

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Audio, video, and related equipment – Determination of power consumption –
Part 3: Television sets

(standards.iteh.ai)

Appareils audio, vidéo et matériel connexe – Détermination de la consommation
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Partie 3: Téléviseurs



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**Appareils audio, vidéo et matériel connexe – Détermination de la consommation
de puissance –
Partie 3: Téléviseurs**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUDIO, VIDEO, AND RELATED EQUIPMENT –
DETERMINATION OF POWER CONSUMPTION –****Part 3: Television sets**

FOREWORD

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International Standard IEC 62087-3 has been prepared by technical area 12: AV energy efficiency and smart grid applications, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This bilingual version (2018-04) corresponds to the monolingual English version, published in 2015-06.

This first edition of IEC 62087-3 cancels and replaces Clauses 6 and 11 and Annex B of IEC 62087:2011. This standard together with IEC 62087-1 to IEC 62087-2 and IEC 62087-4 to IEC 62087-6 cancels and replaces IEC 62087:2011 in its entirety. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to Clauses 6 and 11 and Annex B of IEC 62087:2011.

- For TVs with an automatic brightness control feature, power may now be measured at multiple specific illumination levels.
- A method has been defined for determining the ratio of peak luminance expected in the home versus the peak luminance expected in the retail environment.
- Sections related to general measuring conditions and procedures are now in IEC 62087-1:2015.
- Sections related to signals and media are now in IEC 62087-2:2015.
- The titles have changed in order to comply with the current directives and to accommodate the multipart structure.

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

FDIS	Report on voting
100/2468/FDIS	100/2498/RVD

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

The French version of this standard has not been voted upon.

A list of all parts in the IEC 62087 series, published under the general title *Audio, video, and related equipment – Determination of power consumption*, can be found on the IEC website.

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 website 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.

INTRODUCTION

This standard specifies the determination of the power consumption of television sets for consumer use. It is used in conjunction with IEC 62087-2:2015, which specifies signals and media.

This standard includes measuring procedures for the determination of power consumption in the On (operation) mode, which was identified as “On (average) mode” in previous editions of IEC 62087. Additionally, it specifies measuring procedures for the determination of power consumption in the Off mode and Partial On mode. This standard also defines the determination of the peak luminance ratio for use associated with television set power consumption evaluation as well as the power factor.

A verification procedure to assess product compliance is described in Annex A of IEC 62087-1:2015.

IEC 62087 has been subdivided and currently consists of the following planned or published parts:

- Part 1: General
- Part 2: Signals and media
- Part 3: Television sets
- Part 4: Video recording equipment
- Part 5: Set top boxes
- Part 6: Audio equipment

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AUDIO, VIDEO, AND RELATED EQUIPMENT – DETERMINATION OF POWER CONSUMPTION –

Part 3: Television sets

1 Scope

This part of IEC 62087 specifies the determination of the power consumption and related characteristics of television sets. Television sets include, but are not limited to, those with CRT, LCD, PDP, OLED, or projection technologies.

The operating modes and functions, as they specifically apply to television sets, are defined in detail in this part of IEC 62087.

This standard is limited to television sets that can be connected to an external power source. Television sets that include a non-removable, main battery are not covered by this standard. Television sets may include any number of auxiliary batteries.

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 (standards.iteh.ai)

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 62087-1:2015, *Audio, video, and related equipment – Determination of power consumption – Part 1: General*

IEC 62087-2:2015, *Audio, video, and related equipment – Determination of power consumption – Part 2: Signals and media*

IEC 62301:2011, *Household electrical appliances – Measurement of standby power*

3 Terms, definitions, and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms, definitions and abbreviations, in IEC 62087-1:2015, IEC 62087-2:2015, and the following apply.

3.1.1 additional functions

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

Note 1 to entry: Examples of additional functions include, but are not limited to, a VCR unit, a DVD unit, an HDD unit, an FM-radio unit, a memory card-reader unit, or an ambient lighting unit.

