INTERNATIONAL STANDARD

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First edition
2004-03

Semiconductor devices – Mechanical and climatic test methods –

Part 24: Accelerated moisture resistance – Unbiased HAST

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 24: Accelerated moisture resistance – Unbiased HAST

FOREWORD

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International Standard IEC 60749-24 has been prepared by IEC technical committee 47: Semiconductor devices.

This standard cancels and replaces IEC/PAS 62336 published in 2002. This first edition constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
47/1736/FDIS	47/1746/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 24: Accelerated moisture resistance – Unbiased HAST

1 Scope and object

The unbiased highly accelerated stress testing (HAST) is performed for the purpose of evaluating the reliability of non-hermetically packaged solid-state devices in humid environments.

It is a highly accelerated test which employs temperature and humidity under non-condensing conditions to accelerate the penetration of moisture through the external protective material (encapsulant or seal) or along the interface between the external protective material and the metallic conductors which pass through it. Bias is not applied in this test to ensure that the failure mechanisms potentially overshadowed by bias can be uncovered (e.g. galvanic corrosion).

This test is used to identify failure mechanisms internal to the package and is destructive.

NOTE This test is a complete rewrite of the test contained in Clause 4C of Chapter 3 of IEC 60749 (1996) (without bias voltage).

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.

IEC 60749-33, *Semiconductor devices – Mechanical and climatic test methods – Part 33: Accelerated moisture resistance – unbiased autoclave*

IEC 60749-5, *Semiconductor devices – Mechanical and climatic test methods – Part 5: Steady-state temperature humidity bias life test*

3 Test apparatus

The test requires a chamber capable of maintaining a specified temperature and relative humidity under pressure during ramp-up to, and ramp-down from, the specified test conditions.

3.1 Records

A permanent record of the temperature profile for each test cycle is recommended. Calibration records shall verify that the equipment avoids condensation on devices under test (DUTs) hotter than 50 °C during ramp-up and ramp-down for conditions of maximum thermal mass loading. Calibration records shall verify that, for steady-state conditions and maximum thermal mass loading, test conditions are maintained within the tolerances specified in Clause 5.