# INTERNATIONAL STANDARD

# IEC 60191-6-16

First edition
2007-04

## Mechanical standardization of semiconductor devices –

## Part 6-16: Glossary of semiconductor tests and burn-in sockets for BGA, LGA, FBGA and FLGA



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

# MECHANICAL STANDARDIZATION OF SEMICONDUCTOR DEVICES –

## Part 6-16: Glossary of semiconductor tests and burn-in sockets for BGA, LGA, FBGA and FLGA

## FOREWORD

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International Standard IEC 60191-6-16 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/679/FDIS | 47D/683/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 Directive, Part 2.

A list of all the parts of 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 maintenance result 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- withdrawn,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.

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

# MECHANICAL STANDARDIZATION OF SEMICONDUCTOR DEVICES –

## Part 6-16: Glossary of semiconductor tests and burn-in sockets for BGA, LGA, FBGA and FLGA

## 1 Scope

This part of IEC 60191 gives a glossary of semiconductor sockets for BGA, LGA, FBGA and FLGA. This standard intends to establish definitions and unification of terminology relating to tests and burn-in sockets for BGA, LGA, FBGA and FLGA.

## 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 60191-1:1966, *Mechanical standardization of semiconductor devices – Part 1: Preparation of outline drawings of semiconductor devices*

IEC 60191-2:1966, *Mechanical standardization of semiconductor devices – Part 2: Dimensions*

IEC 60191-3:1999, *Mechanical standardization of semiconductor devices – Part 3: General rules for the preparation of outline drawings of integrated circuits*

IEC 60191-4:1999, *Mechanical standardization of semiconductor devices – Part 4: Coding system and classification into forms of package outlines for semiconductor devices*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE 1 Long terms are indicated in two lines.

NOTE 2 A symbol indicates the dimensional symbol in drawing.

NOTE 3 A dash (-) in the columns of “Drawing part” and “Symbol” indicates no correspondence to symbols or drawing parts.

## 3.1 General

**Table 1 – General**

| No. | Term | Definition | Symbol | Drawing part |
|---|---|---|---|---|
| 101 | IC socket | connector to electrically connect and mechanically hold IC package | - | - |
| 102 | production socket | socket used in the production of PCB assemblies for electrical equipment to facilitate package replacement | - | - |
| 103 | test and burn-in socket | socket mainly used for electrical characteristics test, burn-in and reliability test of package with its production process. Designed for reliable contact, durable actuation and high environmental operating temperature | - | - |
| 104 | clamshell type socket | socket having a style that surrounds the package with hinged base and lid | - | Figure 1 |
| 105 | open-top type socket | socket having a style to load/unload package from the top opening of socket by pressing down the cover mechanism | - | Figure 2 |

## 3.2 Clamshell type

**Table 2 – Clamshell type**

| No. | Term | Definition | Symbol | Drawing part |
|---|---|---|---|---|
| 201 | base | base part to hold contacts and other socket parts and to be assembled on PCB | - | Figure 1(1) |
| 202 | lid | part making a pair with base whose function is to hold the package | - | Figure 1(2) |
| 203 | latch | latch to fix the cover with base at closed position | - | Figure 1(3) |
| 204 | hinge | hinge to join base and lid | - | Figure 1(4) |
| 205 | alignment plate | supporting part to align terminals with through holes on PCB for ease of socket terminal insertion | - | Figure 1(5) |
| 206 | alignment pin | pin mounted on socket to define relative position of socket with PCB | - | Figure 1(6) |
| 207 | contact | electrically connecting part of socket consisting of contact point with package lead and terminal portion to be soldered on PCB | - | Figure 1(7) |
| 208 | contact point | section of the contact making connection with package | - | Figure 1,(8) |
| 209 | terminal | electrical connector protruding from socket base in order to solder on PCB. Part of the contact | - | Figure 1(9) |
| 210 | platform | part to hold package | - | Figure 1(10) |
| 211 | pusher | part to hold package and to maintain stable contact of package leads with socket contacts | - | Figure 1(11) |
| 212 | package guide | guide for package established in socket to align package leads with socket contact | - | Figure 1(12) |
| 213 | mounting flange | flange to mount socket on PCB | - | Figure 1(13) |
| 214 | socket width | socket width excluding mounting flange | $W$ | Figure 1 |
| 215 | maximum socket width | maximum socket width including mounting flange | $W_1$ | Figure 1 |
| 216 | socket length | socket length excluding protrusion of the latch at its closed position | $L$ | Figure 1 |
| 217 | maximum socket length | maximum socket length including protrusion of the latch at its closed position | $L_1$ | Figure 1 |
| 218 | latch moving distance | distance of the latch movement beyond socket length | $L_3$ | Figure 1 |

