ENERGY STAR® Program Requirements Product Specification for Audio/Video

Eligibility Criteria Draft 1 Version 4.0

Following is the Version 4.0 ENERGY STAR Product Specification for Audio/Video products. A product shall meet all the identified criteria if it is to earn the ENERGY STAR.

1 DEFINITIONS

A) Audio/Video (AV) Product: A mains-connected product that offers Audio Amplification and/or Optical Disc Player functions.

B) Auto Power Down (APD): The capability to automatically switch a device from On Mode to Sleep Mode after a predetermined period of time (APD timing) has elapsed. APD timing begins when both:

1) The device has ceased performance of all Primary Functions, and

2) The last user input has been received (e.g., remote control signal, volume adjustment).

If either a Primary Function resumes or a user input is received, the APD timing will reset. The intent of APD is that products will automatically power down into Sleep Mode when they are not being adjusted by the user and are not performing a Primary Function.

Example 1: A DVD player is by definition performing a Primary Function during active video playback from the disc; and thus, is not required to APD for the duration of active video playback. The same DVD player is expected to power down to Sleep Mode within the APD time setting when video content playback concludes, such that the product does not indefinitely remain in On Mode while in a disc menu screen.

Example 2: An amplifier that is playing music is performing a Primary Function and thus is not required to APD. Once the music has stopped playing, and the user is not interacting with the product, the product will be expected to power down.

C) Loss of Signal (LOS):

1) For audio signals, LOS is defined as:

a) Analog Inputs: Signal dropping below that required for maximum power by a factor of not less than 30dB and not more than 70dB. For products without audio amplification, Signal less than 1dB above the measured noise floor for 60 seconds.

b) HDMI: Receive <Inactive Source> or <Standby> signal over the CEC channel, or [Power Status] of an upstream device goes to “Standby” or “In Transition to Standby” over the CEC channel;

c) Other Digital Inputs (e.g., Ethernet): No audio information in the data stream; or

d) Detectable cable disconnects.

2) For video signals, LOS is defined as:

a) Analog Inputs: Loss of either the horizontal or vertical sync signal

b) HDMI: Receive <Inactive Source> or <Standby> signal over the Consumer Electronics Control (CEC) channel, or [Power Status] of an upstream device goes to “Standby” or “In Transition to Standby” over the CEC channel; or detection of a disabled TMDS link, a TMDS clock line signal below 22.5 MHz for more than one second, or a TMDS link operating outside of the valid frequency range;

c) DVI: Detection of a disabled TMDS link, a TMDS clock line signal below 22.5 MHz for more than one second, or a TMDS link operating outside of the valid frequency range;

d) Other Digital Inputs (e.g., Ethernet): No video information in the data stream; or

e) Detectable cable disconnects.

D) Primary Function: Any discrete, dynamic device function that can be perceived by an end user, including the delivery or processing of audio/video content, and excluding the following:

1) Continuous device functions (e.g., clocks, Status Displays, indicator lamps),

2) Static device functions, such as:

a) No active audio or video processing or output;

b) Playback paused or stopped;

c) No optical disc media in disc drive; or

d) Waiting in disc menu or other menu for user input.

E) Operational Modes:

1) On Mode: Where the product is connected to a mains power source, has been activated and is capable of providing one or more Primary Functions. The common terms “active”, “in-use” and “normal operation” also describe this mode.

a) Active State: A state within On Mode in which a product is performing a Primary Function.

b) Idle State: A state within On Mode in which a product is not performing a Primary Function and no content is actively being delivered to the end-user.

2) Sleep Mode: Where the product is connected to a mains power source, is incapable of providing a Primary Function, and offers one or more of the following user oriented or protective functions which may persist for an indefinite time. The common term “standby” may also describe this mode.

a) To facilitate the activation of other modes (including activation of On Mode) by remote switch (including remote control), internal sensor, or timer;

b) Continuous function: information or Status Displays including clocks;

c) Continuous function: sensor-based functions.

For purposes of this specification, Sleep Mode is defined as the condition where the product is connected to a power source, produces neither sound nor picture, neither transmits nor receives program information and/or data (excluding data transmitted to change the unit’s condition from Sleep Mode to On Mode), and is waiting to be switched to On Mode by a direct or indirect signal from the consumer (e.g., with the remote control).

