



# ENERGY STAR® Program Requirements Product Specification for Telephony

## Draft 2 Test Method Rev. Dec-2012

### 1 OVERVIEW

The following test method shall be used for determining product compliance with requirements in the ENERGY STAR Eligibility Criteria for Telephony.

### 2 APPLICABILITY

ENERGY STAR test requirements are dependent upon the features of the product under evaluation. The following guidelines shall be used to determine the applicability of each section of this document:

- The test procedures in Section 6.2 shall be performed on all products.
- The test procedures in Section 6.3 shall be performed on all products except Wireless Voice over Internet Protocol (VoIP) Telephones and Additional Handsets.
- The test procedures in Section 7 shall be performed on VoIP and Hybrid Telephones with Data Switch Ports.
- Telephones with Video Calling capability shall not be included in the Version 3.0 ENERGY STAR Program for Telephony.

**Note:** Stakeholders requested that Telephones capable of transmitting full-motion video be included under the scope of the Version 3.0 ENERGY STAR Program for Telephony. DOE and EPA have decided not to include video-capable Telephones in this version but may consider them for inclusion in the next revision cycle of the Telephony Program. DOE and EPA have therefore updated relevant definitions to make it clear that video-capable Telephones are excluded.

### 3 DEFINITIONS

Unless otherwise specified, all terms used in this document are consistent with the definitions in the ENERGY STAR Eligibility Criteria for Telephony.

**Note:** For initial discussion, the acronyms and definitions below have been included in the test method. Some definitions are based on those in the current eligibility criteria for telephony, while others are new and have been included to permit testing of VoIP phones. All definitions and acronyms will eventually be moved to the specification.

#### A) Product Types:

1) Telephone: A commercially available electronic product whose primary purpose is to transmit and receive sound over a distance using a voice or data network.

##### a. Sound Transmission Mechanism:

i. Analog Telephone: A Telephone or component of a Telephone system that ultimately converts sound into analog waveforms for transmission through an RJ11 connection.

ii. Voice over Internet Protocol (VoIP) Telephone: A Telephone or component of a Telephone system that ultimately converts sound into Internet Protocol data packets for transmission through an Ethernet connection.

- iii. Hybrid Telephone: A Telephone or component of a Telephone system that has the ability to ultimately convert sound into both analog waveforms for transmission through a RJ11 connection and Internet Protocol data packets for transmission through an Ethernet connection.
  - iv. Cellular Telephone: A Telephone that converts sound into multiple-access (e.g., Code-Division Multiple Access (CDMA)) packets for transmission to a cellular.

Configuration:

  - i. Cordless Telephone: A Telephone with a base station and a handset. The charging base of a Cordless Telephone or its External Power Supply is designed to plug into a wall outlet, and although the Cordless Telephone base has a permanent physical connection to the network, there is no physical connection between the portable handset and the network.
  - ii. Corded Telephone: A Telephone with a permanent physical connection between the handset and the network.
  - iii. Conference Telephone: A Telephone without a handset that utilizes a speakerphone for all communications and is primarily used for conference calls.
  - iv. Additional Handset: A Telephone consisting of a handset, charger, and battery, designed for use with a multi-handset Telephone system.
  - v. Wireless Telephone: A Telephone consisting of a handset, charger, and battery that connects to a network via an IEEE 802.11 (WiFi) connection.

**Note:** DOE and EPA have refined the Product Type definitions so that Telephones may be categorized by two non-mutually exclusive characteristics: sound transmission mechanism and configuration, and propose that the following products be under consideration for inclusion in the Version 3.0 specification. DOE and EPA welcome further stakeholder comment on the applicability of the test method to these proposed covered product types.

		Sound-only Transmission			Sound and Video Transmission
		Analog	VoIP/Hybrid	Cellular	
Configuration	Additional Handset	Currently Covered under V2.1		<u>Not Under Consideration</u> (Proposed for inclusion under ENERGY STAR Battery Charging Systems Program)	
	Cordless				
	Corded	w/ External Power Supply	<u>Under Consideration</u>		
		w/o External Power Supply	<u>Not Under Consideration</u>		
	Conference		<u>Under Consideration</u>		
	Wireless		<u>Not Under Consideration</u> (No products in this space)		
				<u>Not Under Consideration</u>	

**Note:** Based on stakeholder comment, EPA and DOE have included a new definition for Wireless Telephones, as they are under consideration for inclusion in the Version 3.0 ENERGY STAR Program for Telephony. EPA and DOE are interested in stakeholder feedback regarding the proposed definition.