**Table 2 – Clamshell type** *(continued)*

| No. | Term | Definition | Symbol | Drawing part |
|---|---|---|---|---|
| 219 | socket height | distance from socket mounting plane to the lid top surface at its closed position | $A$ | Figure 1 |
| 220 | maximum socket height | distance from socket mounting plane to the lid top surface including protruded section with its closed position | $A_4$ | Figure 1 |
| 221 | maximum height with opened lid | maximum socket height from its mounting plane with the lid at fully open position including protrusions | $A_5$ | Figure 1 |
| 222 | lid open angle | angle of the lid at fully open position | $\theta$ | Figure 1 |
| 223 | base width | width of socket base | $W_2$ | Figure 1 |
| 224 | base length | length of socket base | $L_2$ | Figure 1 |
| 225 | seating plane height | height from socket mounting surface to the platform top surface | $A_2$ | Figure 1 |
| 226 | terminal length | length from socket mounting plane to terminal tip | $A_3$ | Figure 1 |

### 3.3 Open-top type

**Table 3 – Open-top type**

| No. | Term | Definition | Symbol | Drawing part |
|---|---|---|---|---|
| 301 | base | base part to hold contacts and other socket parts and to be assembled on PCB | - | Figure 2(1) |
| 302 | cover | part to actuate the pusher and contact point of the contact | - | Figure 2(2) |
| 303 | bumper | protective part surrounding the base | - | Figure 2,(3) |
| 304 | alignment plate | supporting part to align terminals with through holes on PCB for ease of socket terminal insertion | - | Figure 2(4) |
| 305 | alignment pin | pin mounted on socket to define relative position of socket with PCB | - | Figure 2(5) |
| 306 | contact | electrically connecting part of socket consisting of contact point with package lead and terminal portion to be soldered on PCB | - | Figure 2 (6) |
| 307 | contact point | section of the contact making a connection with package | - | Figure 2(7) |
| 308 | terminal | electrical connector protruding from socket base in order to solder on PCB, a part of contact | - | Figure 2(8) |
| 309 | platform | part to hold package. In case of the open top type socket, this functionality is likely built in main body of socket | - | Figure 2(9) |
| 310 | pusher | part to hold package and to maintain stable contact of package leads with socket contacts | - | Figure 2(10) |
| 311 | package guide | guide for package established in socket to align package leads with socket contact | - | Figure 2(11) |
| 312 | retainer | part to retain package | - | Figure 2(12) |
| 313 | socket width | socket width excluding bumper and others | $W$ | Figure 2 |
| 314 | maximum socket width | maximum socket width including bumper and others | $W_1$ | Figure 2 |
| 315 | socket length | socket length excluding bumper and others | $L$ | Figure 2 |
| 316 | maximum socket length | maximum socket length including bumper and others | $L_1$ | Figure 2 |
| 317 | socket height | height of socket from its mounting plane | $A$ | Figure 2 |
| 318 | end stroke height | distance from socket mounting plane to top surface of the cover in its fully depressed position | $A_1$ | Figure 2 |
| 319 | seating plane height | distance from socket mounting plane to top surface of the platform without package | $A_2$ | Figure 2 |
| 320 | terminal length | length from socket mounting plane to terminal tip | $A_3$ | Figure 2 |

### 3.4 Printed circuit board

**Table 4 – Printed circuit board**

| No. | Term | Definition | Symbol | Drawing part |
|---|---|---|---|---|
| 401 | mounting hole | hole drilled on PCB to mount socket mechanically | - | Figure 3(1) |
| 402 | alignment hole | hole drilled on PCB to align relative position of socket and PCB | - | Figure 3(2) |
| 403 | socket mounting pattern | description including dimension of mounting hole, alignment hole and plated-through hole with their relative positional dimension | - | Figure 3 |
| 404 | socket mounting area | area on PCB where is required for socket mounting and operation | - | Figure 3(3) |
| 405 | socket mounting width | width of socket mounting area | $W_p$ | Figure 3 |
| 406 | socket mounting length | length of socket mounting area | $L_p$ | Figure 3 |
| 407 | maximum socket mounting width | width of socket mounting area including mounting flange or bumper | $W_{p1}$ | Figure 3 |

