

Semiconductor

Semiconductor Packaging-Post D/B & W&B AOI

SW6000 Series

Semiconductor Bonding AOI

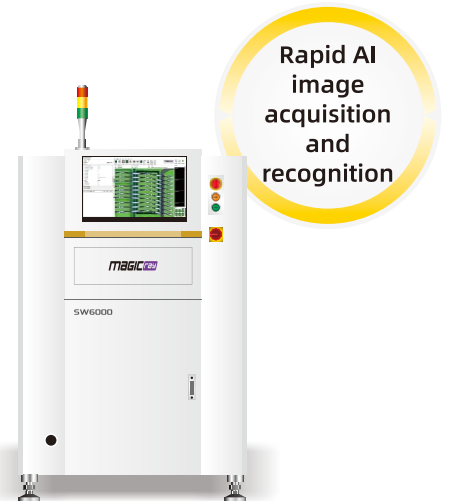


Rapid & Easy Use 3D Inspection

Magic-Ray wire bonding AOI — SW6000 Utilizes 3D structured light for the third-order optical inspection of semiconductors and lead wires (2mil and up), Features rapid post wire bonding defect testing and precision inspection, as well as advanced functionalities for rapid programming, defect annotation, and data storage.

Product Features

- Designed for power component packaging post die and wire bonding defect detection.
- Combined 2D camera & 3D structured light image capture for rapid inspection.
- Compatible with conveyor track to allow for inline testing and features offline testing with automatic loading and unloading.
- AI powered smart programming vastly improves programming efficiency.
- Completely offline programming capabilities - debugging without stopping production.
- Flexible lighting and adjustable Z axis easily handle complicated inspection situations.
- Links with MES systems, supports TCP/IP, SECS/GEM communication protocols and more.
- Advanced SPC capabilities support data review and process analysis.



Inspection Method



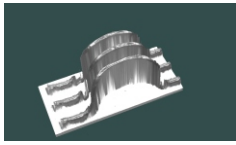
Optical Principle

- Uses phase-shift projection to faithfully replicate object height.

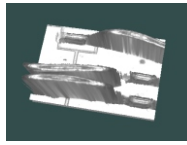


「Inspection Examples」

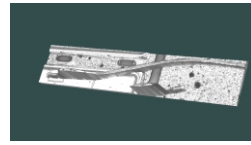
■ Bonding Wire Defect



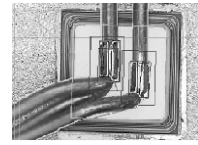
▲ Bent Wire



▲ Wire Colliding



▲ Wire Collapsing



▲ Wire Piling Up

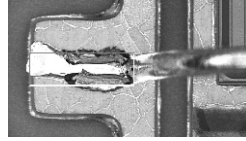
■ Solder Joint Defect



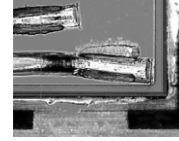
▲ Solder Joint Length Defect



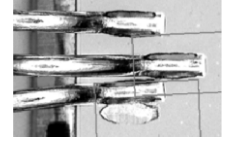
▲ Crimp Area Damage



▲ Pressure Damage

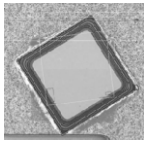


▲ Solder Point Stripping

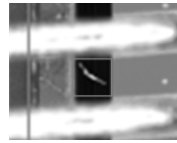


▲ Solder Joint Shifting

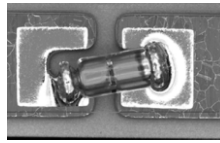
■ Chip and Board Defect



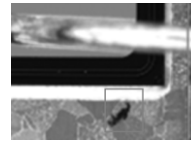
▲ Chip Rotation



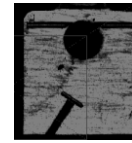
▲ Scratched Chip



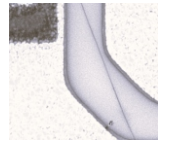
▲ NTC Shifting



▲ DBC Contamination



▲ Frame Contamination

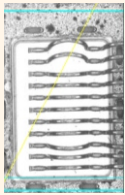


▲ Ceramic Crack

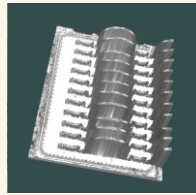
「Core Technology and Advantages」

■ 3D Structured Light Technology

Capture 2D & 3D images synchronously to facilitate rapid testing.



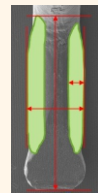
▲ 2D Image



▲ 3D Image

■ Precise Contour Segmentation Technology

Accurately segments wire bonding and solder point contours and even solder joint crimping areas. Analyzes the shape and size of the crimping area to determine welding point quality.



