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## Association Standard

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### 穿戴式移动数据终端通用规范-手腕式

General specifications of wearable mobile data terminal-wrist category

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## 前 言 Foreword

本文件按照GB/T 1.1-2020《标准化工作导则 第1部分：标准化文件的结构和规则》的规定起草。

This document is drafted according to the rules stipulated in GB/T 1.1.-2020 Standardization Guidelines Part 1: Structure and Rules of Standardization Documents.

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本文件起草单位：上海市工商联国际物流商会、上海浩创亘永科技有限公司。

This document is drafted by: SFIC International Logistics Chamber of Commerce, Shanghai Hyco Genyong Technology Co., Ltd.

本文件主要起草人：杨心怀、邵钟林、徐桥南、宋定初、高文中、王志特、徐非凡、钱定金、王晓盛、刘军涛、庞训涛、周建军、薛泮、刘维娜、毕文龙。

This document is mainly drafted by Xinhuai Yang, Zhonglin Shao, Qiaonan Xu, Dingchu Song, Wenzhong Gao, Zhite Wang, Feifan Xu, Dingjin Qian, Xiaosheng Wang, Juntao Liu, Xuntao Pang, Jianjun Zhou, Feng Xue, Weina Liu, Wenlong Bi.

本标准英文翻译人：王昊月、张斯琪

This document is translated in English by: Haoyue Wang, Siqi Zhang.

# 穿戴式移动数据终端通用规范-手腕式 General specifications of wearable mobile data terminal-wrist category

## 1 范围 Scope

本文件规定了手腕式数据终端的要求、质量评定程序、标志、包装、运输、储存等。

This document specifies the requirements, quality assessment procedures, marking, packaging, transportation, storage, etc. of wrist typed wearable mobile data terminal (hereinafter collectively referred to as products).

本文件适用于手腕式数据终端的研发、制造、试验及应用，其他形式的手腕式数据终端可参照采用。

This document applies to the research, development, manufacturing and application of wearable mobile data terminal worn on wrists. Other forms of wrist typed mobile data terminal can use this as reference.

## 2 规范性引用文件 Normative references

下列文件对于本文件的应用是必不可少的，凡是注日期的引用文件，仅所注日期的版本适用于本文件，凡是不注日期的引用文件，其最新版本（包括所有修改单）适用于本文件。

The following documents are indispensable to the application of this document. For dated references, only the dated versions apply to this document. For undated references, the latest versions (including all amendments) apply.

GB/T 191 包装储运图示标志

GB/T 191 Packaging - Pictorial marking for handling of goods

GB/T 1988 信息技术 信息交换用七位编码字符集

GB/T 1988 Information technology-7-bit Coded character set for information interchange

GB/T 2312 信息交换用汉字编码字符集 基本集

GB/T 2312 Code of Chinese graphic character set for information interchange; Primary set

GB/T 2421.1 电工电子产品环境试验 概述和指南

GB/T 2421.1 Environmental testing for electric and electronic products - General and guidance

GB/T 2422 电工电子产品环境试验 术语

GB/T 2422 Environmental testing for electric and electronic products Terms and definitions

GB/T 2423.1 电工电子产品环境试验 第1部分：试验方法：试验A：低温

GB/T 2423.1 Environmental testing - Part 1: Test methods - Tests A: Cold

GB/T 2423.2 电工电子产品环境试验 第2部分：试验方法：试验B：高温

GB/T 2423.2 Environmental testing - Part 2: Test methods - Tests B: Dry heat

GB/T 2423.3 电工电子产品环境试验 第3部分：试验方法：试验Cab：恒定湿热试验

GB/T 2423.3 Environmental testing - Part 3: Testing methods - Test Cab: Constant damp heat test

GB/T 2423.5 电工电子产品环境试验 第5部分：试验方法：试验Ea和导则：冲击

GB/T 2423.5 Environmental testing - Part 2: Test methods - Test Ea and guidance: Shock

GB/T 2423.6 电工电子产品环境试验 第6部分：试验方法：试验Eb和导则：碰撞

GB/T 2423.6 Environmental testing for electric and electronic products - Part 2: Test methods - Test Eb and guidance: Crash

GB/T 2423.10 电工电子产品环境试验 第10部分：试验方法：试验Fe：振动（正弦）

GB/T 2423.10 Environmental testing of electrical and electronic products Part 10: Test method: Test Fe: Vibration (sinusoidal)

GB/T 2828.1 计数抽样检验程序 第1部分: 按接收质量限(AQL)检索的逐批检验抽样计划

GB/T 2828.1 Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

GB/T 4208-2017/IEC 60529: 2013 外壳防护等级(IP代码)

GB/T 4208-2017/IEC 60529: 2013 Degrees of protection provided by enclosure(IP code)

GB/T 4857.2 包装 运输包装件基本试验 第2部分: 温湿度调节处理

GB/T 4857.2 Packaging - Basic tests for transport packages - Part 2: Temperature and humidity conditioning

GB/T 4857.5 包装 运输包装件 跌落试验方法

GB/T 4857.5 Packaging-Transport packages-Vertical impact test method by dropping

GB 4943.1 信息技术设备 安全 第1部分: 通用要求

GB 4943.1 Information technology equipment - Safety - Part 1: General requirements

GB/T 5080.7-1986 设备可靠性试验 恒定失效率假设下的失效率与平均无故障时间验证试验方案

GB/T 5080.7-1986 Equipment reliability testing Compliance test plans for failure rate and mean time between failures assuming constant failure rate

GB/T 5095.5 电子设备机电元件 基本试验规程及测量方法 第5部分 撞击试验(自由元件)、静负荷试验(固定元件)寿命试验和过负荷试验

GB/T 5095.5 Electromechanical components for electronic equipment - Basic testing procedures and measuring methods-Part 5: Impact tests (free components), static load test(fixed components), endurance tests and overload tests

GB/T 5271.14 信息技术 词汇 第14部分: 可靠性、可维护性与可用性

GB/T 5271.14 Information technology - Vocabulary Part 14: Reliability, maintainability and availability

GB 5296.1 消费品使用说明 第1部分: 总则

GB 5296.1 Instructions for use of products of consumer interest - Part 1: General principles

GB/T 8897.1 原电池 第1部分: 总则

GB/T 8897.1 Primary batteries - Part 1: General

GB 9254 信息技术设备的无线电骚扰限值和测量方法

GB 9254 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement

GB/T 11460 信息技术 汉字字型要求和检测方法

GB/T 11460 Information technology - Requirements and test method of the Chinese ideograms font

GB 13000 信息技术 通用多八位编码字符集(UCS)

GB 13000 Information technology - Universal multiple-octet coded character set (UCS)

GB/T 13426-1992 数据通讯设备的可靠性要求和试验方法

GB/T 13426-1992 Reliability requirements and test methods for digital communication equipment

GB/T 15732 汉字按键输入通用词语集

GB/T 15732 General word set for Chinese character keyboard input

GB 15934 电器附件 电线组件和互连电线组件

GB 15934 Electrical accessories - Cord sets and interconnection cord sets

GB/T 17618 信息技术设备抗扰度限值和测量方法

GB/T 17618 Information technology equipment - Immunity characteristics - Limits and methods of measurement

GB 17625.1-2012 电磁兼容 限值 谐波电流 发射限值

GB 17625.1-2012 Electromagnetic compatibility - Limits - Limits for harmonic current emissions

GB/T 17626.2-2018 电磁兼容 试验和测量技术 静电放电抗扰度试验

GB/T 17626.2-2018 Electromagnetic compatibility - Testing and measurement techniques -

## Electrostatic discharge immunity test

GB 18030 信息技术 中文编码字符集

GB 18030 Information technology - Chinese coded character set

GB 18455 包装回收标志

GB 18455 Package recycling mark

GB/T 18910.1-2002 液晶和固态显示器件 第1部分: 总规范

GB/T 18910.1-2002 Liquid crystal and solid-state display devices - Part 1: Generic specification

