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Semiconductor devices – Mechanical and climatic test methods – Part 37: Board level drop test method using an accelerometer

Dispositifs à semiconducteurs – Méthodes d'essais mécaniques et climatiques – Partie 37: Méthode d'essai de chute au niveau de la carte avec utilisation d'un accéléromètre

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SEMICONDUCTOR DEVICES –
MECHANICAL AND CLIMATIC TEST METHODS –

Part 37: Board level drop test method using an accelerometer

FOREWORD

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International Standard IEC 60749-37 has been prepared by IEC technical committee 47: Semiconductor devices.

This standard cancels and replaces IEC/PAS 62050 published in 2004. This first edition constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
47/1937/FDIS	47/1948/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.

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This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60749 series, under the general title *Semiconductor devices – Mechanical and climatic test methods*, can be found in 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- withdrawn;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
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INTRODUCTION

Handheld electronic products fit into the consumer and portable market segments. Included in handheld electronic products are cameras, calculators, cell phones, cordless phones, pagers, palm size PCs, personal computer memory card international association (PCMCIA) cards, smart cards, 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 the circuit board, track cracking on the board, cracking of solder interconnections between the components and the board, and component cracks. The primary driver of these failures is excessive flexing of the 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, interconnect or board failures. The failure is a function of the combination of the board design, construction, material, thickness and surface finish; interconnect material and standoff height and component size.

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 a 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 studies 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.

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