

Methods of measurement for the power consumption of audio, video and related equipment

National foreword

This British Standard is the UK implementation of EN 62087:2009. It is identical to IEC 62087:2008. It supersedes BS EN 62087:2003 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio, video and multimedia systems and equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EN 62087

October 2009

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English version

Methods of measurement for the power consumption of audio, video and related equipment (IEC 62087:2008)

Méthodes de mesure de l'énergie
consommée des appareils audio,
vidéo et analogues
(CEI 62087:2008)

Messverfahren für die Leistungsaufnahme
von Audio-, Video- und
verwandten Geräten
(IEC 62087:2008)

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CENELEC

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Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of the International Standard IEC 62087:2008, prepared by IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 62087 on 2009-08-01 without any modification.

This European Standard supersedes EN 62087:2003.

The main changes with respect to EN 62087:2003 are listed below.

- Clause 2 is expanded to include references to video content to be used for On (average) mode measurements;
- Clause 3 is expanded to include additional definitions and abbreviations;
- Clause 4 is expanded to include On (average) mode for measuring average television power consumption;
- Clause 5 is modified to require reporting of the power supply voltage and frequency, and the ambient temperature. Clause 5 also includes updated requirements regarding the power measurement instrument;
- Subclause 6.7 is updated to indicate that it is maintained for backward compatibility;
- Clause 11 is newly added. It describes the methods for measuring On (average) mode television power;
- Annex B is newly added. It describes considerations for measuring On (average) mode television power;
- Annex C is newly added. It describes the video signals to be used for measuring On (average) mode television power.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2010-08-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2012-08-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62087:2008 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62087	NOTE Harmonized as EN 62087:2003 (not modified).
IEC 62301	NOTE Harmonized as EN 62301:2005 (modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE Where 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>
-	-	Domestic and similar electronic equipment interconnection requirements: Peritelevision connector	EN 50049-1	- ¹⁾
IEC 60107-1	1997	Methods of measurement on receivers for television broadcast transmissions - Part 1: General considerations - Measurements at radio and video frequencies	EN 60107-1	1997
IEC 61938	1996	Audio, video and audiovisual systems - Interconnections and matching values - Preferred matching values of analogue signals	EN 61938 + corr. February	1997 1997

¹⁾ Undated reference.

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INTRODUCTION

This standard specifies methods of measurement for the power consumption of television sets, video recording equipment, Set Top Boxes, audio equipment and multi-function equipment for consumer use.

This edition adds methods for measuring On (average) mode power consumption of television sets as defined in Clause 11. The power consumption of many televisions varies depending upon the video signal being displayed. Clause 11 includes three different video signals: static, dynamic broadcast-content, and Internet-content. For information about the three video signals and guidance on which signal(s) to use, see Annex C.

For additional considerations regarding average television power consumption, see Annex B.

METHODS OF MEASUREMENT FOR THE POWER CONSUMPTION OF AUDIO, VIDEO AND RELATED EQUIPMENT

1 Scope

This International Standard specifies methods of measurement for the power consumption of television sets, video recording equipment, Set Top Boxes (STBs), audio equipment and multi-function equipment for consumer use. Television sets include, but are not limited to, those with CRT, LCD, PDP or projection technologies.

Moreover the different modes of operation which are relevant for measuring power consumption are defined.

The methods of measurement are only applicable for equipment which can be connected to the mains.

The measuring conditions in this standard represent the normal use of the equipment and may differ from specific conditions, for example as specified in safety standards.

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 60107-1:1997, *Methods of measurement on receivers for television broadcast transmissions – Part 1: General conditions – Measurements at radio and video frequencies*

IEC 61938:1996, *Audio, video and audiovisual systems – Interconnections and matching values – Preferred matching values of analogue signals*

EN 50049-1, *Domestic and Similar Electronic Equipment Interconnection Requirements: Peritelevision Connector*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

additional functions

functions that are not required for the basic operation of the device

NOTE In the case of a television set, examples of additional functions include, but are not limited to, a VCR unit, a DVD unit, a HDD unit, a FM-radio unit, a memory card-reader unit, or an ambient lighting unit.

3.1.2

audio equipment

stand-alone equipment or a system of separable or non-separable components for one or more audio functions

3.1.3**conditional access module**

a plug-in module that enables reception of program material or a service that is protected

3.1.4**gamma-corrected average picture level (APL')**

the average luma (Y') level of the external video input signal applied to the television set. APL' is measured during the active scanning time integrated over a frame period; defined as a percentage of the range between reference black and reference white level

NOTE This is not a measure of the inverse gamma-corrected signal that might be available inside a television set and delivered to the display device. The external and internal video signals are shown in Figure 1.

