



SLOVENSKI STANDARD

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Metode za meritve digitalnega omrežja - Karakteristike zmogljivosti prenosa prizemnega večpredstavnostnega digitalnega omrežja (IEC 62553:2012)

Methods of measurement for digital network - Performance characteristics of terrestrial digital multimedia transmission network

Messverfahren für digitale Netze – Leistungsdaten von terrestrischen digitalen Multimedia-Übertragungsnetzen

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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English version

**Methods of measurement for digital network -
Performance characteristics of terrestrial digital
multimedia transmission network
(IEC 62553:2012)**

Méthodes de mesure applicables
aux réseaux numériques -
Caractéristiques de performance
des réseaux de transmission
numériques multimédia terrestres
(CEI 62553:2012)

Messverfahren für digitale Netze -
Leistungsdaten von terrestrischen
digitalen Multimedia-Sendernetzen
(IEC 62553:2012)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 103/89/CDV, future edition 1 of IEC 62553, prepared by IEC/TC 103 "Transmitting equipment for radiocommunication" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62553:2013.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-10-01
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-01-01

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62273-1	2007	Methods of measurement for radio transmitters - Part 1: Performance characteristics of terrestrial digital television transmitters	EN 62273-1	2007
ISO/IEC 13818-1 + A1 + A2 + A3 + A4 + A5 + A6	2007 2007 2008 2009 2009 2011 2011	Information technology - Generic coding of moving pictures and associated audio information: Systems	-	-
ETSI TR 101 190	-	Digital Video Broadcasting (DVB); Implementation guidelines for DVB terrestrial services; Transmission aspects	-	-
ETSI TS 101 191	-	Digital Video Broadcasting (DVB); DVB mega-frame for Single Frequency Network (SFN) synchronization	-	-
ETSI TR 102 377	-	Digital Video Broadcasting (DVB); DVB-H Implementation Guidelines	-	-
ARIB STD-B31	-	Transmission system for digital terrestrial television broadcasting	-	-

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Methods of measurement for digital network – Performance characteristics of terrestrial digital multimedia transmission network

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METHODS OF MEASUREMENT FOR DIGITAL NETWORK –

Performance characteristics of terrestrial digital
multimedia transmission network

FOREWORD

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International Standard IEC 62553 has been prepared by subcommittee IEC technical committee 103: Transmitting equipment for radiocommunication.

The text of this standard is based on the following documents:

CDV	Report on voting
103/89/CDV	103/106/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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METHODS OF MEASUREMENT FOR DIGITAL NETWORK –

Performance characteristics of terrestrial digital multimedia transmission network

1 Scope

When a transmission network for digital terrestrial television broadcasting (DTTB) is being deployed, new networking technologies such as the Single Frequency Network (SFN) can be employed excelling the conventional analogue TV systems. However, new technical evaluation parameters are introduced for installing SFN systems. In addition new quality evaluation methods are also established in order to achieve stable and high-quality broadcasting services avoiding the cliff effect, which is one of the typical phenomena in the digital transmission that the signal quality is abruptly degraded when the received C/N becomes just lower than a specific value representing the system limit.

Given the background described above, this International Standard has the purposes of

- establishing measuring methods that enable the objective evaluation of the performance of transmission networks so as to make stable DTTB services a reality,
- establishing a technical baseline, such as a definition of technical terms, to standardize measuring methods.

The measurement methods described in this standard are intended for digital terrestrial television transmission network test and validation. The measurement methods for digital terrestrial transmitter are not included in this standard. These methods are described in IEC 62273-1.

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This standard does not give any regulations and/or mandatory requirements. The specifications and requirements defined for each system have priority over this standard. However, there may be some cases where details are not specified in each individual specification or different systems should be evaluated under a common measurement method. The purpose of this standard is to provide a common technical baseline that makes measurement results comparable in all cases.

2 Normative references

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

IEC 62273-1:2007, *Methods of measurement for radio transmitters – Performance characteristics of terrestrial digital television transmitters*

ISO/IEC 13818-1:2007, *Information technology – Generic coding of moving pictures and associated audio information: Systems*

Amendments 1 to 6

TR 101 190, *Digital video broadcasting (DVB); implementation guidelines for DVB Terrestrial services; Transmission aspects*

TS 101 191, *Digital video broadcasting (DVB); DVB mega-frame for Single Frequency Network (SFN) synchronization*

TR 102 377, *Digital Video Broadcasting (DVB); DVB-H Implementation Guidelines*

ARIB STD-B31, *Transmission system for digital terrestrial television broadcasting*

3 Terms and abbreviations

ADC	Analog to Digital Converter
ARIB	Association of Radio Industries and Businesses
ASI	Asynchronous Serial Interface
ATM	Asynchronous Transfer Mode
BER	Bit Error Ratio
C/N	Carrier to Noise rate
CPU	Central Processing Unit
DTTB	Digital Terrestrial Television Broadcasting
DVB	Digital Video Broadcasting
DVB-H	DVB Handheld
DVB-T	DVB Terrestrial
D/U	Desired to Undesired Signal Ratio
END	Equivalent Noise Degradation
ETSI	European Telecommunication Standards Institute
FFT	Fast Fourier Transform
GPS	Global Positioning System
IF	Intermediate Frequency
IFFT	Inverse Fast Fourier Transform
IIP	ISDB-T Information Packet
IP	Internet Protocol
ISDB-T	Integrated Services Digital Broadcasting – Terrestrial
ISI	Inter Symbol Interference
ISO	International Organization for Standardization
ITU	International Telecommunication Union
JEITA	Japan Electronics and Information Technology Industries Association
MER	Modulation Error Ratio
MFN	Multi-Frequency Network
MIP	Mega-frame Initialization Packet
MMSE	Minimum Mean Square Error
MPEG	Moving Picture Experts Group
OFDM	Orthogonal Frequency Division Multiplex
PCR	Program Clock Reference
PCR_AC	PCR Accuracy
PCR_FO	PCR Offset
PCR_OJ	PCR Overall Jitter
PDH	Plesiochronous Digital Hierarchy

PRBS	Pseudo Random Binary Sequence
PID	Packet Identifier
PLL	Phased Locked Loop
PN	Pseudo Random Noise
QAM	Quadrature Amplitude Modulation
RBW	Resolution Bandwidth
RF	Radio Frequency
RS	Reed-Solomon
SDH	Synchronous Digital Hierarchy
SFN	Single Frequency Network
SP	Scattered Pilot signal
SPI	Synchronous Parallel Interface
STL	Studio to Transmitter Link
STS	Synchronization Time Stamp
TMCC	Transmission and Multiplex Configuration Control signal
TS	Transport Stream
TTL	Transmitter to Transmitter Link
TV	TeleVision
UHF	Ultra-High Frequency (300 MHz to 3 000 MHz)
UI	Unit Interval
VBW	Video Bandwidth
VHF	Very High Frequency (30 MHz to 300 MHz)
VLAN	Virtual Local Area Network

4 General conditions of measurement

4.1 Definitions and classifications of digital terrestrial TV transmission network

4.1.1 General

The digital terrestrial broadcasting transmission networks defined in this standard consist of two or more Digital Tv transmitters, relay lines (SDH or PDH contribution link: e.g. satellite, ATM radio, ATM optical fibre, IP Ethernet VLAN), broadcast-wave relay stations (called Gap-Filler or Transposer) through which the same broadcasting program is transmitted. Figure 1 shows an example of the transmission network.

The network is classified in 4.1.2 and 4.1.3 according to the following conditions

- a) Assigned frequencies of each transmitter station which compose the network.
- b) Signal transmission method between transmitter stations.