56    B) Operational Modes:

- 57    1) Partial On (Sleep) Mode: A mode that may persist for an indefinite time when a Telephone is  
58       connected to a power source and a telephone line or other physical or wireless network  
59       connection and is capable of receiving a call. The Telephone is not receiving or transmitting  
60       sound, and the handset is “on the hook” and the speakerphone is not engaged.
- 61    2) On Mode: Comprises the Call Origination and Active Modes.
- 62       a. Call Origination Mode: The mode in which the Telephone is connected to a power source  
63       and is “off the hook”. Though not necessarily transmitting and receiving data, a dial tone  
64       is present.
- 65       b. Active Mode: The mode in which the Telephone is connected to a power source and a  
66       telephone line or other physical or wireless network connection and is receiving and/or  
67       transmitting sound and/or playing/recording a message and the handset is “off the hook”  
68       or the speakerphone is engaged.
- 69    3) Off Mode: The mode in which the Telephone is connected to a power source but is not  
70       performing any Partial On or On Mode functions.

71    **Note:** In an effort to harmonize with the upcoming IEC 62542—Standardization of environmental aspects  
72       - Glossary of terms, EPA and DOE propose to retain Partial On (Sleep) Mode as specified in the Draft 1  
73       Test Method but have made the above revisions to the Mode definitions to minimize confusion with  
74       industry terms. DOE and EPA welcome stakeholder feedback regarding the proposed Mode term  
75       updates.

76    Idle Mode has traditionally been used by industry to describe an “on-hook” state. To further avoid  
77       confusion, EPA and DOE have decided to rename Idle (Off-hook) Mode used in the Draft 1 Test Method  
78       to Call Origination Mode in the Draft 2 Test Method.

79    Additionally, stakeholders commented that using the term Operation Mode as one of the group of terms  
80       named Operational Modes was confusing. Therefore, EPA and DOE are proposing to change the term  
81       Operation Mode to Active Mode, as this is the term used by industry. Stakeholder comment is welcome  
82       on all changes to Operational Mode term changes.

83    DOE is also interested in stakeholder feedback regarding the number of products, specifically Conference  
84       Telephones that are capable of entering Off Mode. As stated above, Off Mode occurs when the unit is  
85       plugged in but is performing no functions and is unable to receive a call. DOE is also interested in  
86       feedback regarding whether or not Off Mode is utilized for the Telephones during normal usage.

87    C) Functionalities:

- 88    1) Video Calling: The capability of a Telephone to convert both full-motion video and sound into  
89       Internet Protocol data packets for transmission through an Ethernet connection.
- 90    2) Charging: The capability of a Telephone to charge a cordless handset battery.

91    **Note:** EPA and DOE have removed Charging Mode from the Operational Modes and made Charging  
92       functionality, because they believe charging may occur during any of the Operational Modes and should  
93       not be an exclusive Mode by itself.

- 94    3) Digital Answering Technology: The capability to receive a call, play an outgoing message, and  
95       record an incoming message.

- 96        4) Data Switch Port: The capability to provide data connectivity to a computer Ethernet network  
97                  interface controller (NIC).

98        5) High Resolution Display: A function by which a device provides a pixel-based visual display with  
99                  resolution greater than or equal to 480x234 pixels, including an LCD panel. This definition does  
100                 not include Status Displays.

101       6) Status Display: A function by which a product provides a visual display of less than 480x234 pixel  
102                 resolution, including a back-lit alphanumeric clock or channel indicator. This definition does not  
103                 include single indicator lamps.

**Note:** EPA proposes the above definitions for categorizing Telephone display types and welcomes comments on their applicability to all Telephone products.

- 104      7) Multi-Handset Technology: The capability of supporting multiple additional handsets.  
105      8) Spread Spectrum Technology (SST): A communication technique whereby the carrier frequency  
106            of a signal is automatically and rapidly changed to provide enhanced transmission range,  
107            extendable portable numbers, and additional security. This definition includes direct sequence  
108            (e.g., digital spread spectrum or DSS) and frequency hopping.

