

Computers and Light-Emitting Diode Lamps Appliance Efficiency Rulemaking

September 22, 2017

[Proposed changes shown to regulatory language approved by OAL on August 22, 2017]

Title 20. Public Utilities and Energy Division 2.

State Energy Resources Conservation and Development Commission

1602. Definitions.

...[skipping (a) through (u)]

(v) Computers, Computer Monitors, Televisions, Signage Displays, and Consumer Audio and Video Equipment.

...[skipping *Add-in card* through *Digital Cinema Initiative (DCI)-P3*]

“Discrete GPU” means a graphics processing unit (GPU) with a local memory controller interface and local graphics-specific memory. ~~Discrete GPUs are not packaged on the same die or substrate as the CPU.~~

...[skipping *Energy-Efficient Ethernet capability* through *Medical computer monitor*]

“Mobile gaming system” means a computer that is primarily used for gaming and that is designed specifically for portability and to be operated for extended periods both with and without a direct connection to an AC mains power source. A mobile gaming system is sold with an integrated display and a physical keyboard, and has all of the following criteria:

- (1) First discrete GPU with frame buffer bandwidth of 128 gigabytes per second or greater;
- (2) System memory of 16 gigabytes or more;
- (3) An external power supply with a nameplate output power of 150 watts or greater; and
- (4) Total battery capacity of ~~9075~~ 9075 watt-hours or greater.

...[skipping *Mobile thin client*]

“Mobile workstation” means a high-performance, single-user computer primarily used for graphics, computer-aided design (CAD), software development, financial, or scientific applications, among other computation intensive tasks, excluding game play, and that is designed specifically for portability and to be operated for extended periods of time either with or without a direct connection to an external power source. Mobile workstations utilize an integrated display and are capable of operation on an integrated battery. A mobile workstation may use an external power supply and have an integrated keyboard and pointing device. In addition, a mobile workstation must meet all of the following criteria:

- (1) Has a mean time between failures (MTBF) of at least 13,000 hours;
- (2) Has qualified or is currently being reviewed for qualification by two or more independent software vendor (ISV) product certifications;
- (3) ~~Has~~Supports either:
 - (A) At least one discrete GPU with frame buffer bandwidth of 96 gigabytes per second or greater; or
 - (B) A total of 4 gigabytes or more of system memory with a bandwidth of 134 gigabytes per second or greater and an integrated GPU;
- (4) Supports the inclusion of three or more internal storage devices; and
- (5) Supports at least 32 gigabytes of system memory.

...[skipping *Monitor screen area* through the end of section 1602]

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code; and sections 16, 26 and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), 25402.5.4 and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

1605.3. State Standards for Non-Federally-Regulated Appliances.

...[skipping (a)-(u)]

(v) Computers, Computer Monitors, Televisions, Signage Displays, and Consumer Audio and Video Equipment.

...[skipping (1)-(4)]

(5) Desktop computers, thin clients, mobile gaming systems, portable all-in-ones, and notebook computers. Desktop computers, thin clients, mobile gaming systems, portable all-in-ones, and notebook computers manufactured on or after January 1, 2019, shall:

(A) Comply with Table V-7; and

(B) Be shipped with power management settings that do both of the following:

1. Transition the computer into either the computer sleep mode or computer off mode measured in Section 1604(v)(5) within 30 minutes of user inactivity. If the transition is to a computer sleep mode, that sleep mode shall either:
 - a. Be a computer sleep mode as described in ACPI as S3; or
 - b. Consume power less than or equal to the values shown in Table V-6.
2. Transition connected displays into sleep mode within 15 minutes of user inactivity.

(C) If the model is shipped at the purchaser’s request with either a limited capability operating system or without an operating system, or if the model is not capable of having an operating system, the model is not required to comply with Section 1605.3(v)(5)(B).

(D) Desktop computers and thin clients assembled before July 1, 2021, entirely from parts manufactured before September 1, 2018, are not required to comply with Section 1605.3(v)(5)(A).

...[skipping Table V-6 through Table V-7]

Table V-8

List of Potentially Applicable Adders

<i>Function</i>	<i>Desktop Computer, Mobile Gaming System, and Thin Client Adder (kWh/yr)</i>	<i>Notebook Computers and Portable All-In-One Adder (kWh/yr)</i>
... [skipping System Memory through Integrated Display]		
First Discrete GPU <u>that is not packaged on the same substrate as the CPU</u> (on or after January 1, 2019 and before July 1, 2021) Where “B” is frame buffer bandwidth measured in GB/s	$58.6 * \tanh(0.0038 * B - 0.137) + 26.8$	$29.3 * \tanh(0.0038 * B - 0.137) + 13.4$
First Discrete GPU <u>that is not packaged on the same substrate as the CPU</u> (on or after July 1, 2021) Where “B” is frame buffer bandwidth measured in GB/s	$29.4 * \tanh(0.008 * B - 0.03) + 11 + (0.011 * B)$	$14.7 * \tanh(0.008 * B - 0.03) + 5.5 + (0.0055 * B)$
<u>First Discrete GPU that is packaged on the same substrate as the CPU</u> (on or after January 1, 2019) Where “B” is frame buffer bandwidth measured in GB/s	<u>$29.4 * \tanh(0.008 * B - 0.03) + 11 + (0.011 * B)$</u>	<u>$14.7 * \tanh(0.008 * B - 0.03) + 5.5 + (0.0055 * B)$</u>
... [skipping Additional Discrete GPU to the end of Table V-8]		

