



ENERGY STAR® Program Requirements for Digital-to-Analog Converter Boxes (DTAs)

Eligibility Criteria

Below is the Version 1.1 product specification for ENERGY STAR qualified DTAs. A product must meet all of the identified criteria if it is to be qualified as ENERGY STAR by its manufacturer.

- 1) **Definitions:** Below is a brief description of a DTA and other terms as relevant to ENERGY STAR.
 - A. **Auto-Power Down:** Eligible equipment shall provide the capability to automatically switch from the On state to the Sleep state after a period of time without user input. This capability shall be enabled at the factory as the default setting for the device.
 - B. **DTA:** Stand-alone device that does not contain features or functions except those necessary to enable a consumer to convert any channel broadcast in the digital television service into a format that the consumer can display on television receivers designed to receive and display signals only in the analog television service, but may also include a remote control device. In addition to meeting the requirements laid out in this Version 1.1 ENERGY STAR specification, DTAs must also meet the minimum technical requirements laid out in the Technical Appendices of the National Telecommunications and Information Administration's (NTIA) final rule-making on its Digital Television Converter Box Coupon Program (see <http://www.ntia.doc.gov/> for the final rulemaking).
 - C. **Off Mode:** A state in which there is negligible or no power consumption.
 - D. **On Mode:** A state in which the DTA is actively delivering its principal functions and some or all of its applicable secondary functions.
 - E. **Sleep Mode:** A state in which the device has greater power consumption, capability, and responsiveness than it does in the Off state, and has less (or similar) power consumption, capability and responsiveness than it does in the On state.
- 2) **Qualifying Products:** In order to qualify as ENERGY STAR, a DTA model must meet the definition in Section 1.B and the specification requirements provided in Section 3, below. As explained in Section 1, this specification does not cover converters that work with satellite or cable digital signals, nor does it cover devices with multiple primary functions, such as a DVD player with DTA conversion capability or a DTA with video recording capabilities.
- 3) **Energy-Efficiency Specifications for Qualifying Products:** Only those products listed in Section 2 that meet the following criteria may qualify as ENERGY STAR. The effective date for these requirements is provided in Section 6 of this specification.

Table 1: Criteria for ENERGY STAR Qualified DTAs

Mode	Power Consumption under Test Conditions Effective Date: January 31, 2007
On Mode*	≤ 8 watts
Sleep Mode	≤ 1 watt

* DTA must incorporate an auto-power down feature to automatically switch from the On state to the Sleep state after a period of time without user input. This capability shall be enabled at the factory as the default setting for the device. The default period of inactivity before the equipment automatically switches to the Sleep state shall be four hours or less. Eligible equipment may allow the current program to complete before switching to the Sleep state. The default energy related settings may not

be altered during the initial user set-up process and shall persist unless the user chooses at a later date to manually:

- a) disable the "automatic switching to Sleep state" capability, or
- b) adjust the default time period from 4 hours or less to some other value.

DTAs may come out of Sleep Mode in order to scan for program and system information or private data (PSIP). When doing so, DTAs may exceed the 1 watt Sleep Mode requirement for no longer than one hour in an eight hour period. If the 1 watt Sleep Mode requirement is exceeded for longer than this, the DTA will not be eligible to qualify for ENERGY STAR.

- 4) **Test Criteria:** Manufacturers are required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines. The test results must be reported to EPA using the DTA Qualifying Product Information (QPI) Form. EPA is calling for the use of the below named test procedures. Any power allowances included in the documents containing and pertaining to these test procedures that originate from a source other than EPA are not relevant to the ENERGY STAR program requirements for DTAs and should be ignored.

In performing these tests, partner agrees to measure a model's On Mode power consumption using Section 6 of CEA-2022, *Digital STB Active Power Consumption Measurement* and Sleep Mode power consumption using Annex A of CEA-2013-A, *Digital STB Background Power Consumption*. However, the following clarifications shall be incorporated into the test procedures when testing to determine whether a product meets ENERGY STAR requirements:



- A. In place of section 6.4.i) in CEA-2022 and section A.4.i) in CEA-2013-A regarding the amount of allowable variation in the load when measuring On Mode and Sleep Mode, respectively, ENERGY STAR wishes to reference the following language adapted from IEC 62301: *Household Electrical Appliances – Measurement of Standby Power*. The language provides guidance on how to take an integrated, averaged measurement over a period of time in situations when the load being measured may not be entirely stable.

