



**ENERGY STAR® Program Requirements  
for Set-top Boxes  
DRAFT 1 – Version 2.0  
June 29, 2007**

5

6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52

**Table of Contents**

<b>Partner Commitments</b>	<b>2</b>
<i>Commitments</i>	2
<i>Performance for Special Distinction</i>	3
<b>Eligibility Criteria</b>	<b>5</b>
<i>Section 1: Definitions</i>	5
<i>Section 2: Qualifying Products</i>	7
<i>Section 3: Energy Efficiency and Power Management Criteria</i>	7
<i>Section 4: Test Procedures</i>	9
<i>Section 5: User Interface</i>	12
<i>Section 6: Effective Date</i>	12
<i>Section 7: Future Specification Revisions</i>	12
<b>Appendix A: Determination of Base Functions</b>	<b>13</b>



# ENERGY STAR® Program Requirements for Set-top Boxes

## Partner Commitments DRAFT 1 – Version 2.0 June 29, 2007

58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100  
101

### Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified set-top boxes. The ENERGY STAR Partner must adhere to the following program requirements:

- comply with current ENERGY STAR Eligibility Criteria, defining the performance criteria that must be met for use of the ENERGY STAR certification mark on set-top boxes and specifying the testing criteria for set-top boxes. EPA may, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at EPA's request;
- comply with current ENERGY STAR Identity Guidelines, describing how the ENERGY STAR marks and name may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance;
- qualify at least one ENERGY STAR set-top box model within 30 days of activating the set-top box portion of the agreement. When the manufacturing Partner qualifies the product, it must meet the specification (e.g., Version 2.0, Tier 1) in effect at that time;
- provide clear and consistent labeling of ENERGY STAR qualified set-top boxes. The ENERGY STAR mark must be clearly displayed:

1. On the top/front of the product. Labeling on the top/front of product may be permanent or temporary. All temporary labeling must be affixed to the top/front of product with an adhesive or cling-type application;

Electronic Labeling Option: Manufacturers have the option of using an alternative electronic labeling approach in place of this product labeling requirement, as long it meets the following requirements:

- The ENERGY STAR mark must appear in cyan, black, or white (as described in "The ENERGY STAR Identity Guidelines"); and
- The ENERGY STAR mark must be at least 10% of the screen by area, may not be smaller than 76 pixels x 78 pixels, and must be legible.

*Note: EPA welcomes suggestions from stakeholders on the feasibility and possible approaches for electronic labeling.*

2. In product literature (i.e., user manuals, spec sheets, etc.);
3. On product packaging for products sold at retail; and

- 102 4. On the manufacturer's Internet site where information about ENERGY STAR qualified models is  
103 displayed;
- 104 • provide to EPA, on an annual basis, an updated list of ENERGY STAR qualified set-top box models.  
105 Once the Partner submits its first list of ENERGY STAR qualified set-top box models, the Partner will  
106 be listed on the ENERGY STAR Web site. Partner must provide annual updates in order to remain on  
107 the list of participating product manufacturers;
- 108
- 109 • provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in  
110 determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total  
111 number of ENERGY STAR qualified set-top boxes shipped (in units by model) or an equivalent  
112 measurement as agreed to in advance by EPA and Partner. Partner is also encouraged to provide  
113 ENERGY STAR qualified unit shipment data segmented by meaningful product characteristics (e.g.,  
114 type, presence of additional functions, or other as relevant), total unit shipments for each model in its  
115 product line, and percent of total unit shipments that qualify as ENERGY STAR. The data for each  
116 calendar year should be submitted to EPA, preferably in electronic format, no later than the following  
117 March and may be provided directly from the Partner or through a third party. The data will be used  
118 by EPA only for program evaluation purposes and will be closely controlled. Any information used will  
119 be masked by EPA so as to protect the confidentiality of the Partner;
- 120
- 121 • notify EPA of a change in the designated responsible party or contacts for set-top boxes within 30  
122 days.
- 123
- 124

## 125 **Performance for Special Distinction**

126 In order to receive additional recognition and/or support from EPA for its efforts within the  
127 Partnership, the ENERGY STAR Partner may consider the following voluntary measures and should keep  
128 EPA informed on the progress of these efforts:

129

- 130 • consider energy efficiency improvements in company facilities and pursue the ENERGY STAR mark  
131 for buildings;
- 132
- 133 • purchase ENERGY STAR qualified products. Revise the company purchasing or procurement  
134 specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA  
135 for periodic updates and coordination. Circulate general ENERGY STAR qualified product information  
136 to employees for use when purchasing products for their homes;
- 137
- 138 • feature the ENERGY STAR mark(s) on Partner Web site and in other promotional materials. If  
139 information concerning ENERGY STAR is provided on the Partner Web site as specified by the  
140 ENERGY STAR Web Linking Policy (this document can be found in the Partner Resources section on  
141 the ENERGY STAR Web site at [www.energystar.gov](http://www.energystar.gov)), EPA may provide links where appropriate to  
142 the Partner Web site;
- 143
- 144 • ensure the power management feature is enabled on all ENERGY STAR qualified monitors and  
145 computers in use in company facilities, particularly upon installation and after service is performed;
- 146
- 147 • provide general information about the ENERGY STAR program to employees whose jobs are relevant  
148 to the development, marketing, sales, and service of current ENERGY STAR qualified product  
149 models;
- 150
- 151 • provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the  
152 program requirements listed above. By doing so, EPA may be able to coordinate, communicate,  
153 and/or promote Partner's activities, provide an EPA representative, or include news about the event in  
154 the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may be as simple  
155 as providing a list of planned activities or planned milestones that Partner would like EPA to be aware

156 of. For example, activities may include: (1) increase the availability of ENERGY STAR qualified  
157 products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2)  
158 demonstrate the economic and environmental benefits of energy efficiency through special in-store  
159 displays twice a year; (3) provide information to users (via the Web site and user's manual) about  
160 energy-saving features and operating characteristics of ENERGY STAR qualified products: and (4)  
161 build awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on  
162 one print advertorial and one live press event;  
163

- 164 • provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase  
165 availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and  
166 its message.



# ENERGY STAR® Program Requirements for Set-top-Boxes

## Eligibility Criteria DRAFT 1 – Version 2.0 June 29, 2007

172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214

1) **Definitions:** Below are the definitions of the relevant terms in this document.

### STB Types

All STB types can come as stand-alone tuners or as part of a larger device with other tuners and/or secondary functions such as, but not limited to, DVR and DVD playback/recording.

- A. **Digital STB:** A STB that receives and decodes digital video signals, presents the decoded video to a display and/or recording device via one or more analog and/or digital interfaces for consumption by an end user, which includes one or any combination of satellite, cable, terrestrial and/or IP receiving technologies. Source: CSA C380-06
- B. **Cable STB:** A STB whose principal function is to receive television signals from a broadband, hybrid/[fiber] coaxial, community cable distribution system and deliver them to a consumer display and/or recording device. Source: CSA C380-06 modified
- C. **Satellite STB:** A STB whose principal function is to receive television signals from satellites and deliver them to a consumer display and/or recording device. Source: CEA-2022 and CSA C380-06
- D. **Internet Protocol (IP) STB:** A STB whose principal function is to receive television/video signals encapsulated in IP packets and deliver them to a consumer display and/or recording device. Source: CSA C380-06

*Note: Only dedicated IP-based STBs provided as part of a service contract are covered under this Tier 1 specification. Future Tiers may consider IP products distributed under other scenarios.*

- E. **Digital Terrestrial STB:** Any STB whose principal function is to receive television signals over the air (OTA) and deliver them to a consumer display and/or recording device. Source: CEA-2022 and CSA C380-06
- F. **Analog Cable:** Any STB whose principal function is to provide cable reception but receives it only via analog (not digital) signals. Source: CEA-2022

### Components

- G. **Cable Card<sup>(TM)</sup>:** A plug-in card that complies with the ANSI/SCTE 28 interface [that] is inserted into a Digital Cable Ready device to enable the decryption of premium services and provide other network control functions. Also know as a “Card” or a “Point of Deployment” (POD module) Source: CEA-2022 modified

215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270

## Functions

- H. Base Function: For purposes of this specification, the primary function that defines the criteria that apply to a STB. The Base Function is one of the following: Cable, Satellite, IP or Terrestrial. (See Section 3 below).
- I. Additional Functions: Additional Functions consist of one or more of the following: Additional Tuners, Digital Video Recorder (DVR) and/or DVD Players and Recorders, High Definition Resolution (Cable and Satellite STBs only).