GB/T 21023 中文语音识别系统通用技术规范

GB/T 21023 General specification for Chinese speech recognition system

GB/T 26125 电子电气产品 六种限用物质(铅、汞、镉、六价铬、多溴联苯和多溴二苯醚)的测定

GB/T 26125 Electronic and electrical products Determination of six restricted substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers)

GB/T 26572 电子电气产品中限用物质的限量要求

GB/T 26572 Requirements for limiting restricted substances use in electronic and electrical products

GB/T 28828 信息安全技术公共及商用服务信息系统个人信息保护指南

GB/T 28828 Information security technology - Guideline for personal information protection within information system for public and commercial services

GB/T 30426 含碱性或其他非酸性电解质蓄电池和蓄电池组 便携式锂蓄电池和蓄电池组

GB/T 30426 Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium cells and batteries for portable applications

GB/T 31241-2014 便携式电子产品用锂离子电池和电池组安全要求

GB/T 31241-2014 Lithium ion cells and batteries used in portable electronic equipment - Safety requirements

GB/T 32638 移动通讯终端电源适配器及充电数据接口技术要求和试验方法

GB/T 32638 Mobile communication terminal power adapter and charging/data interface technical requirements and test methods

GB/T 36951-2018 《信息安全技术 物联网感知终端应用安全技术要求》

GB/T 36951-2018 Information security technology - Security technical requirements for application of sensing terminals in internet of things

GB/T 37024-2018 《信息安全技术物联网感知层网关安全技术要求》

GB/T 37024-2018 Information security technology - Security technical requirements of gateway in sensing layer of the internet of things

GB/T 37025-2018 《信息安全技术物联网数据传输安全技术要求》

GB/T 37025-2018 Information security technology - Security technical requirements of data transmission for internet of things

GB/T 37035-2018 可穿戴产品分类与标识

GB/T 37035-2018 Classification and identification of wearable product

GB/T 37044-2018 《信息安全技术物联网安全参考模型及通用要求》

GB/T 37044-2018 Information security technology - Security reference model and generic requirements for internet of things

GB/T 37093-2018 《信息安全技术 物联网感知层接入通信网的安全要求》

GB/T 37093-2018 Information security technology - Security requirements for IoT sensing layer access to communication network

SJ/T 11363 电子信息产品中有毒有害物质的限量要求

SJ/T 11363 Requirements for concentration limits for certain hazardous substances in electronic information products

SJ/T 11364 电子信息产品污染控制标识要求

SJ/T 11364 Marking for control of pollution caused by electronic information products

SJ/T 11365 电子信息产品中有毒有害物质的检测方法

SJ/T 11365 Testing methods for hazardous substances in electronic information products

SJ/T 11461.6.2-2016 有机发光二极管显示器件

SJ/T 11461.6.2-2016 Organic light emitting diode display device

QB/T 4887 热塑性聚氨酯表带

QB/T 4887 Thermoplastic polyurethane bracelets

### 3 术语和定义 Terms and Definitions

GB/T 12905-2019界定的以及下列术语和定义适用于本文件。

Terms and definitions defined by GB/T 12905-2019 and the following apply to this document.

#### 3.1

**移动数据终端 Mobile Data Terminal**

在移动通信设备中，终止来自或送至网络的无线传输，并将终端设备的能力适配到无线传输的部分。

Part in the mobile communication device that terminates the wireless transmission from or to the network, and adapt the capabilities of the terminal device to the wireless transmission.

#### 3.2

**电池模块 Battery Module**

为手腕式数据终端提供电源和电源管理的工作单元。

Working units that provide power and power management for wrist-type data terminals.

#### 3.3

**信息交互模块 Information Interaction Module**

实现提醒、导航、校准、监测、支付、通话等交互功能，接收或发送相关信息的工作单元。

Working units that provides interactive functions such as reminding, navigation, calibration, monitoring, paying, and calling, and that receive or send relative information.

#### 3.4

**控制模块 Control Module**

完成信息处理和计时信号生成的工作单元。

Work units that process information and generates timing signal.

#### 3.5

**信息显示模块 Information Display module**

以指针指示、图文显示、语音提示等方式，完成信息输出的工作单元。

Working units that use pointer indication, graphic display, voice notification, etc. To produce information output.

### 3.6

#### 腕带组件 Wrist Band Components

实现可佩戴特性的零部件组合，包含腕带部件、带扣部件、连接件等。

A combination of parts that meets wearable characteristics, including wristband parts, buckle parts, connectors, etc.

### 3.7

#### 触摸屏 Touch Screen

通过触摸实现信号输入的感应式显示装置。

Inductive display device that generate signal input through touch.

### 3.8

#### 操作组件 Operating Components

用于控制或调整手腕式数据终端功能选项的装置。

A device that controls or adjusts a wrist-type data terminal's functional options.

注：如按钮、触控件等。

Note: e.g. button, touching control, etc.

### 3.9

#### 充电触点 Charging Contact

用于手腕式数据终端电池充电的一组导电元件。

A set of conductive elements that charges a wrist data terminal's battery.

### 3.10

#### 待机时间 Standby Time

手腕式数据终端完全充满电后，在室温环境下开机，不进行任何操作，直至自动关机的时间。

Cycle between the wrist-type data terminal is turned on at the room temperature without any operation and automatically turned off after it is fully charged.

### 3.11

#### 可穿戴设备 Wearable Device

由GB/T 37035-2018可穿戴产品分类与标识中规定，整合在随身佩戴物品或植入表皮/体内，可以舒适的穿戴或佩戴的智能电子设备。通常具有多种感知、监测活动状态或生理指标以及提高工作效率等功能。

Smart electronic devices that are integrated into wearable items or implanted in the epidermis/body and can be worn comfortably as specified in GB/T 37035-2018 "Classification and identification of wearable products". They have many functions such as sensing, monitoring activity status or physiological indicators, and improving work efficiency.

[来源：GB/T 37035-2018，3.1，有修改]



[Source: GB/T 37035-2018, 3.1, modified]

### 3.12

手腕可穿戴式移动数据终端 Wrist type wearable mobile data terminal

一种具有计算处理能力的佩戴于手腕上的可穿戴设备。

A wearable device with computing and processing capabilities worn on the wrist.

## 4 缩略语 Abbreviations

下列缩略语用于本文件：

The following abbreviations are used in this document:

WIFI 无线网络：Wireless Fidelity；

LCD 液晶显示屏：Liquid Crystal Display；

OLED 有机发光二极管：Organic Light Emitting Diode；

HBM 人体放电模型：Human Body Model；

CS 字符集：Character Set。

## 5 要求 Requirements

### 5.1 外观和结构 Appearance and structure

产品的外观和结构应满足下列要求：

The appearance and structure of the product shall meet the following requirements:

a) 表面不应有明显的凹痕、划伤、裂纹、变形和污染；

a) No obvious dent, scratch, crack, deformation, or pollution on the surface;

b) 表面涂覆层应均匀，不应起泡、龟裂、脱落和磨损；

b) Uniform coating without blistering, cracking, shedding, or abrasion;

c) 金属零部件不应有锈蚀及其他机械损伤；

c) No rust or other mechanical damages on the metal parts;

d) 零部件应紧固无松动，开关、按钮和其他控制部件应灵活可靠。

d) Parts shall be fastened without looseness, and switches, buttons, and other control parts shall be flexible and reliable.

### 5.2 中文信息处理 Chinese information processing

#### 5.2.1 字符集 Character sets

产品应采用 GB/T 1988、GB 2312、GB 18030、GB 13000 等国家标准规定的字符集，并需建立相互之间的映射关系。

Product shall adopt the character sets specified by national standards such as GB/T 1988, GB 2312, GB 18030, GB 13000, etc., and shall establish the mutual mapping relationship in between.

#### 5.2.2 汉字字型 Chinese fonts

汉字字型应符合 GB/T 11460 的规定。

Chinese fonts shall meet the specifications of GB/T 11460.

#### 5.2.3 输入法 Input method

配备手写输入功能的产品应符合 GB/T 18790 的要求。

Product equipped with handwriting input function shall meet the requirements of GB/T 18790.

配备语音输入功能的产品应符合 GB/T 21023 的要求。

Products equipped with voice input function shall meet the requirements of GB/T 21023.

