IEC JEITA

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PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

**Mechanical standardization of semiconductor devices –
Part 6-18: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Design guide for ball grid array (BGA)**

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IEC-PAS 60191-6-18 was submitted by the JEITA (Japan Electronics and Information Technology Industries Association) and has been processed by IEC subcommittee 47D: Mechanical standardization for semiconductor devices, of IEC technical committee 47: Semiconductor devices.

The text of this PAS is based on the following documents	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document:
Draft PAS	Report on voting
47D/677/NP	47D/701/RVN

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned will transform it into an International Standard.

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MECHANICAL STANDARDIZATION OF SEMICONDUCTOR DEVICES –

Part 6-18: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Design guide for ball grid array (BGA)

1 Scope

This PAS provides common outline drawings and dimensions for all types of structures and composed materials of ball grid array (hereinafter called BGA), whose terminal pitch is one millimetre or larger and whose package body outline is square.

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.

None.

3 Terms and definitions

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

3.1
ball grid array
BGA
low-profile package whose terminals are metal balls located on one surface in a matrix of at least three rows and three columns; terminals may be missing from some row-column intersections

NOTE BGA stands for "Ball Grid Array" in this standard to be aligned with IEC 60191-6-2, 60191-6-4, and 60191-6-5. Only IEC 60191-4 refers BGA as "Bottom Grid Array", and it is not common language in the industry and no other standard uses this name.

3.2
plastic ball grid array
P-BGA
BGA whose substrate is made of organic printed wiring board

3.3
tape ball grid array
T-BGA
BGA whose substrate is made of polyimide tape

3.4
ceramic ball grid array
C-BGA
BGA whose substrate is made of ceramic circuit board

3.5
P-BGA (flip chip interconnection)
BGA whose substrate is made of organic printed wiring board and is connected to the die by the bumps on the die

3.6
Recommended BGA variations
BGA variations that shall be considered to be the first choice for production

Package variations other than recommended BGA variations are not recommended to prevent the endless proliferation of the BGA variations.

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., while 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, or AC34. The letters I, O, Q, S, X and Z are not used for naming the terminal rows.

5 Nominal package dimension

A nominal package dimension is defined as “the package width (E) X length (D)”, which is expressed to the tenth place, in millimetres.