## Additional Functionalities

- J. Digital Video Recorder (DVR) / Personal Video Recorder (PVR): A device that records video in a digital format to a rewritable disk drive or other non-volatile storage media. The term covers DVR / PVR functions integrated in a STB; it does not include software for personal computers that enables video capture and playback to and from the computer's data storage.
- K. Additional Tuners: An additional tuner has a physically separate A/V input that can be used concurrently with the primary tuner; they need not be for the same source media type. Out-Of-Band tuners for DOCSIS and other similar types of technologies are not considered additional tuners. For example, a device with additional tuners has the ability to tune into two or more separate streams of video simultaneously and place those on separate outputs (outputs being either physical outputs, recording mechanisms or network based outputs).
  - a. Second, third, fourth, etc... tuner(s) of the same type as the Base Functions (e.g. the second tuner in a dual tuner Cable STB.)
  - b. Second, third fourth, etc... tuner(s) of a different type from the Base Functions (e.g. a terrestrial tuner integrated in a Satellite STB.)
- L. DVD Player: A device whose primary purpose is the decoding of digitized video signals on a DVD. . DVD (also known as "Digital Versatile Disc" or "Digital Video Disc") is an optical disc storage media format that can be used for data storage, including movies with high video and sound quality.
- M. DVD Recorder: A device whose primary purpose is the production or recording of digitized video/audio signals on a DVD
- N. High Definition Resolution: Video that is transmitted at resolutions greater than 480i/p. Credit for High Definition applies only to STBs with a Base Function of Cable or Satellite.

## Miscellaneous

- O. Game Console: A stand alone device whose primary use is to play video games.

*The primary input for game consoles are special hand held controllers rather than a mouse and keyboard used by conventional computers. Game consoles are also equipped with audio visual outputs for use with televisions as the primary display, rather than an external monitor or integrated display. These devices do not typically use a conventional operating system, but often perform a variety of multimedia functions such as: DVD/CD playback, digital picture viewing, and digital music playback. Source: ENERGY STAR Version 4.0 Computers specification Game consoles are addressed by the ENERGY STAR Version 4.0 Computers specification, and are not included in this Set-top Box specification.*

- P. Digital Television Adapter (DTA): Receives terrestrial, (over the air) digital signals and converts them to an analog output suitable for analog TVs. Does not provide digital signal output. The DTA category does not include converters that work with satellite or cable digital signals, nor does it

271 cover devices with multi-functionality such as a DVD player with digital to analog conversion  
272 capability. Source: ENERGY STAR Digital-to-Analog Converter Box specification.  
273 DTAs are addressed under the Version 1.0 ENERGY STAR specification for Digital-to-Analog  
274 Converter Boxes, and are not included in this Set-top box specification.  
275

276 Q. Cable, Satellite, and Telecom Service Providers: An entity that provides video (and possibly  
277 other) content to these subscribers with whom it has an ongoing financial relationship. A service  
278 provider in the context of ENERGY STAR is one that distributes to end users STBs covered by  
279 this specification under an agreement such as a lease or rental arrangement.  
280

### 281 **Operational Modes**

282  
283 R. Sleep: A state in which the device has greater power consumption, capability, and  
284 responsiveness than it does in the Off state, and has less (or similar) power consumption,  
285 capability, and responsiveness than it does it in the On state. Source: CEA-2022 For purposes of  
286 this specification a Sleep state initiated by a user (Sleep) is distinguished from a Sleep state that  
287 is machine initiated (Auto Power Down).  
288

289 S. On: A state in which the STB is actively delivering its principal functions and some or all of its  
290 applicable secondary functions Source: CEA-2022 and CSA 380-06  
291  
292

*Note: This specification employs a concept similar to, but not the same as, Secondary Function called  
"Additional Functions."*

293  
294 T. Auto Power Down: The capability to automatically switch from the On state to the Sleep or Off  
295 state after a period of time without user input, generally based on the amount of time the unit has  
296 remained "idle" from last active use (i.e., user input such as channel change, volume change,  
297 menu access, etc).  
298  
299

300 **2) Qualifying Products: In order to qualify as ENERGY STAR, STBs must be defined in**  
301 **Section 1 and meet the technical requirements in Section 3. The following devices that fall within the**  
302 **definition of an STB, or provide functions similar to STBs, do not qualify under this specification:**

303  
304 Game Consoles (See definition above)  
305 DTAs (See definition above)  
306 TVs  
307 IP set-top boxes that are not dependent on a dedicated service and/or provided as part of a  
308 service contract.  
309

