



NSAI
Standards

Irish Standard
I.S. EN 60749-4:2017

Semiconductor devices - Mechanical and climatic test methods - Part 4: Damp heat, steady state, highly accelerated stress test (HAST)

I.S. EN 60749-4:2017

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 60749-4:2017 is the adopted Irish version of the European Document EN 60749-4:2017, Semiconductor devices - Mechanical and climatic test methods - Part 4: Damp heat, steady state, highly accelerated stress test (HAST)

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EUROPEAN STANDARD

EN 60749-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2017

ICS 31.080.01

Supersedes EN 60749-4:2002

English Version

**Semiconductor devices - Mechanical and climatic test methods -
Part 4: Damp heat, steady state, highly accelerated stress test
(HAST)
(IEC 60749-4:2017)**

Dispositifs à semiconducteurs - Méthodes d'essais
mécaniques et climatiques - Partie 4: Essai continu
fortement accéléré de contrainte de chaleur humide (HAST)
(IEC 60749-4:2017)

Halbleiterbauelemente - Mechanische und klimatische
Prüfverfahren - Teil 4: Feuchte Wärme, konstant, Prüfung
mit hochbeschleunigter Wirkung (HAST)
(IEC 60749-4:2017)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 60749-4:2017

European foreword

The text of document 47/2346/FDIS, future edition 2 of IEC 60749-4, prepared by IEC/TC 47 "Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60749-4:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-01-07
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-04-07

This document supersedes EN 60749-4:2002.

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60749-5	-	Semiconductor devices - Mechanical and climatic test methods - Part 5: Steady-state temperature humidity bias life test	EN 60749-5	- 1)

1) To be published.

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IEC 60749-4

Edition 2.0 2017-03

INTERNATIONAL STANDARD

**Semiconductor devices – Mechanical and climatic test methods –
Part 4: Damp heat, steady state, highly accelerated stress test (HAST)**





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IEC 60749-4

Edition 2.0 2017-03

INTERNATIONAL STANDARD

**Semiconductor devices – Mechanical and climatic test methods –
Part 4: Damp heat, steady state, highly accelerated stress test (HAST)**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 4: Damp heat, steady state, highly accelerated stress test (HAST)

FOREWORD

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International Standard IEC 60749-4 has been prepared by IEC technical committee 47: Semiconductor devices.

This second edition cancels and replaces the first edition published in 2002. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) clarification of requirements for temperature, relative humidity and duration detailed in Table 1;
- b) recommendations that current limiting resistor(s) be placed in the test set-up to prevent test board or DUT damage;
- c) allowance of additional time-to-test delay or return-to-stress delay.

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

FDIS	Report on voting
47/2346/FDIS	47/2371/RVD

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

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

A list of all parts in the IEC 60749 series, published under the general title *Semiconductor devices – Mechanical and climatic test methods*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

A bilingual version of this publication may be issued at a later date.

SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 4: Damp heat, steady state, highly accelerated stress test (HAST)

1 Scope

This part of IEC 60749 provides a highly accelerated temperature and humidity stress test (HAST) for the purpose of evaluating the reliability of non-hermetic packaged semiconductor devices in humid environments.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60749-5, *Semiconductor devices – Mechanical and climatic test methods – Part 5: Steady state temperature humidity bias life test*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 HAST test – General remarks

The HAST test employs severe conditions of temperature, humidity and bias which 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. The stress usually activates the same failure mechanisms as the “85/85” steady-state temperature humidity bias life test, IEC 60749-5. As such the test method may be selected from IEC 60749-5 or from this test method. When both test methods are performed, test results of the 85 °C/85 % RH steady-state temperature humidity bias life test, IEC 60749-5, take priority over HAST.

This test method shall be considered destructive.

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