3.1.2

brightest selectable preset picture setting

user selectable, preset picture setting that produces the highest luminance picture in the home or default configuration

Note 1 to entry: See Figure 1.

3.1.3

conditional access

encryption, decryption, and authorization techniques employed to protect content from unauthorized viewing

3.1.4

conditional access module

plug-in module that enables conditional access

3.1.5

category 5e cable

twisted pair cable used for computer networks

Note 1 to entry: See IEC 61156-5 and IEC 61156-6.

3.1.6

default configuration

configuration for television sets without a forced menu

Note 1 to entry: See Figure 1.

3.1.7

default picture setting

out-of-the-box picture setting for television sets in the home or default configuration

Note 1 to entry: See Figure 1.

3.1.8

forced menu

configuration selection required of the user when a television set is turned on for the first time that forces the user to choose between the home configuration and the retail configuration

Note 1 to entry: See Figure 1.

3.1.9

home configuration

forced menu selection most likely to be chosen for home use

Note 1 to entry: Subclause 4.2.2 describes the selection of home configuration from the forced menu. This configuration selection is generally named “home”, “standard”, or equivalent.

Note 2 to entry: See Figure 1.

3.1.10

neutral density filter

ND filter

optical device that reduces the light intensity in the visible wavelength region

3.1.11

overall brightest preset picture setting

either the retail picture setting or the brightest selectable preset picture setting, whichever produces the highest luminance picture

Note 1 to entry: See Figure 1.

3.1.12**plug-in module**

device that plugs into television sets to provide additional functionality

3.1.13**point of deployment module**

conditional access module for digital signal reception

3.1.14**quick start**

feature that, when enabled, presents sound and picture quickly when switching from Partial On mode to On mode

3.1.15**retail configuration**

forced menu selection most likely to be chosen for use in a retail environment

Note 1 to entry: Subclause 4.2.3 describes the selection of retail configuration from the forced menu. This configuration selection is generally recommended by the manufacturer for presentation in a public space when the television set is offered for sale and might be named “retail”, “store”, “shop”, or equivalent.

Note 2 to entry: See Figure 1.

3.1.16**retail picture setting**

out-of-the-box picture setting for television sets with a forced menu in the retail configuration

Note 1 to entry: See Figure 1.

3.1.17**selectable preset picture setting**

TV picture setting that is selectable by a user from a set of manufacturer-defined picture settings

Note 1 to entry: See Figure 1.

3.1.18**special functions**

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

Note 1 to entry: Examples of special functions include, but are not limited to, special sound processing, power saving functions (e.g. automatic brightness control).

3.1.19**television set****TV**

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

Note 1 to entry: A television set may include additional functions that are not required for its basic operation.

3.2 Abbreviations

ABC	Automatic Brightness Control
AV	Audio-visual
BD	Blu-ray Disc™ ¹

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 an endorsement by IEC of the product named.

CRT	Cathode Ray Tube
DVD	Digital Versatile Disc
DHCP	Dynamic Host Configuration Protocol
DVI	Digital Visual Interface
FM	Frequency Modulation
HDD	Hard Disk Drive
HDMI® ²	High Definition Multimedia Interface
IP	Internet Protocol
LAN	Local Area Network
LCD	Liquid Crystal Display
LMD	Luminance Measuring Device
LNB	Low Noise Block
NAT	Network Address Translation
ND	Neutral Density
OLED	Organic Light-Emitting Diode
PC	Personal Computer
PDP	Plasma Display Panel
RF	Radio Frequency
SCR	Silicon Controlled Rectifier
STB	Set Top Box
SSID	Service Set Identifier
TV	Television set
UUT	Unit Under Test
VCR	Video Cassette Recorder
VGA	Video Graphics Array
WAN	Wide Area Network
WLAN	Wireless Local Area Network
WOL	Wake-On-LAN
WoWLAN	Wake on Wireless LAN
WPA	Wi-Fi Protected Access
WPA2	Wi-Fi Protected Access 2

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4 Specification of operating modes and functions

4.1 Table of operating modes and functions

Table 1 describes the various operating modes and functions for television sets.

