



BSI Standards Publication

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)

National foreword

This British Standard is the UK implementation of EN 60191-6-12:2011. It is identical to IEC 60191-6-12:2011. It supersedes BS EN 60191-6-12:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/47, Semiconductors.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments issued since publication

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**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)

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CENELEC

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

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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	-

CONTENTS

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 – e = 0,80mm pitch.....	15
Table 4	– Combination list of D, E, M _D , and M _E – $\boxed{e}$ = 0,65 mm pitch	16
Table 5	– Combination list of D, E, M _D , and M _E – $\boxed{e}$ = 0,50 mm pitch	17
Table 6	– Combination list of D, E, M _D , and M _E – $\boxed{e}$ = 0,40 mm pitch	18
Table 7	– Combination list of D, E, M _D , and M _E – $\boxed{e}$ = 0,30 mm pitch	19

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)

1 Scope

This part of IEC 60191 provides standard outline drawings, dimensions, and recommended variations for all fine-pitch land grid array packages (FLGA) with terminal pitch of 0,8 mm or less.

2 Normative references

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.

IEC 60191(all parts), *Mechanical standardization of semiconductor devices*

IEC 60191-6, *Mechanical standardization of semiconductor devices – Part 6: General rules for the preparation of outline drawings of surface mounted semiconductor device packages*

3 Terms and definitions

For the purposes of this document, the terms and definitions given IEC 60191 series and the following apply.

3.1

fine-pitch land grid array

FLGA

package with metal lands on one side of a substrate in a matrix of at least three rows and three columns on a pitch of 0,8 mm or less, wherein the maximum standoff height is 0,10 mm or less

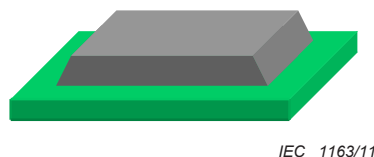
NOTE Terminals may be missing from some row-column intersections.

3.2

flange-type FLGA

FLGA with a package outline (length, width) defined by a package flange part, mostly substrate, extending outward beyond the perimeter of a molded part or of a flip-chip-bonded part

NOTE Flange-type FLGA, shown in Figure 1, is generally cut by singulation press, thus resulting in larger dimensional errors than the singulation by dicing saw



IEC 1163/11

Figure 1 – Flange-type FLGA

3.3

rectangle-type FLGA

FLGA with a package outline (length, width) defined by a molded part with no extending flange part

NOTE Rectangle-type FLGA, shown in Figure 2, is generally cut by dicing, thus resulting in less dimensional errors than the singulation by press machine.



IEC 1164/11

Figure 2 – Rectangle-type FLGA

4 Terminal position numbering

When a package is viewed from the terminal side with the index corner in the bottom left corner position, terminal rows are lettered from bottom to top starting with A, then B, C,,, AA, AB, *etc.*, whereas terminal columns are numbered from left to right starting with 1. Terminal positions are designated by a row-column grid system and shown as alphanumeric identification, e.g., A1, B1.

The letters I, O, Q, S, X and Z shall not be used for naming the terminal rows.

5 Nominal package dimension

A nominal package dimension is defined as “the package width (E) $\times$ length (D)”, which is expressed in the tenths place in millimeter.