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ACOUSTIC MICROSCOPY FOR NON-HERMETIC ENCAPSULATED ELECTRONIC DEVICES

Contents

		Page
1	**Scope**	**1**
2	**Definitions**	**1**
3	**Apparatus**	**5**
3.1	Reflective Acoustic Microscope System (see Figure 5) Comprised of:	**5**
3.2	Through Transmission Acoustic Microscope System (see Figure 7) Comprised of:	**6**
3.3	Reference Packages or Standards	**6**
3.4	Sample Holder	**6**
4	**Procedure**	**6**
4.1	Equipment Setup	**6**
4.1.1	Select the Transducer	**6**
4.1.2	Verify Setup	**6**
4.1.3	Place Devices in the Sample Holder	**6**
4.1.4	Align the Transducer	**7**
4.1.5	Focus	**7**
4.2	Perform Acoustic Scans	**7**
4.2.1	Inspect for any Anomalies	**7**
4.2.2	Consider Potential Pitfalls	**8**
4.2.3	Evaluate	**8**
4.2.4	Record	**8**
4.3	Characterization of AM Reflection Mode System	**8**
4.3.1	AM System Setup	**8**
Annex A	**Acoustic Microscopy Check Sheet**	**11**
Annex B	**Potential Image Pitfalls**	**14**
Annex C	**Some Limitations of Acoustic Microscopy**	**15**
Annex D	**Reference Procedure for Presenting Applicable Scanned Data**	**17**

Figures	**Page**
Figure 1 — Example of A-mode Display	**1**
Figure 2 — Example of B-mode Display	**2**
Figure 3 — Example of C-mode Display	**2**
Figure 4 — Example of Through Transmission Display	**3**
Figure 5 — Relationship of Properties for Focused Transducers	**4**
Figure 6 — Diagram of a Reflective Acoustic Microscope System	**4**
Figure 7 — Diagram of a Through Transmission Acoustic Microscope System	**5**
Figure 8 — Example of Maximizing the Focus for the Top Surface, Approximate Middle and Bottom Surface of a Homogeneous Device.	**7**
Figure 9 — Example Structure of Reference Bonded Wafer Sample per SEMI 3D17	**9**
Figure 10 — Layout of the Artificial Voids of Different Sizes and Densities in a Die-sized Array per SEMI 3D-17	**9**
Figure 11 — Example of a 300mm Diameter Reference Bonded Wafer Sample with the Die Numbering System and Layout for the Die-sized Arrays per SEMI 3D-17	**10**
Figure 12 — Delamination Types from Circuit and Non-Circuit Side Scan	**11**
Figure 13 — Ultrasound Waves Approaching Various Example Surfaces.	**15**
Figure 14 — Ultrasound Reflection from Various Example Surfaces	**16**
Figure 15 — Edge Effect Causing Reduction in Returned Signal Amplitude Due to Edge.	**16**
Figure 16 — Edge Effect Due to Depth in a Sample.	**16**

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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.

