INTERNATIONAL STANDARD

IEC 60191-6-3

First edition
2000-09

Mechanical standardization of semiconductor devices –

**Part 6-3:
General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Measuring methods for package dimensions of quad flat packs (QFP)**

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Normalisation mécanique des dispositifs à semiconducteurs –

IEC 60191-6-3:2000
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*Partie 6-3:
Règles générales pour la préparation des dessins d'encombrement des dispositifs à semiconducteurs à montage en surface – Méthodes de mesure pour les boîtiers plats quadrangulaires (QFP)*

Reference number
IEC 60191-6-3:2000(E)

Numbering

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Terminology, graphical and letter symbols

For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV).

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For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

* See web site address on title page.

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MECHANICAL STANDARDIZATION OF SEMICONDUCTOR DEVICES –

Part 6-3: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Measuring methods for package dimensions of quad flat packs (QFP)

FOREWORD

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International Standard IEC 60191-6-3 has been prepared by subcommittee 47D: Mechanical standardization of semiconductor devices, of IEC technical committee 47: Semiconductor devices.

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

FDIS	Report on voting
47D/370/FDIS	47D/388/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 3.

The committee has decided that the contents of this publication will remain unchanged until 2003. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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MECHANICAL STANDARDIZATION OF SEMICONDUCTOR DEVICES –

Part 6-3: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Measuring methods for package dimensions of quad flat packs (QFP)

1 Scope

This part of IEC 60191 stipulates a method for quad flat packs (QFP) measuring dimensions which are classified into Form E.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60191. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60191 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

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IEC 60191-6:1990, *Mechanical standardization of semiconductor devices – Part 6: General rules for the preparation of outline drawings of surface mounted semiconductor device packages*

3 Definitions

IEC 60191-6-3:2000

For the purpose of this part of IEC 60191, the definitions of IEC 60191-6 apply.

4 Measuring methods

4.1 The measuring methods described in this standard are for dimension values guaranteed to users on the basis of the following items.

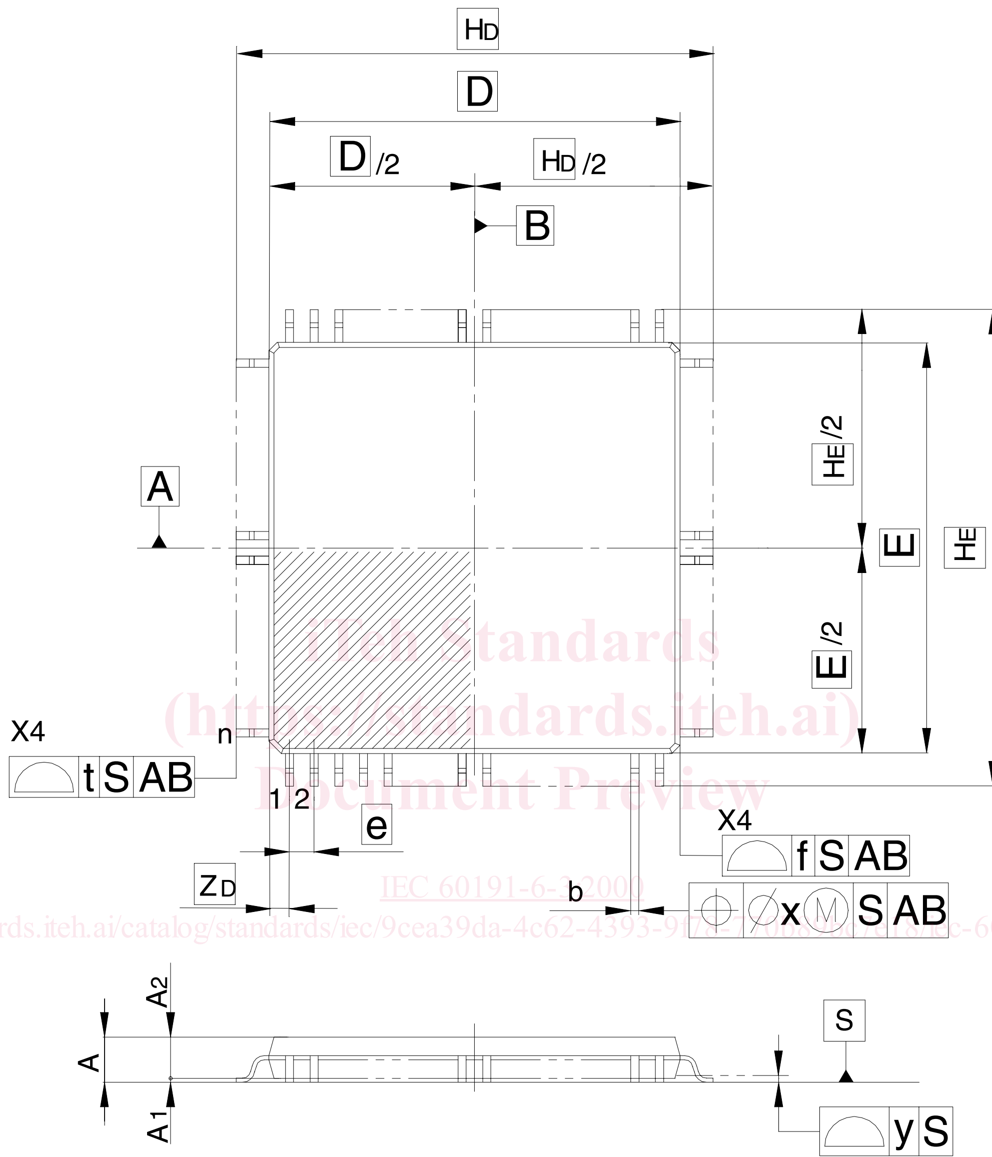
a) In general, measuring the dimensions shall be made with the semiconductor packages mounted on printed circuit-board as the guarantee is made to user.

