

ICS 31.080.01

CCS L 40



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

GB/T 4937.14-2018

**Semiconductor devices -- Mechanical and climatic test methods
-- Part 14: Robustness of terminations (lead integrity)**

Issued on: September 17, 2018

Implemented on: January 1, 2019

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

Table of Contents

Foreword

1 Scope

2 Normative references

3 General

3.1 Equipment

3.2 General procedure applicable to all test conditions

3.3 General instructions

4 Test conditions A---tension

4.1 Purpose

Foreword

GB/T 4937 "Mechanical and Climatic Test Methods for Semiconductor Devices" consists of the following components.

--- Part 1. General;

--- Part 2. Low pressure;

--- Part 3. External visual inspection;

--- Part 4. Strongly accelerated steady-state damp heat test (HAST);

---Part 5. Steady-state temperature and humidity bias life test;

---Part 6. High temperature storage;

--- Part 7. Internal water vapor content test and other residual gas analysis;

--- Part 8. Sealing;

---Part 9. Logo durability;

--- Part 10. Mechanical shock;

--- Part 11. rapid temperature change double tank method;

--- Part 12. Sweeping vibration;

--- Part 13. Salt spray;

--- Part 14. Terminal strength (lead robustness);

---Part 15. Resistance to soldering of through-hole mounting devices;

- Part 16. Particle collision noise detection (PIND);
- Part 17. Neutron irradiation;
- Part 18. Ionizing radiation (total dose);
- Part 19. Chip shear strength;
- Part 20. The combined effects of moisture-resistant and soldering heat on plastic surface mount devices;
- Part 20-1. Operation, packaging, marking and transport of surface mount 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 24. Accelerated moisture-resistant and non-biased strong accelerated stress test (HSAT);
- Part 25. Temperature cycling;
- Part 26. Electrostatic discharge (ESD) sensitivity test human body model (HBM);
- Part 27. Electrostatic discharge (ESD) sensitivity test mechanical model (MM);
- Part 28. Electrostatic discharge (ESD) sensitivity test, charged device model (CDM), device level;
- Part 29. Latch test;
- Part 30. Pre-treatment of unsealed surface mount devices prior to reliability testing;
- Part 31. Flammability of plastic encapsulated devices (internal);
- Part 32. Flammability of plastic encapsulated devices (external);
- Part 33. Accelerated moisture resistance without bias high pressure cooking;
- Part 34. Power cycling;
- Part 35. Acoustic scanning microscopy of plastic electronic components;
- Part 36. Constant acceleration;
- Part 37. Plate-level drop test method using accelerometers;
- Part 38. Soft error test methods for semiconductor memory devices;
- Part 39. Measurement of moisture diffusivity and water dissolution rate of raw materials for semiconductor components;

- Part 40. Plate-level drop test method using tension meter;
- Part 41. Reliability test methods for non-volatile memory devices;
- Part 42. Storage of temperature and humidity;
- Part 43. Guide to the reliability identification scheme for integrated circuits (ICs);
- Part 44. Test method for neutron beam irradiation single particle effect of semiconductor devices.

This part is the 14th part of GB/T 4937.

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 60749-14.2003 "Semiconductor device mechanical and climatic test methods Part 14.

Lead end strength (lead robustness).

1 Scope

This part of GB/T 4937 specifies several different test methods for determining the robustness of the lead/package interface and leads. when

The board assembly error caused the lead to bend, and this test was performed in order to reassemble the lead reshaping process. For hermetic sealers

It is recommended that the seal test be carried out in accordance with IEC 60749-8 after this test to determine whether the stress applied to the lead end also causes a seal.

Bad effects.

Each of the test conditions in this section is destructive and only applies to the qualification test.

This section applies to all through-hole mounting devices and surface mount devices that require user lead forming.

2 Normative references

The following documents are indispensable for the reference to 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.

Semiconductors - Mechanical and climatic test methods - Part 8. Seals (Semiconductor devices-Me-

chanicalandclimatictestmethods-Part 8.Sealing)

3.1 Equipment

The applicable equipment is described under each specific test condition.

3.2 General procedure applicable to all test conditions

The device shall be subjected to the stresses determined by the specific test conditions. If there are no other regulations, the specified end point measurement and inspection shall be carried out (pre-

Except for processing). If possible, stress should be applied to the leads randomly selected on each device. The same lead cannot be used for multiple tests condition.

3.3 General instructions

Relevant documents should specify the following.

- a) test conditions;
- b) Sample size (including number of test leads and total number of devices per device) and stress level.

4.1 Purpose

This test condition is used for the linear tensile load test. This test is to check the resistance to linear tension of the device leads, soldering and sealing.