

Mobile and portable DVB-T/H radio access —

Part 2: Interface conformance testing

The European Standard EN 62002-2:2006 has the status of a British Standard

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National foreword

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Part 2: Interface conformance testing
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zu DVB-T/H
Teil 2: Konformitätsprüfung
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CENELEC

European Committee for Electrotechnical Standardization
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Foreword

The text of the International Standard IEC 62002-2:2005, prepared by IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the formal vote and was approved by CENELEC as EN 62002-2 on 2006-10-01 without any modification.

The following dates were fixed:

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|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2007-10-01 |
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Endorsement notice

The text of the International Standard IEC 62002-2:2005 was approved by CENELEC as a European Standard without any modification.

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MOBILE AND PORTABLE DVB-T/H RADIO ACCESS –

Part 2: Interface conformance testing

1 Scope

This part of IEC 62002 provides the conformance testing rules and guidelines for equipment built to meet the mobile and portable DVB-T/H radio access interface specification (IEC 62002-1).

The purpose of this standard is to limit the required test cases to a practical level. Nevertheless, the manufacturer is responsible for guaranteeing that the terminal fulfils the mobile and portable DVB-T/H radio access interface specification (IEC 62002-1) in all its aspects.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62002-1, *Mobile and portable DVB-T/H radio access – Part 1: Interface specification*

ETSI EN 300 744, V1.5.1:2004, *Digital Video Broadcasting (DVB) – Framing structure, channel coding and modulation for digital terrestrial television*

3 Abbreviations

For the purposes of this document, the following abbreviations apply.

λ	Lambda, wavelength ($\lambda = c/f$)
A2	German analogue TV stereo system
A_A	Coupling between antennas
AGC	Automatic gain control
A_{GSM}	Stop-band attenuation of the GSM reject filter
B	Bandwidth
BER	Bit error ratio
C	Carrier power (in band carrier power including any echoes)
c	Speed of light $c = 3,0 \times 10^8$ m/s
C_i	Power contribution from the i -th signal
C_t	Total useful carrier power
C/N	Carrier-to-noise ratio
C/N_{min}	Minimum C/N
CPE	Common phase error
CR	Code rate
dB	Decibel

dBc	dB compared to carrier power C
dBd	Antenna gain in dB compared to reference dipole (0 dBd = –2,14 dBi)
dBi	Antenna gain in dB compared to isotropic antenna (0 dBi = 2,14 dBd)
dB(mW)	Power in dB compared to 1 mW
DUT	Device under test
DVB, DVB-T	Digital video broadcasting, terrestrial digital video broadcasting
DVB-H	Digital video broadcasting to hand-held terminals
DVB-RCT	DVB terrestrial return channel
E	Field strength V/m
$E(\text{dB}\mu\text{V/m})$	Field strength in dB compared to 1 μV
EDGE	Enhanced data rates for GSM/global evolution
EMC	Electromagnetic compatibility
END	Equivalent noise degradation
ENF	Equivalent noise floor
ESR	Erroneous second ratio
f	Frequency in Hz
$f(\text{MHz})$	Frequency in MHz
f_c	Centre frequency
F	Noise factor
fd, Fd	Doppler frequency
$Fd_{3\text{dB}}$	Doppler frequency with minimum C/N requirement raised by 3 dB
FER	Frame error rate
G	Gain
G_a	Antenna gain
GI	Guard interval
GPRS	General packet radio service
GSM	Global system for mobile communications
I	Interfering power
ICI	Intercarrier interference
J	Joule
k	Boltzmann's constant $k = 1,38 \times 10^{-26} \text{ J/K}$
K	Kelvin
L1, L2, L3	Linearity patterns
L_{GSM}	Insertion loss of the GSM reject filter
LNA	Low noise amplifier
MER	Modulation error ratio
$MFER$	MPE-FEC frame error rate
MHz	Megahertz
MPEG-2	Motion pictures expert group, video compression standard
n, m, N	Channel indexes

<i>NF</i>	Noise figure in dB
NICAM	Additional sound carrier for analogue TV, modulated with a near instantaneous companded audio multiplex
PA	Power amplifier
PAL, PAL B, PAL G, PAL I, PAL I1	Phase alternation line, TV systems using PAL
<i>PER</i>	Packet error ratio
PFP	Picture failure point
P_{in}	Input power W
P_{in} (dB(mW))	Input power dB compared to 1 mW
P_{max}	Maximum power
ppm	Parts per million
PSI/SI	Program specific information, service information
P_{TX}	Transmission power
P_x	Excess noise power dBc
QAM16, QAM64	Quadrature amplitude modulation, 16-level and 64-level versions
QEF	Quasi error free
QoS	Quality of service
QPSK	Quaternary phase shift keying
RF	Radiofrequency
RS	Reed Solomon
Rx	Receiver
S1,S2	Selectivity patterns
SECAM, SECAM L	Sequential à mémoire, TV system using SECAM
SFN	Single frequency network
SFP	Subjective failure point
<i>T</i>	Temperature in kelvins
T_c	Corner point
T_e	Total duration of the gating pulses
t_i	Time of arrival for the <i>i</i> -th signal
TS	Transport stream
T_g	Guard interval duration
T_u	Active symbol duration
Tx	Transmitter
UHF	Ultra high frequency
UMTS	Universal mobile telecommunications system
VHF	Very high frequency
W	Watt
WCDMA	Wide-band code division multiple access
W_i	Weighting coefficient for the <i>i</i> -th component

