

SLOVENSKI STANDARD

SIST EN 61191-2:2018

01-januar-2018

Nadomešča:
SIST EN 61191-2:2014

Sestavi plošč tiskanih vezij - 2. del: Področna specifikacija - Zahteve za površinsko nameščene spajkane sestave

Printed board assemblies - Part 2: Sectional specification - Requirements for surface mount soldered assemblies

Elektronikaufbauten auf Leiterplatten - Teil 2: Rahmenspezifikation - Anforderungen an gelötete Baugruppen in Oberflächenmontage

Ensembles de cartes imprimées - Partie 2: Spécification intermédiaire - Exigences relatives à l'assemblage par brasage pour montage en surface

Ta slovenski standard je istoveten z: **EN 61191-2:2017**

ICS:

31.180	Tiskana vezja (TIV) in tiskane plošče	Printed circuits and boards
31.190	Sestavljeni elektronski elementi	Electronic component assemblies

SIST EN 61191-2:2018

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61191-2:2018

<https://standards.iteh.ai/catalog/standards/sist/0941a760-1c15-4e35-98eb-079ae145723/sist-en-61191-2-2018>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61191-2

October 2017

ICS 31.190; 31.240

Supersedes EN 61191-2:2013

English Version

**Printed board assemblies - Part 2: Sectional specification -
Requirements for surface mount soldered assemblies
(IEC 61191-2:2017)**

Ensembles de cartes imprimées - Partie 2: Spécification
intermédiaire - Exigences relatives à l'assemblage par
brasage pour montage en surface
(IEC 61191-2:2017)

Elektronikaufbauten auf Leiterplatten -
Teil 2: Rahmenspezifikation - Anforderungen an gelötete
Baugruppen in Oberflächenmontage
(IEC 61191-2:2017)

This European Standard was approved by CENELEC on 2017-06-27. 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.

SIST EN 61191-2:2018

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



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 61191-2:2017**European foreword**

The text of document 91/1386/CDV, future edition 3 of IEC 61191-2, prepared by IEC/TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61191-2:2017.

The following dates are fixed:

- latest date by which the document has to be (dop) 2018-04-13
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2020-10-13
standards conflicting with the
document have to be withdrawn

This document supersedes EN 61191-2:2013.

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

Endorsement notice

The text of the International Standard IEC 61191-2:2017 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 60068-2-20	NOTE	Harmonized as EN 60068-2-20.
IEC 60068-2-58	NOTE	Harmonized as EN 60068-2-58.
IEC 61188-5-1	NOTE	Harmonized as EN 61188-5-1.
IEC 61188-5-2	NOTE	Harmonized as EN 61188-5-2.
IEC 61188-5-3	NOTE	Harmonized as EN 61188-5-3.
IEC 61188-5-4	NOTE	Harmonized as EN 61188-5-4.
IEC 61188-5-5	NOTE	Harmonized as EN 61188-5-5.
IEC 61188-5-6	NOTE	Harmonized as EN 61188-5-6.
IEC 61188-7	NOTE	Harmonized as EN 61188-7.
IEC 61189-2	NOTE	Harmonized as EN 61189-2.
IEC 61190-1-2	NOTE	Harmonized as EN 61190-1-2.
IEC 61193-1	NOTE	Harmonized as EN 61193-1.
IEC 61193-3	NOTE	Harmonized as EN 61193-3.
IEC 62326-1	NOTE	Harmonized as EN 62326-1.
IEC 62326-4	NOTE	Harmonized as EN 62326-4.
IEC 62326-4-1	NOTE	Harmonized as EN 62326-4-1.
ISO 9001	NOTE	Harmonized as EN ISO 9001.

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 60194	-	Printed board design, manufacture and assembly - Terms and definitions	EN 60194	-
IEC 61191-1	-	Printed board assemblies - Part 1: Generic specification - Requirements for soldered electrical and electronic assemblies using surface mount and related assembly technologies	EN 61191-1	-
IPC-A-610	-	Acceptability of Electronics Assemblies	-	-

SIST EN 61191-2:2018

<https://standards.iteh.ai/catalog/standards/sist/0941a760-1c15-4e35-98eb-079ae145723/sist-en-61191-2-2018>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61191-2:2018

<https://standards.iteh.ai/catalog/standards/sist/0941a760-1c15-4e35-98eb-079ae145723/sist-en-61191-2-2018>



IEC 61191-2

Edition 3.0 2017-05

INTERNATIONAL STANDARD



**Printed board assemblies –
Part 2: Sectional specification – Requirements for surface mount soldered
assemblies**

STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/0941a760-1c15-4e35-98eb-079ae145723/sist-en-61191-2-2018>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 31.190; 31.240

