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**Product standard to demonstrate the compliance of short
range devices (SRD) and similar applications related to
human exposure to electromagnetic fields (10Hz~30MHz)**

短距离及类似设备电磁照射符合性要求（10Hz~30MHz）

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Table of Contents

Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Exposure limits.....	6
5 Assessment process	8
6 Assessment criteria	10
Annex A (normative) Derivation of low power exclusion levels for ICNIRP and IEEE exposure limitations.....	11
Annex B (normative) Assessment on electromagnetic exposure of wireless power device	13
Annex C (normative) Electromagnetic exposure assessment of near field communication equipment.....	17
Annex D (normative) Assessment on electromagnetic exposure of radio frequency identification device.....	19

Product standard to demonstrate the compliance of short range devices (SRD) and similar applications related to human exposure to electromagnetic fields (10Hz~30MHz)

1 Scope

This Standard specifies the compliance of short-range devices and similar applications related to human exposure to electromagnetic fields.

This Standard applies to short-range devices and wireless devices for similar applications. The frequency range is 10Hz to 30MHz. Similar products such as wireless power supply equipment, near field communication equipment, radio frequency identification equipment can refer to this Standard.

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.

YD/T 2347-2011, *Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure*

IEC 62311-2008, *Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0Hz~300GHz)*

IEC 62479-2010, *Assessment of the compliance of low-power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields*

ICNIRP Guidelines-1998, *Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300GHz)*

ICNIRP Guidelines-2010, *Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (1Hz~ 100kHz)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

SAR - The specific absorption rate, in watts per kilogram;

E - The rms value of the electric field strength in the tissue, in volts per meter;

σ - The medium conductivity, in Siemens per meter;

ρ - The tissue density, in grams per cubic meter;

c_h - The specific heat capacity of tissue, in joules per kilogram and kelvins;

$\frac{dT}{dt}|_{t=0}$ - The differential of temperature at the initial moment in the tissue with respect to time, in Kelvin per second.

3.4 Occupational Exposure Limitations

Apply to all electric, magnetic and electromagnetic field (EMF) exposure limits to which individuals are exposed in the course of their work.

3.5 General Public Exposure Limitations

The limits for exposure to all electric, magnetic and electromagnetic fields that apply to the general public, excluding exposures at work and in medical procedures.

4 Exposure limits

4.1 Requirements for basic restrictions

See Table 1 and Table 2 for the basic restrictions of electromagnetic exposure within the frequency range covered by this Standard. In the 100kHz to 10MHz band, both the basic restrictions for induced electric field and specific absorption rate shall be met. For electric or magnetic fields including transients or very short-term peaks, the induced electric field limits recommended by ICNIRP shall be considered as instantaneous values and not time averaged.

6 Assessment criteria

If the technology used in the equipment does not generate electric fields, magnetic fields or touch currents above the reference level values in the position normally occupied by the user (for example: there are no touchable conductive parts, or touchable conductive parts are permanently earthed), the device is then considered to meet the requirements of this Standard with respect to electric fields, magnetic fields or touch currents without further evaluation.

Laboratory measurement techniques and computational modeling can be used for demonstration of compliance with the limits.

Use the phase center of the probe as the reference point for the test distance. Usually, the test is carried out at a distance of 30cm from the phase center of the measuring probe to the boundary of the device under test. Or test according to the usage distance declared by the manufacturer. This manufacturer's declaration needs to be documented in the report.

For very localized sources of exposure, within a few centimeters of the body, a realistic approach when conducting exposure assessments is to assess doses to induced electric fields on a case-by-case basis. When the distance becomes larger, the localization of the field distribution will weaken. If the distribution is still non-uniform, the exposure of the body or part of the body can be spatially averaged. Compare with the reference levels.

For the assessment of short-range devices used in industry and workplaces, occupational exposure limitations shall be followed.

For the assessment of short-range devices other than work and medical applications, public exposure limitations shall be followed.

Determine the specific test configuration according to the different configurations of short-range devices. Measure the maximum electromagnetic exposure value. The assessment of exposure shall be representative of the test set-up for the typical operating conditions of short-range devices. Record the test arrangement in the report. For the exposure assessment of wireless power supply equipment, it shall be carried out according to the test arrangement specified in Annex B. For the exposure assessment of near-field communication equipment, follow the test arrangement specified in Annex C. For the exposure assessment of radio frequency identification equipment, according to the test arrangement specified in Annex D.

Annex C

(normative)

Electromagnetic exposure assessment of near field communication equipment

C.1 Background of near field communication technology

Near Field Communication (NFC), also known as short-range wireless communication, is a short-range high-frequency wireless communication technology. It allows contactless peer-to-peer data transfer between electronic devices. Generally, it exchanges data within no more than 20cm.

This technology evolved from contactless radio frequency identification (RFID). It was jointly developed by Philips and Sony. Its basis is RFID and interconnection technology. Near field communication is a short-range high-frequency radio technology. The operating frequency is 13.56MHz. Its transmission speed has three types: 106 kbit/s, 212 kbit/s or 424 kbit/s. At present, the near field communication has passed the ISO/IEC IS 18092, the EMCA-340 and the ETSI TS 102 190. NFC has two modes of reading: active and passive.

There are three working modes of NFC:

Card emulation: This mode is actually an IC card using RFID technology. It can replace a large number of IC cards (including credit cards) in shopping malls, bus cards, access control, bus tickets, tickets. In this mode, there is a great advantage. That is, the card is powered by an RF signal from a contactless reader, allowing it to work even if the host device (such as a mobile phone) is out of power.

P2P mode: This mode is similar to other wireless data transmission technologies. It is available for data exchange. But the transmission distance is shorter, the transmission creation speed is faster, the transmission speed is also faster, and the power consumption is low (similar to Bluetooth). Linking two devices with NFC function can realize peer-to-peer data transmission, such as downloading music, exchanging images or synchronizing device address book. Therefore, through NFC, multiple devices such as digital cameras, PDAs, computers and mobile phones can exchange data or services.

Reader/writer mode: It is used as a non-contact card reader, such as reading relevant information from posters or electronic tags for exhibition information.

C.2 Test configuration for NFC device

For the tested equipment exceeding the low power exclusion level in Annex A, an electromagnetic exposure assessment test is required. NFC devices need to be tested in

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Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

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