#### 5.2.4 预装软件 Pre-installed software

配置的软件应与系统的硬件资源相适用，除系统软件、部分驱动软件或增配的应用软件外，还应配有相应的自检程序，对同一系列产品的软件应遵循系列化、标准化、模块化、中文化。

The configured software shall be compatible with the hardware resources of the system. In addition to the system software, part of the drive software, and additional application software, the software shall also be equipped with corresponding self-check procedures and follow serialization, standardization, modular, and Chinese culture.

产品的软件应与说明书中的描述保持一致。

Product's software shall be consistent with the description in the manual.

外购软件应符合中华人民共和国工业和信息化部令9号《软件产品管理办法》的要求。

Outsourcing software shall meet the requirements of Ministry of Industry and Information Technology of the People's Republic of China No.9-"Management Measures for Software Products".

#### 5.3 数据接口 Data interface

产品应选用WIFI、蓝牙、ZigBee、数字蜂窝移动通讯等无线通信技术实现数据交换，其采用的无线通讯技术应5.14中的要求。

Product shall use WIFI, Bluetooth, ZigBee, digital cellular mobile communication, and other wireless communication technologies to achieve data exchange. And the wireless communication technology adopted shall meet the requirements in Section 5.14.

#### 5.4 按键 Keys

按键应按动灵活，接触可靠，无卡住现象，并拥有良好的手感。其动作参数，包括动作力、释放力、动作行程、超行程、差程、全行程和释放行程等，应符合产品所用按键型号的详细规范。在规定的符合条件下，通断寿命应大于  $10^5$  次。

The keys shall be flexible and reliable in contact, free from jamming, and comfortable to touch. The operating parameters, including operating force, release force, operating stroke, over-travel, differential, full stroke, and release stroke, etc., shall meet the detailed specifications of the key type used in the product. The on-off life shall be greater than  $10^5$  times under the specified conditions.

#### 5.5 显示部件 Display parts

##### 5.5.1 LCD 显示屏 LCD display screen

采用LCD的显示屏的产品，其显示性能应符合GB/T 18910.1-2002的规定。

Product's performance with LCD display screen shall meet the requirements of GB/T 18910.1-2002.

##### 5.5.2 显示屏 Display screen

采用OLED的显示屏的产品，其显示性能应符合SJ/T 11461.2的规定。

Product's performance with OLED display screen shall meet the requirements of SJ/T 11461.2.

#### 5.6 腕带 Wristbands

热塑性聚氨酯腕带的外观、物理机械性能、耐高低温性能、耐光照性能、耐腐蚀性能和有害物质限量的要求符合QB/T 4887的规定。

Thermoplastic polyurethane wristband's appearance, physical and mechanical properties, high and low temperature resistance, light resistance, corrosion resistance, and hazardous substances limit requirements shall meet the requirements of QB/T 4887.

其他塑胶材料腕带可亦参照执行。

Wristbands of other plastic materials can also refer to this document.

## 5.7 节能 Energy saving

产品应有自动待机或睡眠功能。

Product shall have automatic standby or sleep function.

## 5.8 安全 Safety

### 5.8.1 电气安全 Electrical safety

产品的电气安全要求应符合GB 4943.1的规定。

Product's electrical safety shall meet the requirements of GB 4943.1.

### 5.8.2 信息安全 Information security

产品的信息安全应符合GB/T 28828、GB/T 36951-2018、GB/T 37024-2018、GB/T 37025-2018、GB/T 37044-2018、GB/T 37093-2018 的相关规定。

Product's information security shall comply with the relevant regulations of GB/T 28828, GB/T 36951-2018, GB/T 37024-2018, GB/T 37025-2018, GB/T 37044-2018, and GB/T 37093-2018.

## 5.9 人工汗环境适用性 Artificial sweat environment adaptability

产品应耐汗水腐蚀和功能稳定，即经过人工汗环境试验后，产品整体不应有显著变化，其功能应能保持正常。人工汗环境试验宜在产品的功能试验、机械试验和电气试验都通过的情况下进行，人工汗环境试验的准备要求应符合GB/T 4775-2014中6.1.1、6.1.2和6.1.3的规定。

Product shall be resistant to sweat corrosion and stable in function. It shall not have noticeable change, and shall maintain normal functions after the artificial sweat environment test. The artificial sweat environment test shall be carried out after product passes the functional test, mechanical test, and electrical test. And the preparation shall meet the requirements of GB/T 4775-2014 section 6.1.1, 6.1.2, and 6.1.3.

## 5.10 抗静电能力 Antistatic capability

产品的抗静电能力应满足表1的要求。

Product's antistatic capability shall meet the requirements in Table 1.

表1 抗静电能力

Table 1 Antistatic ability

产品类型 Product type	放电方式 (HBM) Human-Body Model	
	空气放电kV Air discharge	接触放电kV Contact discharge
穿戴式移动数据终端 Wearable mobile data terminal	≥20	≥15

### 5.11 外壳防护能力 Shell protection capability

产品的外壳防护等级划分应符合GB/T 4208-2017/IEC 60529: 2013中的规定, 并满足下列要求:

Division of protection level of product's outer case shall meet the specifications of GB/T 4208-2017/IEC 60529: 2013 and the following requirements:

- 防水等级 $\geq 6$ ;
- Water-proof level $\geq 6$ ;
- 防尘等级 $\geq 6$ 。
- Dust-proof level $\geq 6$ .

### 5.12 电源适用能力 Power adaptability

对于交流供电的, 应能在产品额定电压偏差 $\pm 10\%$ , 频率偏差 $\pm 1\text{Hz}$ 范围内的条件下正常工作。

For alternating current (AC) power supply, product shall work normally when it's rated voltage deviation is within  $\pm 10\%$  and frequency deviation within  $\pm 1\text{Hz}$ .

对于直流供电的, 应能在产品额定电压偏差 $\pm 5\%$ 范围内的条件下正常工作。

For direct current (DC) power supply, product shall work normally when it's rated voltage deviation is within  $\pm 5\%$ .

### 5.13 电磁兼容性 Electromagnetic compatibility

#### 5.13.1 无线电骚扰限值 Radio disturbance limit

产品的无线电骚扰限值应符合GB 9254规定的B级要求。

Product's radio disturbance limit shall meet the B-level requirements specified in GB 9254.

#### 5.13.2 抗扰度限值 Immunity limit

产品的抗扰度限值应符合GB/T 17618中的规定。

Product's immunity limit shall meet the requirements specified in GB/T 17618.

### 5.14 通讯标准 Communication standard

产品支持的无线通讯方式应兼容蓝牙协议标准(包含BT4.1+HS、V3.0+HS、V2.1+EDR)、WIFI协议标准(包含WIFI 802.11 a/b/g/n/ac)及蜂窝通讯标准(FDD-LTE: B1/B2/B3/B4/B5/B7/B8; TDD-LTE: B38/B39/B40/B41; GSM: 850/900/1800/1900MHz)。

Product shall support wireless communication method compatible with Bluetooth protocol standards (including BT4.1+HS, V3.0+HS, V2.1+EDR), WIFI protocol standards (including WIFI 802.11 a/b/g/n/ac), and Cellular communication standards (FDD-LTE: B1/B2/B3/B4/B5/B7/B8; TDD-LTE: B38/B39/B40/B41; GSM: 850/900/1800/1900MHz).

产品的有线通讯接口应兼容USB2.0、USB3.0。

Product's wired communication interface shall be compatible with USB2.0 and USB3.0.

### 5.15 环境适应性 Environmental adaptability

#### 5.15.1 气候环境适应性 Climate and environment adaptability

产品的气候环境适应性应满足表2的要求。

Product's climate and environment adaptability shall meet the requirements of Table 2.

表2 气候环境适应性

Table 2 Climate and environment adaptability

产品种类 Product Type	环境光照(lx) Ambient light
一维指环扫描设备 (LD) One-dimensional ring scanning device (LD)	≤48000
一维指环扫描设备 (CCD) One-dimensional ring scanning device (CCD)	≤110000
二维指环扫描设备 Two-dimensional ring scanning device	≤86111

5.15.2 机械环境适应性 Mechanical environment adaptability

5.15.3 振动适应性 Vibration adaptability

产品的振动适应性应满足表3的要求。

Product's vibration adaptability shall meet the requirements of Table 3.