For all modes, main batteries, if any, shall be removed for the duration of the measurement procedure. (IEC 62087-1:2015, 5.1.1.1.)

² HDMI® is a registered trade mark of HDMI Licensing, LLC. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named.

Table 1 – Operating modes and functions

Power	Mode	Sub-mode	Function(s)	Functional description for TV
0 W	Disconnected	Disconnected	– Disconnected from power source	The television set is disconnected or galvanically isolated from all external power sources.
≥0 W	Off	Off	– Off	The television set is connected to an external power source and does not produce picture or sound and does not provide any other function that depends on an external power source. The television set cannot be switched into any other mode with the remote control unit, or an external or internal signal. Note that some power may be consumed if an EMC filter or other components exist on the source side of the power switch.
>0 W	Partial On	Standby-passive	– Wake on <ul style="list-style-type: none"> • remote control • internal signal 	The television set is connected to an external power source and does not provide picture or sound. The television set can be switched into another mode with the remote control unit or an internal signal, but not with an external signal.
		Standby-active, low	– Wake on <ul style="list-style-type: none"> • remote control • internal signal • external signal 	The television set is connected to an external power source and does not provide picture or sound. The television set can be switched into another mode with the remote control unit or an internal signal and can additionally be switched into another mode with an external signal. NOTE When in Standby-active, low mode, a television may be able to be switched into the On mode, the Off mode, the Standby-passive, or the Standby-active, high mode.
		Standby-active, high	– Wake on <ul style="list-style-type: none"> • remote control • internal signal • external signal – Data communications	The television set is connected to an external power source and does not provide picture or sound. The television set can be switched into another mode with the remote control unit, an internal signal, or an external signal. Additionally, the television set is exchanging/receiving data with/from an external source. Determination of power consumption in this sub-mode is not specified by this standard.
	On	Operation	– Operation	The television set is connected to an external power source and provides picture and, if possible, sound.

4.2 Configurations and picture settings

4.2.1 Conceptual framework

Figure 1 shows a conceptual framework that includes the various configurations and picture settings for television sets.