**109 D) Telecommunications and Test Equipment:**

- 110 1) Router: A network device that determines the optimal path along which network traffic should be  
111 forwarded as its primary function. Routers forward packets from one network to another based on  
112 network layer information. Devices fitting this definition may provide both Router functionality and  
113 wireless network capability.

114 2) Switch: A network device that filters, forwards, and floods frames based on the destination  
115 address of each frame as its primary function. The Switch operates at the data link layer of the  
116 Open Systems Interconnection (OSI) model.

117 3) Power Sourcing Equipment (PSE): An electronic device, such as a Switch or a Midspan that  
118 sources (supplies) the power on the Ethernet cable for PoE devices. PoE Switches supply power  
119 and terminate the data link. PoE Midspans inject power and are placed between a non-PoE  
120 switch and the device being powered but provide no additional network functionality.

## 122 E) Additional Terms:

- 123        1) External Power Supply (EPS): A component contained in a separate physical enclosure external  
124        to the Telephone product casing and designed to convert line voltage ac input from the mains to  
125        lower ac or dc voltage(s) for the purpose of powering the Telephone. An External Power Supply  
126        shall connect to the Telephone product via a removable or hard-wired male/female electrical  
127        connection, cable, cord or other wiring.

128        2) Internet Protocol (IP): The communications protocol used for the transmission of data packets  
129        across multiple networks (e.g., the Internet) as defined by the Internet Engineering Task Force<sup>1</sup>  
130        (IETF).

<sup>1</sup> IETF, RFC 791: Internet Protocol – Defense Advanced Research Projects Agency (DARPA) Internet Program Protocol Specification <<http://tools.ietf.org/html/rfc791>>

- 131       3) Voice over Internet Protocol (VoIP): The transmission of voice and other sound and/or full-motion  
132       video over a network using the Internet Protocol where sound is converted into IP data packets  
133       by the device for transmission over a network that uses IP. This network may be local or the  
134       Internet. Devices using VoIP do not plug into a traditional telephone jack but connect to a network  
135       through an access point, Ethernet or WiFi.
- 136       4) Energy Efficient Ethernet (EEE): A technology which enables reduced power consumption of  
137       Ethernet interfaces during times of low data throughput. Specified by *IEEE 802.3az*.
- 138       5) Power over Ethernet (PoE): A technology which enables transfer of electrical power, along with  
139       data, to network end point devices through an Ethernet cable. Currently specified by *IEEE 802.3-*  
140       *2012*.

141       **Note:** Stakeholders commented that IEEE 802.3 was under revision when ENERGY STAR Version 3.0  
142       Telephony Draft 1 Test Method was published. The revision to IEEE 802.3, IEEE 802.3-2012, was ratified  
143       on September 5, 2012. DOE has updated the definition for PoE to reference this newest version of IEEE  
144       802.3. DOE and EPA welcome stakeholder feedback regarding this change.

145       Stakeholders also commented that Power over HDBaseT (PoH) should be included in the scope of the  
146       Draft 2 Test Method. DOE is currently unaware of PoH being used by any Telephones covered under the  
147       scope defined in the Draft 2 Test Method. As such, DOE has not included PoH in the Draft 2 Test  
148       Method. However, DOE and EPA are requesting information from stakeholders regarding PoH  
149       Telephones.

- 150       6) Unit Under Test (UUT): The specific sample of a representative model undergoing measurement  
151       which includes the base product (the Telephone) and any Additional Handsets and accessories  
152       packaged with it, or an Additional Handset with any accessories packaged with it, depending on  
153       the product type being tested for qualification.

154       **Note:** Stakeholders asked whether Additional Handsets counted as accessories under the definition of  
155       UUT in the Telephony Test Method Draft 1 (Rev. June 2012). The word “accessories” in the Draft 1 Test  
156       Method definition of UUT was not intended to include Additional Handsets sold and packaged with the  
157       base station. Accessories were intended to mean the other items shipped with the base station, excluding  
158       the Additional Handsets and their charging bases. DOE and EPA have proposed the above update to the  
159       definition of UUT to clarify. Stakeholder feedback is welcome regarding the proposed update.

- 160       F) Product Family: A group of product models that are (1) made by the same manufacturer, (2) subject  
161       to the same ENERGY STAR qualification criteria, and (3) of a common basic design. Product models  
162       within a family differ from each other according to one or more characteristics or features that either  
163       (1) have no impact on product performance with regard to ENERGY STAR qualification criteria, or (2)  
164       are specified herein as acceptable variations within a Product Family. For Telephones, acceptable  
165       variations within a Product Family include:  
166           1) Color,  
167           2) Housing,  
168           3) Number of Additional Handsets.