310 **3) Energy Efficiency and Power Management Criteria: Only those products addressed by**  
311 **a Qualifying Product definition in Section 2 that meet the following criteria may qualify as ENERGY**  
312 **STAR. The criteria take the form of maximum allowable energy usage per year (kWh) as calculated in**  
313 **subsection below. Effective dates are provided in Section 6 of this specification.**  
314

### 315 **A) Calculated Total Energy Consumption Criteria**

316  
317 The criterion for ENERGY STAR qualified STBs is a calculated total energy consumption (in annual  
318 kWh). The criterion (herein called an "allowance") is an allowance for Base Function, plus allowances  
319 for specific additional functions present across a duty cycle. This duty cycle is further explained in  
320 Section 4.  
321

322 Annual Energy Allowance(kWh/yr) = Base Function Allowance  
323 + Additional Functions Allowance

Note: For set-top boxes, EPA is proposing to employ a Total Energy Consumption (TEC) approach as defined above. EPA believes there are several significant benefits from following this approach for STBs over traditional approaches such as establishing maximum Watt criteria for various power states, or setting prescriptive criteria for components or functionality. The main benefit is to assure energy savings while allowing manufacturers flexibility to meet the criteria with cost effective strategies.

**B) Base Function Allowance**

The Base Function shall be established as detailed below. A flow chart depicting this decision process is provided in Appendix A.

- a. If the STB meets the definition of Cable STB above, regardless of whether the cable reception is considered the “principal function” by the manufacturer or service provider, and/or the STB is capable of receiving cable service after installation of a Cable Card™, the Base Function is CABLE.
- b. If the STB Base Function is not CABLE, and the STB meets the definition of Satellite STB above, regardless of whether the satellite reception is considered the “principal function” by the manufacturer or service provider, the Base Function is SATELLITE.
- c. If the STB Base Function is not CABLE or SATELLITE, and the STB meets the definition of IP STB above, regardless of whether the IP reception is considered the “principal function” by the manufacturer or service provider, the Base Function is IP.
- d. If the STB Base Function is not CABLE, SATELLITE, or IP, and the STB meets the definition of Terrestrial STB above, regardless of whether the terrestrial reception is considered the “principal function” by the manufacturer or service provider, the Base Function is TERRESTRIAL.

**Table 2: Base Functions Annual Energy Allowance**

Base Functions	Annual Energy Allowance (kWh/yr)
Cable	TBD
Satellite	TBD
IP	TBD
Terrestrial	TBD

**C) Additional Functions Allowance**

The Additional Functions Allowance, if applicable, shall be determined using values from Table 3.

**Table 3: Additional Functions Annual Energy Allowance**

Additional Functions	Annual Energy Allowance (kWh/yr)
DVR	TBD
DVD Player / Recorder	TBD
DVD Player	TBD
Additional Tuners	TBD
High Definition Resolution (Cable & Satellite Only)	TBD

- o When only one Additional Function is present in the STB, the Additional Functions Allowance shall be equal to that for the function. For example, the Additional Functions Allowance for a standard definition STB with a DVR will be TBD.)



- 367                   o When two Additional Functions are present in the STB, the Additional Functions  
368 Allowance shall be TBD.  
369

370 *Note: Based on preliminary data, EPA anticipates that for STBs with two additional functions, the*  
371 *Additional Functions Allowance will be a percentage of the sum of the two allowances. EPA is seeking*  
372 *feedback on this approach.*

373  
374 *Note: ENERGY STAR recognizes the potential for savings from systems that can serve multiple TVs and*  
375 *requests feedback from stakeholders on possible ways of handling these types of systems. One possible*  
376 *solution to this could be the following:*

377  
378 *A Service Provider uses the same test procedure as when deploying one box to one TV system, but*  
379 *applies a standard multiplier for two and three TV systems. For example, a two TV system would be given*  
380 *an allowance equal to that of a one TV system allowance multiplied by some factor less than two. Note*  
381 *that this is not to suggest a per installation ENERGY STAR specification.*

#### 382 383 384 **D) Network Connectivity Requirements**

385  
386 STBs shall reduce the speed of any active 1 Gb/s Ethernet network links when transitioning to Sleep or  
387 Off.  
388  
389

#### 390 **4) Test Procedures:**

391  
392 **A) Product Testing Set-up, Procedures, and Documentation:** The specific instructions for  
393 testing the energy efficiency of STBs will be drawn from, but not limited to, the following:

- 394  
395                   – CSA-C380-06, Test procedure for the measurement of energy consumption of set-top boxes  
396 (STBs)  
397                   – CEA-2022, Digital STB Active Power Consumption Measurement  
398                   – CEA-2013-A, Digital STB Background Power Consumption  
399

400 The test results produced by the procedure shall be used as the primary basis for determining ENERGY  
401 STAR qualification. Manufacturers are required to perform tests and self-certify those models that meet  
402 the ENERGY STAR guidelines.  
403  
404

405 *Note: It is EPA's intention to use existing domestic and international test procedures (as applicable) with*  
406 *the goal of furthering international harmonization of energy-related test procedures and possibly voluntary*  
407 *program requirements.*

#### 408 409 410 **B) Total Energy Consumption (TEC) Assessment**

411  
412 Total Energy Consumption is an assessment tool that provides flexibility to approach the issue of  
413 energy efficiency while retaining a comparable metric to assess performance. In this specification on  
414 and sleep mode power levels will be weighted by the number of hours a defined typical user spends  
415 using a device in active mode, and the number of hours the device will spend in sleep or auto power  
416 down. The product of this will be a single energy value representing the energy usage of the device  
417 over the course of an entire year.  
418

*Note: The procedure below is based on CSA-C380-06 and standard procedures for calculating annual*  
*energy consumption. This procedure considers three possible power states: On, Sleep and Auto Power*  
*Down.*

Note: An enhanced test procedure based on a more detailed categorization of power states has been proposed by industry representatives and is attached. This proposal addresses cable and satellite STBs and in the near term, will be amended to consider IP-based products.

EPA seeks feedback from stakeholders on these procedures especially as to:

- o What level of additional precision can be gained from the more detailed test proposed?
- o What type of equipment, beyond power meters, is required to perform the test procedure?
- o Does the test procedure require substantial exceptions to test requirements using CSA-C380-06?
- o Will the test procedures need to be amended in the next few years as STB products evolve?

419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457

To determine if a STB meets the specification criteria (Annual Energy Allowance) the Total Energy Consumption of the STB shall be calculated as follows. If the TEC assessed for the product is less than the Annual Energy Allowance, the product meets the criteria.

Total Energy Consumption (kWh/yr) =

$$(W_{ON} * H_{ON} + W_{SLP} * H_{SLP} + W_{Auto PD} * H_{Auto PD}) * 365/1000$$

Where:

$W_{ON}$ ,  $W_{SLP}$ ,  $W_{Auto PD}$ , are the power in Watts measured for the ON, SLEEP and AUTO POWER DOWN power states. Watt ON, SLEEP, and AUTO POWER DOWN are multiple ON, SLEEP, and AUTO POWER DOWN states but for simplicity, are represented by one variable each in this equation.

$H_{ON}$ ,  $H_{SLP}$ ,  $H_{Auto PD}$ , are the hours per day measured for the ON, SLEEP and AUTO POWER DOWN power states. Hour ON, SLEEP, and AUTO POWER DOWN are multiple time periods of activity but for simplicity, are represented by one variable each in this equation.

### **C) On Power Measurements**

To follow CSA-C380-06 Section 4.6.2. "ON State Test Method" as amended. Amendments to be defined following final determination of approach for testing products.

### **D) Sleep Power Measurements**

To follow CSA-C380-06 Section 4.5 "Standby State Test Method" Amendments to be defined following final determination of approach for testing products.

### **E) Auto Power Down Power Measurements**

To follow CSA-C380-06 Section 4.5 "Standby State Test Method" Amendments to be defined following final determination of approach for testing products.

458 **F) Electronic Program Guide and System Update Requirements**

459

460 STBs may exit Sleep mode in order to scan for program and system information or private data (PSIP).  
 461 STBs may exit the Sleep mode for no longer than one hour in an eight hour period that the device would  
 462 otherwise remain in Sleep mode.

463

464 **G) Auto Power Down And Other Sleep Event Requirements**

465

466 For an STB for which the Partner claims Auto Power Down functionality or other automatically initiated  
 467 sleep capability, for purposes of calculating the total energy consumption in Section 4, the following  
 468 requirements must be met:

469

470 1. For STBs with Auto Power Down capability, the STB must be shipped from the manufacturer with  
 471 the auto power down setting at four hours or less of inactivity. Eligible equipment may allow the  
 472 current program to complete before switching to the Sleep state. The default energy related  
 473 settings may not be altered during the initial user set-up process and shall persist unless the user  
 474 chooses at a later date to manually: a) disable the "automatic switching to Sleep state" capability,  
 475 or b) adjust the default time period from four hours or less to some other value.

