



ENERGY STAR® Program Requirements for Small Network Equipment

Partner Commitments

1 Following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacture
2 and labeling of ENERGY STAR qualified products. The ENERGY STAR Partner must adhere to the
3 following partner commitments:
4

5 **Qualifying Products**

- 6 1. **Comply with current ENERGY STAR Eligibility Criteria**, which define performance requirements
7 and test procedures for Small Network Equipment. A list of eligible products and their corresponding
8 Eligibility Criteria can be found at www.energystar.gov/specifications.
- 9 2. **Prior to associating the ENERGY STAR name or mark with any product**, obtain written
10 certification of ENERGY STAR qualification from a Certification Body recognized by EPA for Small
11 Network Equipment. As part of this certification process, products must be tested in a laboratory
12 recognized by EPA to perform Small Network Equipment testing. A list of EPA-recognized
13 laboratories and certification bodies can be found at www.energystar.gov/testingandverification.
- 14 3. **Ensure that all of Partner's products that bear the ENERGY STAR certification mark** meet the
15 following standard:
 - 16 • Product material requirements as defined in restriction of hazardous substances (RoHS)
17 regulations, as generally accepted. This includes exemptions in force at the date of product
18 manufacture: where the maximum concentration values tolerated by weight in homogeneous
19 materials are: lead (0.1%), mercury (0.1%), cadmium (0.01%), hexavalent chromium (0.1%),
20 polybrominated biphenyls (PBB) (0.1%), or polybrominated diphenyl ethers (PBDE) (0.1%).
21 Batteries are exempt.

22 *Notes:*

- 23 • The explicit intention is to harmonize with EU RoHS.
- 24 • For purposes of ENERGY STAR third-party certification, these requirements shall not be reviewed when products are initially
25 qualified nor during subsequent verification testing. Rather, EPA reserves the right to request supporting documentation at any
26 time.
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28 **Using the ENERGY STAR Name and Marks**

- 29 4. Comply with current ENERGY STAR Identity Guidelines, which define how the ENERGY STAR name
30 and marks may be used. Partner is responsible for adhering to these guidelines and ensuring that its
31 authorized representatives, such as advertising agencies, dealers, and distributors, are also in
32 compliance. The ENERGY STAR Identity Guidelines are available at www.energystar.gov/logouse.
- 33 5. Use the ENERGY STAR name and marks only in association with qualified products. Partner may not
34 refer to itself as an ENERGY STAR Partner unless at least one product is qualified and offered for
35 sale in the U.S and/or ENERGY STAR partner countries.
- 36 6. Provide clear and consistent labeling of ENERGY STAR qualified Small Network Equipment.
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 - 38 6.1. Partner must use the ENERGY STAR mark in all of the following ways:
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 - 40 6.1.1. On the top or front of the product. Labeling on the top or front of the product may be
41 permanent or temporary. All temporary labeling must be affixed to the top or front of the
42 product with an adhesive or cling-type application;

- 43
44 6.1.2. In product literature (i.e. user manuals, spec sheets, etc.);
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46 6.1.3. On product packaging for products sold at retail; and
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48 6.1.4. On the Partner's Internet site where information about ENERGY STAR qualified models is
49 displayed:
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51 6.2. If additional information about the ENERGY STAR program(s) or other products provided by the
52 Partner on its Web site, Partner must comply with the *ENERGY STAR Web Linking Policy*,
53 which can be found at www.energystar.gov/partners.

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55 **Verifying Ongoing Product Qualification**

- 56 7. Participate in third-party verification testing through a Certification Body recognized by EPA for Small
57 Network Equipment, providing full cooperation and timely responses, EPA/DOE may also, at its
58 discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These
59 products may be obtained on the open market, or voluntarily supplied by Partner at the government's
60 request.