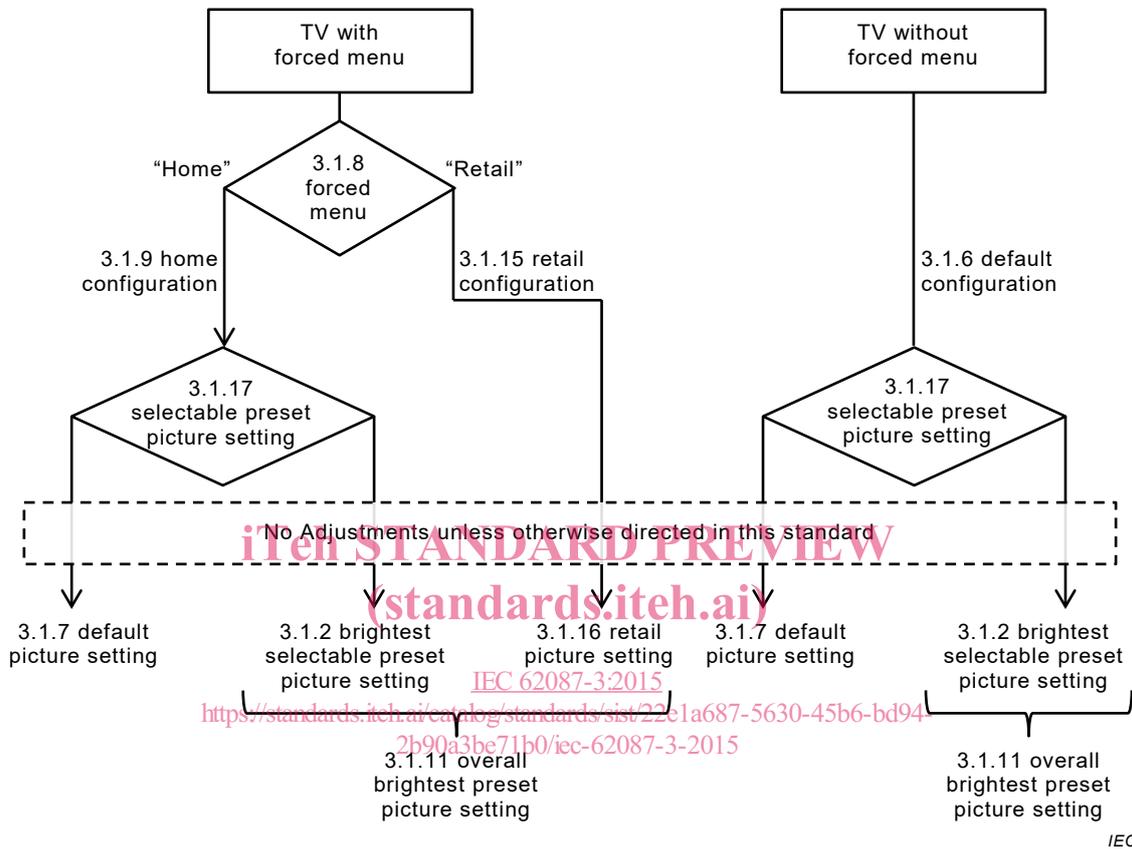


Figure 1 – Configurations and picture settings, conceptual framework

4.2.2 Selection of home configuration

When directed in this standard, the home configuration shall be selected from the forced menu by choosing the configuration that is recommended for normal home use and, if not clearly defined, it shall be selected by choosing the first configuration listed in the forced menu.

If the UUT has no forced menu, it shall remain in the default configuration.

NOTE A factory reset might be required in order to enter the home configuration after the retail configuration has been previously selected.

4.2.3 Selection of retail configuration

When directed in this standard, retail configuration shall be selected from the forced menu by choosing the configuration that, without any other adjustments, results in the highest display luminance.

If the UUT has no forced menu, it shall remain in the default configuration.

NOTE A factory reset might be required in order to enter the retail configuration after the home configuration has been previously selected.

5 Measurement conditions

5.1 General

The measurement conditions clause specifies requirements that are independent of the equipment to be evaluated. When setting up a test laboratory, these requirements shall be taken into account.

The requirements of this clause apply to the procedures specified in Clause 6.

5.2 Power source

Defined in IEC 62087-1:2015, 5.1.1.

5.3 Environmental conditions

Defined in IEC 62087-1:2015, 5.1.2.

5.4 Ambient light conditions

For determining On mode power consumption for television sets with ABC enabled, ≤ 1 lx shall be confirmed at the surface of the ABC sensor assembly with the light sources (5.6.4, 5.6.5) off and the UUT in the Off or Disconnected mode.

For determining the peak luminance ratio with a non-contact LMD, ≤ 5 lx shall be confirmed at the nominal centre of the display area of the UUT in Off or Disconnected mode. This requirement applies whether or not a light source (5.6.5) is applied to disable the ABC feature.

[IEC 62087-3:2015](http://standards.iec.org/standards/sist/12/1687-1630-4515-bd94-2b90a3be71b0/iec-62087-3-2015)

A dark room and/or shroud may be necessary in order to achieve the required ambient light conditions.

5.5 Measuring equipment

5.5.1 Power measuring instrument

Defined in IEC 62087-1:2015, 5.1.5.

5.5.2 Luminance measuring device

Defined in IEC 62087-1:2015, 5.1.7.

5.5.3 Illuminance measuring instrument

Defined in IEC 62087-1:2015, 5.1.8.

5.6 Signal generation

5.6.1 Equipment

Defined in IEC 62087-2:2015, 6.1.

5.6.2 Interfaces

Defined in IEC 62087-2:2015, 6.2.

5.6.3 Accuracy

Defined in IEC 62087-2:2015, 6.3.