476

477 2. For other types of automatically initiated sleep events, the period of sleep, unless interrupted by  
 478 the user, shall be at least TBD hours. For example, a STB set to go to sleep automatically at 2:00  
 479 a.m. should remain in sleep mode until Y a.m. unless interrupted by the user.

480

481 3. STBs may come out of an automatically initiated Sleep mode in order to scan for program and  
 482 system information or private data (PSIP). STBs may exit the Sleep mode for no longer than one  
 483 hour in an eight hour period that the device would otherwise remain in Sleep mode.

484

485

486 **H) Total Energy Consumption (TEC) Hours**

487

488

<b>Table 5: Total Energy Consumption (TEC) Assessment Hours</b>		
	No Auto Power Down Capability (Hours)	With Auto Power Down Capability (Hours)
Hours On ( $H_{on}$ )	TBD	TBD
Sleep ( $H_{SLP}$ )	TBD	TBD
Auto Power Down ( $H_{Auto PD}$ )	0	TBD

489

*Note: Table 5 provides a simple model of duty cycles for STBs that is intended to work with Wattage readings obtained following the CSA-C380-06 test procedures. For STB models employing an auto power down capability meeting the requirements of Section 3G above, use TBD hours per day in the auto power down state when calculating the TEC for the STB.*

*An alternative procedure based on a more detailed categorization of power states and duty cycle, proposed by industry representatives, is attached.*

490

491

492 **I) Submittal of Qualified Product Data to EPA:** Partners are required to report data on those  
 493 models that meet the ENERGY STAR guidelines to EPA. The test results must be reported to EPA using  
 494 the Set-top Box Version 2.0 Qualifying Product Information (QPI) Form or Online Product Submittal Tool  
 495 (OPS).

496

497

498 **5) User Interface:**

499  
500 Power Control User Interface: Although not mandatory, manufacturers are strongly recommended to  
501 design products in accordance with the Power Control User Interface Standard — IEEE 1621 (formally  
502 known as “Standard for User Interface Elements in Power Control of Electronic Devices Employed in  
503 Office/Consumer Environments”). Compliance with IEEE 1621 will make power controls more  
504 consistent and intuitive across all electronic devices. For more information on the standard see  
505 <http://eetd.LBL.gov/Controls>.

506  
507  
508 **6) Effective Date:** The date that manufacturers may begin to qualify products as ENERGY STAR  
509 under this Version 2.0 specification will be defined as the *effective date* of the agreement. The ENERGY  
510 STAR specification for STBs (Version 2.0) Tier 1 is effective September 1, 2009. Any previously executed  
511 agreement on the subject of ENERGY STAR qualified set-top boxes shall be terminated effective  
512 February 2, 2005.

- 513  
514 1. Qualifying and Marking products under the Tier 1 Version 2.0 specification: All products, including  
515 models originally qualified under Version 1.0, with a date of manufacture on or after September 1,  
516 2009, must meet the new (Version 2.0) requirements in order to qualify for Energy Star. The date  
517 of manufacture is specific to each unit and is the date (e.g., month and year) on which a unit is  
518 considered to be completely assembled.

519  
520 *Note: ENERGY STAR is proposing a 2009 effective date based on preliminary data that*  
521 *demonstrates that there is little variation in energy use among currently available products. By*  
522 *establishing ENERGY STAR requirements now for a 2009 effective date, EPA is attempting to give*  
523 *manufacturers the design time needed to make more significant changes when it comes to products’*  
524 *energy consumption.*

525  
526 *EPA will consider the development of a Tier 2 for this product category should technology or market*  
527 *changes identify additional energy savings opportunities.*