- 169       G) Acronyms:
- 170           1) ac: Alternating Current  
171           2) C: Celsius  
172           3) CAT 5/6: Category 5 or 6 cable, the standard cables used for Ethernet connections  
173           4) dc: Direct Current  
174           5) EPS: External Power Supply  
175           6) Hz: Hertz

- 176        7) KHz: Kilohertz  
177        8) IEC: International Electrotechnical Commission  
178        9) IP: Internet Protocol  
179        10) PoE: Power over Ethernet  
180        11) PSE: Power Sourcing Equipment  
181        12) SST: Spread Spectrum Technology  
182        13) UUT: Unit Under Test  
183        14) V: Volts  
184        15) VoIP: Voice over Internet Protocol  
185        16) W: Watts

## 186      **4 TEST SETUP**

### 187      **4.1 Test Setup for All Products**

- 188      A) Test Setup and Instrumentation: Test setup and instrumentation for all portions of this method shall  
189      be in accordance with the requirements of IEC 62301, Ed. 2.0, "Household Electrical Appliances –  
190      Measurement of Standby Power," Section 4, "General Conditions for Measurements", unless  
191      otherwise noted in this document. In the event of conflicting requirements, the ENERGY STAR Test  
192      Method shall take precedence.
- 193      B) Input Power:
- 194        1) Products intended to be powered from a PoE source shall be connected to a PSE voltage source  
195        of  $53 \pm 2$  volts during testing. The PSE voltage source must be compliant with IEEE 802.3-2012.  
196            a. Lower voltages required for detection and classification of Powered Devices (PDs) may be  
197            used prior to testing.

198      **Note:** Stakeholders commented that restricting the input voltage for PoE units to  $48 \pm 2$  volts prohibits the  
199      use of Type 2 PSEs for testing. DOE and EPA have updated the input voltage requirements to  $53 \pm 2$  to  
200      allow for the use of Type 2 PSEs during testing, while still providing stringent power requirements and  
201      allowing for flexibility in the developing market of PoE measuring equipment. Type 1 PSEs will still be  
202      able to operate under these voltage requirements.

203      Stakeholders also commented that some PSEs must use voltages lower than the specified range during  
204      detection and classification of PDs for compliance with IEEE 802.3. DOE has updated the input power  
205      requirements to allow for lower voltages during detection and classification prior to testing. Stakeholders  
206      are encouraged to comment on these updates. DOE is also interested in stakeholder feedback regarding  
207      whether any PoE products would not operate within the provided voltage range.

- 208        2) Products intended to be powered from ac mains shall be connected to a voltage source  
209        appropriate for the intended market, as specified in Table 1.

**Table 1: Input Power Requirements for Ac-Powered Products**

<b>Market</b>	<b>Voltage</b>	<b>Voltage Tolerance</b>	<b>Maximum Total Harmonic Distortion</b>	<b>Frequency</b>	<b>Frequency Tolerance</b>
North America, Taiwan	115 V ac	+/- 1.0 %	2.0 %	60 Hz	+/- 1.0 %
Europe, Australia, New Zealand	230 V ac	+/- 1.0 %	2.0 %	50 Hz	+/- 1.0 %
Japan	100 V ac	+/- 1.0 %	2.0 %	50 Hz or 60 Hz	+/- 1.0 %