b) In general, measurement may be made either by hand or automatically.

c) If a specified dimension is difficult to measure, the best alternative measuring method is defined as the formal measuring method.

d) The dimensions that cannot be measured unless the package is destroyed may be calculated from other dimensions or replaced by representative values.

4.2 Reference characters and drawing



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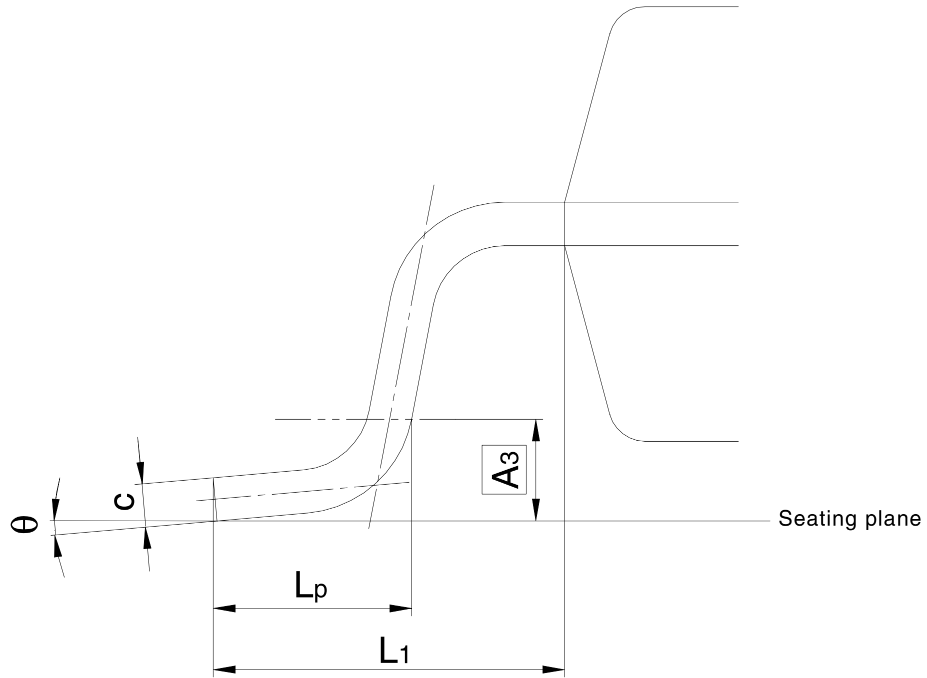
IEC 1671/2000

Figure 1



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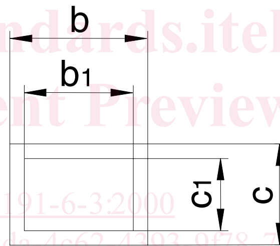

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IEC 1672/2000

Figure 2

4.3 Datum

The datum shall be defined as follows.

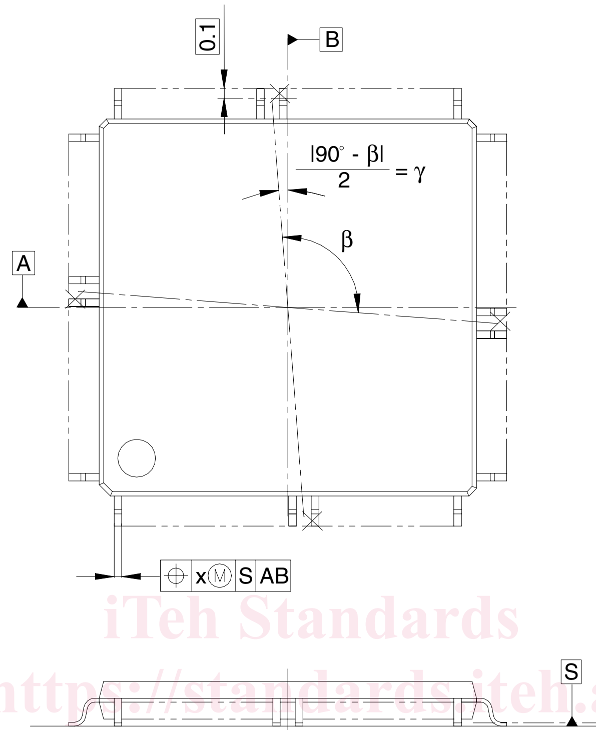

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Figure 3

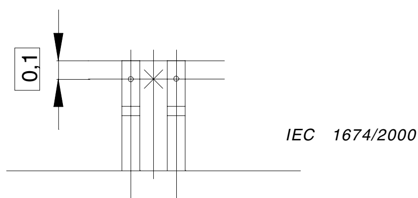
IEC 60191-6-3:2000

Centres of opposite sides of a package, which are defined below, shall be connected together. An angle β subtended by the two crossing lines shall be obtained.

A difference |90° - β| of the angle β from 90° shall be equally distributed to the sides to obtain rectangular axes. The rectangular axes are depicted as datum lines A and B of the package.

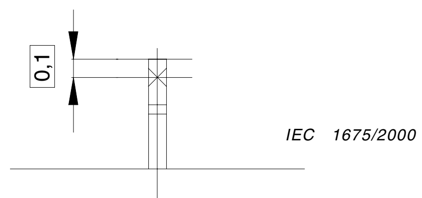
Description of the centres of sides

Even number of leads on a package side



A centre of facing sides of adjacent leads at a position 0,1 mm inside the top of the leads

Odd number of leads on a package side



The centre of leads at a position 0,1 mm inside the top of the leads

Figure 4

4.4 Overall width HE / overall length HD / Package width D / package length E

4.4.1 Description

a) As to the overall width and overall length, all lead tops should be located within the range t centring on the position which is at a theoretically correct distance of HE/2 or HD/2 from the datum A or B.

b) As to the package width and length, the package end-face should be located within the range f centring on the position which is at a theoretically correct distance of E/2 or D/2 from the datum A or B.

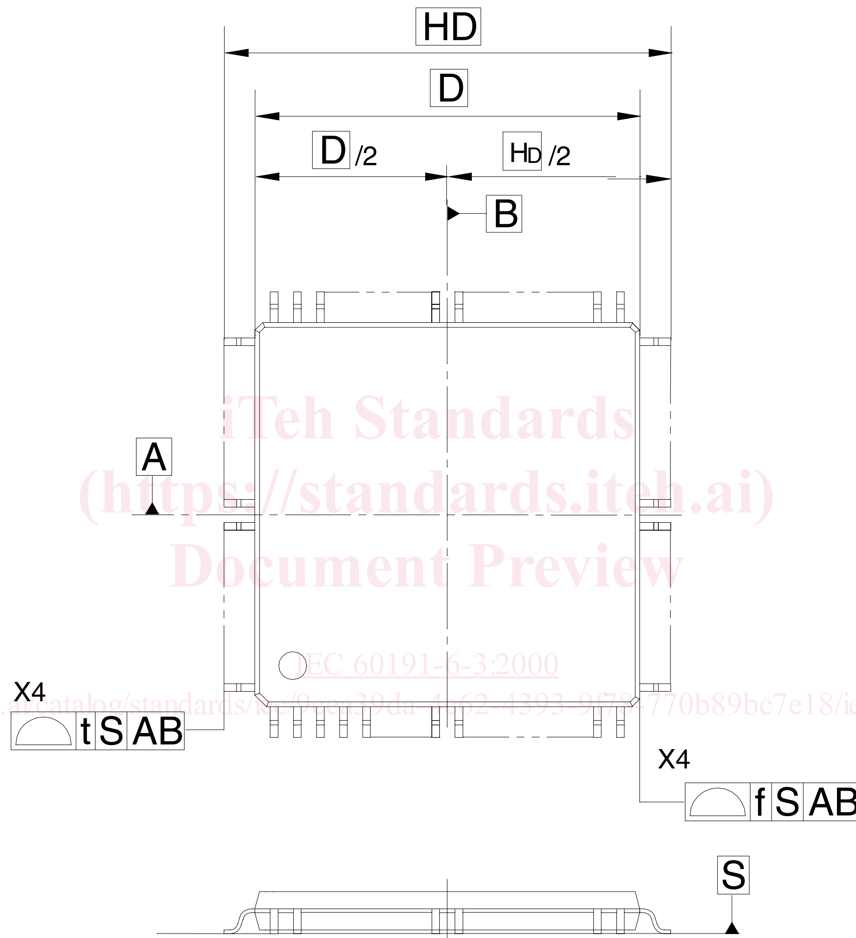


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Figure 5