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62 **Providing Information to EPA**

- 63 8. Provide unit shipment data or other market indicators to EPA annually to assist with creation of
64 ENERGY STAR market penetration estimates, as follows:
- 65 8.1. Partner must submit the total number of ENERGY STAR qualified Small Network Equipment
66 shipped in the calendar year or an equivalent measurement as agreed to in advance by EPA
67 and Partner. Partner shall exclude shipments to organizations that rebrand and resell the
68 shipments (unaffiliated private labelers).
- 69 8.2. Partner must provide unit shipment data segmented by meaningful product characteristics (e.g.,
70 type, capacity, presence of additional functions) as prescribed by EPA.
- 71 8.3. Partner must submit unit shipment data for each calendar year to EPA or an EPA-authorized
72 third party, preferably in electronic format, no later than March 1 of the following year.
- 73 Submitted unit shipment data will be used by EPA only for program evaluation purposes and will be
74 closely controlled. If requested under the Freedom of Information Act (FOIA), EPA will argue that the
75 data is exempt. Any information used will be masked by EPA so as to protect the confidentiality of
76 the Partner;
- 77 9. Report to EPA any attempts by recognized laboratories or Certification Bodies (CBs) to influence
78 testing or certification results or to engage in discriminatory practices.
- 79 10. Notify EPA of a change in the designated responsible party or contacts within 30 days using the My
80 ENERGY STAR Account tool (MESA) available at www.energystar.gov/mesa.

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82 **Performance for Special Distinction**

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

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- 87 ■ Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase
88 availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and
89 its message.

- 90 ▪ Consider energy efficiency improvements in company facilities and pursue benchmarking buildings
91 through the ENERGY STAR Buildings program.
- 92 ▪ Purchase ENERGY STAR qualified products. Revise the company purchasing or procurement
93 specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA
94 for periodic updates and coordination. Circulate general ENERGY STAR qualified product information
95 to employees for use when purchasing products for their homes.
- 96 ▪ Feature the ENERGY STAR mark(s) on Partner website and other promotional materials. If
97 information concerning ENERGY STAR is provided on the Partner website as specified by the
98 ENERGY STAR Web Linking Policy (available in the Partner Resources section of the ENERGY
99 STAR website), EPA may provide links where appropriate to the Partner website.
- 100 ▪ Ensure the power management feature is enabled on all ENERGY STAR qualified displays and
101 computers in use in company facilities, particularly upon installation and after service is performed.
- 102 ▪ Provide general information about the ENERGY STAR program to employees whose jobs are
103 relevant to the development, marketing, sales, and service of current ENERGY STAR qualified
104 products.
- 105 ▪ Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the
106 program requirements listed above. By doing so, EPA may be able to coordinate, and communicate
107 Partner's activities, provide an EPA representative, or include news about the event in the ENERGY
108 STAR newsletter, on the ENERGY STAR website, etc. The plan may be as simple as providing a list
109 of planned activities or milestones of which Partner would like EPA to be aware. For example,
110 activities may include: (1) increasing the availability of ENERGY STAR qualified products by
111 converting the entire product line within two years to meet ENERGY STAR guidelines; (2)
112 demonstrating the economic and environmental benefits of energy efficiency through special in-store
113 displays twice a year; (3) providing information to users (via the website and user's manual) about
114 energy-saving features and operating characteristics of ENERGY STAR qualified products; and (4)
115 building awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA
116 on one print advertorial and one live press event.
- 117 ▪ Join EPA's SmartWay Transport Partnership to improve the environmental performance of the
118 company's shipping operations. The SmartWay Transport Partnership works with freight carriers,
119 shippers, and other stakeholders in the goods movement industry to reduce fuel consumption,
120 greenhouse gases, and air pollution. For more information on SmartWay, visit
121 www.epa.gov/smartway.
- 122 ▪ Join EPA's Green Power Partnership. EPA's Green Power Partnership encourages organizations to
123 buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel-
124 based electricity use. The partnership includes a diverse set of organizations including Fortune 500
125 companies, small and medium businesses, government institutions as well as a growing number of
126 colleges and universities. For more information on Green Power, visit www.epa.gov/greenpower.



