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

GB/T 17799.1-2017

**Electromagnetic compatibility -- Generic standards -- Immunity
for residential, commercial and light-industrial environments
(English Translation)**

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1 Scope

The electromagnetic compatibility (EMC) immunity requirements specified in this Part of GB/T 17799 are applicable to electrical and electronic equipment used in residential, commercial and light industrial environments, covering the immunity requirements in the frequency range of 0 Hz~400 GHz. Frequency bands not specified in this Part do not need to be measured.

If there are no relevant specific product or product type EMC immunity standards, the general EMC immunity standards in this Part apply.

This Part applies to equipment directly connected to the low-voltage public mains network or to a dedicated DC power supply powered by a low-voltage public mains network. This Part also applies to battery-powered equipment or equipment powered by non-public, non-industrial low-voltage distribution systems that are to be used in the locations described below.

The environments included in this Part are indoor and outdoor environments in residential, commercial and light industrial premises. The descriptions of some site environments are listed below, including (but not limited to):

- Residential place, such as: residence, apartment, etc.;
- Retail outlets, such as stores, supermarkets, etc.;
- Commercial buildings, such as offices, banks, etc.;
- Public entertainment areas, such as: cinemas, public bars, dance halls, etc.;

- Outdoor places, such as gas stations, parking lots, playgrounds and sports centers, etc.;
- Light industrial places, such as workshops, laboratories, maintenance centers, etc.

Any place that receives low-voltage power supply directly from the public mains network belongs to residential, commercial and light industrial environments.

The purpose of this Part is to specify the immunity test requirements for continuous and transient conducted and radiated disturbances, including electrostatic discharge, for equipment within the applicable scope.

This Part specifies immunity requirements to ensure adequate immunity levels for equipment operating in residential, commercial and light industrial environments.

However, these immunity levels do not include some extreme conditions that may occur in any location with a very low probability. The tests recommended in this Part do not include all disturbance phenomena, but only those related to the equipment covered by this section are considered. These test requirements represent basic EMC immunity requirements.

NOTE 1: For information on other harassment phenomena, see IEC 61000-4-1 [1].

This Part specifies test requirements for each port considered.

NOTE 2: Safety considerations are outside the scope of this Part.

NOTE 3: Under special circumstances, the disturbance level may exceed the test levels specified in this Part. For example, use a handheld transmitter close to the device. In these cases, specialized mitigation measures are required.

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 2900.83, Electrotechnical terminology -- Electrical and magnetic devices (GB/T 2900.83-2008, IEC 60050-151:2001, IDT)

GB/T 4365, Electrotechnical terminology -- Electromagnetic compatibility [GB/T 4365-2003, IEC 60050(161):1990, IDT]

GB/T 9254, Information technology equipment, multimedia equipment and receivers -- Electromagnetic compatibility -- Part 1: Emission requirements (GB/T 9254-2008, IEC/CISPR 22:2006, IDT)

GB/T 17626.2, Electromagnetic compatibility -- Testing and measurement techniques -- Electrostatic discharge immunity test (GB/T 17626.2-2006, IEC

61000-4-2:2001, IDT)

GB/T 17626.3, Electromagnetic compatibility -- Testing and measurement techniques -- Part 31: AC mains ports broadband conducted disturbance immunity test (GB/T 17626.3-2006, IEC 61000-4-3:2002, IDT)

GB/T 17626.4, Electromagnetic compatibility -- Testing and measurement following criteria, record in the test report.

a) Performance criteria A

During and after the test, the equipment shall operate continuously in the intended manner. No degradation in performance or loss of functionality below the manufacturer's specified performance level shall be allowed when the equipment operates as intended. Performance levels may be replaced by allowable performance losses. If the manufacturer does not specify a minimum performance level or allowable loss of performance, both can be derived from the product instructions and product documentation; or from the reasonable expectations of the user when the equipment is used in the intended manner.

b) Performance criteria B

After the test, the equipment shall continue to operate in the intended manner. No reduction in performance levels or loss of functionality below the manufacturer's specified performance levels shall be permitted when the equipment is used in the manner intended. Performance levels can be replaced by allowable performance losses. During the test, the performance level is allowed to be reduced, but the actual working status or stored data is not allowed to change. If the manufacturer does not specify a minimum performance level or allowable loss of performance, both can be derived from the product instructions and product documentation; or from the reasonable expectations of the user when the equipment is used in the intended manner.

c) Performance criteria C

Temporary loss of function is permitted provided that such function is restored by itself or by operation of the controls.

5 Test conditions

The equipment under test shall be tested in the expected most sensitive operating mode (e.g., determined by limited pre-testing). This working condition shall be consistent with normal usage. Test specimen configurations shall be varied to obtain maximum sensitivity in typical applications and actual installations.

If the equipment is part of a system or can be connected to auxiliary equipment, the equipment shall be tested with a minimum and representative number of auxiliary equipment connected to the ports that must be used. A similar description can be found in

GB/T 9254.

If the manufacturer's technical specifications specifically require external protective devices or measures, and this has been clearly stated in the user's manual, appropriate external protective devices or measures must be used when applying the test requirements of this Part.

The test layout and working conditions during the test shall be accurately recorded in the test report. When it is not possible to test every function of the equipment, the most critical working conditions shall be selected for testing.

If a device has many similar ports or certain ports have many similar connections, then a sufficient number of ports shall be selected to simulate actual working conditions to ensure that all different types of terminals are involved.

Tests shall be conducted at rated power supply voltage within the temperature, humidity and air pressure ranges specified for the product, unless otherwise specified in the underlying standard.

6 Product documentation

If the manufacturer requires the use of its own technical specifications to assess the EMC performance compliance or degradation of the product during or after testing in accordance with this Part, this shall be stated in the user documentation. The manufacturer shall be able to provide such technical specifications when required.

7 Applicability

The application of immunity testing depends on the specific equipment and its configuration, ports, technology, process and operating status.

The relevant ports of the equipment shall be tested according to the requirements of

Table 1 ~ Table 4. Testing shall only be performed when the port in question is present.

Which tests are inappropriate and unnecessary can be determined based on the electrical characteristics and intended use of the specific equipment. In this case, the reasons for not testing shall be recorded in the test report.

8 Immunity test requirements

The equipment immunity test requirements involved in this Part are given based on the port.

Testing shall be performed in a fully defined and reproducible manner.

The tests shall be carried out one by one in a single test sequence. The order of tests is