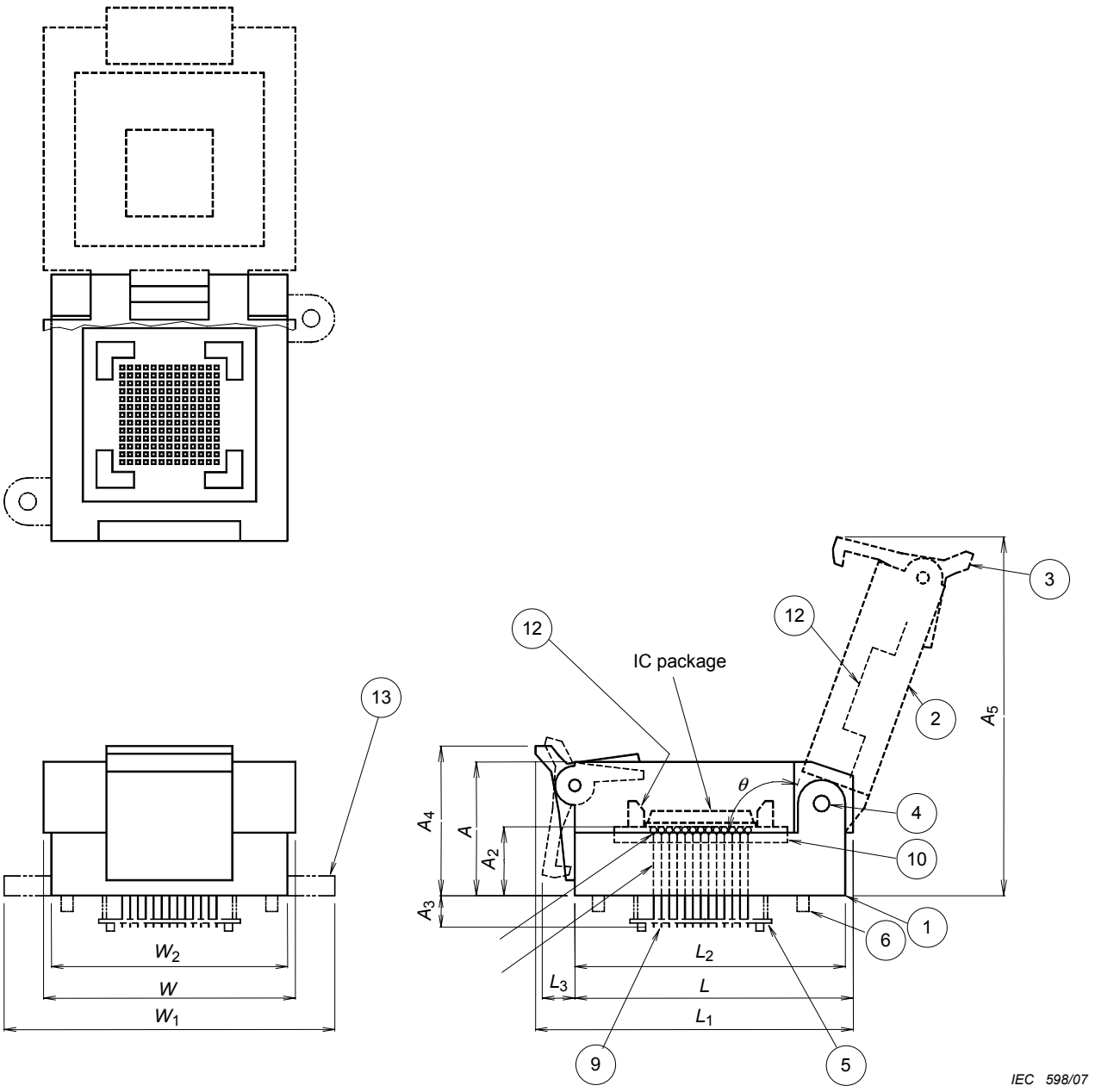


**Figure 1 – Clamshell type socket**

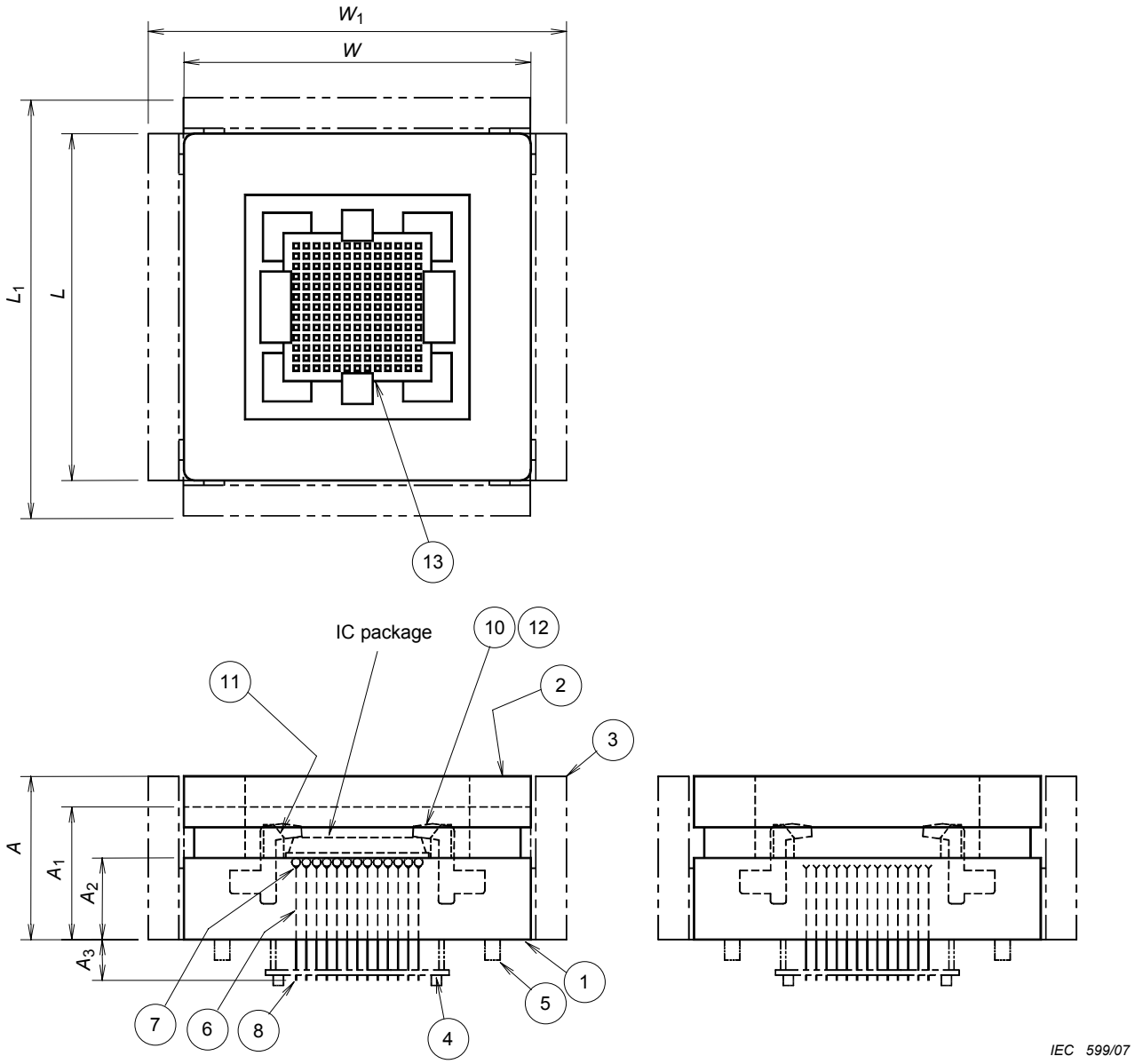


**Figure 2 – Open-top