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**NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**GB 43630-2023**

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**Minimum allowable values of energy efficiency and energy  
efficiency grades for tower and rack servers**

塔式和机架式服务器能效限定值及能效等级

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### 1 Scope

GB 43630-2023 is the Chinese national standard on minimum allowable values of energy efficiency and energy efficiency grades for tower and rack servers, in the field of energy and heat transfer engineering. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 28 December 2023 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 January 2025. Classification: ICS 27.010, CCS F01. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the energy efficiency grades and energy efficiency limits for tower and rack servers. It also describes the corresponding test methods. This document applies to one-way or two-way general-purpose tower and rack servers (hereinafter referred to as servers). This document does not apply to servers that only have auxiliary processing accelerators. NOTE. One-way or two-way refers to the number of central processing unit (CPU) slots in a server, which is 1 or 2.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 9813.3, General specification for computer -- Part

### 3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 9813.3, ISO/IEC 21836.2020 as well as the followings apply.

3.1 work mode A mode of which the server operating system and other software are fully loaded, and the server runs a load test.

3.2 energy efficiency of servers Under specified test conditions, the ratio of server performance standard score to energy consumption. NOTE. The energy efficiency of servers is obtained by running the benchmark tool for server energy efficiency (BenchSEE).

3.3 minimum allowable values of energy efficiency for servers The minimum energy efficiency or energy efficiency score allowed by the server under specified test conditions. NOTE. The energy efficiency score is obtained by running the testing tool for the energy efficiency of servers specified in ISO/IEC 21836.2020.

### 4 Technical requirements

4.1 Efficiency grades The energy efficiency of servers is classified into three levels, with Level 1 being the most efficient. For servers equipped with CPUs manufactured using a process technology of 14 nm or larger, or CPUs manufactured using non-extreme ultraviolet (EUV) lithography equipment, the energy efficiency of each level conforms to the specifications in Table

1. For servers equipped with CPUs manufactured using a process technology smaller than 14 nm, the energy efficiency of each level conforms to the specifications in Table 2.

#### 4.2 Energy efficiency limits

4.2.1 For servers configured with central processing units (CPUs) manufactured using a process of 14 nm or greater, or with CPUs manufactured using non-EUV lithography equipment, the energy efficiency limits shall comply with Level 3 in Table 1.

4.2.2 For servers configured with central processing units manufactured using a process smaller than 14 nm, the energy efficiency limits shall comply with Level 3 in Table 2.

4.2.3 The energy efficiency of servers may be determined using the benchmark tool for server energy efficiency (BenchSEE) only when the energy efficiency of servers cannot be measured. The server energy efficiency score may be obtained using the server energy efficiency testing tool specified in ISO/IEC 21836.2020. The server energy efficiency score shall comply with the requirements in Table 3.

### 5 Test methods

5.1 Server energy efficiency testing shall be conducted in accordance with the

requirements of Annex A.

5.2 The energy efficiency of servers is calculated in the benchmark tool for server energy efficiency (BenchSEE) according to the method in Annex B.

## Annex A

(normative) Requirements for server energy efficiency testing A.1 Test environment requirements The test environment meets the following requirements.

- a) The ambient temperature shall be  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . The atmospheric pressure shall be  $86 \text{ kPa} \sim 106 \text{ kPa}$ .
- b) For servers under test with a nominal power of  $1.5 \text{ kW}$  or less, the test power supply shall be AC  $(220 \pm 1\%) \text{ V}$ . For servers under test with a nominal power greater than  $1.5 \text{ kW}$ , the test power supply shall be AC  $(220 \pm 4\%) \text{ V}$ .
- c) For servers under test with a nominal power of  $1.5 \text{ kW}$  or less, the current harmonic distortion of the test power supply shall not exceed 2%. For servers under test with a nominal power greater than  $1.5 \text{ kW}$ , the current harmonic distortion of the test power supply shall not exceed 5%.
- d) The power input frequency shall be  $(50 \pm 1.0\%) \text{ Hz}$ . A.2 Test instrument and equipment requirements The test instruments and equipment must meet the following requirements.
  - a) The power meter and temperature sensor shall be annually calibrated according to relevant requirements.
  - b) The power meter shall provide power measurements. The overall relative error of all power measurements shall not exceed 1%. The minimum frequency response is
  - c) The temperature sensor accuracy error shall be  $\pm 0.5^{\circ}\text{C}$  or less.
  - d) The power meter shall be directly connected between the AC power supply and the server under test. Uninterruptible power supplies (UPS) shall not be used.
  - e) The data output interfaces of the power meter and temperature sensor shall be connected to the corresponding input interfaces of the test host computer. Power and temperature data shall be automatically recorded by the test host computer. Manual recording is not allowed.