IPC/JEDEC J-STD-035A

Acoustic Microscopy for Non-Hermetic Encapsulated Electronic Devices

A joint standard developed by the B-10a IPC Plastic Chip Carrier Cracking Task Group and the JEDEC JC-14.1 Committee on Reliability Test Methods for Packaged Devices

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Users of this standard are encouraged to participate in the development of future revisions.

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ACOUSTIC MICROSCOPY FOR NON-HERMETIC ENCAPSULATED ELECTRONIC DEVICES

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ACOUSTIC MICROSCOPY FOR NON-HERMETIC ENCAPSULATED ELECTRONIC DEVICES

(From JEDEC Board Ballot JCB-22-59, formulated under the cognizance of the JC-14.1 Subcommittee on Reliability Test Methods for Packaged Devices.)

1 Scope

This test method defines the procedures for performing acoustic microscopy on non-hermetic encapsulated electronic devices. This method provides users with an acoustic microscopy process flow for detecting anomalies (delaminations, cracks, mold compound voids, etc.) nondestructively in encapsulated electronic devices while achieving reproducibility.

2 Definitions

A-mode - Acoustic data collected at the smallest X-Y-Z region defined by the limitations of the given reflective acoustic microscope. 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. See Figure 1 - Example of A-mode Display.

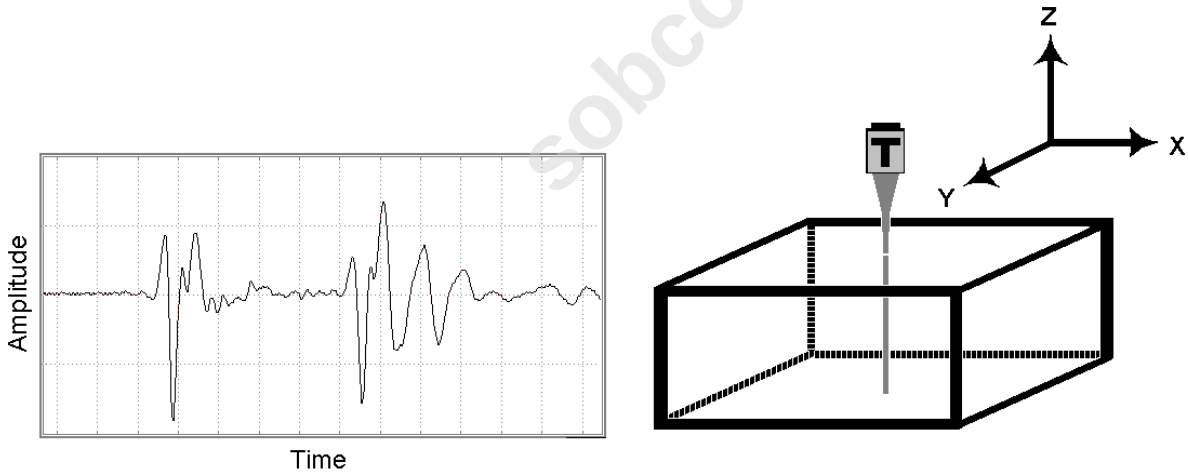

Figure 1 — Example of A-mode Display

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. A B-mode scan furnishes a two-dimensional (cross-sectional) description along a scan line (X or Y). See Figure 2.

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2 Definitions (cont'd)

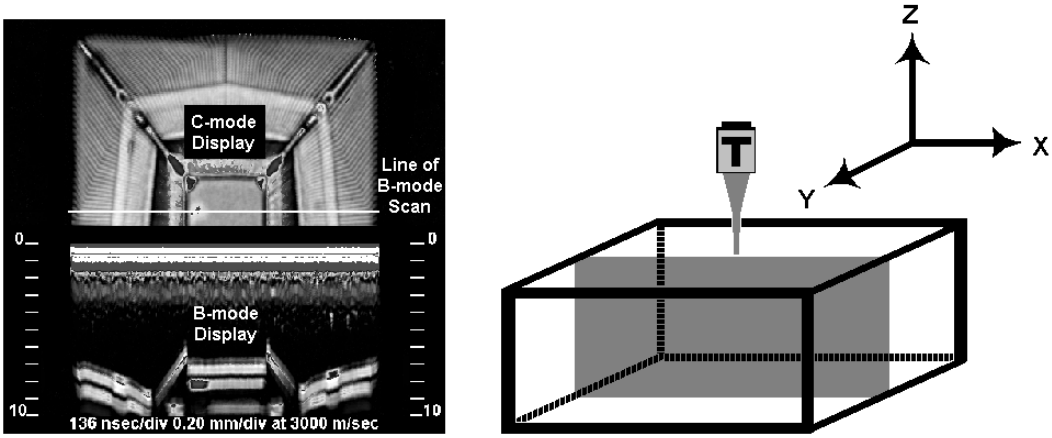

Figure 2 — Example of B-mode Display

Back-Side Substrate View Area (Refer to Annex A, Type IV) - The interface between the encapsulant and the back of the substrate within the outer edges of the substrate surface.

C-mode - Acoustic data collected in an X-Y plane at depth (Z) using a reflective acoustic microscope. 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 depth (Z). See Figure 3.

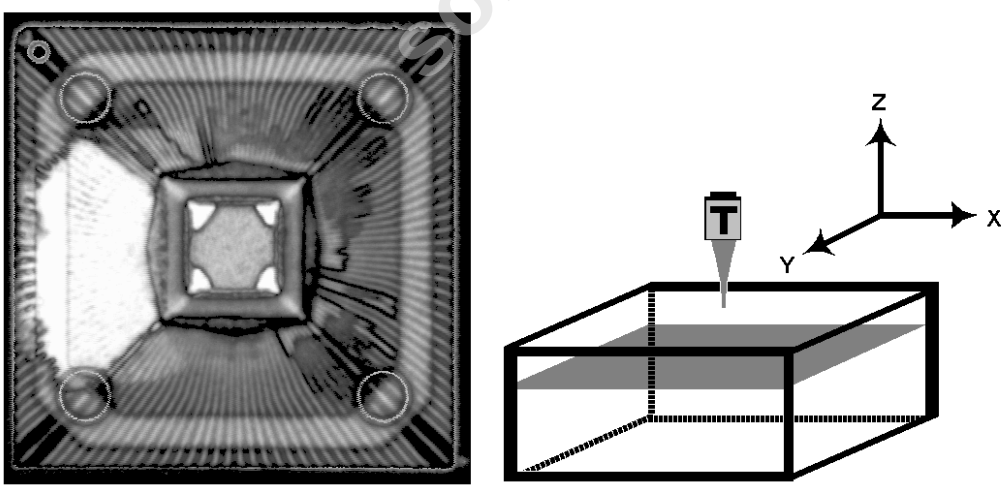

Figure 3 — Example of C-mode Display

Crack - A separation within a bulk material. See also ''Delamination.''

Delamination - An interfacial separation between two materials intended to be bonded. See also ''Crack.''

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