3) Off Mode: Where the product is connected to a mains power source, is not providing any On Mode or Sleep Mode functions and cannot be switched into any other mode except by user actuation of a manual power switch. An indicator that only shows the user that the product is in the off position is included within the classification of an Off Mode.

F) External Power Supply (EPS): Also referred to as External Power Adapter. A component contained in a separate physical enclosure external to the AV Product, designed to convert line voltage AC input from the mains to lower dc voltage(s) in order to provide power to the AV Product. An EPS connects to the AV Product via a removable or hard-wired male/female electrical connection, cable, cord or other wiring.

G) High-Definition Multimedia Interface (HDMI): A compact audio/video interface for transmitting uncompressed digital data.

1) Consumer Electronics Control (CEC) Protocol: A single-conductor wire or bus technology that is an optional feature in the HDMI specification. CEC is meant to carry IR/remote and/or control commands between interconnected HDMI devices.

H) High-Definition Resolution (HD): Video output with resolution greater than 480 lines (480 i/p).

I) Standard Definition Resolution (SD): Video output with resolution less than or equal to 480 lines (480 i/p).

J) Multi-component System: A product consisting of several components with separate enclosures that are sold as and intended for use as a single system. A “Home Theater in a Box” is an example of a Multi-component System.

K) Audio Amplifier Type Classifications:

1) Full-spectrum Audio Amplifier: An amplifier capable of full audible frequency range (20 Hz to 20 kHz) output on all channels.

2) Limited-bandwidth Audio Amplifier: An amplifier limited to less than full audible frequency range (20 Hz to 20 kHz) output on one or more channels.

L) Audio Amplifier Use Classifications:

1) Consumer Amplifier: An amplifier product that possesses 4 of the following 5 characteristics:

a) Digital inputs use a S/PDIF, HDMI, or portable music player dock connector(s), or a standard wireless technology (e.g., a Bluetooth receiver supporting A2DP);
b) Analog inputs utilize RCA connections, TRS connections (1/4” or 1/8”), and/or spring clip style connectors;
c) Analog inputs have -5 dBV input sensitivity to achieve full output power when using a 1kHz since wave input;
d) Ac plug has two conductors and no grounding connection and is limited to 15 amperes ac current (e.g., NEMA 1);
e) An IR or RF remote control is included with or can control the product.

2) Commercial Amplifier: All amplifier products that do not meet the defining criteria for a Consumer Amplifier will be considered a Commercial Amplifier.

M) Product Functions:

1) Audio Amplification: A function by which a device increases the amplitude of an audio signal for purposes of sending the signal to a transducer for playback.

2) High Resolution Display: A function by which a device converts a video signal into a visual output (e.g., LCD panel, plasma display panel). This definition does not include Status Displays or Smart Displays.

3) Status Display: A function by which a product provides a visual display of less than 480x234 pixel resolution or 5 inches diagonal screen size, including a back-lit alphanumeric clock or channel indicator. This definition does not include single indicator lamps.[1]

4) IP Video Tuner: A function by which a device can play back streaming digital video content packetized or downloaded over an IP network.

5) Networking / Control Protocol: A function by which a device can connect to a network for transmission and receipt of data. The connection may be wired or wireless (e.g., IR communications, Ethernet, Bluetooth, RS-232, USB).

[1] Note that single indicator lamps are not provided power allowances under this specification.

6) Wi-Fi and Gigabit Ethernet Protocols: Networking connections that have been defined to require additional power for transmission and receipt of data in Audio/Video products. Connections are limited to Gigabit Ethernet and Wi-Fi.

7) Optical Disc Player / Recorder: A function by which a device can read and/or write data to removable disk media (e.g., CD, DVD, Blu-ray Disc).

8) Voice-activated Digital Assistant: Voice-activated software that can interpret commands and carry out electronic tasks for the user.

9) Tower/PA system: A public address system used to project sounds from instruments and other acoustic sources.

Note: EPA has deleted the definition for Audio Signal Processing in harmonization with the updated test procedure as it is no longer referenced in the document. EPA also proposes a definition for Tower/PA system and proposed requirements for this product type in Draft 1. EPA welcomes stakeholder feedback on these definitions.

N) Total Harmonic Distortion (THD): The ratio of the sum of the powers of all harmonic components to the power of the fundamental frequency of a signal.

O) Maximum Undistorted Power (MUP): The amplifier output power at which the THD of any output channel is 1.0% or greater for a given input.