- 211 C) Ambient Temperature: Ambient temperature shall remain at  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , for the duration of the test.
- 212 D) Relative Humidity: Relative humidity shall remain between 10% and 80%, for the duration of the test.
- 213 E) Ac Power Meter: When measuring ac power, power meters shall possess the following attributes:
- 214 1) Crest Factor:
- 215 a. An available current crest factor of 3 or more at its rated range value; and
- 216 b. Lower bound on the current range of 10 mA or less.
- 217 2) Minimum Frequency Response: 3.0 kHz
- 218 3) Minimum Resolution:
- 219 a. 0.01 W for measurement values less than 10 W;
- 220 b. 0.1 W for measurement values from 10 W to 100 W; and
- 221 c. 1.0 W for measurement values greater than 100 W.
- 222 4) Measurement Accuracy:
- 223 a. Power measurements with a value greater than or equal to 0.5 W shall be made with an uncertainty of less than or equal to 2% at the 95% confidence level.
- 224 b. Power measurements with a value of less than 0.5 W shall be made with an uncertainty of less than or equal to 0.01 W at the 95% confidence level.
- 225 F) PoE Power Meter: When measuring PoE, power meters shall possess the following attributes:
- 226 1) Cable Compatibility: Capable of measuring Power over Ethernet connections directly from the Category 5 or 6 (CAT5/6) cable, regardless of the PoE method used (i.e., Mode A or Mode B).
- 227 a. Only PoE methods covered under IEEE 802.3 shall be used during testing.
- 228 2) Enables Ethernet link and packet traffic flow to UUT from a link partner at all network speeds at which the UUT is capable.
- 229 3) Acts as a PSE or allows another PSE to source power to the UUT.

230 **Note:** DOE has updated the PoE power meter requirements to allow for the use of meters that both source the power to and measure the power consumption of the UUT, as DOE did not want to preclude the use of this type of equipment during testing. Stakeholders are encouraged to comment on the new PoE power meter requirements.

231 DOE has also prohibited the use of PoE methods that are not covered under IEEE 802.3 such as all four Ethernet cable pairs to provide power. Stakeholders are encouraged to comment on the proposed change.

- 241       4) Minimum Resolution:  
242           a. 0.01 W for measurement values less than 10 W;  
243           b. 0.1 W for measurement values from 10 W to 100 W; and  
244           c. 1.0 W for measurement values greater than 100 W.  
245       5) Measurement Accuracy:  
246           a. Power measurements shall have an accuracy of less than or equal to  $\pm$  (2% + 0.1 W).  
247       6) Cable Length: A one meter CAT 5/6 cable shall be used between the power meter and the Unit  
248           Under Test (UUT) for all testing.

## 249      **5 TEST CONDUCT**

### 250      **5.1 Test Conduct for All Products**

- 251       A) As-shipped Condition: The UUT shall be in new condition and shall be tested in its “as-shipped”  
252           condition including, but not limited to, display brightness settings.  
253       B) Battery-powered Products: If the UUT contains rechargeable batteries, or can be integrated with  
254           another device that contains rechargeable batteries, all batteries shall be fully charged prior to the  
255           start of testing and shall remain in place for the duration of testing.  
256       C) Additional Handsets and Accessories: All UUTs shall be tested in two configurations:  
257           1) With only the base and no Additional Handsets or accessories connected or set up, and  
258           2) With all Additional Handsets and accessories, shipped with the unit, connected and set up in their  
259           default configuration  
260           a. Additional Handsets and the base shall be placed on non-conducting surfaces, at least 1.2  
261           meters above the floor. Additional handsets shall be placed  $3 \pm 0.1$  meters from the base with  
262           no obstacles between them.  
263           b. Additional Handsets set up during testing shall remain in Partial On Mode for the duration of  
264           testing.  
265           c. When testing a UUT with Additional Handsets set up, only the power consumption of the  
266           base unit should be measured.  
267           d. The model name and number of all Additional Handsets and accessories used during testing  
268           shall be reported.

269      **Note:** Stakeholders recommended that the test method specify the number of Additional Handsets that  
270           should be in Active Mode when set up. DOE believes that using one handset at a time most accurately  
271           reflects normal usage and has clarified the test method to state that all Additional Handsets shall remain  
272           in Partial On Mode during all testing. DOE also clarified that only the power consumption of the base unit  
273           should be measured when testing with Additional Handsets. Stakeholders are encouraged to comment on  
274           DOE's assumption and the clarifications proposed above.

275      Additionally, DOE is proposing to require that Additional Handsets be placed  $3 \pm 0.1$  meters from the base  
276           unit, as some units can alter their power consumption and transmission power based on the cordless  
277           handset location relative to the base unit. The proposed update ensures that phones are tested in the  
278           same manner across all labs.

- 279       D) VoIP Server: Any standard configuration and/or equipment for creating a VoIP network is permitted.  
280           The UUT shall have a dial tone and be capable of receiving and making a phone call within the local  
281           VoIP network. A valid VoIP route to outside the local VoIP server is not required.  
282           1) The VoIP Server and all other network equipment shall be able to support the highest network  
283           speed at which the UUT is capable of operating.