...[skipping to the end of section 1605.3]

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code; and sections 16, 26 and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), 25402.5.4 and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

1606. Filing by Manufacturers; Listing of Appliances in Database.

...[skipping (a) to (a)(3)(E)“Exception 4. To Section 1606(a)(3)(C)”]

Exception 5. To Section 1606(a)(3)(C):

Manufacturers of state-regulated LED lamps and LED versions of state-regulated small-diameter directional lamps may certify estimated values for rated lifetime until testing per section 1604(k) is complete. When reporting estimated values, the certification report shall describe the prediction method, which must use statistical projections consistent with the methods specified in 10 C.F.R. section 430.23(ee) (Appendix BB to subpart B of part 430, “Uniform Test Method for Measuring the Input Power, Lumen Output, Lamp Efficacy, Correlated Color Temperature (CCT), Color Rendering Index (CRI), Power Factor, Time to Failure, and Standby Mode Power of Integrated Light-Emitting Diode (LED) Lamps”) (Jan. 1, 2017). Manufacturers shall maintain records of the development of all estimated values and any associated initial test data. Manufacturers shall update the certification in the database upon completion of the required test procedures for rated lifetime.

...[skipping Table X, “All Appliances” through Section V Medical Computer Monitors]

<i>Appliance</i>	<i>Required Information</i>	<i>Permissible Answers</i>
<u>Computers</u>	...[skipping Computer Type through Total Battery Capacity]	
	Discrete GPU(s) present in system	True, False
	<u>First Discrete GPU is packaged on the same substrate as the CPU</u>	<u>True, False</u>
	...[skipping First Discrete GPU Frame Buffer Bandwidth to Video Surveillance Card]	
	Wired Ethernet or Fiber Card with a transmit rate of 10 GB/s or greater	True, False
	Total System Memory (gigabytes)	
	Highest system System memory bandwidth (gigabytes/second)	
	<u>8 gigabytes or more of system memory with a bandwidth of 632 GB/s or more</u> System memory with bandwidth higher than 632 GB/s (gigabytes)	<u>True, False</u>
	<u>8 gigabytes or more of system memory with a bandwidth of 432 GB/s or more</u> System memory with bandwidth higher than 432 GB/s (gigabytes)	<u>True, False</u>
	<u>4 gigabytes or more of system memory with a bandwidth of 146 GB/s or more</u> System memory with bandwidth higher than 146 GB/s (gigabytes)	<u>True, False</u>
	<u>4 gigabytes or more of system memory with a bandwidth of 134 GB/s or more</u> System memory with bandwidth	<u>True, False</u>

	<u>higher than 134 GB/s (gigabytes)</u>	
	<u>First channel system memory type</u>	<u>DDR, GDDR, HBM, Other</u>
	<u>First channel system memory bandwidth (GB/s)</u>	
	<u>First channel system memory (GB)</u>	
	<u>Second channel system memory type</u>	<u>DDR, GDDR, HBM, Other, None</u>
	<u>Second channel system memory bandwidth (GB/s)</u>	
	<u>Second channel system memory (GB)</u>	
	<u>Third channel system memory type</u>	<u>DDR, GDDR, HBM, Other, None</u>
	<u>Third channel system memory bandwidth (GB/s)</u>	
	<u>Third channel system memory (GB)</u>	
	<u>Fourth channel system memory type</u>	<u>DDR, GDDR, HBM, Other, None</u>
	<u>Fourth channel system memory bandwidth (GB/s)</u>	
	<u>Fourth channel system memory (GB)</u>	
	<u>Fifth channel system memory type</u>	<u>DDR, GDDR, HBM, Other, None</u>
	<u>Fifth channel system memory bandwidth (GB/s)</u>	
	<u>Fifth channel system memory (GB)</u>	
	<u>Sixth channel system memory type</u>	<u>DDR, GDDR, HBM, Other, None</u>
	<u>Sixth channel system memory bandwidth (GB/s)</u>	
	<u>Sixth channel system memory (GB)</u>	
	<u>Seventh channel system memory type</u>	<u>DDR, GDDR, HBM, Other, None</u>
	<u>Seventh channel system memory bandwidth (GB/s)</u>	
	<u>Seventh channel system memory (GB)</u>	
	<u>Eighth channel system memory type</u>	<u>DDR, GDDR, HBM, Other, None</u>
	<u>Eighth channel system memory bandwidth (GB/s)</u>	
	<u>Eighth channel system memory (GB)</u>	
	... [skipping “Computer sleep mode type” to the end of Table X]	

...[skipping (a)(4) through (j)]

The following documents are incorporated by reference into section 1606.

Number

Title

...[skipping CALIFORNIA ENERGY COMMISSION]

FEDERAL STATUTES AND REGULATIONS

C.F.R., Title 10, section 430.23(ee) (Appendix

Uniform Test Method for Measuring the Input

BB to subpart B of part 430) (Jan. 1, 2017)

Power, Lumen Output, Lamp Efficacy,
Correlated Color Temperature (CCT), Color
Rendering Index (CRI), Power Factor, Time to
Failure, and Standby Mode Power of Integrated
Light-Emitting Diode (LED) Lamps

Copies available from:

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
<http://www.gpo.gov>

...[skipping NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA) to the
end of section 1606]

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code; and sections 16, 26 and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), 25402.5.4 and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).