ENERGY STAR[®] Product Specification for Small Network Equipment

Eligibility Criteria Final Draft Version 1.0

1 Following is the ENERGY STAR product specification for Small Network Equipment. A product shall meet
2 all of the identified criteria if it is to earn the ENERGY STAR.

3 **1 DEFINITIONS**

4 A) Product Classifications:

- 5 1) Network Equipment: A device whose primary function is to pass Internet Protocol (IP) traffic
6 among various network interfaces / ports.
- 7 2) Small Network Equipment (SNE): Network Equipment that is intended to serve users in either
8 small networks or a subset of a large network. SNE includes a) all Network Equipment with
9 integral wireless capability and b) other Network Equipment meeting **all** of the following
10 criteria:
- 11 a) Designed for stationary operation;
- 12 b) Contains no more than eleven (11) wired Physical Network Ports;
- 13 c) Primary configuration for operation outside of standard equipment racks;
- 14 d) Meets the definition of one or more of the Product Types defined below.
- 15 3) Large Network Equipment: Network Equipment that is rack-mounted, intended for use in
16 standard equipment racks, and/or contains more than eleven (11) ports for wired network.

17 **Note:** EPA has clarified that products which are rack mounted and contain more than 11 ports are also
18 considered Large Network Equipment.

19 B) Small Network Equipment Types:

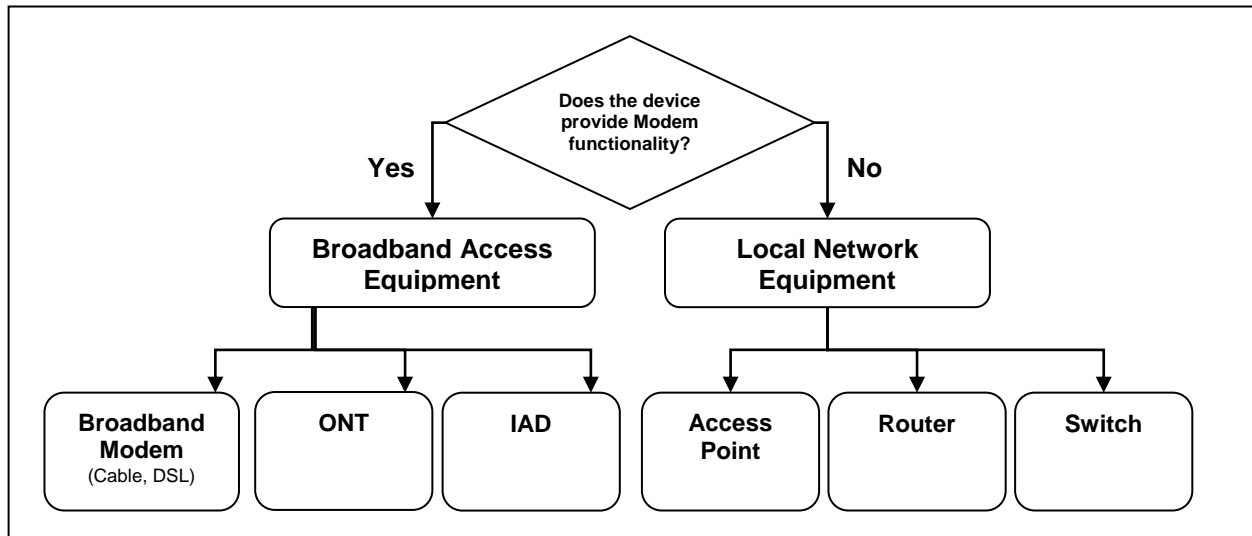
20 1) Broadband Access Equipment

- 21 a) Broadband Modem: A device that transmits and receives digitally-modulated analog
22 signals over a wired or optical network as its primary function. The Broadband Modem
23 category does not include devices with integrated Router, Switch, or Access Point
24 functionality.
- 25 b) Integrated Access Device (IAD): A network device with a modem and one or more of the
26 following functions: wired network routing, multi-port Ethernet switching and/or access
27 point functionality.
- 28 c) Optical Network Termination Device (ONT): A type of device that converts signals
29 between copper (wired) or wireless connections and an optical fiber connection. ONTs
30 are available in either desktop or building-mounted versions with different connectivity
31 options.

