YD

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OF THE PEOPLE'S REPUBLIC OF CHINA

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YD/T 983-2013

Replacing YD/T 983-1998

Limits and methods of measurement of electromagnetic compatibility of telecommunication power supply equipment

通信电源设备电磁兼容性要求及测量方法

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Table of Contents

Foreword

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard is developed and mainly referenced to GB 9254 “Limits and methods of measurement of radio interference characteristics of information technology equipment”, GB/T 17618 “Information technology equipment - Immunity characteristics - Limits and methods of measurement”, GB 19286 “Electromagnetic compatibility requirement and measurement methods for telecommunication network equipment”.

This Standard replaces YD/T 983-1998 “Limits and methods of measurement of electromagnetic compatibility for telecommunication Power supply equipment” from the date of implementation.

Compare with YD/T 983-1998, the main changes of this Standard are as follows:

- SPECIFY that the telecommunication power supply equipment in this Standard does not include UPS (see Clause 1);
- ADD the frequency range of 1 GHz ~ 6 GHz for radiation disturbance test (see 8.2):
- MODIFY the classification and limits of harmonic current equipment (see 8.3);
- EXPAND the frequency range of radiated, radio-frequency, electromagnetic field immunity to 2.7 GHz (see Clause 9);
- SPECIFY the immunity level of telecommunication power supply equipment in telecommunication centers and other-than-telecommunication centers (see Clause 9).

Attention is drawn to the possibility that some of the contents of this document may be the subject of patent rights. The issuing agency of this document shall not be held responsible for identifying any or all of such patent rights.

This Standard was proposed by and shall be under the jurisdiction of China Communications Standards Association.

This Standard is drafted by Telecommunication Research Institute of the Ministry of Industry and Information Technology of the People’s Republic of China.

Main drafters of this Standard: Tang Weisheng, Zhou Yi, Zhang Yunzhuan, Lu Bingsong.

This Standard was first issued on October 28, 1998. This is the first revision.

Limits and methods of measurement of electromagnetic compatibility of telecommunication power supply equipment

1 Scope

This Standard specifies the electromagnetic compatibility requirements for telecommunication power supply equipment (hereinafter referred to as TPE, excluding UPS, generator and battery), including limits, performance criteria and measurement methods, etc.

This Standard applies to the power supply equipment for telecommunication switching equipment, telecommunication transmission equipment and wireless communication equipment.

2 Normative references

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

GB 9254 Limits and methods of measurement of radio interference characteristics of information technology equipment

GB 17625.1 Electromagnetic compatibility - Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

GB 17625.2 Electromagnetic compatibility (EMC) - Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection

GB/T 17626.2 Electromagnetic compatibility (EMC) - Testing and measurement techniques - Electrostatic discharge immunity test

GB/T 17626.3 Electromagnetic compatibility - Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test

GB/T 17626.4 Electromagnetic compatibility - Testing and measurement techniques

EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
TPE	Telecommunication Power Supply Equipment
UPS	Uninterrupted Power Supply

4 Test conditions

4.1 General conditions

The TPE shall be tested under normal test conditions. The test conditions shall be recorded in the report.

Regardless whether the TPE requires special software or test fixtures to connect to the host equipment, the test layout shall be as close to the normal or typical actual operation state as possible.

The test conditions of the TPE shall be as close to the actual installation conditions as possible, and the wiring shall be consistent with the actual process. If the TPE is to be installed in a rack or an enclosure as specified by the manufacturer, unless otherwise stated, the TPE shall be installed according to the method stated in the instructions or the installation manual.

If the equipment is part of the system or is connected to the ancillary equipment, the equipment shall be connected to the ancillary equipment of the minimum typical configuration during the test, however, the port connected to the ancillary equipment shall be activated.

If the equipment has a large number of ports, it shall select a sufficient number of ports to ensure that the actual situation can be simulated and that different types of ports can be tested.

If the TPE consists of multiple telecommunication power supply modules, each telecommunication power supply module shall be tested.

Measures shall be taken to avoid the effects of immunity test signals on the measuring equipment and test ancillary equipment (e.g. signal sources, ancillary equipment, etc.) located inside/outside the test environment. Measures shall be taken to avoid the effects of auxiliary test equipment located inside/outside the test environment on the test result.