6 Symbols and drawings

6.1 BGA outline

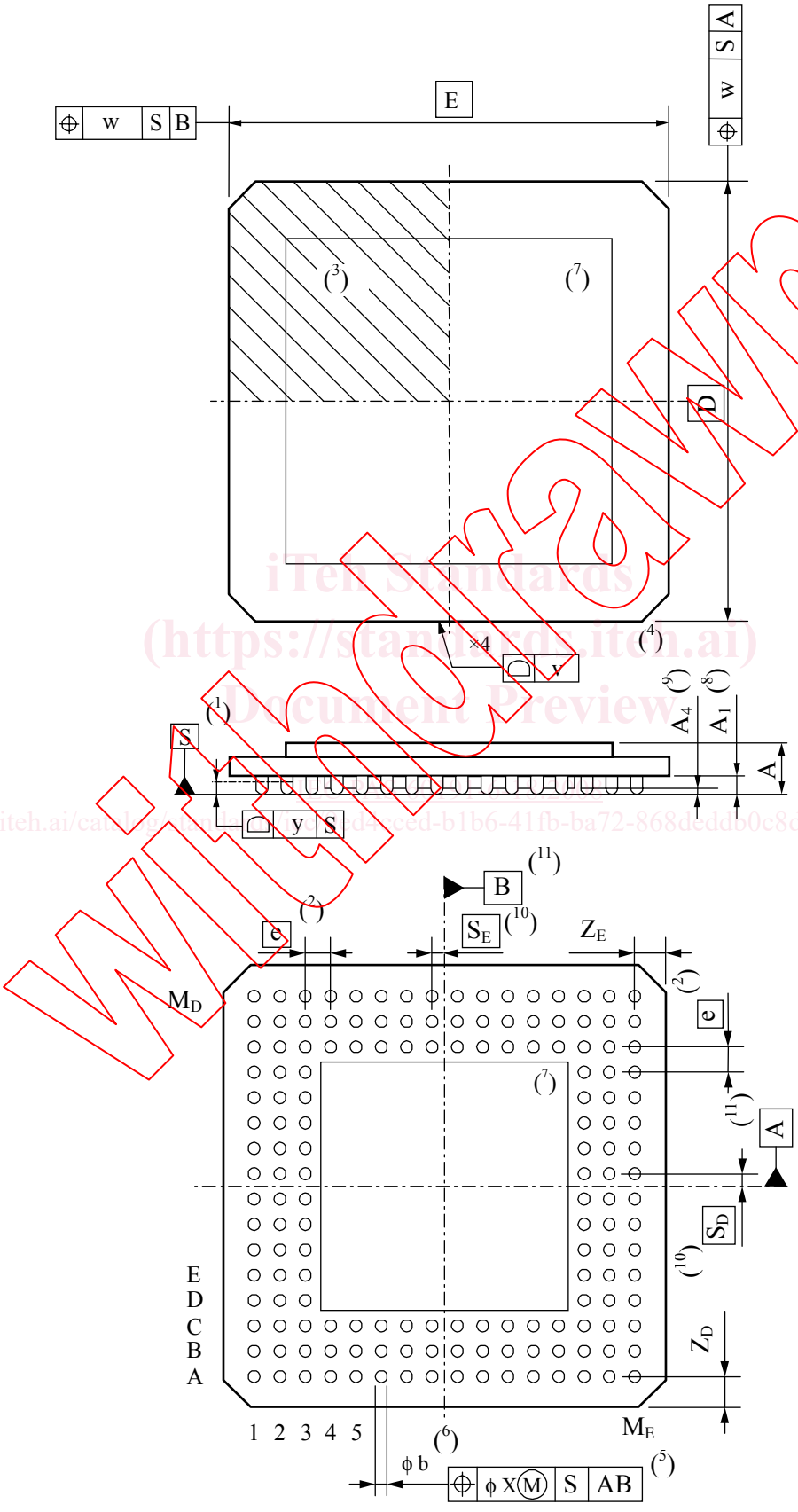

Figure 1 – Cavity down type

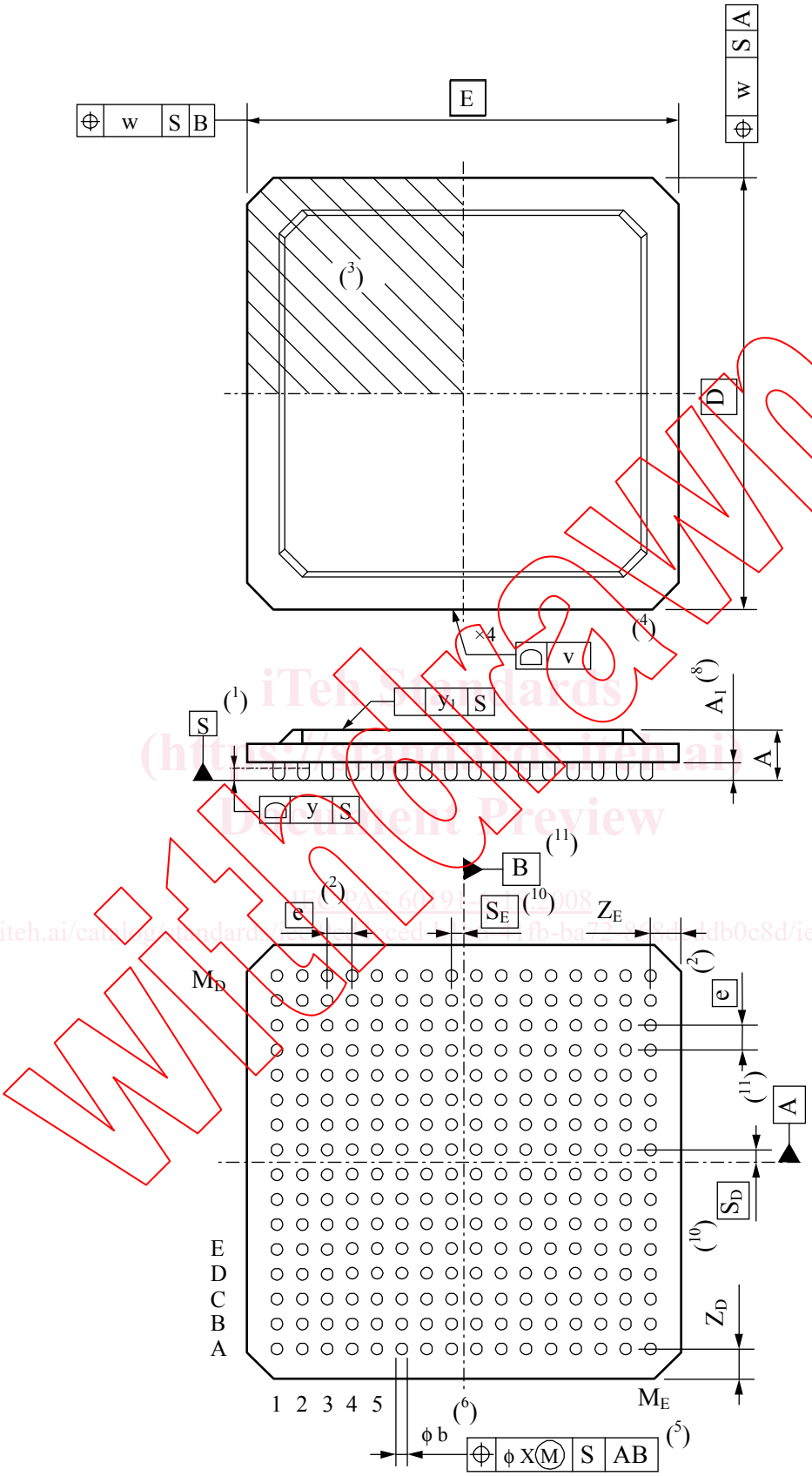

Figure 2 – Cavity up type