32 2) Local Network Equipment

- 33 a) Access Point: A device that provides wireless network connectivity to multiple clients as
34 its primary function. For the purposes of this specification, Access Points include devices
35 providing only IEEE 802.11 (Wi-Fi) connectivity.

- 36 b) Router: A network device that determines the optimal path along which network traffic
 37 should be forwarded as its primary function. Routers forward packets from one network to
 38 another based on network layer information. Devices fitting this definition may provide
 39 both Router functionality and wireless network capability.
- 40 c) Switch: A network device that filters, forwards, and floods frames based on the
 41 destination address of each frame as its primary function. The switch operates at the data
 42 link layer of the OSI model.
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46 **Figure 1: Product Type Assignment**

- 47 C) Operational Modes and States:
- 48 1) On Mode: The product is connected to a power source, is ready to use, and is providing one
 49 or more primary functions.
- 50 a) Idle State: The product is in On Mode and the data rate is 0 kb/s.
- 51 b) Low Data Rate: The product is in On Mode and traffic is passed across ports at 1.0 kb/s
 52 (0.5 kb/s in each direction) as defined in the test procedure.
- 53 c) High Data Rate: The product is in On Mode and traffic is passed across ports at a
 54 selected reference rate as defined in the test procedure.
- 55 D) Components:
- 56 1) External Power Supply (EPS): A component contained in a separate physical enclosure from
 57 the SNE product designed to convert line voltage ac input into lower voltage ac or dc
 58 output(s) for the purpose of powering the SNE product. An EPS must connect to the SNE
 59 product via a removable or hard-wired male/female electrical connection, cable, cord or other
 60 wiring.
- 61 E) Marketing or Shipment Terminology:
- 62 1) Cable, Satellite, and Telecom Service Provider ("Service Provider"): An entity that provides
 63 Internet connectivity to subscribers with whom it has an ongoing contractual relationship.
- 64 2) Manufacturing Partner: An entity that manufactures, or markets OEM-manufactured SNE for
 65 sale to either end customers or Service Providers.

66 F) Additional Terms:

- 67 1) End Point Device: A device that functions as either an originator or destination for network
68 traffic passed through Network Equipment. Examples of end point devices include
69 computers, servers, set-top boxes, IP-capable televisions, IP phones, etc. For the purposes
70 of this specification, an end point device is not considered network equipment.
- 71 2) Energy Efficient Ethernet (EEE): A technology which enables reduced power consumption of
72 Ethernet interfaces during times of low data throughput. Specified by IEEE 802.3az.
- 73 3) Link Rate: The maximum PHY bit rate possible on a particular link (e.g., 1000BASE-T
74 Ethernet supports 1 Gb/s in each direction [2 Gb/s total]; IEEE 802.11g supports 54 Mb/s
75 total).
- 76 4) Physical Data Port: An integrated physical connection point primarily intended to accept non-
77 IP data. For the purposes of this specification, a port must support one of the following media
78 types to fit this definition:
- 79 a) Universal Serial Bus (USB);
80 b) Firewire;
81 c) Thunderbolt;
82 d) SATA;
83 e) SCSI; or
84 f) RS-232.
- 85 5) Physical Network Port: An integrated physical connection point primarily intended to accept
86 IP or similar traffic via a cable. For the purposes of this specification, a port must support one
87 of the following media types to fit this definition:
- 88 a) Twisted Pair Copper (Ethernet, DSL);
89 b) Coaxial Cable (DOCSIS); or
90 c) Fiber Optic.