表3 振动适应性

Table 3 Vibration adaptability

项目 Project	内容 Content	指标 Index
初始和最后振动 响应检查 Initial and final vibration response check	频率范围, Hz Frequency range	10~55
	扫频速度, oct/min Sweep speed	≤1
	位移幅值,mm Displacement amplitude	0.15
定频耐久 Fixed frequency durability	位移幅值,mm Displacement amplitude	0.75 (10Hz~25Hz) 0.15 (25Hz~55Hz)
	持续时间,min Duration	30±1
扫频耐久 Sweep frequency durability	频率范围,Hz Frequency range	10~55~10
	位移幅值,mm Displacement amplitude	0.15
	扫频速度,oct/min Sweep speed	≤1
	循环次数 Cycles	5

5.15.4 冲击适应性 Shock adaptability

产品应满足1.5米高落摔至混凝土地面，6面8角12棱各跌落1次（共26次）后，各项性能正常。

Product shall meet the requirements of 1.5 meters falling to concrete. Perform normally after falling once on each of 6 sides, 8 corners, and 12 edges (26 times in total).

5.15.5 碰撞适应性 Crash adaptability

产品应满足0.5米高度滚筒测试不低于1000次后，各项性能正常。

Product shall perform normally after 0.5 meter height roller test no less than 1000 times.

### 5. 15. 6 运输包装件跌落适应性 Drop adaptability of transport package

产品的运输包装件跌落适应性应满足表4的要求。

Drop adaptability of transport package shall meet the requirements in Table 4.

表4 运输包装件跌落适应性

Table 4 Drop adaptability of transport package

包装件质量 kg Weights of the package	跌落高度 mm Drop heights
$m \leq 15$	1000
$15 < m \leq 30$	800
$30 < m \leq 40$	600
$40 < m \leq 45$	500
$45 < m \leq 50$	400
$m > 50$	300

### 5. 15. 7 自由跌落环境适应性 Free drop adaptability

产品的自由跌落试验条件应满足表5的要求。

Product's free drop adaptability shall meet the requirements in Table 5.

表5 自由跌落试验条件

Table 5 Free drop test conditions

试验样品g Test sample	跌落高度mm Drop heights
$m \leq 300$	1000
$300 < m \leq 500$	800
$500 < m \leq 1500$	500
$m > 1500$	300

### 5. 16 可靠性 Reliability

采用平均失效间隔工作时间(MTBF)衡量产品的可靠性水平。

Use mean time between failures (MTBF) to measure reliability.

本文件规定的产品m值(MTBF的不可接收值) $\geq 7500h$ 。

This document specifies product's m value (MTBF unacceptable value) shall be  $\geq 7500h$ .

### 5. 17 功耗及续航 Power consumption and endurance

#### 5. 17. 1 工作功耗 Working power consumption

产品的工作功耗可分为3个级别，用1、2、3表示级别：

Product's power consumption shall be divided into 3 levels as level 1, level 2, and level 3:

a) 3级：平均功耗  $2W < P \leq 3W$  且峰值功耗  $4W < P_{max} \leq 6W$ ,表示功耗水平一般，根据情况选用；

a) Level 3: The average power consumption is  $2W < P \leq 3W$ , and the peak power consumption is  $4W < P_{max} \leq 6W$ , indicating average power consumption level. Selection depends.

b) 2级：平均功耗  $1W < P \leq 2W$  且峰值功耗  $2W < P_{max} \leq 4W$ ,表示功耗水平良好,推荐选用；

b) Level 2: Average power consumption  $1W < P \leq 2W$ , and peak power consumption  $2W < P_{max} \leq 4W$ , indicating good power consumption level. Recommended selection.

c) 1级: 平均功耗  $P \leq 1W$  且峰值功耗  $P_{max} \leq 2W$ , 表示功耗水平优秀, 优先选用。

c) Level 1: Average power consumption  $P \leq 1W$ , and peak power consumption  $P_{max} \leq 2W$ , indicating excellent power consumption. Preferred selection.

测试环境条件如下:

The test environment conditions are as follows:

——温度:  $25^{\circ}C \pm 5^{\circ}C$ ;

——Temperature:  $25^{\circ}C \pm 5^{\circ}C$ ;

——湿度: 35%~65%。

——Humidity: 35%~65%.

#### 5.17.2 待机功耗 Standby power consumption

产品应有待机功能, 待机功耗应小于0.2W。

The product shall have a standby function, and the standby power consumption shall be less than 0.2W.

测试环境条件如下:

The test environment conditions are as follows:

——温度:  $25^{\circ}C \pm 5^{\circ}C$ ;

——Temperature:  $25^{\circ}C \pm 5^{\circ}C$ ;

——湿度: 35%~65%。

——Humidity: 35%~65%.

#### 5.17.3 续航能力 Endurance

在累计已使用5个电池充放周期内, 以电池满电状态下, 其续航能力大于18小时。

The working time is more than 18h in accumulated 5 battery charging and discharging cycles and when the battery is fully charged.

测试环境条件如下:

The test environment conditions are as follows:

——温度:  $25^{\circ}C \pm 5^{\circ}C$ ;

——Temperature:  $25^{\circ}C \pm 5^{\circ}C$ ;

——湿度: 35%~65%。

——Humidity: 35%~65%.

#### 5.18 安全 Safety

5.18.1 产品的安全应符合 GB 4943.1 的要求。

5.18.1 The safety of product shall meet the requirements of GB 4943.1.

5.18.2 电子电气产品六种限用物质(铅、汞、镉、六价铬、多溴联苯和多溴二苯醚)应符合 GB/T 26125 的要求。

5.18.2 The six restricted substances in electronic and electrical products (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers) should meet the requirements of GB/T 26125.

5.18.3 电子电气产品中限用物质的限量要求应符合 GB/T 26572 的要求。

5.18.3 The limit requirements of restricted substances in electronic and electrical products shall meet the requirements of GB/T 26572.

5.18.4 表壳体及其附件人工汗耐腐蚀性能应符合 QB/T 4775-2014 的要求。

5.18.4 Product's outer case and the accessories' anti-corrosion performance shall meet the requirements of QB/T 4775-2014.

5.19 有害物质限量 Quantity limits of harmful substances

产品的有害物质限量应满足SJ/T 11363的要求。

Product's hazardous substances quantity shall meet the requirements of SJ/T 11363.

5.20 电池 Battery

使用原电池的产品应符合GB/T 8897.1中第4章的规定。

Products using primary batteries shall meet the requirements of Chapter 4 in GB/T 8897.1.

使用锂蓄电池和蓄电池组的产品应符合GB/T 30426和GB 31241的规定。

Products using lithium batteries and battery packs shall meet the requirements of GB/T 30426 and GB 31241.

使用其他电池的产品应符合相应的标准或规范。

Products using other batteries shall comply with corresponding standards or specifications.

5.21 补光灯 Fill light

配备补光灯的产品，可采用全局补光或者局部补光。

Product equipped with fill light shall use global fill light or local fill light.

5.22 个人信息防护 Personal information protection

产品工作时进行信息处理过程中涉及的用户个人信息保护应满足GB/Z 28828的要求。

Product's information processing that involves user's personal information protection shall meet the requirements of GB/Z 28828.

5.23 电源适配器及充电数据接口 Power adapter and charging data interface

产品所配置的电源适配器及充电数据接口要求参照GB/T 32638规定执行。

Product shall implement the power adapter and charging data interface that meet the requirements of GB/T 32638.

5.24 文档格式 File format

使用说明书文档应符合 GB 5296.1 的规定，其他文档应符合相应标准或规范。

Instructions shall comply with the specifications of GB 5296.1, and other documents shall comply with corresponding standards or specifications.

6 质量评定程序 Quality assessment procedure

6.1 一般规定 General regulations

产品在定型时（设计定型、生产定型）和生产过程中应按本文件和产品标准中的补充规定进行检验，并应符合这些规定的要求。



The product shall be inspected according to the supplementary provisions in this document and product standards during the finalization (design and production finalization) and production process, and shall meet the requirements of these regulations.

