IEC 60749-15

Edition 3.0 2020-07
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 31.080.01

ISBN 978-2-8322-8686-9

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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 third edition cancels and replaces the second edition published in 2010. This edition constitutes a technical revision.

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

a) inclusion of new Clause 3, Terms and definitions;
b) clarification of the use of a soldering iron for producing the heating effect;
c) inclusion an option to use accelerated ageing.

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

FDIS	Report on voting
47/2630/FDIS	47/2639/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.

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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.

~~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.~~

~~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.

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 60068-2-20, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60749-3, *Semiconductor devices – Mechanical and climatic test methods – Part 3: External visual examination*

IEC 60749-8, *Semiconductor devices – Mechanical and climatic test methods – Part 8: Sealing*

IEC 60749-15

Edition 3.0 2020-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Dispositifs à semiconducteurs – Méthodes d'essais mécaniques et climatiques – Partie 15: Résistance à la température de brasage pour dispositifs par trous traversants



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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DISPOSITIFS À SEMICONDUCTEURS – MÉTHODES D'ESSAIS MÉCANIQUES ET CLIMATIQUES –

Partie 15: Résistance à la température de brasage pour dispositifs par trous traversants

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La Norme internationale IEC 60749-15 a été établie par le comité d'études 47 de l'IEC: Dispositifs à semiconducteurs.

Cette troisième édition annule et remplace la deuxième édition parue en 2010, dont elle constitue une révision technique.

La présente édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) ajout de l'Article 3, Termes et définitions;
b) clarification sur l'utilisation d'un fer à braser pour produire un effet thermique;

c) ajout d'une option relative à l'utilisation du vieillissement accéléré.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
47/2630/FDIS	47/2639/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 60749, publiées sous le titre général *Dispositifs à semiconducteurs – Méthodes d'essais mécaniques et climatiques*, peut être consultée sur le site web de l'IEC.

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DISPOSITIFS À SEMICONDUCTEURS – MÉTHODES D'ESSAIS MÉCANIQUES ET CLIMATIQUES –

Partie 15: Résistance à la température de brasage pour dispositifs par trous traversants

1 Domaine d'application

La présente partie de l'IEC 60749 décrit un essai utilisé pour déterminer si les dispositifs à semiconducteurs encapsulés utilisés pour le montage par trous traversants peuvent résister aux effets de la température à laquelle ils sont soumis pendant le brasage de leurs broches en utilisant le brasage à la vague.

Dans le but d'établir une procédure d'essai normalisée pour les méthodes les plus reproductibles, la méthode d'immersion dans la brasure est utilisée en raison de ses conditions plus contrôlables. Cette procédure détermine si les dispositifs sont capables de résister à la température de brasage rencontrée lors d'opérations de fabrication des cartes à câblage imprimé, sans endommager leurs caractéristiques électriques ou leurs connexions internes.

Cet essai est destructif et il peut être utilisé en vue de la qualification, de l’acceptation de lots et pour contrôler les produits.

La chaleur du brasage se propage dans le boîtier du dispositif par les broches de l'autre côté de la carte. Cette procédure ne simule pas l'exposition à la chaleur du brasage à la vague ou à la chaleur de refusion sur le même côté de la carte que le corps du boîtier.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l’édition citée s’applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60068-2-20, *Essais d’environnement – Partie 2-20: Essais – Essai T: Méthodes d'essai de la brasabilité et de la résistance à la chaleur de brasage des dispositifs à broches*

IEC 60749-3, *Dispositifs à semiconducteurs – Méthodes d’essais mécaniques et climatiques – Partie 3: Examen visuel externe*

IEC 60749-8, *Dispositifs à semiconducteurs – Méthodes d’essais mécaniques et climatiques – Partie 8: Etanchéité*