- 284 E) Hybrid Telephones: Hybrid Telephones shall be tested as VoIP Telephones.
- 285 1) If a Hybrid Telephone ships with an EPS or connects directly to the mains, it shall be tested as an  
286 ac powered unit.
- 287 2) Otherwise, it shall be tested as a PoE unit.

## 288 **6 TEST PROCEDURES FOR ALL PRODUCTS**

### 289 **6.1 UUT Preparation**

- 290 A) Set up the UUT in accordance with its instructions for use, except where these conflict with the  
291 requirements of this test method. If no instructions for use are available, then factory or "default"  
292 settings shall be used.
- 293 B) PoE Powered Units:
- 294 1) Connect the UUT to the PoE power meter and connect the PoE power meter to a port on a suitable  
295 Switch. There shall be no Midspans between the power meter and UUT. A suitable  
296 Switch is defined as a Switch that:
- 297 a. Supports the maximum network speed of the UUT's network connection.
- 298 b. Supports all modes of PoE that the Telephone can support, unless PoE power is supplied by  
299 the PoE power meter.
- 300 2) Units that can utilize an alternate power source, as well as PoE, shall be tested using the PoE  
301 connection.
- 302 3) Set up the Switch according to manufacturer instructions and connect it to the VoIP Server.
- 303 4) Connect a second VoIP Telephone that is compatible with the network to the Switch (for Active  
304 Mode testing).
- 305 5) Configure the VoIP Server and both Telephones to prepare for making and receiving calls locally  
306 to the VoIP Server and the VoIP system the server implements.
- 307 a. Record the manufacturer and model number of the VoIP Server.
- 308 b. Set the network speed to the UUT's highest supported speed.
- 309 c. In the event that a VoIP Server setting does not have a default and is not specified in this test  
310 method, the setting shall be set according to the tester's discretion and recorded.
- 311 C) Ac Powered Units:
- 312 1) Set up the UUT in its standard configuration, utilizing any included EPSSs, if applicable. Connect  
313 an approved power meter to an ac line set to the appropriate voltage and frequency as specified  
314 in Table 1.
- 315 2) Plug the UUT into the measurement outlet on the power meter. No power strips or uninterruptible  
316 power supply units shall be connected between the UUT and the meter.
- 317 3) Connect the UUT to a suitable external telephone jack for Analog Telephones or a suitable VoIP  
318 Server for Hybrid and Wireless VoIP Telephones.
- 319 a. Additional Handsets shall be connected to a multi-handset Telephone system and be capable  
320 of making calls.
- 321 b. In the case that a working telephone line is not available, a Ringdown Simulator may be used  
322 as a replacement. Another Telephone must be connected to the Ringdown Simulator.
- 323 c. For Wireless VoIP Telephones, set up a WiFi network according to manufacturer instructions  
324 and connect the UUT to the WiFi network. The WiFi network shall be connected to a VoIP  
325 Server.

326        4) The UUT shall be capable of making a call across either the public switched telephone network, a  
327              Ringdown Simulator, or a VoIP network, for Wireless IP Telephones and Hybrid Telephones.

## 328        **6.2 Partial On Mode Measurement**

329        A) For UUTs with cordless handsets:

330        1) Place the handset with a fully charged battery in the charge cradle at least 2 hours prior to the  
331              beginning of testing.

332        a. For Wireless VoIP Telephones, the handset shall be placed on the battery charger during  
333              testing.

334        2) Ensure the UUT is in the Partial On Mode.

335        3) If the UUT can be placed in Call Origination Mode while the handset is in the cradle:

336        a. Place the UUT in Call Origination Mode for less than 1 minute.

337        b. Confirm the presence of a dial tone.

338        c. Return the UUT to Partial On Mode.

339        4) If the UUT cannot be placed in Call Origination Mode while the handset is in the cradle:

340        a. Remove the handset from the cradle.

341        b. Confirm the presence of a dial tone.

342        c. Return the handset to the cradle, within one minute of removing it, and the UUT to the Partial  
343              On Mode.

344        d. Wait 10 minutes.

345        5) Measure and record the ac input voltage and frequency.

346        6) Set the meter to begin accumulating true power values at a rate greater than or equal to  
347              1 reading per second. Accumulate power values for 2 hours and record the average (arithmetic  
348              mean) value.