## 6.2 检验分类 Inspection classifications

本文件规定的检验分为：

The inspections specified in this document are divided into:

- a) 定型检验；
- a) Finalization inspection;
- b) 质量一致性检验。
- b) Quality consistency inspection.

各类检验项目和顺序分别按表6的规定进行，若产品标准中有补充的检验项目时，则应将其插入至表6的相应位置。

Carry out various inspection items and order according to Table 6. If there are supplementary inspection items in the product standard, insert them into the corresponding position in Table 6.

表6 检验项目

Table 6 Inspection items

检验项目 Inspection items		要求章条号 Required chapter	实验方法章条号 Experimental method chapter	定型检验 Finalization inspection	质量一致性检验 Quality consistency inspection	
					逐批检验 Batch inspection	周期检验 Periodicity inspection
外观结构 Appearance and structure		5.1	B.2	○	○	○
电源适应能力 Power adaptability		5.3	B.4	○	—	○
电磁电容性 Electromagnetic capacitance	无线电骚扰限值 Radio disturbance limit	5.4.1	B.5.1	○	—	○
	抗扰度限值 Immunity limits	5.4.2	B.5.2	○	—	○
通讯接口 Communication Interface		5.5	B.6	○	○	○
环境适应性 Environmental adaptability		5.7	B.8	○	—	○
可靠性 Reliability		5.8	B.9	○	—	○
功耗 Power consumption		5.9	B.10	○		

安全 Security	5.10	B.11	○	○	○
限用物质的限量 Limits of restricted substances	5.11	B.12	△	—	△
电池 Battery	5.12	B.13	○	—	○
按键 Key	5.13	B.14	○	—	○
补光灯 Fill light	5.14	B.15	○	○	○
支持性软件 Supportive software	5.16	B.17	○	○	○
<p>注1: “○”表示在该类检验中应进行的实验项目, “-”表示在该类检验中不进行的实验项目, “△”表示可选检验的项目  Note 1: ‘○’ indicates the experimental items that shall be carried out in this type of inspection. ‘-’ indicates the experimental items that are not carried out in this type of inspection. ‘△’ indicates the optional inspection items.</p> <p>注2: “安全”项目在逐批检验时, 只进行接触电流和抗电强度的实验。  Note2: During inspection in batch of ‘security’ item, only tests of contact current and electric strength are carried out.</p>					

### 6.3 定型检验 Finalization inspection

#### 6.3.1 产品在设计定型和生产定型时应通过定型检验。

6.3.1 The product shall pass the finalization inspection during design finalization and production finalization.

#### 6.3.2 定型检验由产品制造单位委托通过国家认可主管部门认可的第三方检测机构进行。

6.3.2 Finalization inspection is entrusted by the product manufacturer to conduct a third-party inspection agency approved by the national accreditation authority.

#### 6.3.3 定型检验中的可靠性鉴定试验的样品数依据产品批量、试验时间确定, 其他检验项目的样品数量为2台或2台以上。

6.3.3 The number of samples for the reliability inspection in the finalization inspection is determined according to the product batch and test time. The number of samples for other inspection items is 2 or more.

#### 6.3.4 定型检验中的各试验项目故障的判定和计入方法见附录A, 除可靠性试验外, 其余项目均按以下规定进行:

6.3.4 Refer to Appendix A for the judgment and accounting method of the failure of each inspection item in the finalization inspection. Except for the reliability inspection, the other items are carried out according to the following regulations:

——试验中出现故障或某项通不过时, 应停止试验, 查明故障原因, 提出故障分析报告, 重新进行该项试验。

——When a failure occurs during the test or an item fails, stop the inspection, find out the cause of

the failure, submit a failure analysis report, and repeat the inspection ;

——若在以后的试验中再次出现故障或某项通不过时，再查明故障原因，排除故障，提出故障分析报告后，应重新进行定型检验。

——If a failure occurs again in the future inspection or an item fails to pass, find out the cause of the failure again, eliminate the failure, and submit a failure analysis report, and then perform the type inspection again.

6.3.5 检验后要提交定型检验报告。

6.3.5 Submit a finalized inspection report after the inspection.

6.4 逐批检验 Batch inspection

6.4.1 逐批检验由产品制造单位的质量检验部门负责进行。

6.4.1 Batch inspection shall be carried out by the quality inspection department of the product manufacturer.

6.4.2 批量生产或连续生产的产品，进行全数逐批检验，检验中，出现任一项不合格时，返修后重新进行检验，若再次出现任一项不合格时，则判该台产品为不合格品。逐批检验中性能和外观结构检查，允许按 GB/T 2828.1 进行抽样检验，如采用抽样检验，产品标准中应规定接收质量限(AQL)和抽样方案和拒收后的处理方法。

6.4.2 All mass-produced or continuous-produced products shall be carried out batch inspections. During the inspection, if any item is unqualified, the inspection shall be performed again after repairing. If any item is unqualified again, the product will be judged as an unqualified product. In the batch inspection of performance and appearance structure inspection, sampling inspection is allowed according to GB/T2828.1. If sampling inspection is adopted, the product standard shall specify the acceptance quality limit (AQL), sampling plan and treatment method after rejection.

6.4.3 通过检验的产品为合格产品。

6.4.3 The products that pass the inspection are qualified products.

6.5 周期检验 Periodicity inspection

6.5.1 连续生产的产品，每年至少进行一次周期检验，当设计、工艺改动和元器件、零部件更换时，应重新进行周期检验。

6.5.1 Continuously produced products shall undergo periodicity inspection at least once a year. When the design, process changes and components and parts are replaced, repeat the periodicity inspection.

6.5.2 周期检验由产品制造单位或委托通过国家认证认可主管部门认可的检测机构负责进行，根据订货方的要求，产品制造单位应提供该产品近期的周期检验报告。

6.5.2 Periodicity inspections are carried out by the product manufacturing unit or an inspection agency authorized by the national certification and accreditation authority. According to the requirements of the ordering party, the product manufacturing unit shall provide the product's recent periodicity inspection report.

6.5.3 周期检验样品应在逐批检验合格产品中随机抽取，其中可靠性试验的样品数据产品批量、试验时间和成本确定，其余检验项目的试验样品数为 2 台或 2 台以上。

6.5.3 Periodicity inspection samples shall be randomly selected from batch inspection of qualified products. The sample data of reliability inspection product batch, inspection time and cost are determined. The number of tested samples for other inspection items shall be 2 or more.

6.5.4 周期检验中的各检验项目故障的判定和计入方法见附录 A，除可靠性试验外，其余项目的故障按以下处理：

6.5.4 Refer to Appendix A for the judgment and accounting method of the failure of each inspection item in the periodicity inspection. Except for the reliability inspection, the failure of the other items shall be handled as follows:

检验中出现故障或任一项通不过时应查明故障原因，提出故障分析报告。经修复后，重新进行该项检验之后，再按顺序做以下各项试验，如再次出现故障或某项通不过，再查明故障原因，提出故障分析报告，再经修复后，应重新进行周期检验。在重新进行周期检验中又出现某一项通不过的情况时，判该产品通不过周期检验。经过周期检验中的环境试验的样品，应印有标记，一般不应作为合格品出厂。

When a failure occurs during the inspection or any item fails, find out the cause of the failure and submit a failure analysis report. After repairing, perform the inspection again, and then do the following inspections in order. If a failure occurs again or one of the items fails, then find out the cause of the failure and submit a failure analysis report. After the repair, the periodicity inspection shall be repeated again. When a certain item fails in the periodicity inspection again, it is judged that the product fails the periodicity inspection. The samples that have undergone the environmental test in the periodic inspection shall be marked, and generally shall not be shipped as qualified products.