91 **Note:** Based on stakeholder feedback, EPA has removed the Ethernet term as a separate physical
92 network port type. It has been added, along with other examples, in the twisted copper pair category.
93 Additional examples and reordering have also been performed for better clarity.

- 94 6) Power over Ethernet (PoE): A technology which enables transfer of electrical power, along
95 with data, to network end point devices through an Ethernet cable. Currently specified by
96 IEEE 802.3af and IEEE 802.3at.
- 97 7) Standard Equipment Rack: An equipment enclosure commonly seen in data centers or
98 managed facilities and intended to house a variety of information technology equipment.
99 Front panel width is typically 19 inches (482.6 mm) in width. Standard Equipment Racks are
100 defined by EIA-310, IEC 60297, or DIN 41494.
- 101 8) Unit Under Test (UUT): The network equipment device being tested.
- 102 9) Wireless Local Area Network (WLAN) Test Client: A device that is capable of establishing an
103 802.11x link with an Access Point (AP) and transmitting data to and receiving from the AP.
- 104 10) Full Network Connectivity: The ability of an End Point Device to maintain network presence
105 while in Sleep Mode or another low power mode (LPM) of equal or lower power consumption
106 and intelligently wake when further processing is required (including occasional processing
107 required to maintain network presence). Presence of the End Point Device, its network
108 services and applications is maintained even though the End Point Device is in a LPM. From
109 the vantage point of the network, an End Point Device with full network connectivity that is in

110 LPM is functionally equivalent to an idle End Point Device with respect to common
111 applications and usage models. Full network connectivity in LPM is not limited to a specific
112 set of protocols but can cover applications installed after initial installation. Also referred to as
113 “network proxy” functionality and as described in the Ecma-393 standard.

114 a) Network Proxy - Base Capability: To maintain addresses and presence on the network
115 while in LPM, the system handles IPv4 ARP and IPv6 NS/ND.

116 b) Network Proxy - Full Capability: While in LPM, the system supports Base Capability,
117 Remote Wake, and Service Discovery/Name Services.

118 c) Network Proxy - Remote Wake: While in LPM, the system is capable of remotely waking
119 upon request from outside the local network. Includes Base Capability.

120 d) Network Proxy - Service Discovery/Name Services: While in LPM, the system allows for
121 advertising host services and network name. Includes Base Capability.

122 11) External Proxy Capability: The ability of an SNE device to maintain Full Network Connectivity
123 on behalf of an End Point Device. Must include an implementation of a standard protocol for
124 communicating between the End Point Device and the SNE device. Note: A known such
125 protocol is mDNS. Waking the sleeping End Point Device is typically accomplished by Wake-
126 On-LAN, a wireless equivalent, or some other directed traffic.

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

133 1) Color,

134 2) Housing, or

135 3) Any of the functional adders specified in Table 2.

136 2 SCOPE

137 2.1 Included Products

138 2.1.1 Products that meet the definition for Small Network Equipment as specified herein are eligible for
139 ENERGY STAR qualification, with the exception of products listed in Section 2.2. In addition,
140 SNE shall meet one of the following equipment type definitions:

141 i. Broadband Modems (Cable, DSL);

142 ii. Optical Network Termination Device (ONT);

143 iii. Integrated Access Device (IAD);

144 iv. Router;

145 v. Switch; or

146 vi. Access Point.

147 2.2 Excluded Products

148 2.2.1 Products that are covered under other ENERGY STAR product specifications are not eligible for
149 qualification under this specification. The list of specifications currently in effect can be found at
150 www.energystar.gov/specifications.

