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

GB/T 37977.23-2019

**Electrostatics -- Part 2-3: Methods of test for determining the
resistance and resistivity of solid planar materials used to
avoid electrostatic charge accumulation**

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Foreword

GB/T 37977 "Electrostatics" plans to release the following parts.

---Part 2-3. Test methods for resistance and resistivity of antistatic solid planar materials;

--- Part 3-1. Simulation method of electrostatic effect Electromagnetic discharge test waveform of human body model (HBM);

---Part 3-2. Simulation method of electrostatic effect Electrostatic discharge test waveform of machine model (MM);

--- Part 5-1. General requirements for electrostatic protection of electronic devices.

This part is part 2-3 of GB/T 37977.

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

This section uses the translation method equivalent to IEC 61340-2-3..2000 "Electrostatics Part 2-3. Antistatic solid planar material resistance

And the test method of resistivity.

Introduction

The resistance test and the correlation calculation of the resistivity are the contents of the basic part of the electronic measurement technology measured by the voltage method and the current method.

The electrical properties of resistivity have a wide range of values, from most conductive metals to better insulating materials, over 30 orders of magnitude.

In the electrical conductor (metal, carbon, etc.) based on Ohm's law, it is suitable for measuring the instantaneous value of direct current or alternating current. Not

At the same frequency, measurements with alternating current may be affected by capacitive or inductive impedance. Therefore, existing national or international standards

DC current is often used to calculate the resistance of solid materials.

Most non-metallic materials, like plastics, are classified into polymers and ionic conductors. In the measurement, the flow of charge is determined by the application of certain

The field strength of the electric field is achieved. In addition to measuring current, there is also a charging current that is formed from a polarized material and/or an electrostatically charged material.

As the time changes, the measured current gradually becomes smaller and the resistance changes significantly. If you can observe this effect, at a certain charge

After the electrical time, the measurement is repeated by measuring the current with the opposite polarity and then averaging the values obtained twice.

Electrostatics - Part 2-3. Antistatic solid planes

Test method for material resistance and resistivity

1 Scope

This part of GB/T 37977 specifies the test side for the resistance and resistivity of solid planar materials used to avoid electrostatic charge buildup.

The test resistors range from 104 ohm to 1012 ohm.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1410-2006 Test method for volume resistivity and surface resistivity of solid insulating materials (IEC 60093. 1980, IDT)

GB/T 2439-2001 Vulcanized or heat-sensitive rubber - Determination of electrical conductivity and dissipative properties (ISO 1853.

1998, IDT)

GB/T 10064-2006 Test method for determining insulation resistance of solid insulating materials (IEC 60167. 1964, IDT)

GB/T 10580-2003 Standard conditions for the use of solid insulating materials before and during testing (IEC 60212.1971, IDT)

ISO 2951.1974 Vulcanized rubber insulation resistance measurement
(Vulcanizedrubber-Determination ofinsulation

Resistance)

ISO 3915.1981 Measurement of electrical resistivity of plastic conductive plastics
(Plastics-Measurement of resistivity of conductive

Plastics)

IEC 60260.1968 Non-injection type test site with constant relative humidity
(Test enclosures of non-injection type

For constant relative humidity)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Volume resistance volumeresistance

The ratio of the DC voltage (V) applied between the two surface (opposite faces) electrodes of the sample to the steady state current (A) between the two electrodes.

Note. The unit of volume resistance is ohm.

3.2

Volume resistivity

The ratio of DC electric field strength (V/m) to steady state current density (A/m²) in the material. In fact, it is equal to the body in the unit cube

The product resistance is measured by two opposite faces of the electrode.

Note 1. Volume resistivity is not applicable to heterogeneous materials with different electrical properties.

Note 2. The SI unit of volume resistivity is ohm.m.

3.3

Surface resistance surfaceresistance

The ratio of the DC voltage (V) applied to the steady state current (A) between the two electrodes on the same surface of the sample.

Note. The unit of surface resistance is ohm.