

D9650Z™

C-SAM® C-Mode Scanning Acoustic Microscope

The IGBT Power Module Inspection Solution!

Maximum Flexibility for Detailed C-SAM® Inspections of Power Modules

The D9650Z incorporates the latest CSAM® (C-Mode Scanning Acoustic Microscope) technology with enhanced features to accommodate the testing of Power Modules as well as performing standard C-SAM® operations. This new system configuration is optimized for inspection of heatsink bond integrity, thickness of bond layer and wire bond welds. Powered by our Sonolytics 2 software platform with PolyGate technology, the D9650Z is ideal for failure analysis, process development and QC screening in low-volume production environments.



Featuring **WaterPlume**
Inverted scanning keeps the top surface dry and contaminant free.



Features

- Visual PolyGate technology with Multi-Gate and Probing-Gate™ functions to detect:
 - Voids in the die attach, between the die and ceramic substrate insulator.
 - Voids between the ceramic substrate and the base plate.
 - Thickness of the bond layer.
 - Cracks, chips and other defects in the copper clad ceramic substrate.
 - Planarity of the die, insulator (raft) and base plate (heat sink) relative to each other.
- **WaterPlume** configuration scans from underneath, keeping the top surface of the power module dry.
- Available in Dual and Single WaterPlume configurations.
- Completely automated, including integrated drying of the module's bottom surface after testing.

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Available Inspection Modes

- **PolyGate** simultaneously captures up to 100 depths of interest (gates) with independent gains, color maps and waveform analysis.
- **TDI** (Time Domain Imaging) includes A-Scan, B-Scan, C-Scan, Bulk Scan, Multi- Scan, Surface Scan, Interface Scan, Bulk Scan and Loss of Back Echo (LoBE).
- **Q-BAM** (Quantitative B-Scan Analysis Mode) is a nondestructive calibrated cross sectional view of a sample.
- **Waveform analysis modes:**
 - **Amplitude** measures peak-to-peak signal and polarity.
 - **Profile** analyzes distance from front surface to interface of interest.
 - **Time Difference** evaluates distance between two interfaces.
 - **Integration Mode™** allows diminished signals to stand out.
 - **ASF*** (Acoustic Surface Flatness) measures curvature or warpage of a surface.
 - **Thru-Scan*** (Through transmission imaging) displays material continuity and delamination or voids.
- **STaR*** (Simultaneous Thru-Scan and Reflection) generates TDI and Thru-Scan images in one pass.
- **VRM** (Virtual Rescanning Mode) stores 100% of A-Scan echo data to reproduce an image in any mode without re-scanning the actual sample.
- **FDI*** (Frequency Domain Imaging) brings out frequency sensitive details and resonances that are not evident with conventional TDI™.
- **DIA** (Digital Image Analyzer) advanced algorithm to quantify results to automated accept/reject criteria.
 - Area fraction analysis (including Mil-Std-883, Method 2030)
 - Multi-area analysis
 - Void quantification

System

- **Sonolytics 2** for Windows 10® with multi-language operation: English, Japanese and Traditional Chinese.
- **WaterPlume** transducer is a nonimmersion configuration that keeps the top surface of a sample dry using a column of water from underneath.
- **Probing-Gate** automatically configures the parameters for imaging various depths of interest sequentially, downward, upward and expanding.
- **Pixel Pitch** allows the operator to select the desired scan area size and data point spacing, thereby determining the C-SAM image resolution.
- **AutoScan** automates alignment, gain, focus and field of view for multiple locations. Also integrates with **DIA*** analysis tools.
- **Movement Map** offers an interactive graphical representation of the scan area.
- **Color Maps** for image enhancement using pre-defined or user defined color mappings.
- **C-SAM Interactive** provides user application support - an intuitive interaction-based learning tool.
- Instrument settings and parameters are automatically stored for every image saved and can be used to recall previous settings.
- **AIMM*** (Acoustic Impedance Measurement Module) permits characterization of the acoustic properties of materials related to elastic modulus and density on a micro scale.
- Multiple supported digital image file outputs GIF, JPG, TIF, BMP and PCX.
- Clean room ready with ESD safe surfaces.
- Easy loading and unloading of samples from the open area scan tower.

Standard Equipment

- **WaterPlume Base Fixture** for precise placement of standard IGBT Power Module tooling.
- Integrated air knives for drying underside of modules.
- Linear Motor Scanner with capability to scan 314 x 314 mm (12.4 x 12.4 in).
- WaterPlume Scanner capability to scan:
 - Single WaterPlume 308mm x 112mm
 - Dual WaterPlume 155mm x 112mm
- 95 dB Gain - selectable in 0.5 dB steps
- Gates as narrow as 1nsec.
- 16 megapixel (4K) data resolution images.
- Pulsar/Receiver compatible with proprietary transducers up to 230 MHz.
- Digital servo high speed scanner with controller for the fastest image acquisition time.
- **AIPD** (Acoustic Impedance Polarity Detector) simultaneously displays both polarity (i.e., phase) and amplitude information.
- Water management with fill, drain, recirculation and overflow protection.

Optional Equipment

- Up to 268 megapixels (16K) data resolution images.
- **Dual** configuration allows for simultaneous scanning of two modules.
- **Custom fixtures** for power modules available. One fixture is included standard with unit.
- **Waterfall** transducer is a nonimmersion configuration using a column of water from above.

Facility Requirements

- Universal Voltage - 90V to 250V AC, Single Phase, 50/60 Hz and 15 amp circuit (120V).
- Factory air required for drying 10cfm @ 10psi.
- Dimensions: L 1.89 x W 0.74 x H 1.58 m (L 74.5 x W 29.0 x H 61.9 in.)

For more information, speak with your Nordson representative or contact your Nordson regional office

Nordson Test & Inspection Europe, SEA, Africa
ti-sales-eu@nordson.com

Nordson Test & Inspection Americas
ti-sales-us@nordson.com

Nordson Test & Inspection China
ti-sales-cn@nordson.com

Nordson Test & Inspection Japan
ti-sales-jp@nordson.com

Nordson Test & Inspection Singapore
ti-sales-eu@nordson.com

Nordson Test & Inspection Taiwan
ti-sales-tw@nordson.com

Nordson Test & Inspection Korea
ti-sales-korea@nordson.com