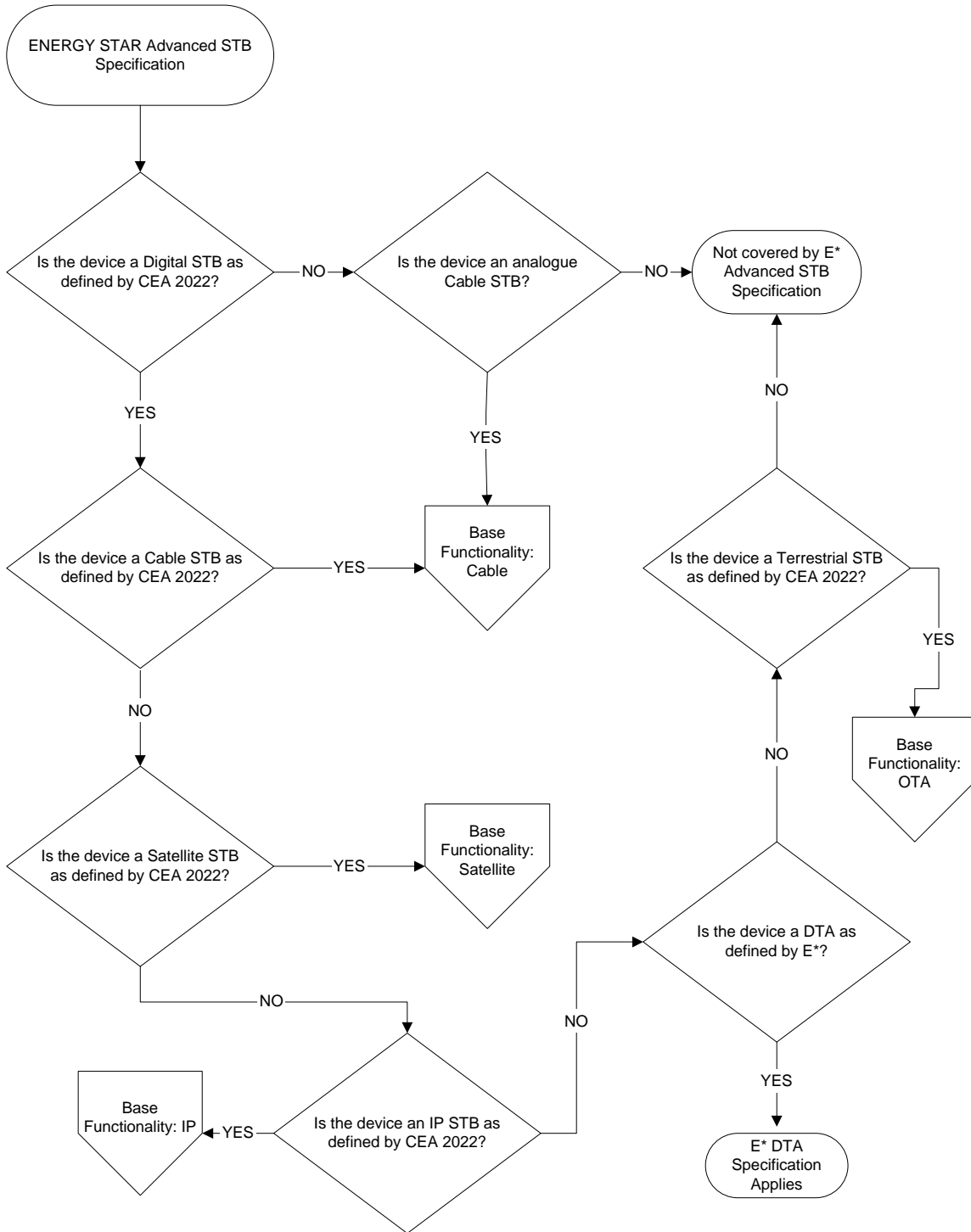
- 528  
529 2. Elimination of Grandfathering: EPA will not allow grandfathering under this Version 2.0 ENERGY  
530 STAR specification. **ENERGY STAR qualification under previous Versions is not**  
531 **automatically granted for the life of the product model.** Therefore, any product sold,  
532 marketed, or identified by the manufacturing partner as ENERGY STAR must meet the current  
533 specification in effect at the time of manufacture of the product.

534  
535 **7) Future Specification Revisions:** EPA reserves the right to revise the specification should  
536 technological and/or market changes affect its usefulness to consumers or industry or its impact on  
537 the environment. In keeping with current policy, revisions to the specification will be discussed with  
538 stakeholders. In the event of a specification revision, please note that ENERGY STAR qualification is  
539 not automatically granted for the life of a product model. To qualify as ENERGY STAR, a product  
540 model must meet the ENERGY STAR specification in effect on the model’s date of manufacture.

541  
542  
543

### APPENDIX A

Figure 1: Determination of Base Functions



544