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REDLINE VERSION

Halvledarkomponenter – Mekaniska och klimatiska provningsmetoder – Del 39: Fuktdiffusionskoefficient och vattenlöslighet i organiskt material som används i halvledarkomponenter

Semiconductor devices –

Mechanical and climatic test methods –

*Part 39: Measurement of moisture diffusivity and water solubility in
organic materials used for semiconductor components*

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INTERNATIONAL STANDARD



**Semiconductor devices – Mechanical and climatic test methods –
Part 39: Measurement of moisture diffusivity and water solubility in organic
materials used for semiconductor components**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 31.080.01

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SEMICONDUCTOR DEVICES –
MECHANICAL AND CLIMATIC TEST METHODS –****Part 39: Measurement of moisture diffusivity and water solubility in
organic materials used for semiconductor components**

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60749-39:2006. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60749-39 has been prepared by IEC technical committee 47: Semiconductor devices. It is an International Standard.

This second edition, based on JEDEC document JESD22-A120B, cancels and replaces the first edition published in 2006. It is used with permission of the copyright holder, JEDEC Solid State Technology Association. This edition constitutes a technical revision.

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

- a) updated procedure for "dry weight" determination.

The text of this International Standard is based on the following documents:

Draft	Report on voting
47/2652/CDV	47/2725/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all the parts of the IEC 60749 series, 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 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.

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SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 39: Measurement of moisture diffusivity and water solubility in organic materials used for semiconductor components

1 Scope

This part of IEC 60749 details the procedures for the measurement of the characteristic properties of moisture diffusivity and water solubility in organic materials used in the packaging of semiconductor components.

These two material properties are important parameters for the effective reliability performance of plastic packaged semiconductors after exposure to moisture and being subjected to high-temperature solder reflow.

~~NOTE – It is recommended that the moisture absorption parameters used in this standard be obtained from the material suppliers (such as the resin supplier).~~

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 60749-20, *Semiconductor devices – Mechanical and climatic test methods – Part 20: Resistance of plastic encapsulated SMDs to the combined effect of moisture and soldering heat*

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Halvledarkomponenter – Mekaniska och klimatiska provningsmetoder – Del 39: Fuktdiffusionskoefficient och vattenlöslighet i organiskt material som används i halvledarkomponenter

*Semiconductor devices –
Mechanical and climatic test methods –
Part 39: Measurement of moisture diffusivity and water solubility in
organic materials used for semiconductor components*

Som svensk standard gäller europastandarden EN IEC 60749-39:2022. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 60749-39:2022.

Nationellt förord

Europastandarden EN IEC 60749-39:2022

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60749-39, Second edition, 2021 - Semiconductor devices - Mechanical and climatic test methods - Part 39: Measurement of moisture diffusivity and water solubility in organic materials used for semiconductor components**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60749-39, utgåva 1, 2006, gäller ej fr o m 2025-01-03.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

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English Version

Semiconductor devices - Mechanical and climatic test methods -
Part 39: Measurement of moisture diffusivity and water solubility
in organic materials used for semiconductor components
(IEC 60749-39:2021)

Dispositifs à semiconducteurs - Méthodes d'essais
mécaniques et climatiques - Partie 39: Mesure de la
diffusivité d'humidité et de l'hydrosolubilité dans les
matériaux organiques utilisés dans les composants à
semiconducteurs
(IEC 60749-39:2021)

Halbleiterbauelemente - Mechanische und klimatische
Prüfverfahren - Teil 39: Messung des
Feuchtediffusionskoeffizienten und der Wasserlöslichkeit in
organischen Werkstoffen, welche bei Halbleiter-
Komponenten verwendet werden
(IEC 60749-39:2021)

This European Standard was approved by CENELEC on 2022-01-03. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 47/2652/CDV, future edition 2 of IEC 60749-39, prepared by IEC/TC 47 "Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60749-39:2022.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-10-03 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2025-01-03 document have to be withdrawn

This document supersedes EN 60749-39:2006 and all of its amendments and corrigenda (if any).

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Endorsement notice

The text of the International Standard IEC 60749-39:2021 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where 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 60749-20	-	Semiconductor devices - Mechanical and climatic test methods - Part 20: Resistance of plastic encapsulated SMDs to the combined effect of moisture and soldering heat	EN IEC 60749-20	-

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Part 39: Measurement of moisture diffusivity and water solubility in organic
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