT when registered and idle in GSM Mode	5.2.2.2.2	c301	
9	As result of Background Scanning, DMT does not automatically switch from non-preferred mode to preferred mode more than twice every 8 minutes	5.2.2.2.3	c301	
10	DMT performs background scanning for GSM when in active communication in DECT Mode	5.2.2.2.1	o	
11	DMT performs background scanning for DECT when in active communication in GSM Mode	5.2.2.2.2	o	
12	Mode switch involves switch off/switch on procedures	5.2.2.3	m	
13	Mode re-selection supported	5.2.2.4	c301	

c301: If A.2/2 then m, else o

A.2.4 DECT profiles supported

Table A.4: DECT profiles supported

Item	DECT Profiles	Reference: EN 301 242 [2]	Status	Support
1	GAP	5.1.3	m	
2	DECT/ISDN End System Configuration	5.1.4	o	
3	DECT/ISDN Intermediate System Configuration	5.1.4	o	
4	DECT/GSM Interworking Profile (ARI-D)	4	x	
5	Direct Mode (PP to PP, ARI-E)	4	x	

History

Document history			
V1.1.1	April 1998	Public Enquiry	PE 9831: 1998-04-03 to 1998-07-31