

SQ7000+ Multi-Function System for AOI and CMM Advanced Substrate, and Die-Level Alignment Application

Benefit Summary

A global leader in graphics processing units (GPUs)- essential for gaming, professional visualization, and data centers-turned to Nordson Test & Inspection for a metrology and inspection solution capable of meeting the demands of their cutting-edge electro-optic packaging. The SQ7000+™ Multi-Function System for Automated Optical Inspection (AOI), Solder Paste Inspection (SPI) and Coordinate Measurement Machine (CMM) delivered. Unmatched performance capturing pad centerlines, measuring substrate alignment angles, and precisely determining die-level position and angle- critical for flip-chip photodiode placement in BGA packages.

Challenge

The customer faced a complex set of challenges in achieving the precision required for advanced substrate inspection and alignment. It was essential to accurately measure the angle between the substrate centerline and the Y-axis reference to ensure proper orientation throughout the assembly process. Additionally, capturing the pad centerline on the substrate with sub-micron precision was crucial to maintain alignment tolerances and ensure downstream process reliability.

These challenges were further complicated by shiny, miniature components that introduced reflection-based distortions, making accurate optical measurements difficult. Furthermore, the need to measure die-level position and angle added another layer of complexity, requiring a system capable of multi-dimensional, high-accuracy inspection in a high-speed production environment.

Solution

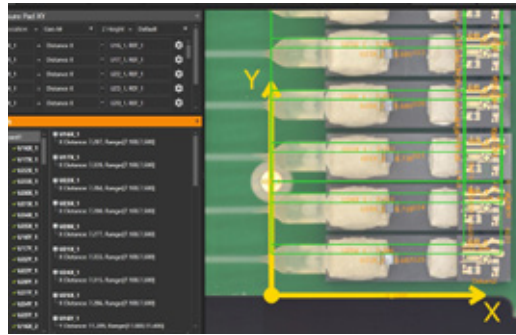
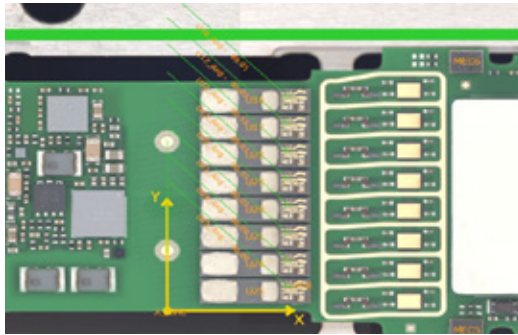
To address the customer's demanding inspection and alignment requirements, the SQ7000+ system was deployed. This advanced solution incorporates Nordson's proprietary Multi-Reflection Suppression® (MRS®) sensor technology, which is widely recognized as best-in-class for inhibiting optical measurement distortions and reflections. MRS® technology enables metrology-grade accuracy across a wide range of applications where precision is critical.

The system's multi functionality, combining AOI and CMM capabilities—enabled comprehensive inspection and metrology. In addition to pad XY and angle measurement and substrate angle alignment, the SQ7000+ also provided on-substrate object and die-level object measurement, ensuring optimal placement and orientation of critical components.

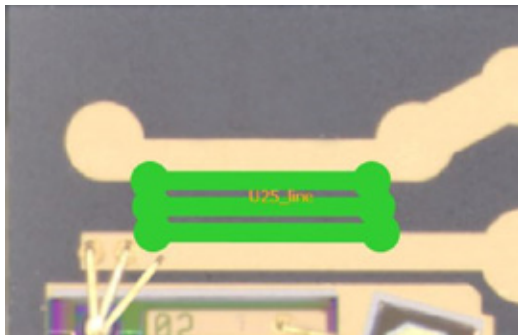
Conclusion

By deploying the SQ7000+, the customer successfully met stringent optical alignment specifications critical to the performance of their next-generation electro-optic modules. The system produces superior performance capabilities for both inspection and metrology at high speed, high resolution and high accuracy. Plus, CMM capabilities and industry-leading MRS sensor technology played a key role in enabling reliable, high-speed production of components essential for advanced data communication systems.

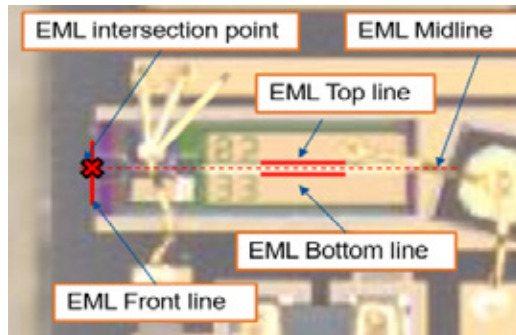
SQ7000+ Advanced Substrate, and Die-Level Alignment Application Case Study



Measuring angle between substrate center line and Y axis reference



Capturing pad center-line on substrate



Capturing pad center-line on substrate

For more information on Nordson Test & Inspection products, services, or solutions, visit our website at www.nordson.com/TestInspect

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