151 2.2.2 The following products are not eligible for qualification under this specification:

- 152 i. Network Equipment capable of accepting interchangeable modules, such as line cards or
153 additional power supplies;
- 154 ii. Network Equipment with one or more network ports using pluggable or modular media
155 adapters such as Gigabit Interface Convertor (GBIC) or Small Form-factor Pluggable
156 (SFP) modules. This does not include USB ports;;
- 157 iii. Network Equipment whose primary wireless capability is not IEEE 802.11 (Wi-Fi);
- 158 iv. Network Equipment that receive direct dc power (PoE, USB) or provide power through
159 PoE;
- 160 v. Large Network Equipment; and
- 161 vi. Network Equipment that is marketed and sold as enterprise Network Equipment and can
162 be controlled and configured for operation by an external controller.

163 **Note:** EPA received stakeholder feedback to add an exclusion for interchangeable modules and
164 additional module media adapters beyond SFP ports. This exclusion does not apply to USB ports, which
165 may be used with adapters that provide network connectivity.

166 EPA received comments to change the enterprise access point exclusion from requiring an external
167 controller, to being able to be controlled by a controller. It was stated that some enterprise access point
168 products can act solely as an access point, or as an access point controller when needed, and that this
169 change excludes those products from scope. Due to a lack of data on these particular products, EPA has
170 excluded them from Version 1.0 and will look into them in more detail in Version 2.0 development.

171 EPA has also clarified that any network products powered directly by dc are out of scope, and products
172 that provide PoE power are also out of scope. The Version 1.0 SNE Test Method cannot adequately
173 address these products types.

174 3 QUALIFICATION CRITERIA

175 3.1 Significant Digits and Rounding

- 176 3.1.1 All calculations shall be carried out with directly measured (unrounded) values.
- 177 3.1.2 Unless otherwise specified, compliance with specification limits shall be evaluated using directly
178 measured or calculated values without any benefit from rounding.
- 179 3.1.3 Directly measured or calculated values that are submitted for reporting on the ENERGY STAR
180 website shall be rounded to the nearest significant digit as expressed in the corresponding
181 specification limit.

182 3.2 Power Supply Requirements

- 183 3.2.1 External Power Supplies (EPSs): EPSs (single- and multiple-voltage) shall meet the level V
184 performance requirements under the International Efficiency Marking Protocol and include the
185 level V marking. Additional information on the Marking Protocol is available
186 at www.energystar.gov/powersupplies.
- 187 i. External Power Supplies shall meet level V requirements when tested using the *Test*
188 *Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac*
189 *Power Supplies, Aug. 11, 2004.*

190 **3.3 Efficiency Criteria**

191 3.3.1 Average Power (P_{AVG}): Calculated Average Power (P_{AVG}) per Equation 1 shall be less than or
 192 equal to the maximum requirement for Average Power (P_{AVG_MAX}), as calculated per Equation 2.

193 **Equation 1: Average Power Calculation (P_{AVG}) for Small Network Equipment**

194
$$P_{AVG} = Average [P_{WAN_TEST}, P_{LAN_TEST}, P_{WIRELESS_TEST}]$$

195 *Where:*

- 196 ▪ *Average[x_i] = Average of terms (x_i) applicable to the UUT;*
- 197 ▪ *P_{WAN_TEST} = Measured power in Wired Network – WAN test, at*
 198 *1.0 kb/s (W);*
- 199 ▪ *P_{LAN_TEST} = Measured power in Wired Network – LAN test, half of*
 200 *available wired LAN ports populated, at 1.0 kb/s (W);*
- 201 ▪ *P_{WIRELESS_TEST} = Measured power in Wireless Network – LAN test,*
 202 *at 1.0 kb/s (W).*

203 **Note:** EPA has revised the “Average Power Consumption” term in Section 3.3.1 to “Average Power” for
 204 simplicity and clarity. References to “power consumption” in Equation 1 have also been revised to
 205 “power”.