6.5.5 检验后要提交周期检验报告。

6.5.5 Submit a periodicity inspection report after the inspection.

## 7 标志、包装、运输、贮存 Signs, packing, transportation, storage

### 7.1 标志 Signs

包装箱外应注明产品型号、数量、质量、制造单位名称、地址、制造日期、产品执行标准编号，包装箱外应印刷或贴有“怕雨”、“易碎物品”等储运标志，储运标志应符合GB/T 191的规定，其他标志应符合国家标准有关规定。

The outside of the packing box shall indicate the product model, quantity, quality, name of the manufacturer, address, date of manufacture, and product implementation standard number. The outside of the packing box shall be printed or affixed with storage and transportation signs such as "Keep Dry" and "Fragile". Storage and transportation signs shall comply with GB/T 191, and other signs shall comply with relevant regulations of national standards.

### 7.2 包装 Packing

包装箱应符合防潮、防尘、防震的要求，包装箱内应有装箱清单、检验合格证、备件、附件及有关的随机文件。

The packing box shall meet the requirements of moisture-proof, dust-proof and shock-proof, and there shall be a packing list, inspection certificate, spare parts, accessories and related random documents in the packaging box.

### 7.3 运输 Transportation

包装后的产品应能用任何交通工具进行运输，产品在运输过程中不允许雨雪或液体直接淋袭和机械损伤。

The packaged product shall be able to be transported by any means of transportation. The product shall not be directly exposed to rain, snow or liquid and mechanical damage during transportation.

#### 7.4 贮存 Storage

产品贮存时应放在原包装箱内，存放产品的仓库环境温度为 $0^{\circ}\text{C}\sim 40^{\circ}\text{C}$ ，相对湿度为 $30\%\sim 85\%$ 。仓库内不应有各种有害气体、易燃和易爆物品及有腐蚀性的化学物品，并且应无强烈的机械震动、冲击和强磁场作用，包装箱应垫离地面至少 $15\text{cm}$ ，距离墙壁、热源、冷源、窗口或空气入口至少 $50\text{cm}$ ，若在制造单位存放超过六个月，则应在出厂前重新进行逐批检验。

The product should be stored in the original packing box. The temperature of the warehouse is  $0^{\circ}\text{C}\sim 40^{\circ}\text{C}$ , and the relative humidity is  $30\%\sim 85\%$ . There should be no harmful gases, flammable and explosive materials and corrosive chemicals in the warehouse, and there should be no strong mechanical vibration, shock and strong magnetic field. The packing box should be at least  $15\text{cm}$  away from the ground and away from the wall. The heat source, cold source, window or air inlet should be at least  $50\text{cm}$ . If stored in the manufacturing unit for more than six months, the batch inspection should be repeated before leaving the factory.

附录 A Appendix A  
(资料性附录) (Informative)  
故障判据 Failure criteria

### A.1 故障定义和解释 Failure definition and explanation

出现以下情况之一均视为故障:

One of the following conditions is regarded as a failure:

a) 受试样品在规定的条件下, 出现一个或几个性能参数超过规定要求;

a) Under the specified conditions, one or several performance parameters of the tested sample exceed the specified requirements;

b) 受试样品在规定的应力范围内工作, 由于机械零件、结构件的损坏或失灵, 或出现了元器件的失效, 则视为受试样品不能完成其规定的功能。

b) The tested sample works within the specified stress range. If damage or failure of mechanical parts, structural parts, or failure of components occur, the tested sample shall not perform its specified functions.

### A.2 故障分类 Failure classifications

#### 关联性故障 Correlation failures

关联性故障是受试样品预期会出现的故障, 通常都是由产品本身条件引起的, 它是在解释试验结果和计算, 可靠性特征值时必须计入的故障。

Correlation failure are expected failure of the tested sample. Products' own conditions generally cause correlation failure. It is a failure that shall be included in the interpretation of test results and calculations and reliability characteristics.

#### 非关联性故障 Non-correlated failures

非关联性故障是受试样品出现非预期的故障, 这类故障不是由产品本身条件引起的, 而是试验要求之外而引起的, 非关联性故障在解释试验结果和计算可靠性特征值时不计入, 但应在试验中做记录, 以便于分析与判断时参考。

Non-correlated failure is unexpected failure in the tested sample. Such failure is not caused by the product's own conditions, but caused by outside the test requirements. Non-correlated failures are not included in the interpretation of test results and calculation of reliability characteristic values, but shall be recorded in the test for easy reference in analysis and judgment.

### A.3 关联性故障判据 Correlation failure criterion

以下故障为关联性故障:

The following failures are correlation failures:

a) 必须更换元器件、零部件、外围设备等才能使系统恢复正常允许;

a) The components, parts, peripheral equipment, etc. shall be replaced in order to restore the system to normal;

b) 必须修理、调整接插件、电缆、插头和消除短路及接触不良，才能恢复正常允许；

b) To return to normal permission, the connectors, cables, plugs, eliminate short circuits and poor contacts shall be adjusted and repaired;

c) 不是由同一因素引的，而同时发生两个以上（含两个）的故障，应记为两个或两个以上的关联性故障，若由同一因素引、则不论出现几次故障，均记为一次关联性故障；

c) If two or more failures occur simultaneously, and not caused by the same factor, they shall be recorded as two or more correlation failures. If they are caused by the same factor, no matter how many failures occur, they shall be recorded as a correlation failure;

d) 由于受试样品本身原因，试验中出现危及测试、维护和使用人员的安全，或造成受试样品设备严重损坏的故障，一旦出现，应立即拒收或判定不合格。

d) Due to the test sample itself, a failure that endangers the safety of testing, maintenance and user personnel or causes serious damage to the test sample equipment occurs during the test. Once it occurs, it shall be immediately rejected or judged as unqualified.

#### A.4 非关联性故障判据 Non-correlation failure criterion

以下故障为非关联性故障：

The following failures are non-correlation failures:

a) 因试验条件变化超出规定范围(电网波动太大、温度波动太大、严重电磁骚扰和机械冲击、振动等)所引起的故障；

a) Failures caused by changes in test conditions that exceed the specified range (too large fluctuations in the power grid, too large temperature fluctuations, severe electromagnetic disturbance, mechanical shock, vibration, etc.);

b) 因人为操作失误而使样机出现故障；

b) Sample failures due to human error;

c) 由于误判而更换元器件、零部件，或在检修过程中，由于人为因素而造成的故障；

c) Replacement of components and parts due to misjudgment, or failure due to human factors during the overhaul;

d) 根据产品有关技术规定，允许调整的部位(零部件、元器件等)未调整好而引起的故障；

d) According to the relevant technical regulations of the product, the parts (parts, components, etc.) that are allowed to be adjusted are not adjusted properly and caused by failure;

e) 被确定是软件程序差错而造成的故障；

e) The failure is determined to be caused by a software program error;

f) 若出现不正常情况，不需修理，停机0.5h后能自动恢复正常运行，每发生累积三次此类事件，则记为一次非关联性故障；

f) If there is an abnormal situation, without repairing, and normal operation shall be automatically restored after 0.5h of shutdown. Every time this type of event occurs three times, it is recorded as a non-correlation failure;

g) 有寿命指标要求的部件，在寿命期以外出现的故障。

g) Failures that occur beyond the life span of components that have life index requirements.

#### A.5 判定 Criteria

承担试验检测的单位，根据失效分析和产品标准及相关标准可以做出关联性故障或非关联性故障的判定。

The unit undertaking the test and inspection shall make the determination of correlation failures or non-correlation failures based on failure analysis, product standards and related standards.

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附录 B Appendix B  
(规范性附录) (Normative)  
试验方法 Test methods

### B.1 B.1 试验环境条件 Test environmental conditions

#### 环境条件 Environment condition

本文件中除气候环境试验、可靠性试验作耐电强度试验外，其他试验在下述条件下进行：

Except for the climate environment test and reliability test for electric strength test in this criterion, other tests are carried out under the following conditions:

——温度：0℃~40℃；

——Temperature: 0℃~40℃；

——相对湿度：40%~90%。

——Relative temperature: 40%~90%.

#### 试验条件 Test condition

在电磁兼容试验、可靠性试验、功耗试验、电池试验过程中，受试样品应处于连续工作模式。

During the electromagnetic compatibility test, reliability test, power consumption test, and battery test, the tested sample shall be in continuous working mode.

