SLOVENSKI STANDARD

SIST EN 60749-35:2007

januar 2007

Polprevodniški elementi - Mehanske in klimatske preskusne metode - 35. del: Akustična mikroskopija za elektronske komponente v plastičnih okrovih (IEC 60749-35:2006)

(istoveten EN 60749-35:2006)

Semiconductor devices - Mechanical and climatic test methods - Part 35: Acoustic microscopy for plastic encapsulated electronic components (IEC 60749-35:2006)

ICS 31.080.01

Referenčna številka
SIST EN 60749-35:2007(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60749-35

September 2006

ICS 31.080.01

English version

Semiconductor devices - Mechanical and climatic test methods Part 35: Acoustic microscopy for plastic encapsulated electronic components

(IEC 60749-35:2006)

Dispositifs à semiconducteurs - Méthodes d'essais mécaniques et climatiques Partie 35: Microscopie acoustique pour composants électroniques à boîtier plastique (CEI 60749-35:2006)

Halbleiterbauelemente - Mechanische und klimatische Prüfverfahren Teil 35: Ultraschallmikroskopie für kunststoffverkappte Bauelemente der Elektronik (IEC 60749-35:2006)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 47/1863/FDIS, future edition 1 of IEC 60749-35, prepared by IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60749-35 on 2006-09-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2007-06-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-09-01

Endorsement notice

The text of the International Standard IEC 60749-35:2006 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60749-20 NOTE Harmonized as EN 60749-20:2003 (not modified).

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
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Première édition
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Dispositifs à semiconducteurs – Méthodes d'essais mécaniques et climatiques –

Partie 35: Microscopie acoustique pour composants électroniques à boîtier plastique

Semiconductor devices – Mechanical and climatic test methods –

Part 35: Acoustic microscopy for plastic encapsulated electronic components

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For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 35: Acoustic microscopy for plastic encapsulated electronic components

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.

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International Standard IEC 60749-35 has been prepared by IEC technical committee 47: Semiconductor devices.

This first edition cancels and replaces IEC/PAS 62191 published in 2000, which was based on a Joint (IPC/JEDEC) Industry Standard. This edition constitutes a technical revision.

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

FDIS	Report on voting
47/1863/FDIS	47/1877/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 Directives, Part 2.

IEC 60749 consists of the following parts, under the general title *Semiconductor devices – Mechanical and climatic test methods:*

Part 1: General
Part 2: Low air pressure
Part 3: External visual inspection
Part 4: Damp heat, steady state, highly accelerated stress test (HAST)
Part 5: Steady-state temperature humidity bias life test
Part 6: Storage at high temperature
Part 7: Internal moisture content measurement and the analysis of other residual gases
Part 8: Sealing
Part 9: Permanence of marking
Part 10: Mechanical shock
Part 11: Rapid change of temperature – Two-fluid-bath method
Part 12: Vibration, variable frequency
Part 13: Salt atmosphere
Part 14: Robustness of terminations
Part 15: Resistance to soldering temperature for through-hole mounted devices
Part 16: Particle impact noise detection (PIND)
Part 17: Neutron irradiation
Part 18: Ionizing radiation (total dose)
Part 19: Die shear strength
Part 20: Resistance of plastic-encapsulated SMDs to the combined effect of moisture and soldering heat
Part 21: Solderability
Part 22: Bond strength
Part 23: High temperature operating life
Part 24: Accelerated moisture resistance – Unbiased HAST
Part 25: Temperature cycling
Part 26: Electrostatic discharge (ESD) sensitivity testing – Human body model (HBM)
Part 27: Electrostatic discharge (ESD) sensitivity testing – Machine model (MM)

Part 28: Electrostatic discharge (ESD) sensitivity testing – Charged device model (CDM) (under consideration)

Part 29: Latch-up test

Part 30: Preconditioning of non-hermetic surface mount devices prior to reliability testing

Part 31: Flammability of plastic-encapsulated devices (internally induced)

Part 32: Flammability of plastic-encapsulated devices (externally induced)

Part 33: Accelerated moisture resistance – Unbiased autoclave

Part 34: Power cycling

Part 35: Acoustic microscopy for plastic encapsulated electronic components

Part 36: Acceleration, steady state

Part 37: Board level drop test method of components for handheld electronic products (to be published)

Part 38: Soft error rate testing of electronic components (under consideration)

Part 39: Measurement of moisture diffusivity and water solubility in organic materials used for semiconductor components (to be published)

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.

SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 35: Acoustic microscopy for plastic encapsulated electronic components

1 Scope

This part of IEC 60749 defines the procedures for performing acoustic microscopy on plastic encapsulated electronic components. This standard provides a guide to the use of acoustic microscopy for detecting anomalies (delamination, cracks, mould-compound voids, etc.) reproducibly and non-destructively in plastic packages.

2 Terms and definitions

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

2.1
A-mode
acoustic data collected at the smallest X-Y-Z region defined by the limitations of the given acoustic microscope

NOTE An A-mode display contains amplitude and phase/polarity information as a function of time of flight at a single point in the X-Y plane. In this test method, A-mode is primarily used for focussing the acoustic microscope. See Figure 1.