P) Product Family: A group of product models that are (1) made by the same manufacturer, (2) subject to the same ENERGY STAR certification criteria, and (3) of a common basic design. Product models within a family differ from each other according to one or more characteristics or features that either (1) have no impact on product performance with regard to ENERGY STAR certification criteria, or (2) are specified herein as acceptable variations within a Product Family. For Audio/Video, acceptable variations within a Product Family include:

1) Color, and

2) Housing.

2 SCOPE

2.1 Included Products

2.1.1 Products that meet the definition of an AV Product as specified herein are eligible for ENERGY STAR certification, with the exception of products listed in Section 2.2.

2.2 Excluded Products

2.2.1 Products that are covered under other ENERGY STAR product specifications are not eligible for certification under this specification. The list of specifications currently in effect can be found at www.energystar.gov/specifications.

2.2.2 The following products are excluded from certification under this specification.

i. Products whose primary video playback capability is via IP Video Tuner and which are sold or provided outside of a dedicated service contract,

ii. Products for use in automotive applications,

iii. Video projectors,

iv. Home and building automation and control products,

v. Whole-house and whole-building audio and/or video systems,

vi. Videoconferencing systems,

vii. Wireless microphone systems,

viii. A/B selector switches, and

ix. Smart speakers and Smart displays

x. Media servers.

Note: EPA understands smart speakers are largely a key component of a smart home system, controlling other products in the home. EPA has an active specification focused on recognizing smart home systems that deliver energy savings-the ENERGY STAR Smart Home Energy Management System (SHEMS) specification. Recognizing smart speakers under the AV specification is expected to result in consumer confusion between the speaker hardware and the SHEMS software that they typically come tied to. Consumers seeing an ENERGY STAR labeled speaker are likely to mistakenly conclude that the smart home system is certified and will deliver energy savings when that may not be the case. As such, EPA has excluded them from the scope of the AV specification. EPA encourages vendors to contact EPA about ENERGY STAR SHEMS system level certification. More about this specification is **here**.

The revised test method allows for battery powered devices to be tested as long as all batteries are fully charged prior to the start of testing and remain in place for the test duration. As such, EPA has removed battery powered devices from the list of excluded products to allow battery powered devices to be included in the scope of this specification. EPA requests stakeholder feedback on the applicability of the CTA test method to whole-house and whole-building AV products in light of the fact that the test method does not exclude them. More specifically, EPA recognizes that products included in these systems may need a CAT 5E or fiber optic cable. They may also have home automation systems coupled with them. Neither of the aforementioned are covered explicitly by the CTA test. EPA requests information on what percentage and what types of whole-house and whole-building AV products could be tested to the CTA test procedure.

3 CERTIFICATION CRITERIA

3.1 Significant Digits and Rounding

3.1.1 All calculations shall be carried out with directly measured (unrounded) values. Only the final result of a calculation shall be rounded.

3.1.2 Unless otherwise specified, compliance with specification limits shall be evaluated using exact values without any benefit from rounding.

3.1.3 Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

Note: EPA made minor editorial edits to the above section to harmonize with other recently updated ENERGY STAR specifications.

3.2 General Requirements

3.2.1 External Power Supplies (EPSs): Single- and Multiple-voltage EPSs shall meet the Level VI or higher performance requirements under the International Efficiency Marking Protocol when tested according to the Uniform Test Method for Measuring the Energy Consumption of External Power Supplies, Appendix Z to 10 CFR Part 430.

i. Single-voltage EPSs shall include the Level VI or higher marking.

ii. Multiple-voltage EPSs meeting Level VI or higher shall include the Level VI or higher marking.

iii. Additional information on the Marking Protocol is available at http://www.regulations.gov/#!documentDetail;D=EERE-2008-BT-STD-0005-0218

Note: EPA has revised the EPS requirement to level VI, harmonizing with the increased stringency of U.S. federal energy conservation standards for EPS.

3.2.2 Multi-component Systems: For products composed of multiple components in separate housings, all components shall be connected in a typical end use configuration in accordance with the CTA-2084-A test method.

3.2.3 Networking / Control Protocols: To certify for ENERGY STAR, AV Products that offer one or more Networking / Control Protocol options shall have networking capability activated and connected to a live physical network unless specified otherwise.

3.3 Auto Power Down (APD) Requirements

3.3.1 APD functionality shall be available on all products except those that are subject to third-party performance standards that prohibit APD, those used for Mass Notification and Emergency Communications Systems and those subject to ANSI/UL 2572.