### B.2 外观结构 Appearance and structure

用目测法和有关检测工具进行外观和结构检查。

Appearance and structure inspection by visual method and relevant inspection tools.

### B.3 电源适应能力试验 Power adaptability test

对于交流供电的产品，交流电源适应能力试验按表B.1中的组合，对受试样品进行试验，应能正常工作。

For AC-powered products, the alternating current power adaptability test shall be performed on the tested samples according to the combination in Table B.1, and they shall work normally.

表B.1 交流电源适应范围

Table B.1 Range of AC power adaptability

组合 Item	标称值 Standard value	
	电压 Voltage V	频率 Frequency Hz
1	220	50
2	198	49
3	198	51
4	242	49
5	242	51

对于直流供电的产品，直流电源适应能力在额定电压和额定电压偏差±5%三个条件下，对受试样品进行试验，应能正常工作。

For DC-powered products, the direct current power adaptability shall be able to work normally when the tested sample is tested under rated voltage and rated voltage deviation  $\pm 5\%$ .

#### B.4 电磁兼容性试验 Electromagnetic compatibility test

无线电骚扰限值的测量方法 Measurement method of radio disturbance limit

按GB 9254规定的方法进行。

See method specified in GB 9254.

抗扰度限值的测量方法 Measurement method of immunity limit

按GB/T 17618规定的方法进行。

See method specified in GB/T 17618.

#### B.5 通讯接口试验 Communication interface test

连接受试样品的通讯接口，查看是否能正常传输数据。

Connect the communication interface of the tested sample to check whether the decoding data shall be transmitted normally.

#### B.6 功耗试验 Power consumption test

工作功耗 Working power consumption

受试样品工作在应用运行模式，用测量仪器检测受试样品的工作电流及电压，即可计算出工作功耗，统计3次检测结果的平均值。

The tested sample is working in the application operation mode, and the working current and voltage of the test sample are detected with a measuring instrument. Calculate the working power consumption, and calculate the average value of the three test results.

待机功耗 Standby power consumption

按产品规格说明书的设置，受试样品应能开启待机模式，检测此状态下的功耗值。

According to the setting of the product specification, the tested sample shall be able to turn on the standby mode to detect the power consumption value in this state.

续航能力试验 Endurance test

产品在充满电的情况下，工作在温度： $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ，湿度： $35\% \sim 65\%$ ，屏幕亮度保持在其最高亮度的80%的条件下。

When the product is fully charged, it works under the conditions of temperature:  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , humidity:  $35\% \sim 65\%$ , and the screen brightness is kept at 80% of its highest brightness.

每5秒通过蓝牙接收一次扫描数据，通过WiFi传至云端服务器，直至低电关机，记录连续工作时间。 Scan data is received via Bluetooth every 3 seconds, and uploaded to the cloud server via WIFI, until the low-power shutdown, and the continuous working time is recorded.

#### B.7 安全 Security

按照GB/T 4943.1, GB/T 26125, GB/T 26572, QB/T 4775-2014, GB/T 34709-2017规定的方法进行。

See method specified in GB/T 4943.1, GB/T 26125, GB/T 26572, QB/T 4775-2014 and GB/T 34709-2017.

#### B.8 限用物质的限量检定 Limit verification of restricted substances

按照GB/T 26125规定的方法进行。

See method specified in GB/T 26125.

#### B.9 电池试验 Battery test

按照GB/T 3124中规定的方法进行。

See method specified in GB/T 3124.

#### B.10 按键试验 Keys test

用手检验产品按键按动是否灵活, 接触是否可靠, 在按键寿命试验机上进行按键寿命试验, 按键负荷根据产品标准设定。

Check whether the product keys are flexible in pressing and whether the contact is reliable by hand. Carry out the key life test on the key life testing machine, and set the key load according to the product standard.

#### B.11 支持性软件 Supportive software

打开产品软件用户界面, 用目测法检查文字是否为简化字。

Open the product software user interface and use visual inspection to check whether the text is simplified.

#### B.12 抗静电能力试验 Antistatic capability test

按照GB/T 17626.2-2018规定的方法进行。

See method specified in GB/T 17626.2-2018.

#### B.13 充电接口插拔使用寿命试验 Charging interface plug life test

模拟用户充电场景, 将受试样品2000次插拔连接数据线后, 目视确认充电接口是否磨损。

Simulate the user's charging scenarios. After plugging and unplugging the tested sample 2000 times to connect the data cable, visually confirm whether the charging interface is worn out.

#### B.14 蓝牙通讯距离试验 Bluetooth communication distance test

将受试样品的蓝牙与带有蓝牙功能的终端设备或其他带有蓝牙功能的蓝牙设备连接起来, 在10m空旷的距离测试, 可以实现数据的发送传递。

Connect the Bluetooth of the tested sample with a terminal device with Bluetooth function or other Bluetooth devices with Bluetooth function, and test in an open distance of 10m, which shall realize data transmission.

## B.15 环境适应性试验 Environmental adaptability test

### 一般要求 General requirement

以下各项试验中，规定的初始检测和最后检测，统一按5.1的要求进行外观和结构检查，受试样品应能正常工作。

In the following tests, the specified initial test and final test shall be uniformly inspected for appearance and structure according to the requirements of 5.1, and the tested samples shall be able to work normally.

### 温度下限试验 Minimum temperature test

#### B.15.1.1 工作温度下限试验 Minimum working temperature test

按GB/T 2423.1 “试验Ad”进行，受试样品应进行初始检测，严酷程度取表2规定的工作温度下限，加电运行2h，受试样品应能正常工作，恢复时间2h。

Test under GB/T 2423.1 “Test Ad”. The tested sample shall undergo initial testing and run for 2h after power-on with the severity taken as the minimum working temperature specified in Table 2. The tested sample shall work normally, and the recovery time shall be 2h.

#### B.15.1.2 贮存运输温度下限试验 Minimum storage and transportation temperature test

按GB/T 2423.1 “试验Ab”进行，严酷程度取表2规定的贮存运输温度下限，受试样品在不工作条件下存放16h，恢复时间为2h，并进行最后检测。

Test under GB/T 2423.1 “Test Ab”. The severity is the minimum storage and transportation temperature specified in Table 2. Store the tested sample for 16h under non-working conditions. After 2-hour recovery time, perform the final test.

### 温度上限试验 Temperature limit test

#### B.15.1.3 工作温度上限试验 Maximum working temperature test

按GB/T 2423.2 “试验Bd”进行，受试样品应进行初始检测，严酷程度取表2规定的工作温度上限，加电运行2h，受试样品应能正常工作，恢复时间为2h。

Test under GB/T 2423.2 “Test Bd”. The tested sample shall undergo initial testing with the severity taken as the maximum working temperature specified in Table 2. And the test sample shall work normally and the recovery time shall be 2h.

#### B.15.1.4 贮存运输温度上限试验 Maximum storage and transportation temperature limit test

按GB/T 2423.2 “试验Bb”进行，严酷程度取表2规定的贮存运输温度上限，受试样品在不工作条件下存放16h，恢复时间为2h，并进行最后检测。

Test under GB/T 2423.2 “Test Bd”. The tested sample shall undergo initial testing with the severity taken as the maximum working temperature specified in Table 2. Store the tested sample for 16h under non-working conditions. After 2-hour recovery time, perform the final test.

## 恒定湿热试验 Constant humidity and heat test

### B. 15. 1. 5 工作条件下恒定湿热试验 Working constant humidity and heat test

按GB/T 2423.3 “试验Cab”进行，受试样品应进行初始检测，严酷程度取表2规定的工作温度、湿热上限，加电运行2h，受试样品应能正常工作，恢复时间为2h，并进行最后检测。

Test under GB/T 2423.3 “Test Cab”. The tested sample shall undergo initial testing, and the severity shall be taken as the working temperature and upper limit of damp heat specified in Table 2, and run for 2h after power-on. The tested sample shall be able to work normally. After 2-hour recovery time, perform the final test.

