

# IEC/PAS 62186

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## Mechanical shock test method

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INTERNATIONAL  
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JESD22-B104-A

# JEDEC STANDARD

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Test Method B104-A  
Mechanical Shock

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ELECTRONIC INDUSTRIES ASSOCIATION

ENGINEERING DEPARTMENT



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## MECHANICAL SHOCK TEST METHOD

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IEC-PAS 62186 was submitted by JEDEC and has been processed by IEC technical committee 47: Semiconductor devices.

The text of this PAS is based on the following document:

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
47/1459/PAS	47/1492/RVD

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## TEST METHOD B104-A

## MECHANICAL SHOCK

(From JEDEC Council Ballot JCB-90-05, formulated under the JC-14.1 Committee on Reliability Test Methods for Packaged Devices.)

**1. PURPOSE**

The Shock Test is intended to determine the suitability of component parts for use in electronic equipment which may be subjected to moderately severe shocks as a result of suddenly applied forces or abrupt changes in motion produced by rough handling, transportation, or field operation. Shock of this type may disturb operating characteristics, particularly if the shock pulses are repetitive. This is a destructive test intended for device qualification. It is normally applicable to cavity-type packages.

**2. APPARATUS**

The shock-testing apparatus shall be capable of providing shock pulses of 500 and 1,500 g (peak) with a pulse duration between 0.5 and 1.0 ms to the body of the device. The acceleration pulse as determined from the unfiltered output of a transducer with natural frequency greater than or equal to five times the frequency of the shock pulse being established, shall be a half-sine waveform with an allowable distortion not greater than  $\pm 20\%$  of the specified peak acceleration. The pulse duration shall be measured between the points at 10% of the peak acceleration during rise time and 10% of the peak acceleration during decay time. Absolute tolerances of the pulse duration shall be  $\pm 30\%$  of the specified duration.

**3. PROCEDURE**

The shock-testing apparatus shall be mounted on a sturdy laboratory table or equivalent base and leveled before use. The device shall be rigidly mounted or restrained by its case with suitable protection for the leads. Means may be provided to prevent the shock from being repeated due to "bounce" in the apparatus. Unless otherwise specified, the device shall be subject to five shock pulses of the peak (g) level specified in the selected test condition and for the pulse duration specified in each of the orientations  $X_1$ ,  $X_2$ ,  $Y_1$ ,  $Y_2$ ,  $Z_1$ , and  $Z_2$ .

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**3. PROCEDURE** (Continued)

One required orientation (Y1) shall be defined as that one in which the internal element(s) tends to be removed from it's mount. Unless otherwise specified, Test Condition B shall apply.

Test Condition	G Level (Peak)	Duration of Pulse (ms)
A	500	1.0±0.1
B	1500	0.5±0.1

**3.1 Measurements**

Hermeticity tests, visual examination, and electrical measurements (consisting of parametric and functional tests) shall be performed.

**3.2 Failure Criteria**

A device shall be defined as a failure if hermeticity cannot be demonstrated, if parametric limits are exceeded, or if functionality cannot be demonstrated under the conditions specified in the applicable procurement document. Mechanical damage—such as cracking, chipping, or breaking of the package will also be considered a failure provided such damage was not caused by fixturing or handling.

**4. SUMMARY**

The following details shall be specified in the applicable procurement document:

- (a) Test condition, if other than Test Condition B (see 3.0) .
- (b) Electrical measurements.
- (c) Sample size and accept number.
- (d) Disposition of failures.
- (e) Hermetic leak rate (if applicable) .

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