

**PUBLICLY  
AVAILABLE  
SPECIFICATION**

**IEC  
PAS 62050**

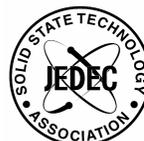
First edition  
2004-11

---

---

**Board level drop test method  
of components for handheld  
electronic products**

Withhold.com



Reference number  
IEC/PAS 62050:2004(E)

# **JEDEC STANDARD**

---

## **Board Level Drop Test Method of Components for Handheld Electronic Products**

---

**JESD22-B111**

**JULY 2003**

---

**JEDEC SOLID STATE TECHNOLOGY ASSOCIATION**



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**BOARD LEVEL DROP TEST METHOD OF COMPONENTS  
FOR HANDHELD ELECTRONIC PRODUCTS**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

A PAS is a technical specification not fulfilling the requirements for a standard but made available to the public.

IEC-PAS 62050 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
47/1753/NP	47/1791/RVN

Following publication of this PAS, the technical committee or subcommittee concerned will investigate the possibility of transforming the PAS into an International Standard

An IEC-PAS licence of copyright and assignment of copyright has been signed by the IEC and JEDEC and is recorded at the Central Office.

This PAS shall remain valid for an initial maximum period of three years starting from 2004-11. The validity may be extended for a single three-year period, following which it shall be revised to become another type of normative document or shall be withdrawn.



---

## BOARD LEVEL DROP TEST METHOD OF COMPONENTS FOR HANDHELD ELECTRONIC PRODUCTS

---

### Introduction

---

The handheld electronic products fit into the consumer and portable market segments. Included in the handheld electronic products are cameras, calculators, cell phones, pagers, palm size PCs, Personal Computer Memory Card International Association (PCMCIA) cards, smart cards, mobile phones, personal digital assistants (PDAs) and other electronic products that can be conveniently stored in a pocket and used while held in user's hand.

These handheld electronic products are more prone to being dropped during their useful service life because of their size and weight. This dropping event can not only cause mechanical failures in the housing of the device but also create electrical failures in the printed circuit board (PCB) assemblies mounted inside the housing due to transfer of energy through PCB supports. The electrical failures may result from various failure modes such as cracking of circuit board, trace cracking on the board, cracking of solder interconnections between the components and the board, and the component cracks. The primary driver of these failures is excessive flexing of circuit board due to input acceleration to the board created from dropping the handheld electronic product. This flexing of the board causes relative motion between the board and the components mounted on it, resulting in component, interconnects, or board failures. The failure is a strong function of the combination of the board design, construction, material, thickness, and surface finish; interconnect material and standoff height; and component size.

## BOARD LEVEL DROP TEST METHOD OF COMPONENTS FOR HANDHELD ELECTRONIC PRODUCTS

(From JEDEC Board Ballot JCB-03-38, formulated under the cognizance of the JC-14.1 Subcommittee on Reliability Test Methods for Packaged Devices)

---

### 1 Scope

---

The Board Level Drop Test Method is intended to evaluate and compare drop performance of surface mount electronic components for handheld electronic product applications in an accelerated test environment, where excessive flexure of a circuit board causes product failure. The purpose is to standardize the test board and test methodology to provide a reproducible assessment of the drop test performance of surface mounted components while duplicating the failure modes normally observed during product level test.

The purpose of this document is to prescribe a standardized test method and reporting procedure. This is not a component qualification test and is not meant to replace any system level drop test that maybe needed to qualify a specific handheld electronic product. The standard is not meant to cover the drop test required to simulate shipping and handling related shock of electronic components or PCB assemblies. These requirements are already addressed in JESD22-B104-B and JESD22-B110. The method is applicable to both area-array and perimeter-leaded surface mounted packages.

Correlation between test and field conditions is not yet fully established. Consequently, the test procedure is presently more appropriate for relative component performance than for use as a pass/fail criterion. Rather, results should be used to augment existing data or establish baseline for potential investigative efforts in package/board technologies.

The comparability between different test sites, data acquisition methods, and board manufacturers has not been fully demonstrated by existing data. As a result, if the data are to be used for direct comparison of component performance, matching study must first be performed to prove that the data are in fact comparable across different test sites and test conditions.

This method is not intended to substitute for full characterization testing, which might incorporate substantially larger sample sizes and increased number of drops. Due to limited sample size and number of drops specified here, it is possible that enough failure data may not be generated in every case to perform full statistical analysis.

---

### 2 Apparatus

---

As per JESD22-B104-B and JESDD22-B110

Withdrawn

---

#### **4 Applicable documents**

---

JESD22-B104-B, *Mechanical Shock*

JESD22-B110, *Subassembly Mechanical Shock*

IPC-SMT-782, *Surface Mount Design and Land Pattern Standard*

IPC-A-600, *Acceptability of Printed Boards*

J-STD-020, *Moisture/Reflow Sensitivity Classification for Non-hermetic Solid State Surface Mount Devices*

J-STD-033, *Standard for Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices*

IPC-9701, *Performance Test Methods and Qualification Requirements for Surface Mount Solder Attachments*