### B. 15. 1. 6 贮存运输条件下恒定湿热试验 Storage and transportation constant humidity and heat test

按GB/T 2423.3 “试验Cab”进行，受试样品应进行初始检测，受试样品在不工作条件下存放48h，恢复时间为2h，并进行最后检测。

Test under GB/T 2423.3 “Test Cab”. The tested sample shall undergo initial testing. Store the tested sample for 48h under non-working conditions. After 2-hour recovery time, perform the final test.

## 振动试验 Vibration test

按 GB/T 2423.10 “试验 Fe”进行，受试样品按工作位置固定在振动台上，进行初始检测。受试样品在不工作状态下，按表3规定值，分别在三个互相垂直方向进行振动。

Test under GB/T 2423.10 “Test Fe”. The tested sample is fixed on the vibrating table according to the working position and undergo initial testing. Under the non-working conditions, the tested sample shall vibrate in three mutually perpendicular directions according to the values specified in Table 3.

#### a) 初始振动响应检查

#### a) Initial vibration response check

试验在给定频率范围内，在一个扫频循环上完成，试验过程中记录危险频率，包括机械共振频率和导致故障及影响性能的频率（后者仅在工作条件下产生）。

Complete the test in a frequency sweep cycle within a given frequency range. During the test, dangerous frequencies are recorded, including mechanical resonance frequencies and frequencies that cause malfunctions and affect performance (the latter are only generated under working conditions).

#### b) 定频耐久试验

#### b) Fixed frequency durability test

用初始振动响应检查中记录的危险频率进行定频试验，如果两种危险频率同时存在，则不得只选其中一种。

Use the dangerous frequency recorded in the initial vibration response check for a fixed frequency test. If two dangerous frequencies exist at the same time, select both of them.

在试验规定频率范围内如无明显共振频率或无影响性能的频率，或危险频率超过四个，则不做定频耐久试验，仅做扫频耐久试验。

If there is no obvious resonance frequency or frequency that affects the performance within the specified frequency range of the test, or more than four dangerous frequencies, the fixed-frequency endurance test will not be done, only the sweep-frequency endurance

#### c) 扫频耐久试验

#### c) Fixed frequency durability test

按表3给定频率范围由低到高，再由高到低，作为一次循环，按表3规定的循环次数进行，已做过定频耐久试验的样品不再做扫频耐久试验。

According to the frequency range given in Table 3 from low to high, and then from high to low, as a cycle, the number of cycles specified in Table 3 shall be carried out. The samples that have been subjected to the fixed frequency durability test will not be subjected to the sweep frequency durability test.

d) 最后振动响应检查

d) Final vibration response check

此项试验在不工作条件下进行，对于已做过定频耐久试验的受试样品应做此项试验，对于做扫频耐久试验的样品，可将最后一次扫频试验作为最后振动响应检查，本试验应将记录的共振频率与初始振动响应检查记录的共振频率相比较，若有明显变化，应对受试样品修整，重新进行本项试验。试验结束后，进行最后检测。

Carry out this test under non-working conditions. The tested samples that have been subjected to the fixed frequency durability test shall undergo this test. For the samples subjected to the sweep frequency durability test, the last sweep test shall be used as the final vibration response check. This test shall compare the recorded resonance frequency with the resonance frequency recorded in the initial vibration response inspection. If there is an obvious change, the tested sample shall be trimmed and the test shall be repeated. After finishing the test, carry out final inspection.

### 冲击试验 Shock test

按 GB/T 2423.5 “试验Ea”进行，受试样品应进行初始检测，安装时要注意重力影响，按表4规定值，在不工作条件下，分别对3个互相垂直轴线方向进行冲击，冲击次数各为3次，试验后进行最后检测。

Test under GB/T 2423.5 “Test Ea”. The tested sample shall undergo initial inspection. Pay attention to the influence of gravity during installation. According to the values specified in Table 4, under non-working conditions, shock the three mutually perpendicular axis directions respectively, and the number of shocks is 3 times. After the test, carry out the final inspection.

### 碰撞试验 Crash test

按 GB/T 2423.6 “试验Eb”进行，受试样品须进行初始检测，安装时要注意重力影响，按表4规定值，在不工作条件下，分别对3个互相垂直轴线方向进行碰撞，碰撞次数各为1000次，试验后进行最后检测。

Test under GB/T 2423.6 “Test Eb”. The tested sample shall undergo initial inspection. Pay attention to the influence of gravity during installation. According to the values specified in Table 4, under non-working conditions, collide with 3 mutually perpendicular axis directions. The number of collisions is 1000 each. After the test, carry out the final inspection.

### 运输包装件跌落试验 Transport package drop test

对受试验品进行初始检测，将运输包装件处于准备运输状态，按GB/T 4857.2进行预处理4h。

Carry out the initial inspection of the tested product, put the transport package in a state of preparation for transportation, and preprocess it for 4h according to GB/T 4857.2.

将运输包装件按GB/T 4857.5和本文件表5的规定值进行跌落，任选四面，每面跌落一次。试验后按标准的规定检查包装件的损坏情况，并对受试样品进行最后的检测。

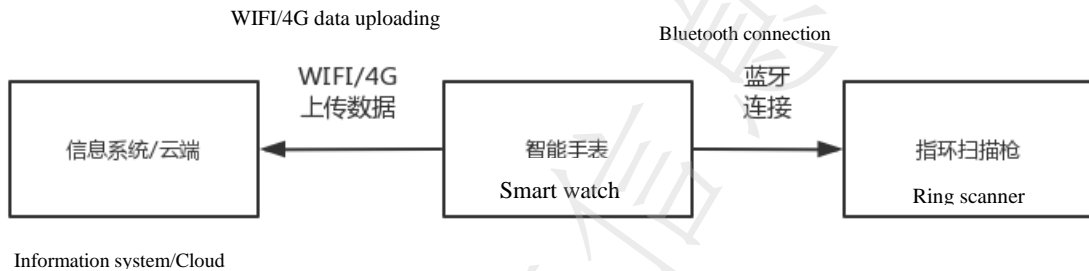
Drop the transport package according to the values specified in GB/T 4857.5 and Table 5 of this document, choose four sides, and drop once on each side. After the test, check the damage of the package according to the provisions of the standard, and carry out the final test on the tested sample.

附录 C Appendix C  
 (资料性附录) (Informative)  
 连接方式 Connections

C.1 手腕式数据终端连接方式 Wrist type wearable data terminal connection

手腕式数据终端连接示意图，如图C.1。

See figure C.1 Wrist type wearable data terminal connection.



图C.1 连接示意图

Figure C.1 Wrist type Wearable data terminal connection

C.2 手腕式数据终端上传云端数据的方式 Wrist type data terminal cloud data uploading

手腕式数据终端连接局域网，打开手腕式数据终端WIFI设置，搜索网络名称进行连接，如图C.2。

Connect the wrist type wearable data terminal to the local area network, open the wrist type wearable data terminal WIFI settings, search for the network name to connect, as shown in figure C.2.



图C.2 连接局域网

Figure C.2 Local area network connection

手腕式数据终端连接网络数据，打开手腕式数据终端4G网络开关，即可通过流量数据进行各终端之间的交互，如图C.3。

Connect the wrist type wearable data terminal to network data. Open the wrist type wearable data terminal 4G network to interact through traffic data among various terminals as shown in figure C.3.



图C.3 连接网络数据

Figure C.3 Network data connection

### C.3 手腕式数据终端连接指环扫描枪 Connecting wrist type wearable data terminal with ring scanner

手腕式数据终端连接指环，打开手腕式数据终端蓝牙设置，搜索指环名称进行连接，如图C.4。

Connecting wrist type wearable data terminal with ring scanner. Open Bluetooth setting in wearable data terminal, search ring scanner name to connect as shown in figure C.4.



图C.4 蓝牙连接指环

Figure C.4 Bluetooth connection of ring scanner



手腕式数据终端连接指环，打开手腕式数据终端蓝牙连接条码，指环扫描条码进行连接，如图C.5。  
Connecting wrist type wearable data terminal with ring scanner. Open Bluetooth connection barcode in the terminal, and scan the barcode with ring scanner as shown in figure C.5.



图C.5 指环连接条码

Figure C.5 Ring scanner connection through the barcode