206 **Equation 2: Maximum Average Power (P_{AVG_MAX}) Calculation for Small Network Equipment**

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$$P_{AVG_MAX} = P_{BASE} + \sum_{i=1}^n P_{ADD_i}$$

208 *Where:*

- 209 ▪ *P_{BASE} = Base power allowance (W) from Table 1;*
- 210 ▪ *P_{ADD_i} = The power allowance as specified in Table 2 for each*
 211 *feature present in the device, for a total of n such allowances.*

212 **Table 1: Base Power Allowances**

Product Type	P _{BASE} (watts) Version 1.0
Broadband Modem – Cable	5.7
Broadband Modem – ADSL	4.0
ONT	4.4
IAD - Cable	6.1
IAD - ADSL	5.5
IAD - VDSL	7.5
Router	3.1
Switch	0.6
Access Point	2.0

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Table 2: Additional Functional Adders

Feature	Power Allowance (P _{ADD}) in watts	Notes
Fast Ethernet (100Base-T)	0.1	Allowance applied once per port present in the UUT.
Gigabit Ethernet (1000Base-T)	0.3	Allowance applied once per port present in the UUT.
Wi-Fi (802.11a/b/g/n)	0.7	Allowance applied once for the UUT for availability of Wi-Fi connectivity.
802.11n per Receive Spatial Stream	0.2	Allowance applied to total number of 2.4 GHz and 5.0 GHz 802.11n receive spatial streams. Only applicable for products that ship with simultaneous dual band Wi-Fi enabled.
802.11ac per Receive Spatial Stream	1.3	Allowance applied to 5.0 GHz 802.11ac receive spatial streams only. Only applicable for products that ship with simultaneous dual band Wi-Fi enabled.
Plain Old Telephone Service (RJ11/RJ14)	0.5	Allowance applied once per port, up to a maximum of two ports.

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Note: EPA has changed the term “chain” to “spatial stream”. Although the terms are very similar, “chain” focuses more on hardware implementation, while “spatial stream” focuses on end-user functionality, which is the purpose of Table 2 above. This change aligns with the language used in the ENERGY STAR Version 4.1 Set Top Box Specification.

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- 3.3.2 Energy Efficiency Ethernet (EEE) Incentive: SNE products that ship with IEEE 802.3az compliant Gigabit Ethernet ports may claim a 0.2 watt additional adder for each Gigabit port when calculating P_{ADD}.
- 3.3.3 External Proxy Incentive: SNE products that ship with External Proxy Capability may claim **one** of the following adders in Table 3 when calculating P_{ADD} based on the level of Proxy functionality in the product, as defined in Section 1.F.10.

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Table 3: External Proxy Incentives

Capability	Incentive Value in watts
Base Capability	0.2
Remote Wake	0.5
Service Discovery/ Name Services	0.8
Full Capability	1.0

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227 4 TESTING

228 4.1 Test Methods

229 4.1.1 When testing SNE, the test methods identified in Table 4 shall be used to determine qualification
230 for ENERGY STAR.

231 **Table 4: Test Methods for ENERGY STAR Qualification**

Product Type	Test Method
All	ENERGY STAR Test Method for Small Network Equipment, Rev. July 2013

232 4.1.2 Products that have both ADSL and VDSL functionality shall be tested using their VDSL
233 functionality.

234 4.1.3 Products that have the DOCSIS 3.0 energy management 1x1 capability shall be tested in an
235 environment that allows this feature to operate at low data traffic rates.

236 **Note:** EPA has added a requirement that products with the DOCSIS 3.0 energy management 1x1 feature
237 shall be tested in an environment that allows this feature to operate. EPA encourages the use of this
238 feature in low data traffic rates as an energy efficiency feature. More information on the DOCSIS 3.0
239 energy management 1x1 feature can be found at: [http://www.cablelabs.com/specifications/CM-GL-
240 EM1x1-V01-130329.pdf](http://www.cablelabs.com/specifications/CM-GL-EM1x1-V01-130329.pdf).