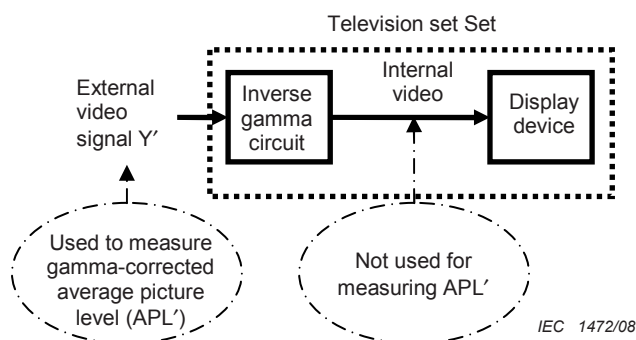


Figure 1 – Gamma-corrected average picture level (APL')

3.1.5**luma (Y')**

a gamma-corrected video signal that represents brightness

NOTE The external video signals that interface with a television are typically gamma-corrected.

3.1.6**multi-function equipment**

combination of equipment with two or more functions in one unit

3.1.7**plug-in module**

a device that plugs into the television set and provides additional functionality

3.1.8**point of deployment module**

a conditional access module for digital cable signal reception

3.1.9**radio receiver**

appliance for the reception of sound broadcast and similar services for terrestrial, cable and satellite transmissions of analogue or digital signals

3.1.10**set top box (STB)**

appliance which performs a function which is not included in the main receiver such as the reception of digital signals or of satellite signals

3.1.11**special functions**

functions that are related to, but not required for, the basic operation of the device

NOTE In the case of a television set, examples of special functions include, but are not limited to, special sound processing, power saving functions (e.g. automatic brightness control).

3.1.12**television set (TV)**

appliance for the display and possible reception of television broadcast and similar services for terrestrial, cable, satellite and broadband network transmission of analogue and/or digital signals

NOTE A television set may include additional functions that are not required for its basic operation.

3.1.13**video recording equipment**

appliance for the recording and reproduction of video and audio signals on a recording medium, for example a Video Cassette Recorder (VCR) or a Digital Versatile Disc (DVD) player or recorder

NOTE Appliances with only playback function are included as well.

3.2 Abbreviations

For the purposes of this International Standard, the following abbreviations apply.

'	Prime
AC/DC	Alternating Current/Direct Current
APL'	Gamma-Corrected Average Picture Level
BD	Blu-ray Disc™ ¹
CRT	Cathode Ray Tube
DVD	Digital Versatile Disc
FM	Frequency Modulation
IF	Intermediate Frequency
HDD	Hard Disk Drive
LCD	Liquid Crystal Display
LNB	Low Noise Broadband unit
MPEG-2	Moving Picture Experts Group
PDP	Plasma Display Panel
PS	Power Supply unit
RF	Radio Frequency
rms	Root Mean Square
STB	Set Top Box
SW	Switch unit
TV	Television set
VCR	Video Cassette Recorder

¹ Blu-ray Disc™ is a trade mark of the Blue-ray Disc Association. This information is given for the convenience of users of this document and does not constitute and endorsement by IEC of the product named.

4 Specification of operating modes

Table 1 – Operating mode

Mode	TV	Video recording equipment (e.g. VCR)	STB	Audio equipment
Disconnected	The appliance is disconnected from all external power sources	The appliance is disconnected from all external power sources	The appliance is disconnected from all external power sources	The appliance is disconnected from all external power sources
Off	The appliance is connected to a power source, produces neither sound nor picture and cannot be switched into any other mode with the remote control unit, an external or internal signal	The appliance is connected to a power source, does not perform any mechanical function (e.g. playing, recording) and cannot be switched into any other mode with the remote control unit, an external or internal signal	The appliance is connected to a power source, fulfils no function and cannot be switched into any other mode with the remote control unit, an external or internal signal	The appliance is connected to a power source, does neither produce sound nor performs any mechanical function (e.g. playing, recording) and cannot be switched into any other mode with the remote control unit, an external or internal signal
Standby-passive	The appliance is connected to a power source, produces neither sound nor picture but can be switched into another mode with the remote control unit or an internal signal	The appliance is connected to a power source, does not perform any mechanical function (e.g. playing, recording), does not produce video or audio output signals but can be switched into another mode with the remote control unit or an internal signal	The appliance is connected to a power source, does not fulfil the main function but can be switched into another mode with the remote control unit or an internal signal	The appliance is connected to a power source, produces neither sound nor performs any mechanical function (e.g. playing, recording) but can be switched into another mode with the remote control unit or an internal signal
Standby-active, low	and can additionally be switched into another mode with an external signal	and can additionally be switched into another mode with an external signal	and can additionally be switched into another mode with an external signal	and can additionally be switched into another mode with an external signal
Standby-active, high	and is exchanging/ receiving data with/from an external source	and is exchanging/ receiving data with/from an external source	and is exchanging/ receiving data with/from an external source	and is exchanging/ receiving data with/from an external source
On (play)	The appliance is connected to a power source and produces sound and picture. This mode is maintained for backward compatibility.	The appliance is connected to a power source and plays the tape or disc inside the appliance	The appliance is connected to a power source and fulfils its main function	The appliance is connected to a power source and is performing one or more of the following modes: produce sound, wake-up signal, or play a tape or disc