Where the power meter reading is stable and where there is no cyclic or pulsing behavior of the load, the instantaneous power reading for the load can be recorded directly from the power meter. (For the purposes of this test procedure, a stable load is one that varies by no greater than $\pm 5\%$ over a five-minute period.) In the case that the load is unstable, report the average power reading over a five-minute period by integrating the energy consumption of the product over this period and dividing by the total time. The meter shall be capable of sampling at a minimum of one-second intervals. If the power in On or Sleep Mode varies periodically (i.e. a regular sequence of power fluctuations that occur over several minutes or hours), the five-minute integration period shall be increased to encompass one or more complete cycles in order to get a representative average value.

- B. Manufacturers will be required to test their DTA models with a passive antenna connected to the product, as opposed to an active antenna (e.g., smart antenna), to determine ENERGY STAR qualification.
- C. Manufacturers will be required to test their DTA models in On Mode with three different input signals at the following commonly broadcasted resolutions: 480i @ 29.97 Hz (4:3), 720p @ 59.94 Hz (16:9 HD) and 1080i @ 29.97 Hz (16:9 HD). On Mode power consumption results will be submitted to EPA at all three input signal resolutions, but only the highest value will be displayed on the ENERGY STAR Web site. (Note that the DTA will have to meet ENERGY STAR requirements when tested with all three input signals; however, the highest power consumption value will be the only one shared with consumers.)
- D. Section A.6, Responsibilities, in CEA-2013-A should be ignored. The test criteria as laid out in the respective test procedures should be adhered to by partners when testing their DTAs to determine ENERGY STAR qualification.

- 5) **User Interface:** Although not mandatory, manufacturers are strongly recommended to design products in accordance with the Power Control User Interface Standard — IEEE 1621 (formally known

as “Standard for User Interface Elements in Power Control of Electronic Devices Employed in Office/Consumer Environments”). Compliance with IEEE 1621 will make power controls more consistent and intuitive across all electronic devices, as more products begin to conform to this standard. The following aspects of IEEE 1621 are most likely to apply to DTAs and are presented here for your convenience. The complete standard is available at: www.ieee.org. A draft version is available for download at: <http://eetd.LBL.gov/Controls/1621>.

- A. Use of the word "Power" and/or the power symbol —  — as the central organizing term for power controls, and specifically on the power indicator and power switch on the box, on the power control on the remote, and on any applicable on-screen displays [sections 4.2 and 4.5].
 - B. Present the state in which the DTA is powered-down but able to wake up from the remote control as the "Sleep" mode. It may not be necessary to refer to sleep directly on the box, control, or on-screen displays, but if that is done, use the word "Sleep" and/or the crescent moon symbol for sleep —  [section 4.1].
 - C. Use Green/Yellow/Off color indications for the power indicator to show On/Sleep/Off (for DTAs, Off only occurs when AC power is removed) [section 4.4.2].
 - D. For on-screen displays and user manuals, use "Auto Power Down" as the term for the auto-power down function [section 4.3].
- 6) **Effective Date:** The date that manufacturers may begin to qualify products as ENERGY STAR under this Version 1.1 specification will be defined as the *effective date* of the agreement. The ENERGY STAR specification for DTAs is effective January 31, 2007.
- 7) **Future Specification Revisions:** EPA reserves the right to revise the specification should technological and/or market changes affect its usefulness to consumers or industry or its impact on the environment. In keeping with current policy, revisions to the specification are arrived at through industry discussions. **Please note that ENERGY STAR qualification is not automatically granted for the life of the product model.** To carry the ENERGY STAR mark, a product model must meet the ENERGY STAR specification in effect on the model's date of manufacture.