



NSAI
Standards

Irish Standard
I.S. EN 60191-6-12:2011

Mechanical standardization of
semiconductor devices -- Part 6-12:
General rules for the preparation of
outline drawings of surface mounted
semiconductor device packages -
Design guidelines for fine-pitch land
grid array (FLGA) (IEC 60191-6-12:2011
(EQV))

I.S. EN 60191-6-12:2011

Incorporating amendments/corrigenda issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<i>This document replaces:</i> EN 60191-6-12:2002	<i>This document is based on:</i> EN 60191-6-12:2011 EN 60191-6-12:2002	<i>Published:</i> 5 August, 2011 19 July, 2002
This document was published under the authority of the NSAI and comes into effect on: 11 August, 2011		ICS number: 31.080.01
NSAI 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60191-6-12

August 2011

ICS 31.080.01

Supersedes EN 60191-6-12:2002

English version

**Mechanical standardization of semiconductor devices -
Part 6-12: General rules for the preparation of outline drawings of surface
mounted semiconductor device packages -
Design guidelines for fine-pitch land grid array (FLGA)
(IEC 60191-6-12:2011)**

Normalisation mécanique des dispositifs à
semiconducteurs -
Partie 6-12: Règles générales pour la
préparation des dessins d'encombrement
des boîtiers des dispositifs à
semiconducteurs à montage en surface -
Lignes directrices de conception pour les
boîtiers matriciels à plots et à pas fins
(FLGA)
(CEI 60191-6-12:2011)

Mechanische Normung von
Halbleiterbauelementen -
Teil 6-12: Allgemeine Regeln für die
Erstellung von Gehäusezeichnungen von
SMD-Halbleitergehäusen -
Konstruktionsleitfaden für Feinraster-
Land-Grid-Array (FLGA)
(IEC 60191-6-12:2011)

This European Standard was approved by CENELEC on 2011-07-13. 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

I.S. EN 60191-6-12:2011

EN 60191-6-12:2011

- 2 -

Foreword

The text of document 47D/784/CDV, future edition 2 of IEC 60191-6-12, prepared by SC 47D, Mechanical standardization for semiconductor devices, of IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60191-6-12 on 2011-07-13.

This European Standard supersedes EN 60191-6-12:2002.

EN 60191-6-12:2011 includes the following significant changes with respect to EN 60191-6-12:2002:

- a) scope is expanded so that this standard include the square type FLGA. The title of this standard has been changed accordingly: "Rectangular type" has been deleted from the title;
- b) ball pitch of 0,3 mm has been added;
- c) datum is changed from the body datum to the ball datum;
- d) combination lists of D , E , M_D , and M_E have been revised.

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) | 2012-04-13 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2014-07-13 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60191-6-12:2011 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 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 60191	Series	Mechanical standardization of semiconductor devices	EN 60191	Series
IEC 60191-6	-	Mechanical standardization of semiconductor devices - Part 6: General rules for the preparation of outline drawings of surface mounted semiconductor device packages	EN 60191-6	-

This page is intentionally left BLANK.

CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references	5
3 Terms and definitions	5
4 Terminal position numbering.....	6
5 Nominal package dimension	6
6 Outline drawings and principle dimensions	7
7 Dimensions	10
Figure 1 – Flange-type FLGA.....	6
Figure 2 – Rectangle-type FLGA.....	6
Figure 3 – Flange-type FLGA.....	7
Figure 4 – Rectangle-type FLGA.....	8
Figure 5 – Mechanical gauge drawing ^e	9
Figure 6 – Pattern of terminal position area ^f	9
Table 1 – Group 1: Dimensions appropriate to mounting and interchangeability	10
Table 2 – Group 2: Dimensions and tolerances	14
Table 3 – Combination list of D, E, M _D , and M _E – $\boxed{e} = 0,80\text{mm}$ pitch.....	15
Table 4 – Combination list of D, E, M _D , and M _E – $\boxed{e} = 0,65\text{ mm}$ pitch	16
Table 5 – Combination list of D, E, M _D , and M _E – $\boxed{e} = 0,50\text{ mm}$ pitch	17
Table 6 – Combination list of D, E, M _D , and M _E – $\boxed{e} = 0,40\text{ mm}$ pitch	18
Table 7 – Combination list of D, E, M _D , and M _E – $\boxed{e} = 0,30\text{ mm}$ pitch	19

INTERNATIONAL ELECTROTECHNICAL COMMISSION

MECHANICAL STANDARDIZATION OF SEMICONDUCTOR DEVICES –

Part 6-12: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Design guidelines for fine-pitch land grid array (FLGA)

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 60191-6-12 has been prepared by subcommittee 47D: Mechanical standardization of semiconductor devices, of IEC technical committee 47: Semiconductor devices.

This second edition of IEC 60191-6-12 cancels and replaces the first edition, published in 2002 and constitutes a technical revision. This edition includes the following significant changes with respect to the previous edition:

- a) scope is expanded so that this standard include the square type FLGA. The title of this standard has been changed accordingly: “Rectangular type” has been deleted from the title.
- b) ball pitch of 0,3 mm has been added;
- c) datum is changed from the body datum to the ball datum;
- d) combination lists of D , E , M_D , and M_E have been revised.

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

CDV	Report on voting
47D/784/CDV	47D/795/RVC

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 the parts in the IEC 60191 series, under the general title *Mechanical standardization of semiconductor devices*, 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.

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.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-