



SLOVENSKI STANDARD

SIST EN 60749-21:2011

01-oktober-2011

Polprevodniški elementi - Mehanske in klimatske preskusne metode - 21. del: Spajkljivost

Semiconductor devices - Mechanical and climatic test methods - Part 21: Solderability

Halbleiterbauelemente - Mechanische und klimatische Prüfverfahren - Teil 21: Lötbarkeit

Dispositifs à semiconducteurs - Méthodes d'essais mécaniques et climatiques - Partie
21: Brasabilité

ITeH STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: **EN 60749-21:2011**

SIST EN 60749-21:2011
<https://standards.iteh.ai/catalog/standards/sist/68659e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011>

ICS:

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

SIST EN 60749-21:2011

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60749-21:2011

<https://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60749-21

August 2011

ICS 31.080.01

Supersedes EN 60749-21:2005

English version

**Semiconductor devices -
Mechanical and climatic test methods -
Part 21: Solderability
(IEC 60749-21:2011)**

Dispositifs à semiconducteur -
Méthodes d'essai mécaniques et
climatiques -
Partie 21: Brasabilité
(CEI 60749-21:2011)

Halbleiterbauelemente -
Mechanische und klimatische
Prüfverfahren -
Teil 21: Lötbarkeit
(IEC 60749-21:2011)

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

This European Standard was approved by CENELEC on 2011-05-12. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 47/2082/FDIS, future edition 2 of IEC 60749-21, prepared by IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60749-21 on 2011-05-12.

This European Standard supersedes EN 60749-21:2005.

EN 60749-21:2011 cancels and replaces EN 60749-21:2005 and constitutes a technical revision. The significant change is the inclusion of Pb (lead)-free backward compatibility.

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) 2012-02-12
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2014-05-12

Annex ZA has been added by CENELEC.

FOR STANDARD PREVIEW
(standards.iteh.ai)

Endorsement notice

SIST EN 60749-21:2011

The text of the International Standard IEC 60749-21:2011 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068 series	NOTE Harmonized in EN 60068 series.
IEC 60068-2-69:2007	NOTE Harmonized as EN 60068-2-69:2007 (not modified).
IEC 60749 series	NOTE Harmonized in EN 60749 series.
IEC 60749-15:2003	NOTE Harmonized as EN 60749-15:2003 (not modified).
IEC 60749-20:2008	NOTE Harmonized as EN 60749-20:2009 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61190-1-2	2007	Attachment materials for electronic assembly - Part 1-2: Requirements for soldering pastes for high-quality interconnects in electronics assembly	EN 61190-1-2	2007
IEC 61190-1-3	2007	Attachment materials for electronic assembly - Part 1-3: Requirements for electronic grade solder alloys and fluxed and non-fluxed solid solders for electronic soldering applications	EN 61190-1-3	2007

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60749-21:2011](https://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011)

<https://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60749-21:2011

<https://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011>



IEC 60749-21

Edition 2.0 2011-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Semiconductor devices – Mechanical and climatic test methods –
Part 21: Solderability**
(standards.iteh.ai)

**Dispositifs à semiconducteur – Méthodes d'essai mécaniques et climatiques –
Partie 21: Brasabilité**
http://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

S

ICS 31.080.01

ISBN 978-2-88912-433-6

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Test apparatus	6
3.1 Solder bath.....	6
3.2 Dipping device.....	6
3.3 Optical equipment	7
3.4 Steam ageing equipment.....	7
3.5 Lighting equipment.....	7
3.6 Materials	7
3.6.1 Flux.....	7
3.6.2 Solder	7
3.7 SMD reflow equipment	8
3.7.1 Stencil or screen	8
3.7.2 Rubber squeegee or metal spatula	8
3.7.3 Test substrate	8
3.7.4 Solder paste	9
3.7.5 Reflow equipment.....	9
3.7.6 Flux removal solvent.....	9
4 Procedure	9
4.1 Lead-free backward compatibility	9
4.2 Preconditioning	10
4.2.1 General.....	10
4.2.2 Preconditioning by steam ageing.....	10
4.2.3 Preconditioning by high temperature storage	11
4.3 Procedure for dip and look solderability testing	11
4.3.1 General	11
4.3.2 Solder dip conditions	11
4.3.3 Procedure.....	11
4.4 Procedure for simulated board mounting reflow solderability testing of SMDs.....	19
4.4.1 General	19
4.4.2 Test equipment set-up.....	19
4.4.3 Specimen preparation and surface condition	20
4.4.4 Visual inspection	21
5 Summary.....	21
Bibliography.....	22
Figure 1 – Areas to be inspected for gullwing packages.....	15
Figure 2 – Areas to be inspected for J-lead packages	16
Figure 3 – Areas to be inspected in rectangular components (SMD method).....	17
Figure 4 – Areas to be inspected in SOIC and QFP packages (SMD method)	18
Figure 5 – Flat peak type reflow profile	20
Table 1 – Steam ageing conditions	10
Table 2 – Altitude versus steam temperature	10

Table 3 – Solder dip test conditions	11
Table 4 – Maximum limits of solder bath contaminant	13

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60749-21:2011](https://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011)

<https://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 21: Solderability

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60749-21 has been prepared by IEC technical committee 47: Semiconductor devices.

This standard cancels and replaces the first edition published in 2004 and constitutes a technical revision. The significant change is the inclusion of Pb (lead)-free backward compatibility.

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

FDIS	Report on voting
47/2082/FDIS	47/2089/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 web site 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.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 60749-21:2011](https://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011)

<https://standards.iteh.ai/catalog/standards/sist/e8639e90-2d40-4317-b7ae-944d47f27d93/sist-en-60749-21-2011>