During the test, the mode of operation and configuration shall be accurately recorded in the test report.

Unless otherwise specified in the product instructions, the TPE shall be connected to the resistive load.

The signal or control port shall be properly connected with the necessary AE or nominal resistance.

The test shall be carried out under the condition of inputting the nominal voltage to the input port.

4.2.2 Immunity test conditions and layouts

All tests shall be carried out under normal installation conditions of the TPE. The distribution of power supply lines and signal lines, grounding, interconnection of cables and the physical layout of the test system shall simulate typical and actual application state and shall comply with the product instructions.

For the TPE subjected to the immunity test, it shall be powered on and working in normal mode. The test shall be carried out under conditions such as specified configuration, typical load configuration (including hardware, software and operating procedures) and full operation.

It shall choose a configuration that minimizes the immunity. It shall consider the possible layouts within the range of normal use.

The test shall be carried out under the condition of inputting the nominal voltage to the input port.

Unless otherwise specified in the product instructions, the TPE shall be connected to the resistive load.

The signal or control port shall be properly connected with the necessary AE or nominal resistance.

During the test, the TPE may operate at a state of small output power (50 % of output power is recommended). The actual output power of the TPE in the test shall be stated in the test report.

The immunity to conducted disturbances test shall be carried out on the power supply input port, power supply output port, and one port of each type of control ports on the TPE.

Power supply lines and control line of not more than 3 m (according to the product instructions) require no immunity test. However, the cables connected to the external network shall be tested.

Internal connection cables between units on the same TPE need not be tested.

To test the TPE's ability to withstand malfunctions and damage to work, the design

6 Performance criteria

The TPE port being monitored during the test may be divided into the following categories.

a) Grade 2 power supply DC port: refers to the DC uninterruptible power supply port (basic power supply DC port).

b) Grade 2 power supply AC port: refers to the AC uninterruptible power supply port (basic power supply AC port).

c) Grade 3 power supply port: refers to the power supply device port (rack power supply port) in the telecommunication equipment.

d) Control signal interface

6.1 Determination criterion A

a) During the EMC test of the equipment, the TPE output voltage shall be within the normal working range.

b) During and after the test of the equipment, the TPE shall operate normally, and there shall be no alarm, false alarm indication (power failure, protective failure, etc.) or error display indication.

6.2 Determination criterion B

a) After the equipment is tested, the TPE shall work normally, and the output voltage shall immediately be within the normal working range.

b) After the equipment is tested, the TPE shall work normally, and there shall be no alarm, false alarm indication (power failure, protective failure, etc.) or error display indication.

6.3 Determination criterion C

The equipment allows loss of monitoring and alarm functions, however, after the equipment is tested, all functions shall be back to normal, and the output voltage shall be within the normal working range.

6.4 Special determination criteria

Special determination criteria are applicable for the Grade 2 DC output port and Grade 2 AC output port.

6.4.1 Grade 2 DC output port

		Immunity to conducted disturbances, induced by radio-frequency fields	9.2.5.2

8 Disturbance measurement methods and limits

8.1 Conducted disturbance

8.1.1 Signal line port

Measurement methods and limits are in accordance with the provisions of GB 9254.

8.1.2 Power supply port

Measurement methods and limits are in accordance with the provisions of GB 9254.

8.2 Radiation disturbance

Measurement methods and limits are in accordance with the provisions of GB 9254.

8.3 Harmonic current (AC power supply input port)

8.3.1 Measurement methods

For equipment with input current ≤ 16 A per phase, measure according to GB 17625.1. For equipment with input current > 16 A per phase, measure according to GB/Z 17625.6.

8.3.2 Limits

For equipment with input current ≤ 16 A per phase, use the limits of Class A equipment in GB 17625.1. For equipment with input current > 16 A per phase, use the limits of Class A equipment in GB/Z 17625.6.

8.4 Voltage fluctuation and flicker (AC power supply input port)

8.4.1 Measurement methods

For equipment with input current ≤ 16 A per phase, measure according to GB 17625.2. For equipment with input current > 16 A per phase, measure according to GB 17625.3.

8.4.2 Limits

For equipment with input current ≤ 16 A per phase, use the corresponding limits in GB 17625.2. For equipment with input current > 16 A per phase, use the corresponding limits in GB/Z 17625.3.

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