SLOVENSKI STANDARD
SIST EN 60749-15:2011

01-februar-2011

Nadomešča:
SIST EN 60749-15:2004

Polprevodniški elementi - Metode za mehansko in klimatsko preskušanje - 15. del: Odpornost proti spajkalni temperaturi za elemente, montirane v skoznjih luknjah (IEC 60749-15:2010)

Semiconductor devices - Mechanical and climatic test methods - Part 15: Resistance to soldering temperature for through-hole mounted devices (IEC 60749-15:2010)

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Halbleiterbauelemente - Mechanische und klimatische Prüfverfahren - Teil 15: Beständigkeit gegen Löttemperatur bei Bauelementen zur Durchsteckmontage (IEC 60749-15:2010)

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Dispositifs à semiconducteurs - Méthodes d'essai mécaniques et climatiques - Partie 15: Résistance à la température de soudage pour dispositifs par trous traversants (CEI 60749-15:2010)

Ta slovenski standard je istoveten z: **EN 60749-15:2010**

ICS:

31.080.01	Polprevodniški elementi (naprave) na splošno	Semiconductor devices in general

SIST EN 60749-15:2011 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60749-15

December 2010

ICS 31.080.01

Supersedes EN 60749-15:2003

English version

Semiconductor devices - Mechanical and climatic test methods - Part 15: Resistance to soldering temperature for through-hole mounted devices

(IEC 60749-15:2010)

Dispositifs à semiconducteurs -
Méthodes d'essai mécaniques et climatiques -
Partie 15: Résistance à la température de soudage pour dispositifs par trous traversants
(CEI 60749-15:2010)

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Ref. No. EN 60749-15:2010 E

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Foreword

The text of document 47/2067/FDIS, future edition 2 of IEC 60749-15, prepared by IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60749-15 on 2010-12-01.

This European Standard supersedes EN 60749-15:2003.

The significant changes with respect from EN 60749-15:2003 include:

– editorial change in the scope,

– addition of lead-free solder chemical composition specification.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-09-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-12-01

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Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60749-15:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60068-2-20 NOTE Harmonized as EN 60068-2-20.

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IEC 60749-15

Edition 2.0 2010-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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**Semiconductor devices – Mechanical and climatic test methods –
Part 15: Resistance to soldering temperature for through-hole mounted devices**

**Dispositifs à semiconducteurs – Méthodes d'essai mécaniques et climatiques –
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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

ICS 31.080.01

ISBN 978-2-88912-231-8

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SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 15: Resistance to soldering temperature for through-hole mounted devices

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International Standard IEC 60749-15 has been prepared by IEC technical committee 47: Semiconductor devices.

This second edition cancels and replaces the first edition published in 2003 and constitutes a technical revision. The significant changes with respect from the previous edition include:

– editorial change in the scope,
– addition of lead-free solder chemical composition specification.

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

FDIS	Report on voting
47/2067/FDIS	47/2078/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.

A list of all parts in 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 publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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**SEMICONDUCTOR DEVICES –
MECHANICAL AND CLIMATIC TEST METHODS –**

**Part 15: Resistance to soldering temperature
for through-hole mounted devices**

1 Scope

This part of IEC 60749 describes a test used to determine whether encapsulated solid state devices used for through-hole mounting can withstand the effects of the temperature to which they are subjected during soldering of their leads by using wave soldering or a soldering iron.

In order to establish a standard test procedure for the most reproducible methods, the solder dip method is used because of its more controllable conditions. This procedure determines whether devices are capable of withstanding the soldering temperature encountered in printed wiring board assembly operations, without degrading their electrical characteristics or internal connections.

This test is destructive and may be used for qualification, lot acceptance and as a product monitor.

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This test is, in general, in conformity with IEC 60068-2-20 but, due to specific requirements of semiconductors, the clauses of this standard apply.

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2 General

The heat is conducted through the leads into the device package from solder heat at the reverse side of the board. This procedure does not simulate wave soldering or reflow heat exposure on the same side of the board as the package body.

3 Test apparatus

3.1 Solder pot

A solder pot of sufficient size to contain at least 1 kg of solder shall be used. The solder pot dimensions shall allow full immersion of the leads without touching the bottom. The apparatus shall be capable of maintaining the solder at the temperature specified in Table 1.

3.2 Dipping device

A mechanical dipping device shall be used that is capable of controlling the rates of immersion and emersion of the leads and providing the dwell time as specified in Table 1.

3.3 Heatsinks or shielding

If applicable, heatsinks or shielding shall be attached to the devices prior to the test and shall be as specified in the relevant specification.

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Table 1 – Parameters for solder dipping

Parameter		Condition A (for wave solder)	Condition B (for soldering iron)
Temperature of molten solder	°C	260 ± 5	350 ± 5
Number of immersions		≤2	≤2
Immersion rate	mm s^{-1}	25 ± 5	25 ± 5
Dwell time	s	10 ± 5	10 ± 5
Emersion rate	mm s^{-1}	25 ± 5	25 ± 5
Distance between solder bath and device body	mm	1,5 ± 0,5	1,5 ± 0,5

4 Materials

4.1 Solder

The solder specification shall be as follows.

Chemical composition

– for SnPb solder the composition in percentage by weight shall be as follows:

Tin: 59 % to 65 %;

Lead: the remainder.

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Chemical composition

– for Pb-free solder the composition in percentage by weight shall be as follows:

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Silver: 3 % to 4 %;

Copper: 0.5 % to 1 %;

Tin: the remainder.

The solder shall not contain impurities which will adversely affect its properties.

Other solders and their applicable bath temperatures may be used as specified in the relevant specification.

4.2 Flux

If flux is applied prior to solder dipping, the flux shall consist of 25 % by weight of colophony in 75 % by weight of isopropyl alcohol, unless otherwise detailed in the relevant specification.

5 Procedure

5.1 Pre-conditioning of specimens

Any special pre-conditioning of the specimens prior to testing shall be as specified in the relevant specification. This preparation may include operations such as bending or other relocation of leads, and the attachment of heat sinks or protective shielding prior to solder dipping.

5.2 Preparation of the solder bath

The molten solder shall be stirred to assure that the temperature is uniform. The dross shall be skimmed from the surface of the molten solder just prior to dipping the part.