4 Test conditions

4.1 General test conditions

4.1.1 General

The general test conditions are set out below. Manufacturers should note that the actual conditions of use could be more stringent.

4.1.2 Temperature

The terminal shall be tested in the normal laboratory conditions defined below:

+ 5 °C to +35 °C For normal conditions (with relative humidity of 25 % to 75 %)

4.1.3 Voltage

All tests are performed under nominal operating voltage as defined by the manufacturer.

4.2 Terminal categories and summarized measurement conditions

Table 1 shows which conformance measurements are performed with different terminal categories and summaries the measurement conditions.

Table 1 – Valid conformance measurements for different terminal categories

Clause	Conditions	Terminal category a car terminals	Terminal category b1 portable TVs	Terminal category b2 pocketable TVs	Terminal category c hand-held convergence terminals
5 <i>C/N</i> performance		Ch 45			
	Gaussian	All modulations, 2k/4k/8k			
	Portable	All modulations, 2k/4k/8k			
	Mobile	QPSK 1/2 , 16QAM 1/2 and 2/3 <i>GI</i> 1/4	-	-	QPSK 1/2 , 16QAM 1/2 and 2/3 <i>GI</i> 1/4
6 Receiver minimum and maximum input signal levels	Minimum and maximum input levels	Ch 21, 45, 64 (UHF), Ch 8, 12 (VHF)			
		QPSK 1/2			
7 Immunity to analogue and/or digital signals in other channels	S1	$N \pm 1$: Ch 45 (UHF), Ch 8 (VHF) with 64QAM 2/3 additionally Ch 21, 64 (UHF), Ch 5, 12 (VHF). $N \pm 2$: Ch 45 (UHF), Ch 8 (VHF)			
		16QAM 3/4 , 16QAM 2/3, 16QAM 1/2 , 64QAM 3/4 , 64QAM 2/3 <i>GI</i> 1/8			
	S2	Ch 45 (UHF), Ch 8 (VHF)			
		64QAM 2/3, <i>GI</i> 1/8			
	L1-L3	Ch 21,45,64 (UHF) Ch 8 (VHF)			
		16QAM 2/3, <i>GI</i> 1/8			
8 Immunity to co-channel interference from analogue TV signals		Ch 45 (UHF)			
		All modulations, <i>GI</i> 1/8			

Table 1 (continued)

Clause	Conditions	Terminal category a car terminals	Terminal category b1 portable TVs	Terminal category b2 pocketable TVs	Terminal category c hand-held convergence terminals
9 Guard interval utilization: echoes within guard interval		Ch 45 (UHF)			
		8k, 64QAM 2/3, <i>GI</i> 1/8 8k, 16QAM 1/2, <i>GI</i> 1/8			
10 Guard interval utilization: echoes outside the guard interval		Ch 45 (UHF)			
		8k, 64QAM 2/3, <i>GI</i> 1/8 8k, 16QAM 1/2, <i>GI</i> 1/8 8k, 16QAM 2/3, <i>GI</i> 1/8			
11 Tolerance to impulse interference		Ch 45 (UHF)			
		8k, 64QAM 2/3, <i>GI</i> 1/8 8k, 16QAM 1/2, <i>GI</i> 1/8 8k, 16QAM 2/3, <i>GI</i> 1/8			

4.3 Required equipment

The following list gives an overview of the measurement equipment required for the entire set of conformance testing. Capabilities and features of the actual equipment may vary and there could be alternative ways of performing the measurements. Therefore, no detailed instructions for various measurements are given and the list of the required equipment is an example.

- 3 DVB-T/H signal sources
- Wideband noise source
- 2 PAL/SECAM analogue TV-signal sources
- Spectrum analyser
- Channel simulator
- RF power meter
- Impulse noise source
- MPEG-2 source
- MPEG-2 decoder
- DVB-H IP encapsulator
- Step attenuators, power dividers, cables and other standard RF measurement accessories

4.4 Reference model and test point

The receiver performance is defined according to the reference model shown in Figure 1.