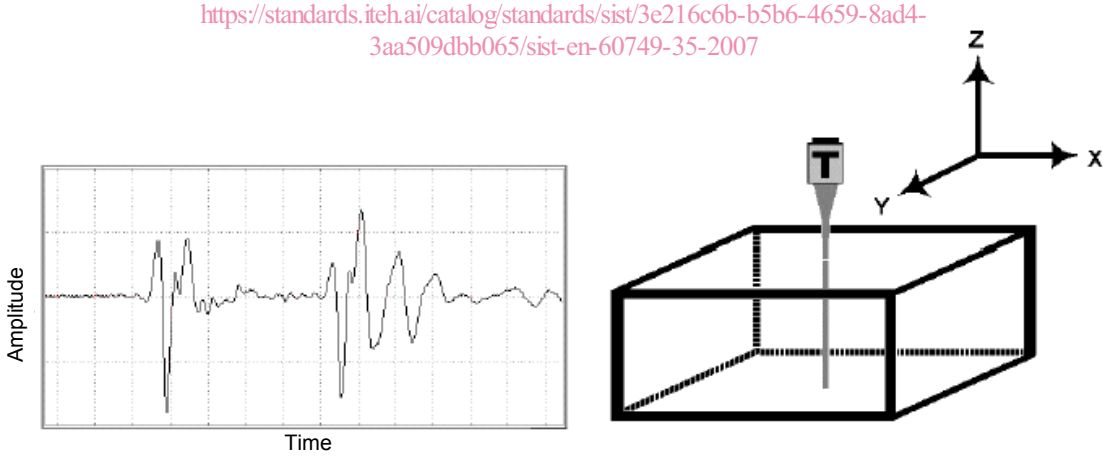

Figure 1 – Example of A-mode display

2.2
B-mode
acoustic data collected along an X-Z or Y-Z plane versus depth using a reflective acoustic microscope. A B-mode scan contains amplitude and phase/polarity information as a function of time of flight at each point along the scan line

NOTE A B-mode scan furnishes a two-dimensional (cross-sectional) description along a scan line (X or Y). In this test method B-mode is used to provide cross-sectional acoustic information. When scanned, B-mode can be used to track the depth of a defect. See Figure 2.

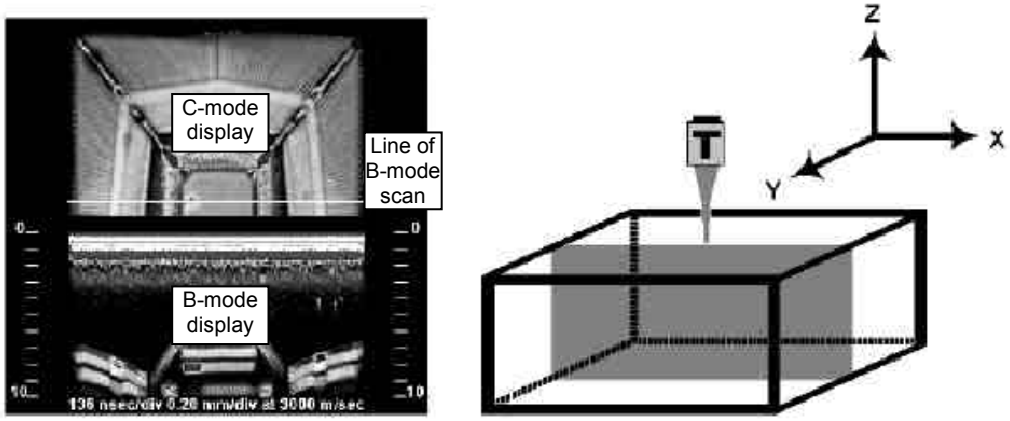

Figure 2 – Example of B-mode display (bottom half of picture on left)

2.3
back-side substrate view area
interface between the encapsulant and the back of the substrate within the outer edges of the substrate surface (refer to Annex A, type IV)

2.4
C-mode
acoustic data collected in an X-Y plane at depth (Z) using a reflective acoustic microscope

NOTE 1 A C-mode scan contains amplitude and phase/polarity information at each point in the scan plane. A C-mode scan furnishes a two-dimensional (area) image of echoes arising from reflections at a particular depth (Z). See Figure 3.

NOTE 2 C-mode is the preferred mode for scanning devices to determine compliance to the criteria of IEC 60749-20.

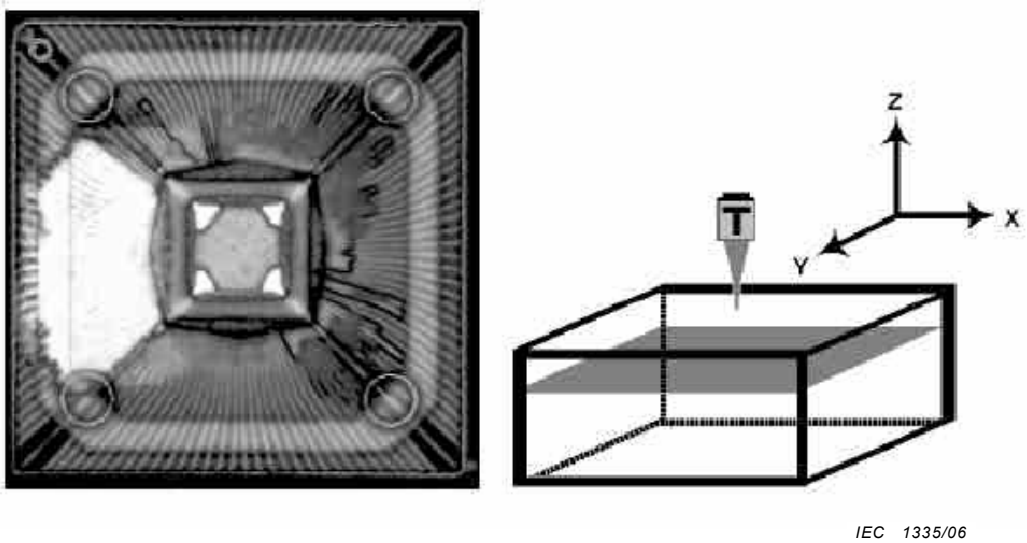

Figure 3 – Example of C-mode display