ISBN 978-2-8322-4322-0

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	5
1 Scope	7
2 Normative references	7
3 Terms and definitions	7
4 General requirements	7
5 Surface mounting of components.....	7
5.1 General.....	7
5.2 Alignment requirements	8
5.3 Process control.....	8
5.4 Surface mounted component requirements	8
5.5 Flatpack lead forming.....	8
5.5.1 General	8
5.5.2 Surface mounted device lead bends	8
5.5.3 Surface mounted device lead deformation	9
5.5.4 Flattened leads.....	9
5.5.5 Dual-in-line packages (DIPs)	9
5.5.6 Parts not configured for surface mounting.....	9
5.6 Small devices with two terminations.....	9
5.6.1 General	9
5.6.2 Stack mounting.....	9
5.6.3 Devices with external deposited elements.....	9
5.7 Lead component body positioning.....	10
5.7.1 General.....	10
5.7.2 Axial-leaded components.....	10
5.7.3 Other components	10
5.8 Parts configured for butt lead mounting.....	10
5.9 Non-conductive adhesive coverage limits.....	10
6 Acceptance requirements	10
6.1 General.....	10
6.2 Control and corrective actions.....	10
6.3 Surface soldering of leads and terminations.....	11
6.3.1 General	11
6.3.2 Solder fillet height and heel fillets	11
6.3.3 Flat ribbon L and gull-wing leads	12
6.3.4 Round or flattened (coined) leads	13
6.3.5 J leads.....	14
6.3.6 Rectangular or square end component	15
6.3.7 Cylindrical end-cap terminations	16
6.3.8 Bottom only terminations	17
6.3.9 Castellated terminations	18
6.3.10 Butt joints	19
6.3.11 Inward L-shaped ribbon leads.....	20
6.3.12 Flat lug leads.....	21
6.3.13 Ball grid array.....	22
6.3.14 Column grid array.....	23
6.3.15 Bottom termination components.....	24

6.3.16	Components with bottom thermal plane terminations (D-Pak)	24
6.3.17	P-style terminations	26
6.4	General post-soldering requirements applicable to all surface-mounted assemblies	26
6.4.1	Dewetting	26
6.4.2	Leaching	26
6.4.3	Pits, voids, blowholes, and cavities	26
6.4.4	Solder wicking	27
6.4.5	Solder webs and skins	27
6.4.6	Bridging	27
6.4.7	Degradation of marking	27
6.4.8	Solder spikes	27
6.4.9	Disturbed joint	27
6.4.10	Component damage	27
6.4.11	Open circuit, non-wetting	27
6.4.12	Component tilting	27
6.4.13	Non-conducting adhesive encroachment	28
6.4.14	Open circuit, no solder available	28
6.4.15	Component on edge	28
7	Rework and repair	28
Annex A (normative)	Placement requirements for surface mounted devices	30
A.1	General	30
A.2	Component positioning	30
A.3	Small devices incorporating two terminations	30
A.3.1	Metallization coverage over the land (side-to-side)	30
A.3.2	Metallization coverage over the land (end)	30
A.4	Mounting of cylindrical end-cap devices (MELFs)	30
A.5	Registration of castellated chip carriers	30
A.6	Surface mounted device lead and land contact	30
A.7	Surface mounted device lead side overhang	30
A.8	Surface mounted device lead toe overhang	31
A.9	Surface mounted device lead height off land (prior to soldering)	31
A.10	Positioning of J lead devices	31
A.11	Positioning gull-wing lead devices	31
A.12	External connections to packaging and interconnect structures	31
Bibliography		32
Figure 1	Lead formation for surface mounted device	8
Figure 2	Fillet height	12
Figure 3	Flat ribbon and gull-wing leads	13
Figure 4	Round or flattened (coined) lead joint	14
Figure 5	J lead joint	15
Figure 6	Rectangular or square end components	16
Figure 7	Cylindrical end-cap terminations	17
Figure 8	Bottom only terminations	18
Figure 9	Leadless chip carriers with castellated terminations	19
Figure 10	Butt joints	20

Figure 11 – Inward L-shaped ribbon leads	21
Figure 12 – Flat lug leads	22
Figure 13 – BGA with collapsing balls	23
Figure 14 – Bottom termination components	24
Figure 15 – Bottom thermal plane terminations	25
Figure 16 – P-style terminations	26
Table 1 – BGA with non-collapsing balls	23
Table 2 – Column grid array.....	23
Table 3 – Reworkable defects	29

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61191-2:2018

<https://standards.iteh.ai/catalog/standards/sist/0941a760-1c15-4e35-98eb-079ae145723/sist-en-61191-2-2018>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRINTED BOARD ASSEMBLIES –**Part 2: Sectional specification –
Requirements for surface mount soldered assemblies****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 61191-2 has been prepared by IEC technical committee 91: Electronics assembly technology.

This third edition cancels and replaces the second edition published in 2013. This edition constitutes a technical revision.

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

- a) the requirements have been updated to be compliant with the acceptance criteria in IPC-A-610F;
- b) some of the terminology used in the document has been updated;
- c) references to IEC standards have been corrected;
- d) five termination styles have been added.

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

CDV	Report on voting
91/1386/CDV	91/1429/RVC

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 of IEC 61191 under the general title *Printed board assemblies* can be found in 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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.