▲ Crimping Area Recognition



▲ Crimping area too narrow
↓
Crimping force too small



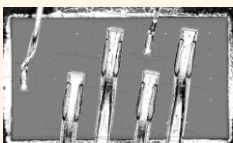
▲ Good



▲ Crimping area too wide
↓
Crimping force too large

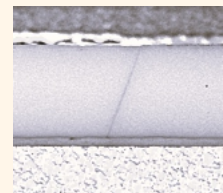
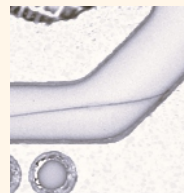
■ AI Powered Smart Programming

Intelligent inspection area and interference area recognition improves programming speed and ease of use.



■ Cracks Detection Technology

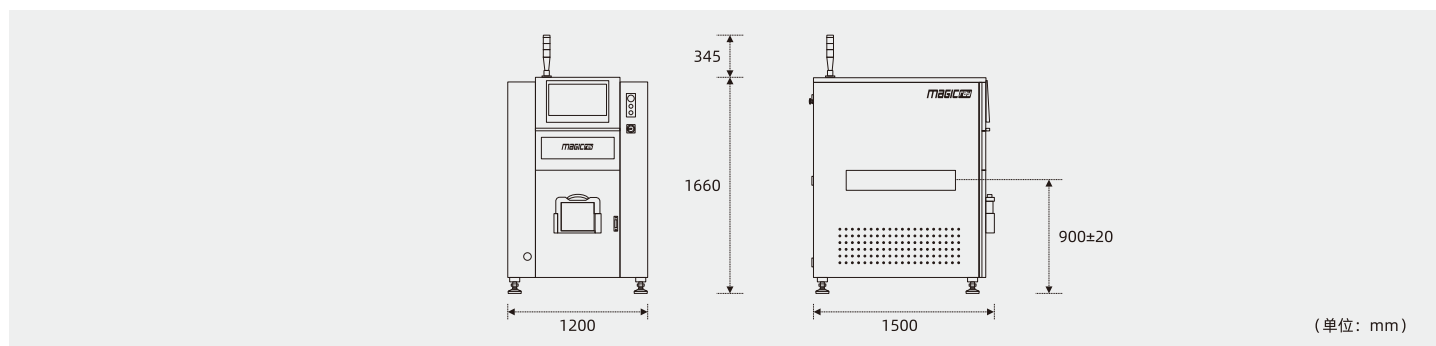
Based on background grayscale changes, machine will automatically detects cracks, capable of identifying ceramic cracks larger than 5 micrometers.



「Product Specification」

Equipment Model	SW6000		
Image System	Camera	21MP/25MP industrial camera	
	Resolution	21MP: 7 μ m, 25MP: 5 μ m	
	FOV	35*28mm (21MP); 25*25mm (25mp)	
	Lens	Telecentric lens	
	Lighting	6 Channel program controlled lighting	
	Height Measurement Method	Structure light gratings*4	
Movement Structure	X/Y/Z Movement	X/Y axis: linear motor; Z axis: AC servo motor	
	Platform	Granite	
	Width Adjustment	Automatic	
	Transport Type	Single section belt	Triple section belt
	Track Height Adjustment	Not adjustable	
	Board Loading Direction	Left to right	
	Fixed Lane	Front lane fixed	
Hardware Configuration	Operating System	Win 10	
	Communication	Ethernet, SMEMA, SECS/GEM	
	Power Requirement	Single phase 200-240V, 50/60Hz, 10A	
	Air Requirement	0.4-0.6MPa	
	Conveyor Height	900 \pm 20mm	
	Equipment Dimensions	L1200*D1500*H1660mm (Without tower light)	
	Equipment Weight	1200kg	
PCB Size	Size	L50*W60-L330*W300mm	L50*W60-L250*W300mm
	Thickness	0.6-3.0mm	
	PCB Weight	0.2-3kg	
	Component Clearance	Top clearance 25mm; Bottom clearance 10mm (Clearance height is 0 when equipped with vacuum suction)	
	Clamping Edges	\geq 3.0mm	
Inspection Items	Defects	Double bond, Wire collapse, Short circuit, Bending, Wire collision, Missing wire, Bowing, etc.; Shift, Stripped, Excess wire, Irregular length, Weld spot damage, etc.; Scratch, Impact, Side collapse, Location shift, etc.; Foreign object, Chipped die, Damage, Tin pad contamination, etc.	
	2D Measurement Precision	2~3 Pixel (Minimum 1.7 μ m/Pixel)	
	3D Measurement Precision	\pm 3 μ m (Repeat precision)	
	Inspection Speed	1000mm ² /s	

「Equipment Dimensions」



Scan to company website



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