3.3.2 APD functionality shall be enabled by default, with APD timing less than or equal to 30 minutes, subject to the following exceptions:

i. Products may offer users the option (e.g., via system menu or physical switch) to modify APD timing in 10-minute intervals, or to disable APD entirely.

ii. Products may initiate APD immediately upon receipt of authoritative control instruction via an active Networking / Control Protocol.

iii. Commercial Amplifiers as defined in Section 1 may be shipped with APD enabled or disabled but shall meet the Idle State power requirements.

Note: EPA proposes that commercial amplifiers meet all the Idle State power requirements and may be shipped with APD enabled or disabled with the exception of those mentioned in section 3.3.1 above.

3.3.3 APD Timing Default Settings shall be as follows:

i. APD Timing ≤ 30 minutes: This timing option is acceptable for use as a default setting. Irrespective of the APD timing, Idle State power requirements are applicable for all products.

ii. APD Timing > 30 minutes: This timing option may only be enabled by the end user and is not available for use as a default setting.

Note: EPA proposes that Idle State power requirements shall be met irrespective of the APD timing default settings based on duty cycle data demonstrating significant savings potential given that a product typically spends an average of 146 hours in idle mode every year. APD has become a standard feature. Changes to the base allowance with the idle state exemption retained would not result in savings or change in the pass rate.

3.4 Sleep Mode Requirements

3.4.1 Measured Sleep Mode power (P_{SLEEP}) shall be less than or equal to the Maximum Sleep Mode Power Requirement (P_{SLEEP_MAX}), as calculated per Equation 1.

i. If a product's Idle State meets the Sleep Mode power requirements, a distinct and separate Sleep Mode is not required to be implemented.

Equation 1: Calculation of Maximum Sleep Mode Power Requirement

$$P_{SLEEP\_MAX} = P_{SLEEP\_BASE} + \sum_{i=1}^{n} P_{WAKE\_i}$$

Where:

- P_{SLEEP_MAX} *is the Maximum Sleep Mode Power Requirement;*
- P_{SLEEP_BASE} *is the base Sleep Mode power allowance for all products, as specified in Table 1;*
- P_{WAKE_i} *is the Sleep Mode power allowance for each active, in-use*
- *networking/control protocol that provides remote hosts with the capability to wake the product from Sleep Mode, as specified in Table 1, for a total of n such allowances.*

Table 1: Sleep Mode Power Allowances

Product Function	Sleep Mode Power Allowance (watts)
Base Allowance for All Products (P_{SLEEP_BASE})	1.0

Note: EPA proposes to eliminate all the networking allowances in sleep mode as technology has rapidly evolved over the past decade and most products that have networking capability have demonstrated that they can meet the base allowance level.

3.5 Idle State Requirements

3.5.1 Measured Idle State power (P_{IDLE}), shall be less than or equal to the Maximum Idle State Power requirement (P_{IDLE_MAX}), as calculated per Equation 2, subject to the following requirements:

Equation 2: Calculation of Maximum Idle State Power Requirement

$$P_{IDLE\_MAX} = \sum_{i=1}^{n} P_{IDLE\_i}$$

Where:

- P_{IDLE_MAX} *is the Maximum Idle State Power Requirement, in watts; and*
- P_{IDLE_i} *is the Idle State power allowance for each applicable product function listed in Table 2, for a total of n such allowances.*

Table 2: Idle State Power Allowances

Product Function		Idle State Power Allowance, P_{IDLE_i} (watts, rounded to the nearest 0.1 W for reporting)
Base (All Products)		4.0
Audio Amplification	$P_{OUT} \leq 50$ watts	2.0
Where: P_{OUT} *is the output power*	$P_{OUT} > 50$ watts	0.02 x P_{OUT}

Note: EPA proposes reducing the allowance for Idle State power requirements based on the data from the ENERGY STAR certified product list. The Version 3.0 data mirror those generated by the CTA test in part-idle where there is no input signal and where the volume is set to a non-zero volume. EPA does not have equivalent data for idle where there is an input signal but volume is set to zero. As such, EPA welcomes stakeholder feedback, along with any data to fine tune these requirements if needed. With the proposed criteria, EPA expects an approximate 40% improvement in terms of savings in Idle State across all Audio/Video product categories compared to the previous version of the specification. EPA also proposes to revise the Audio Amplification allowance to address the Idle power of the Audio Amplification circuitry. EPA currently doesn't have any test data per the new test method and proposes the requirement based on the Version 3.0. EPA seeks stakeholder feedback and/or supporting data regarding these proposed allowances.