349        B) For UUTs without cordless handsets:

350        1) Ensure that the UUT is in the Partial On Mode.

351        2) Verify that there is a dial tone, then return the Telephone to the "on the hook" configuration.

352        3) Measure and record the ac input voltage and frequency.

353        4) Wait 10 minutes, then set the meter to begin accumulating true power values at a rate greater  
354              than or equal to 1 reading per second. Accumulate power values for 10 minutes and record the  
355              average (arithmetic mean) value.

356        **Note:** In the Draft 1 Test Method, DOE requested stakeholder feedback regarding the 5 minute  
357              measurement for the Partial On Mode. Stakeholders commented that many Cordless Telephones go  
358              through charging cycles that last significantly longer than 5 minutes, making the 5 minute measurement  
359              unrepresentative of the actual power consumption of these types of Telephones. Stakeholders further  
360              commented that some charging cycles occur regardless of the status of the handset, while others reset  
361              based on when the handset was placed into the charging cradle. As such, DOE has proposed a separate  
362              test method for units with cordless handsets that ensures batteries are fully charged, and which includes  
363              a longer measurement period (2 hours) to account for charging cycles. Stakeholders are encouraged to  
364              comment on the proposed Partial On Mode test method for units with cordless handsets.

## 365        **6.3 Active Mode Measurement**

366        A) For all UUTs except Wireless Voice over Internet Protocol (VoIP) Telephones and Additional  
367              Handsets:

- 368        1) Ensure the UUT is in the Partial On Mode.  
369        2) Disable any features that would cause the UUT to disconnect or time out during the Active Mode  
370              test. If such a feature cannot be disabled, shorten the stabilization time to permit a 10 minute  
371              measurement period.  
372        3) Verify that there is a dial tone.  
373        4) Sound Volume and Muting: For Active Mode testing, the UUT shall be set up such that:  
374              a. The UUT sound volume shall be silenced, or on the lowest possible setting, and  
375              b. The UUT microphone shall be muted, or on the lowest possible setting, if possible.  
376        5) Make a voice-only call using the UUT.  
377              a. Calls made using the public switched telephone network shall be made to another Telephone  
378              set up at the testing facility.  
379              b. Calls made using VoIP or a Ringdown Simulator shall be made to the other Telephone  
380              connected to the VoIP Server or Ringdown Simulator, respectively.  
381        6) Answer the call on the receiving Telephone.  
382        7) Wait 10 minutes after the call is connected, then set the meter to begin accumulating true power  
383              values at a rate greater than or equal to 1 reading per second. Accumulate power values for  
384              10 minutes and record the average (arithmetic mean) value.

385        **Note:** DOE and EPA are interested in receiving data regarding the normal usage profile for all types of  
386              phones to determine the contribution of Active Mode to total energy consumption.

## 387        7 ADDITIONAL TEST PROCEDURES FOR VOIP AND HYBRID 388              TELEPHONES WITH A DATA SWITCH PORT

### 389        7.1 Measuring Data Switch Port Connectivity

- 390        A) For VoIP and Hybrid Telephones with Data Switch Ports:  
391              1) Set up the UUT according to Section 6.1.  
392              2) Ensure the UUT is in the Partial On Mode.  
393              3) Connect a personal computer to the Data Switch Port of the UUT. Ensure that the computer is on  
394              and that this is the computer's only network connection. Ensure that the computer recognizes this  
395              connection.  
396              4) Wait 5 minutes, then set the meter to begin accumulating true power values at a rate greater than  
397              or equal to 1 reading per second. Accumulate power values for 2 hours and record the average  
398              (arithmetic mean) value.

399        **Note:** DOE is interested in stakeholder feedback regarding how often computers are connected to switch  
400              ports and use this as the only network connection. Investigative testing showed that connecting through  
401              the switch port added a significant amount of energy.

## 402        8 REFERENCES

- 403        A) IEC 62301:2011. Household Electrical Appliances – Measurement of Standby Power. Ed. 2.0.  
404        B) IEEE 802.3-2012. IEEE Standard for Ethernet--Specific requirements—Part 2, Section 33: Data  
405              Terminal Equipment (DTE) Power via Media Dependent Interface (MDI)

406 C) IEEE 802.11-2012. IEEE Standard for Information technology--Telecommunications and information  
407 exchange between systems Local and metropolitan area networks--Specific requirements Part 11:  
408 Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications