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**Standardizacija mehanskih lastnosti polprevodniških elementov – 6-4. del:**  
**Splošna pravila za pripravo tehničnih risb okrovov polprevodniških elementov za**  
**površinsko montažo - Merjenje okrovov z mrežo krogličnih priključkov (BGA) (IEC**  
**60191-6-4:2003)**

Mechanical standardization of semiconductor devices -- Part 6-4: General rules for the preparation of outline drawings of surface mounted semiconductor device packages - Measuring methods for package dimensions of ball grid array (BGA)

Mechanische Normung von Halbleiterbauelementen -- Teil 6-4: Allgemeine Regeln für die Erstellung von Gehäusezeichnungen von SMD-Halbleitergehäusen - Messverfahren für Gehäusemaße von Ball Grid Array (BGA)

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Normalisation mécanique des dispositifs à semiconducteurs -- Partie 6-4: Règles générales pour la préparation des dessins d'encombrement des dispositifs à semiconducteurs à montage en surface - Méthodes de mesure pour les dimensions des boîtiers matriciels à billes

**Ta slovenski standard je istoveten z: EN 60191-6-4:2003**

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**ICS:**

01.100.25	Risbe s področja elektrotehnike in elektronike	Electrical and electronics engineering drawings
31.080.01	Polprevodniški elementi (naprave) na splošno	Semiconductor devices in general
31.240	Mehanske konstrukcije za elektronsko opremo	Mechanical structures for electronic equipment

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EUROPEAN STANDARD

**EN 60191-6-4**

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2003

ICS 31.080.01

English version

**Mechanical standardization of semiconductor devices**  
**Part 6-4: General rules for the preparation of outline drawings of surface**  
**mounted semiconductor device packages -**  
**Measuring methods for package dimensions of ball grid array (BGA)**  
**(IEC 60191-6-4:2003)**

Normalisation mécanique  
 des dispositifs à semiconducteurs  
 Partie 6-4: Règles générales  
 pour la préparation des dessins  
 d'encombrement des dispositifs  
 à semiconducteurs à montage en surface -  
 Méthodes de mesure pour les dimensions  
 des boîtiers matriciels à billes  
 (CEI 60191-6-4:2003)

Mechanische Normung von  
 Halbleiterbauelementen  
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 Erstellung von Gehäusezeichnungen von  
 SMD-Halbleitergehäusen -  
 Messverfahren für Gehäusemaße von  
 Ball Grid Array (BGA)  
 (IEC 60191-6-4:2003)

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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, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

**CENELEC**

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of document 47D/531/FDIS, future edition 1 of IEC 60191-6-4, prepared by SC 47D, Mechanical standardization of semiconductor devices, of IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60191-6-4 on 2003-07-01.

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) 2004-04-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2006-07-01

Annexes designated "normative" are part of the body of the standard.  
In this standard, annex ZA is normative.  
Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 60191-6-4:2003 was approved by CENELEC as a European Standard without any modification.

[SIST EN 60191-6-4:2005](https://standards.iteh.ai/catalog/standards/sist/a7a60691-2e2e-4bf8-a29c-d5aa0dae7b71/sist-en-60191-6-4-2005)

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## **Annex ZA** (normative)

### **Normative references to international publications with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

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# INTERNATIONAL STANDARD

# IEC 60191-6-4

First edition  
2003-06

## Mechanical standardization of semiconductor devices –

### Part 6-4: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Measuring methods for package dimensions of ball grid array (BGA)

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### *Normalisation mécanique des dispositifs à semiconducteurs –*

### *Partie 6-4: Règles générales pour la préparation des dessins d'encombrement des dispositifs à semiconducteurs à montage en surface – Méthodes de mesure pour les dimensions des boîtiers matriciels à billes*

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

# MECHANICAL STANDARDIZATION OF SEMICONDUCTOR DEVICES –

## Part 6-4: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Measuring methods for package dimensions of ball grid array (BGA)

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60191-6-4 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/531/FDIS	47D/546/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.

The committee has decided that the contents of this publication will remain unchanged until 2006. 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.