3.6 Optical Disc Player On Mode Requirements

3.6.1 Measured On Mode power (P_{ON}) for products with Optical Disc Players, shall be less than or equal to the Maximum On Mode Power requirement (P_{ON_MAX}), as calculated per Equation 3, subject to the following requirements:

i. Measured On Mode power for Optical Disc Players capable of processing both SD and HD video content shall be the average of the On Mode power when processing SD content and the On Mode power when processing HD content, as measured per the test procedure.

ii. On Mode power allowances specified in Table 3 shall be applied only once per product. The highest applicable allowance may be used.

iii. Products with a high-resolution display shall use the allowances specified in Table 4.

Equation 3: Calculation of Maximum On Mode Power Requirement

$$P_{ON\_MAX} = P_{ON} + \sum_{i=1}^{n} P_{ADD\_i}$$

Where:

- P_{ON_MAX} *is the Maximum On Mode Power Requirement, in watts;*
- P_{ON} *is the On Mode power base allowance for each applicable product function listed in Table 3, Note: only one* P_{ON} *shall be applied per product; and*
- P_{ADD_i} *is the On Mode Power Function Adder for each applicable product function listed in Table 4, rounded to the nearest 0.1 watts, for a total of n such allowances.*

Table 3: On Mode Power Base Allowances

Product Function	On Mode Power Allowance, P_{ON} (watts)
SD or Audio Source Optical Disc Player: Playback Test	4.5
SD Source to HD Output "Upconversion" Optical Disk Player: Playback Test	4.0
HD Source Optical Disc Player: Playback Test	5.4

Note: EPA has proposed the On Mode power requirements based on the data from the ENERGY STAR qualified product list. EPA is proposing a reduction in the On Mode power allowance for Blu-Ray DVD from 10.5 W to 5.4 W. An analysis of EPA's current dataset supports a healthy selection of products from a range of manufacturers that could qualify at this level. EPA also proposes to revise the requirements for ENERGY STAR DVD players. With the revised criteria, EPA expects a pass rate of 25% for DVD players and an overall 19% pass rate for optical disc players based on the On Mode requirements.

Table 4: On Mode Power Function Allowances

Product Function		On Mode Power Allowance, P_{ADD_i} (watts, rounded to the nearest 0.1 W for reporting)
Audio Amplification *Where:* *P_{OUT} is the output power*	P_{OUT} ≤ 50 watts	2.0
	P_{OUT} > 50 watts	0.02 x P_{OUT}

Note: EPA proposes updating the equation for in-use high resolution displays. EPA also proposes to eliminate networking allowances in On Mode as most products that have networking capability have demonstrated that they can meet the base allowance level. EPA is also revising the Audio Amplification allowance to address the Idle power of the Audio Amplification circuitry while the optical disk player is being tested.

3.7 Products with Audio Amplification Shipped with Speakers On Mode Requirements

3.7.1 Measured On Mode power (P_{ON}) for products with Audio Amplification shipped with speakers, shall be less than or equal to the Maximum On Mode Power requirement (P_{ON_MAX}), as calculated per Equation 4 or Equation 5 for each SPL level that measurements are taken, subject to the following requirements:

i. On Mode power for products with Audio Amplification shipped with speakers shall be measured at ten evenly spaced volume levels between 50 to 70 dB.

ii. If a UUT has a minimum SPL higher than 50 dB, the minimum volume level must be considered for measurement. For example, if a UUT has a minimum SPL of 60 dB then On Mode power must be measured between 60 to 70 dB instead.

iii. Tower/PA system speakers and Tower/PA systems with subwoofers having a driver power greater than 100 watts shall be excluded from this requirement.

iv. These requirements do not apply to multi-component systems. Equation 4: Calculation of Maximum On Mode Power Requirement (Peak Wattage ≤ 5 W)

$$P_{ON\_MAX} = 0.06x - 0.5 + P_{Display}$$

Where:

- *P_{ON_MAX} is the Maximum On Mode Power Requirement, in watts; and*
- *x is the SPL level at which measurements are made.*
- *$P_{Display}$ is the allowance for products with a high-resolution display per Table 5.*