241 4.2 Number of Units Required for Testing

242 4.2.1 Representative Models shall be selected for testing per the following requirements:

- 243 i. For qualification of an individual product model, a product configuration equivalent to that
244 which is intended to be marketed and labeled as ENERGY STAR is considered the
245 Representative Model;
- 246 ii. For qualification of a product family, the configuration that consumes the most energy
247 within the family shall be considered the Representative Model. If models in a product
248 family span multiple categories, product configurations that represent the worst-case
249 power consumption for each product category within the family are considered
250 Representative Models. When submitting product families, manufacturers continue to be
251 held accountable for any efficiency claims made about their products, including those not
252 tested or for which data was not reported.

253 4.2.2 A single unit of each Representative Model shall be selected for testing.

254 4.3 International Market Qualification

255 4.3.1 Products shall be tested for qualification at the relevant input voltage/frequency combination for
256 each market in which they will be sold and promoted as ENERGY STAR.

257 4.4 Optional Performance Reporting

258 4.4.1 At the Partner's option, data on the following performance considerations may be reported along
259 with product evaluation data:

- 260 i. Ethernet Throughput – The maximum data rate supported by the UUT for which there is
261 no packet loss.
- 262 ii. Maximum Number of Wireless Clients - The maximum number of clients supported by the
263 UUT.
- 264 iii. Maximum Number of NAT Clients

- 265 iv. Maximum number of IEEE Gigabit Ethernet ports – The maximum number of IEEE
266 802.3az compliant Gigabit Ethernet ports supported by the UUT. This reporting
267 requirement shall be mandatory for any products that claim the IEEE Incentive in Section
268 3.3.2.
- 269 v. Maximum External Proxy Capability – The highest level of External Proxy Capability
270 provided by the UUT as listed in Table 3. This reporting requirement shall be mandatory
271 for any products that claim the External Proxy Incentive in Section 3.3.3.

272 5 USER INTERFACE

- 273 5.1.1 Manufacturers are encouraged to design products in accordance with the user interface standard
274 IEEE P1621: Standard for User Interface Elements in Power Control of Electronic Devices
275 Employed in Office/Consumer Environments. For details, see <http://eetd.LBL.gov/Controls>.

276 6 EFFECTIVE DATE

- 277 6.1.1 Effective Date: This ENERGY STAR Product Specification for Small Network Equipment shall
278 take effect on **September 1, 2013**. To qualify for ENERGY STAR, a product model shall meet the
279 ENERGY STAR specification in effect on its date of manufacture. The date of manufacture is
280 specific to each unit and is the date on which a unit is considered to be completely assembled.

281 **Note:** EPA released the SNE Final Test Method on July 1, 2013 and anticipates that the specification will
282 be finalized on September 1, 2013 and become effective immediately at which point products may begin
283 to qualify immediately. Please note that to earn ENERGY STAR certification manufacturers must have
284 their products third-party certified by an EPA-recognized Certification Body (CB) to the Version 1.0
285 requirements. For more information, visit www.energystar.gov/3rdpartycert.

- 286 6.1.2 Future Specification Revisions: EPA reserves the right to change this specification should
287 technological and/or market changes affect its usefulness to consumers, industry, or the
288 environment. In keeping with current policy, revisions to the specification are arrived at through
289 stakeholder discussions. In the event of a specification revision, please note that the ENERGY
290 STAR qualification is not automatically granted for the life of a product model.

291 7 CONSIDERATIONS FOR FUTURE REVISIONS

- 292 **7.1 Product Scope:** EPA will investigate expanding the scope to include enterprise access points
293 that are not covered in Version 1.0.
- 294 **7.2 Energy Efficient Ethernet:** EPA expects to require that all ports for PHYs addressed by IEEE
295 802.3az shall be compliant with IEEE 802.3az under the next Version 2.0.
- 296 **7.3 Network Proxy:** EPA will continue to monitor the implementation of proxying capability in SNE
297 hardware and consider the development of a test method to determine the functionality of a network
298 proxy (e.g. one compliant with ECMA-393 ProxZzy for Sleeping Hosts).

299 **Note:** EPA has included additional scope and energy efficiency criteria considerations for future revisions
300 of the ENERGY STAR Small Network Equipment Specification.