

PAKISTAN STANDARD SPECIFICATION
FOR
MINIMUM ENERGY PERFORMANCE STANDARD (MEPS) AND ENERGY
STAR RATING FOR TELEVISION RECEIVERS

0. FOREWORD

- 0.1 This Pakistan Standard was adopted by the authority of the Board of Directors of Pakistan Standards and Quality Control Authority (PSQCA), after the draft prepared by the Technical Committee for “Recording / Audio, video systems (ESTC – 8)” had been approved and endorsed by the National Standards Committee for Electronics on 20th December, 2017.
- 0.2 This Minimum Energy Performance Standard (MEPS) and Energy Star Rating for Television Receivers (Draft) is initiated by National Energy Efficiency & Conservation Authority (NEECA) of Pakistan and placed before all the stakeholders for endorsement and its use is hereby acknowledged with thanks.
- 0.3 This Standard has been prepared and finalized after taking into consideration the views and suggestions put forwarded by the representative section of technologists, manufacturers and utilizing agencies.
- 0.4 This Standard is subject to periodical review in order to keep pace with the changing requirements and latest development in the industry. Any suggestion for improvement will be recorded and placed before the revising committee in due course.
- 0.5 This Standard covers the technical provisions and it does not purport to include all the necessary provisions of a contract.

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Minimum Energy Performance Standard (MEPS) and Energy Star Rating for Television Receivers

1. Purpose

Purpose of this standard is to provide guidance on setting up the minimum and high requirement limits for energy performance testing of television receivers (TVs) in Pakistan and to match with world best practices of energy performance testing of TVs.

2. Scope

This standard specifies the energy efficiency levels, minimum allowable values of energy efficiency, high energy performance values/evaluating values of energy conservation, test methods and inspection rules of TVs. This standard shall apply to the following types and sizes of TVs covering display size from 24 inch to 42 inch commonly used in Pakistan, with supply voltage of 230 V 50 Hz or range 220-240 V, 50 Hz.

-LCD TV (Liquid Crystal Display TVs), Plasma TVs and LED TVs (Light Emitting Diodes TVs)

3. Normative References

The following documentary standards, through reference in this text, constitute the provision of this standard. The latest edition of the normative document is applicable to this standard:

- IEC 60107-1: Method of measurement on receivers for television broadcast transmissions – Part 1: General conditions - Measurement at radio and video frequencies
- IEC 60107-2: Method of measurement on receivers for television broadcast transmissions – Part 2: Audio channels- General methods and methods for monophonic channels
- IEC 60107-3: Method of measurement on receivers for television broadcast transmissions – Part 3: Electrical measurements on multichannel sound television receivers using subcarrier systems

4.2 Power Modes

The consumption of power in the modes mentioned below shall follow the definition of respective clause as mentioned in IEC 62301 - Household electrical appliances measurement of standby power.

Power Modes	Definition
Standby power mode	As per clause 3.6 of IEC 62301
Active Mode	As per clause 3.8 of IEC 62301

4.3 Energy consuming efficiency

Energy consuming efficiency for evaluating the performance of TVs is annual power consumption calculated from the test of clause 6.

4.4 Minimum values of annual power consumption

Minimum Values of annual power consumption pertaining to energy efficiency rating shall not be less than Star-1 as mentioned in this standard in section 5.2, under the specific test conditions.

5. Technical Requirements

5.1 Basic requirements

The performance of the TVs applicable to this standard shall meet the requirements as specified in the standard IEC 60107, IEC 62087 and IEC 62301.

5.2 Energy efficiency levels / stars

Those products which meet the minimum requirements as specified in this standard, when tested regarding energy efficiency values, shall be eligible to apply for the use of Energy Efficiency Star Label.

The minimum allowable values of the energy efficiency i.e. minimum energy performance standard (MEPS) for grant of Energy Efficiency Star Label for TVs shall be as given in the Table 1. The energy efficiency level of TVs shall be divided into 3 stars (see Table -1) among which the 3 stars is the highest in energy efficiency. More stars mean more energy efficiency TVs. The energy efficiency values of all the level of the product shall not be lower than those specified in Table-1.

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Table-1 Energy Performance Values for TVs

Type	Screen size	Screen area A (inch ²)	Star rating criteria (kWh/year)		
			Star 1	Star 2	Star 3
LCD (Normal)	Equation		$0.386A+3.5$	$0.315A+3.50$	$0.245A+3.50$
	24 inch	250	100	82	65
	32 inch	437.6	172	141	111
	42 inch	753.8	294	241	188

Note:

A= Screen area (inch²)

Operation condition: TV watching time = 6 hours/day in Pakistan

6. Methods of measuring energy efficiency performance

(1) Determination of energy consumption efficiency

Efficiency of energy consumption expressed in the value of kWh / year, calculated by the formula:

$$E = \frac{(P_o - PA/4) \times t_1 + P_s \times t_2}{1000}$$

In this formula, E, P_o, P_s, PA, t₁ and t₂ are representing:

E: Annual energy consumption [kWh / year]

P_o: Operational Power [W]P_s: Power on standby [W]

PA: The reduction in power consumption due to energy-saving function [W]

t₁: Annual operating standard time [hours] 2190 (=365 days x 6 hours)*1t₂: Annual standby condition standard time [hours] 4380 (= 365 days x 12 hours)*2

Note: *1 Annual operating standard time is time on mode, which is average 6 hours according to interview survey by JICA Study Team in Islamabad, Lahore and Karachi in June 2014.

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Note *2 Annual standby condition standard time is 18 hours/day in Japan and 12 hours/day in India, therefore the standby time is 12 hours/day in Pakistan.

(2) Measurement method of power consumption

Power consumption of TVs is implemented according to Clause 4.2, IEC 60107.

Measuring conditions are as follows:

- a) Power supply voltage and frequency: rated
- b) Video test signal: three vertical bars signal
- c) Audio test signal(s): 1 kHz sine-wave signal(s)
- d) Signal input: radiofrequency and/or baseband
- e) Modulation of sound channel(s): 100 %
- f) Input signal level: standard input signal level
- g) Test channel for r. f. input: typical channel
- h) Loading of terminals: loudspeaker terminals and baseband output terminals are terminated in accordance with standard audio output signal levels.

Loading of any ancillary circuit is included but any peripheral equipment that is powered from the receiver is excluded.

Measurement procedure is shown below:

- a) Set the receiver under test to the standard settings and then adjust the contrast and brightness controls so as to obtain the luminance specified as standard video output level. The volume control of all the audio channels shall be set to obtain 50 m W at a 1 kHz single tone signal.
- b) Measure power consumption of the receiver with an electro-dynamic wattmeter or any other wattmeter of sufficient accuracy.

7. Testing Protocol and Type Inspection

7.1 Testing Protocol

The input power, power factor and other relevant/required performance characteristics of the TVs shall be measured according to the procedure as specified in the standard IEC 60107 and IEC 62301.

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7.2 Type Inspection

Inspection over the minimum allowable value of energy efficiency shall be carried out if one of the following conditions prevails:

- (1) New product trial;
- (2) The design, technology or material of the product is changed and the performance is influenced;
- (3) Reproduction of the product after a period of more than 1 year;
- (4) The result of market delivery inspection is very much different than the previous type inspection;
- (5) Inspection requirements proposed by standards regulatory body / organization.

7.3 Testing of samples

Through random sampling for type inspection, three (03) samples of the product shall be collected, among which two (02) shall be tested and the third left over shall remain as standby.

If the results of the two tested samples meet the requirements of this standard, the batch represented by these samples shall be declared qualified; otherwise, this batch shall be treated as disqualified. If one out of two tested samples fails to meet the requirements of this standard, the standby sample shall be tested. If the test result meets the requirements of this standard, the batch shall be treated as qualified; otherwise it shall be declared disqualified.
