

ICS 31.080.01

CCS L 40



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

GB/T 4937.26-2023

**Semiconductor devices - Mechanical and climate test methods -
Part 26: Electrostatic discharge(ESD)sensitivity testing - Human
body model(HBM)**

Issued on: September 7, 2023

Implemented on: April 1, 2024

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 26 of GB/T 4937 "Mechanical and Climatic Test Methods for Semiconductor Devices". GB/T 4937 has been released

The following parts.

- Part 1. General provisions;
- Part 2. Low pressure;
- Part 3. External visual inspection;
- Part 4. Highly Accelerated Steady State Hot and Damp Test (HAST);
- Part 11. Rapid temperature change double liquid tank method;
- Part 12. Sweep vibration;
- Part 13. Salt spray;
- Part 14. Terminal strength (lead firmness);
- Part 15. Soldering heat resistance of through-hole mounting devices;
- Part 17. Neutron irradiation;
- Part 18. Ionizing radiation (total dose);
- Part 19. Chip shear strength;
- Part 20. Resistance of plastic surface-mounted devices to the combined effects of moisture and welding heat;

---Part 20-1.Handling, packaging, marking and transportation of surface-mounted devices sensitive to the combined effects of moisture and soldering heat;

---Part 21.Solderability;

---Part 22.Bonding strength;

---Part 23.High temperature working life;

---Part 26.Electrostatic discharge (ESD) sensitivity test human body model (HBM);

---Part 27.Electrostatic discharge (ESD) sensitivity test machine model (MM);

---Part 30.Pretreatment of non-sealed surface-mounted devices before reliability testing.

---Part 31.Flammability of plastic wrappers (caused internally);

---Part 32.Flammability of plastic wrappers (externally caused);

---Part 42.Temperature and humidity storage.

This document is equivalent to IEC 60749-26.2018 "Mechanical and climatic test methods for semiconductor devices - Part 26.Electrostatic discharge"

(ESD) Sensitivity Test Human Body Model (HBM)?.

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

Semiconductor devices are common basic products in the electronics industry chain and are the most basic units in electronic systems. GB/T 4937 "Semiconductors"

"Mechanical and Climatic Test Methods for Semiconductor Devices" is a basic and universal standard for testing semiconductor devices. It is important for the evaluation and assessment of semiconductor devices.

The quality and reliability of the device play an important role and are planned to be composed of 44 parts.

---Part 1.General principles. The purpose is to specify general guidelines for mechanical and climatic testing methods of semiconductor devices.

---Part 2.Low pressure. The purpose is to test the ability of components and materials to avoid electrical breakdown failure.

---Part 3.External visual inspection. The purpose is to detect whether the materials, design, structure, marking and process quality of semiconductor devices comply with the procurement requirements.

Purchase document requirements.

---Part 4.Strongly Accelerated Steady State Hot and Damp Test (HAST). The purpose is to specify the strongly accelerated steady-state hot and humid test (HAST) to detect

Test the reliability of non-hermetic packaged semiconductor devices in humid environments.

---Part 5.Steady-state temperature and humidity bias life test. The purpose is to specify the steady-state temperature and humidity offset life test to detect non-airtight

Reliability of packaged semiconductor devices in humid environments.

---Part 6.High temperature storage. The purpose is to detect the impact of high-temperature storage on semiconductor devices without applying electrical stress.

---Part 7.Internal water vapor measurement and other residual gas analysis. The purpose is to detect the quality of the packaging process and provide information about the gas

information on the long-term chemical stability of the body in the shell.

---Part 8.Sealing. The purpose is to detect the leakage rate of semiconductor devices.

---Part 9.Marking durability. The purpose is to detect mark durability on semiconductor devices.

---Part 10.Mechanical impact. The purpose is to test the adaptability of semiconductor devices and printed board assemblies to moderately severe impacts.

ability.

---Part 11.Rapid temperature change double liquid tank method. The purpose is to specify rapid temperature changes in semiconductor devices (double bath method)

Test procedures, failure criteria, etc.

---Part 12.Sweep vibration. The purpose is to detect the impact of vibration on semiconductor devices within a specified frequency range.

---Part 13.Salt spray. The purpose is to detect the corrosion resistance of semiconductor devices.

---Part 14.Terminal strength (lead firmness). The purpose is to detect the tightness of semiconductor device lead/package interface and leads.

Solidity.

---Part 15.Soldering heat resistance of through-hole mounting devices. The purpose is to detect the wave resistance of through-hole mounted solid-state packaged semiconductor devices.

The ability of the soldering iron or soldering iron to create thermal stress on the leads.

---Part 16. Particle Collision Noise Detection (PIND). The purpose is to specify the detection method for the presence of free particles in cavity devices.

---Part 17. Neutron irradiation. The purpose is to detect the susceptibility of semiconductor devices to performance degradation in neutron environments.

---Part 18. Ionizing radiation (total dose). The purpose is to provide for the evaluation of the effects of low dose rate ionizing radiation on semiconductor devices.

Rapid annealing test method.

---Part 19. Chip shear strength. The purpose is to detect the materials and processes used to mount semiconductor chips on tube sockets or substrates.

Completeness of artistic steps.

---Part 20. Plastic surface-mounted devices are resistant to the combined effects of moisture and welding heat. The purpose is to simulate storage in a warehouse or dry

The moisture absorbed by plastic-packaged surface-mounted semiconductor devices in a dry packaging environment is used to evaluate their resistance to soldering heat.

---Part 20-1. Handling, packaging, marking and transportation of surface-mounted devices sensitive to the combined effects of moisture and soldering heat. The purpose is

Specifies methods for handling, packaging, transportation, and use of plastic-encapsulated surface-mounted semiconductor devices that are sensitive to the combined effects of moisture and soldering heat.

---Part 21. Solderability. The purpose is to specify the terminals of component packages soldered using lead-tin solder or lead-free solder.

Solderability test procedure.

---Part 22. Bonding strength. The purpose is to detect the bonding strength of semiconductor devices.

---Part 23. High temperature working life. The purpose is to specify the effects of bias conditions and temperature on solid-state devices over time.

experiment method.

---Part 24. Accelerated moisture resistance without bias strong accelerated stress test. The purpose is to detect non-hermetically sealed solid-state devices in humid environments.

reliability in the environment.

---Part 25. Temperature cycling. The purpose is to detect semiconductor devices, components and circuit board assemblies subjected to extreme high temperatures and extreme