Equation 5: Calculation of Maximum On Mode Power Requirement (Peak Wattage > 5 W)

$$P_{ON\_MAX} = 0.12x + 2 + P_{Display}$$

Where:

- *P_{ON_MAX} is the Maximum On Mode Power Requirement, in watts; and*

- *x is the SPL level at which measurements are made.*
- $P_{Display}$ *is the allowance for products with a high-resolution display per Table 5.*

Note: EPA proposes On Mode requirements for products with audio amplification that are shipped with speakers. EPA conducted a literature review to determine the commonly used volume levels including home theater systems, movie theaters, gyms etc. Using these average sound levels from this literature review as a proxy, EPA made assumptions to determine the common range of SPL levels in the home while watching a movie via a sound bar or listening to music in the kitchen. EPA identified the 50 to 70 dB range as this is the most common usage volume level among consumers.

EPA also proposes a 100 W driver power limit for Tower/PA system speakers and Tower/PA systems with a subwoofer from market review and product use case. EPA requests that stakeholders submit data and any relevant feedback to determine if the 100 W limit is too restrictive. Based on available test data, EPA concluded that soundbars combined with a subwoofer perform similarly to high performance wireless speakers. The test data also showed no apparent performance difference in speakers that employ digital assistant hosting capabilities when compared to similarly sized speakers. The smaller speakers lack the steep curve indicative of the presence of a woofer. As such, EPA proposes two separate requirements based on the product's peak Wattage.

Table 5: On Mode Power Function Allowances

Product Function	On Mode Power Allowance, (Watts, rounded to the nearest 0.1 W for reporting)
High Resolution Display	$P_{Display} = [(4.0 \times 10^{-5} \times \ell \times A) + 119 \times \tanh(0.0008 \times [A - 200.0] + 0.11) + 6.0]$ Where: *A is the viewable screen area in square inches;* *ℓ is the maximum measured luminance of the display in candelas per square meter;* tanh *is the hyperbolic tangent function.*

3.8 Products with Audio Amplification Shipped without Speakers Efficiency Requirements

3.8.1 TBD

Note: Prior to proposing efficiency requirements for products with Audio Amplification shipped without speakers in a forthcoming Draft 2 Specification, EPA seeks to enhance its dataset for these products such that it is more representative of the market and robust per the updated CTA-2084 test method. As such, EPA welcomes any new data generated per the CTA-2084 test method, as well as proposals on how to address energy use of these products most appropriately.

Note: Products intended for sale in the US market are subject to minimum toxicity requirements. Please see ENERGY STAR® Program Requirements for Audio/Video Products: Partner Commitments for details.

4 TESTING

4.1 Test Methods

4.1.1 When testing Audio/Video products, the test methods identified in Table 6 shall be used to determine ENERGY STAR certification.

Table 2. Test Methods for ENERGY STAR Certification

Product Type	Test Method
All	ANSI/CTA-2084-A Test Methods for Determining Audio/Video Product Energy Efficiency

4.2 Number of Units Required for Testing

4.2.1 Representative Models shall be selected for testing per the following requirements:

i. For certification of an individual product model, a product configuration equivalent to that which is intended to be marketed and labeled as ENERGY STAR is considered the Representative Model;

ii. For certification of a Product Family, any product configuration within the family may be considered the Representative Model.

4.2.2 A single unit of each Representative Model shall be selected for testing.

4.3 International Market Certification

4.3.1 Products shall be tested for certification at the relevant input voltage/frequency combination for each market in which they will be sold and promoted as ENERGY STAR.

5 USER INTERFACE

5.1.1 Partners are encouraged to design products in accordance with the user interface standard IEEE P1621: Standard for User Interface Elements in Power Control of Electronic Devices Employed in Office/Consumer Environments. For details, see: IEEE SA - IEEE 1621-2004.

Note: EPA seeks stakeholder feedback on the user interface requirements and relevance of the same with regards to the specification.

6 EFFECTIVE DATE

6.1.1 Effective Date: The Version 4.0 ENERGY STAR Audio/Video specification shall take effect on **TBD**.

Note: The Version 4.0 specification will be effective nine months after its finalized. Products may certify to the new specification as soon as its final.

6.1.2 Future Specification Revisions: EPA reserves the right to change this specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through stakeholder discussions. In the event of a specification revision, please note that the ENERGY STAR certification is not automatically granted for the life of a product model.