## MECHANICAL STANDARDIZATION OF SEMICONDUCTOR DEVICES –

### Part 6-4: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Measuring methods for package dimensions of ball grid array (BGA)

#### 1 Scope

This part of IEC 60191 covers the requirements for the measuring methods of ball grid array (BGA) dimensions.

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

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#### 3 Terms and definitions

[SIST EN 60191-6-4:2005](https://standards.iteh.ai/catalog/standards/sist/a7a60691-2e2e-4bf8-a29c-d5aa0dae7b71/sist-en-60191-6-4-2005)

For the purposes of this document, the definitions of IEC 60191-6 apply.

The measuring method in this standard is defined for dimension values guaranteed to users on the basis of the following items.

- 1) In general, measurement may be made either by hand or automatically.
- 2) If a dimension is difficult to measure, the best alternative measuring method will be defined as the preferred measuring method.

## 4 Reference character and drawings

### 4.1 Ball grid array package (BGA) Type 1 – Ball datum

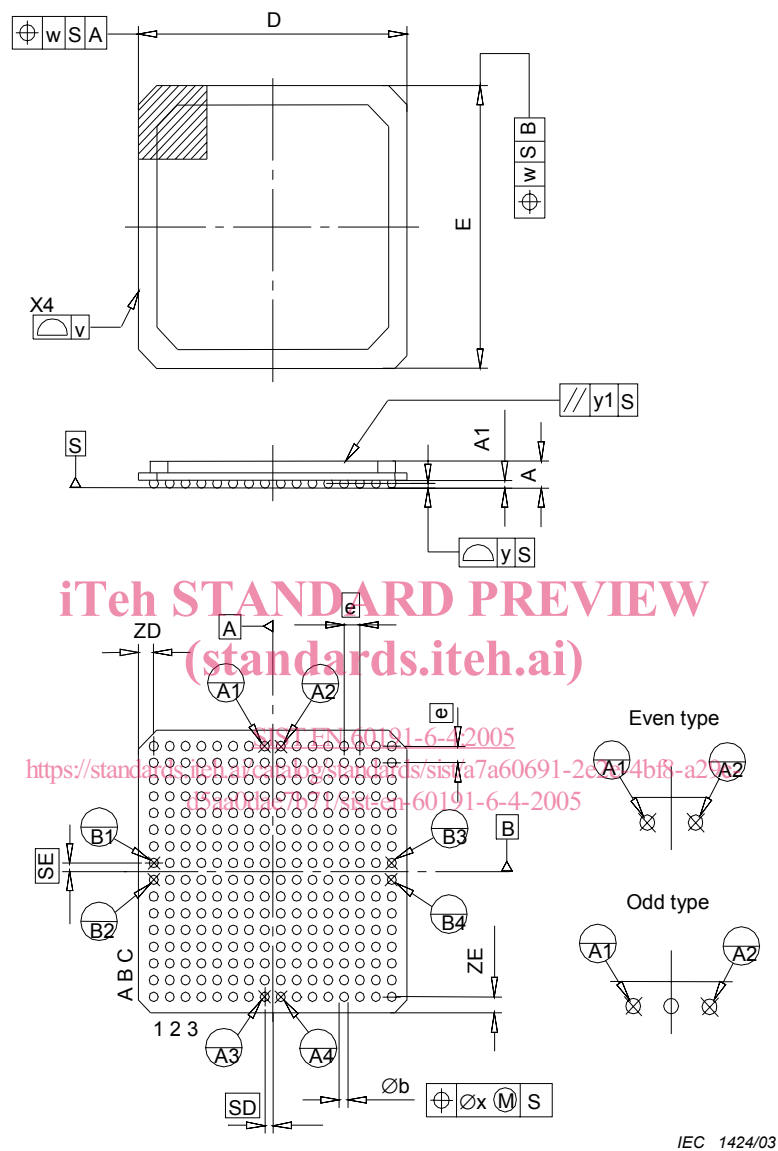


Figure 1 – BGA package Type 1 – Ball datum