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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB 28380-2025

Replacing GB 28380-2012

Minimum allowable values of energy efficiency and energy grades for microcomputers

微型计算机能效限定值及能效等级

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part

1.Rules for the structure and drafting of standardizing documents". This document replaces GB 28380-2012 "Minimum allowable values of energy efficiency and energy grades for microcomputers". Compared with GB 28380-2012, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

a) Deleted the definition of "microcomputer energy-saving evaluation value" (see

2.6 of Edition 2012);

b) Added definitions for "slates/tablets", "long idle", "short idle", and "alternative low power mode" (see Chapter 3 of this Edition);

c) Deleted the "energy-saving evaluation value" (see

3.4 of Edition 2012);

d) Changed the classification and energy efficiency grade indicators of microcomputers (see

4.2 of this Edition;

3.2 of Edition 2012);

e) Changed the calculation method for typical energy consumption of microcomputers, the

percentage of time occupied by each mode of microcomputers, and the power factor of additional functions (see

5.1 of this Edition;

4.2 of Edition 2012);

f) Changed the test methods (see Annex A of this Edition; Annex A of Edition 2012);

1 Scope

GB 28380-2025 is the Chinese national standard on minimum allowable values of energy efficiency and energy grades for microcomputers, 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 24 January 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 February 2026. 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 technical requirements, calculation methods, and test methods for desktop microcomputers, all-in-one desktop microcomputers with display functions (referred to as "all-in-one computers"), and portable microcomputers (referred to as "microcomputers"). This document is applicable to general-purpose microcomputers. This document is not applicable to.

a) Slates/tablets, desktop/rack mounted workstations, and industrial application microcomputers;

b) A microcomputer with two or more independent display units;

c) Microcomputer with a rated output power greater than 500 W;

d) All-in-one computers and portable microcomputers with a diagonal size of less than 294.6 mm (

11.6 in) on the display screen.

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 9813.1, General specification for computer -- Part

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 9813.1, GB/T 9813.2, and GB/T 9813.4 as well as the followings apply.

3.1 slates/tablets Computer equipment that meets all of the following criteria.

a) includes an integrated display with a diagonal dimension greater than 177.8 mm (7 in) and less than 442.0 mm (

b) does not include an integrated physical keyboard or a detachable physical keyboard as shipped;

c) includes and primarily relies on a touchscreen for input;

d) includes and primarily relies on a wireless network connection;

e) includes and primarily relies on an internal battery pack for power;

f) is primarily operated by gripping.

3.2 off mode A mode that the microcomputer is connected to the mains power supply and the product is in the system off mode. NOTE. For microcomputers that support the advanced configuration and power management interface (ACPI), the off mode corresponds to the S5 mode in ACPI.

3.3 sleep mode A mode in which a microcomputer consumes less energy without shutting down. NOTE

1.This mode is selected by the user to enter, or automatically entered by the microcomputer after a period of inactivity. NOTE

2.For microcomputers that support the advanced configuration and power management interface (ACPI), the sleep mode corresponds to the S3 mode in ACPI, which is also called "standby mode" or "suspend" in some operating systems.

3.4 idle A mode that the microcomputer is not in use and is waiting to be assigned tasks or instructions.

3.5 long idle A mode when the microcomputer enters the idle mode and the computer's main display enters a low power mode where the screen content cannot be seen (for example. the backlight is turned off), but is still in working mode (ACPI G0/S0). NOTE

4 Technical requirements

4.1 Classification of microcomputers The type of microcomputer is determined according to Table 1.

4.2 Energy efficiency grades for microcomputers Microcomputer energy efficiency grades are categorized into three grades, with Grade 1 having the lowest typical energy consumption. Microcomputers equipped with CPUs with a unit transistor density greater than

30 Mtr/mm^2 must not exceed the typical energy consumption specified in Table 2 for each energy efficiency grade. Microcomputers equipped with CPUs with a unit transistor density less than or equal to

30 Mtr/mm^2 or manufactured using non-extreme ultraviolet (EUV) lithography equipment must not exceed the typical energy consumption specified in Table 3 for each energy efficiency grade.

4.3 Minimum allowable values of energy efficiency for microcomputers The minimum allowable value of energy efficiency for microcomputers is Grade 3 of the energy efficiency grades in Table 2 or Table 3.

5.1 Calculation methods

5.1.1 Calculation method for typical energy consumption The typical energy consumption of a microcomputer is calculated according to formula (1). For microcomputers that use ALPM to replace sleep modes and long idle times, calculate according to formula (2). Where, TEC - Typical energy consumption of a microcomputer, in kilowatt-hours (kWh); 8760 - Annual hours, in hours (h);

Annex A

(normative) Test method for typical energy consumption of microcomputers A.1 Test conditions When testing, the ambient temperature is 15°C~35°C, the relative humidity is 25%~75%, and the atmospheric pressure is 86 kPa~106 kPa. The test power supply is AC 220 V ±

2.2 V, and the power frequency is

1 Hz. The total harmonic distortion of the test power supply is no more than 2%. A.2 Test instruments When the power meter measures at an active power of no more than 10 W, the measurement results are accurate to

0.01 W. When it measures at an active power greater than 10 W and less than 100 W, the measurement results are accurate to

0.1 W. When it measures at an active power greater than 100 W, the measurement results are accurate to 1 W. The measurement range of the luminance colorimeter must be at least

0.02 cd/m2~2000 cd/m

2.The luminance resolution must be at least