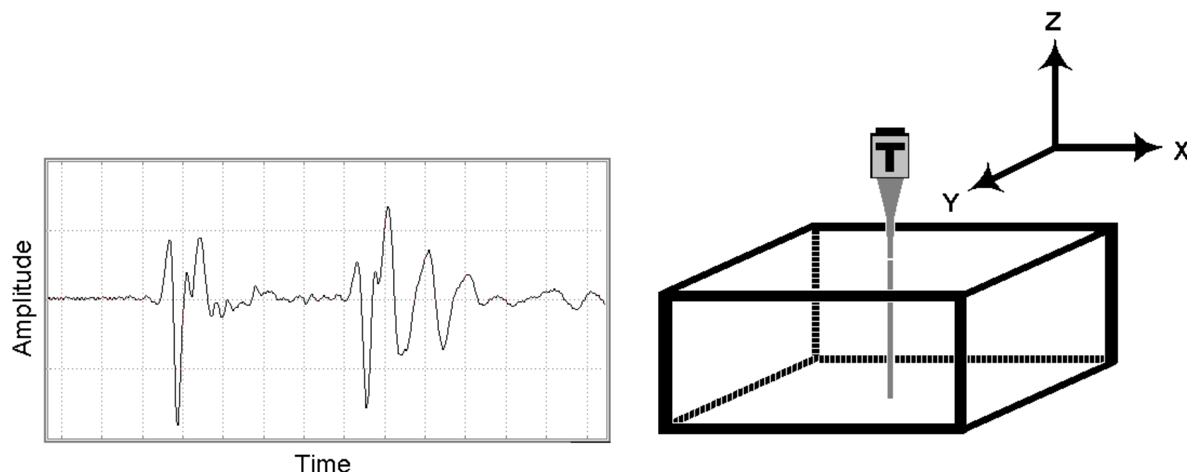

Figure 1 — Example of A-mode Display

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.

2 Definitions (cont'd)

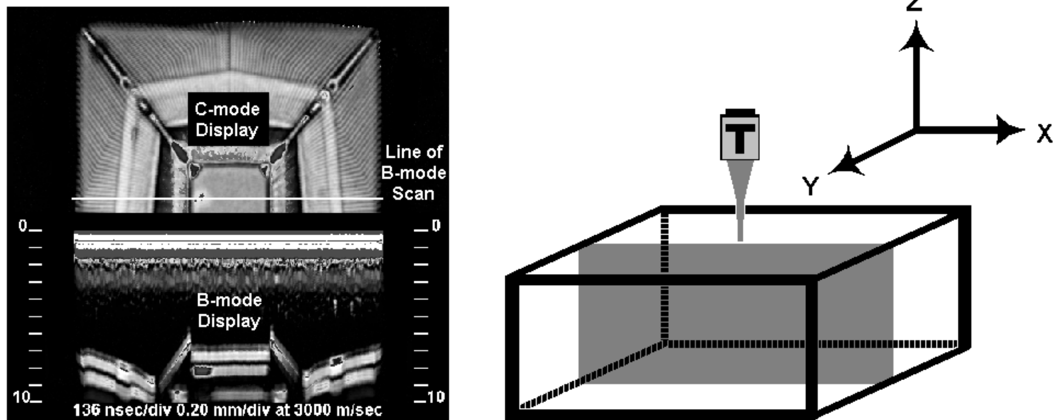

Figure 2 — Example of B-mode Display

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.

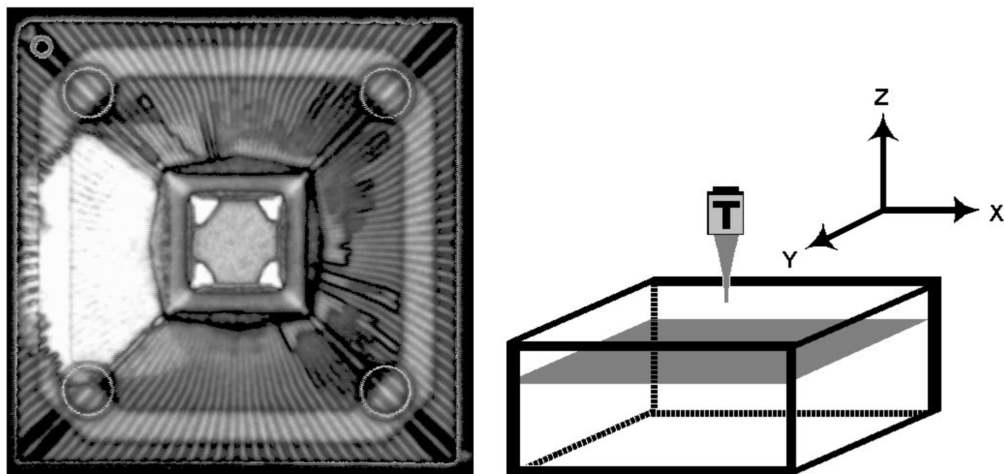

Figure 3 — Example of C-mode Display

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

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