type socket**

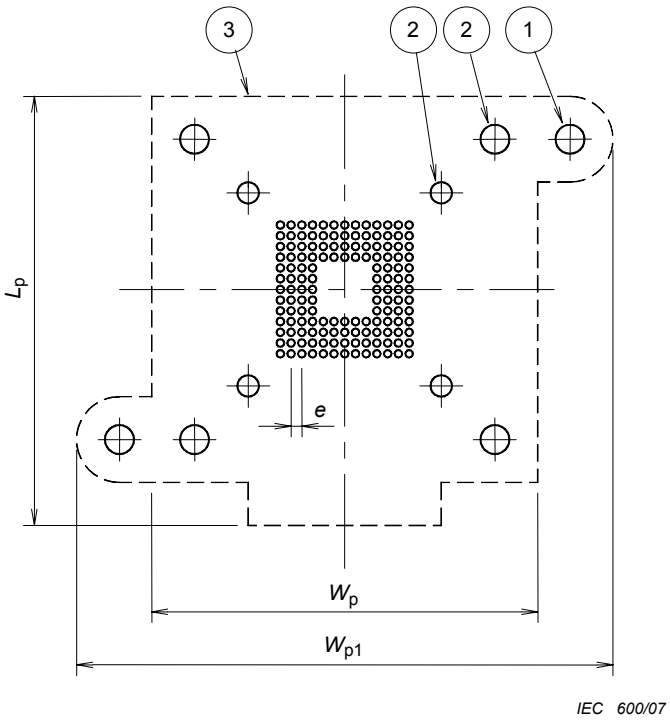


**Figure 3 – Socket mounting pattern**

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