



YSi-X Specifications

* Specifications and appearance are subject to change without prior notice.

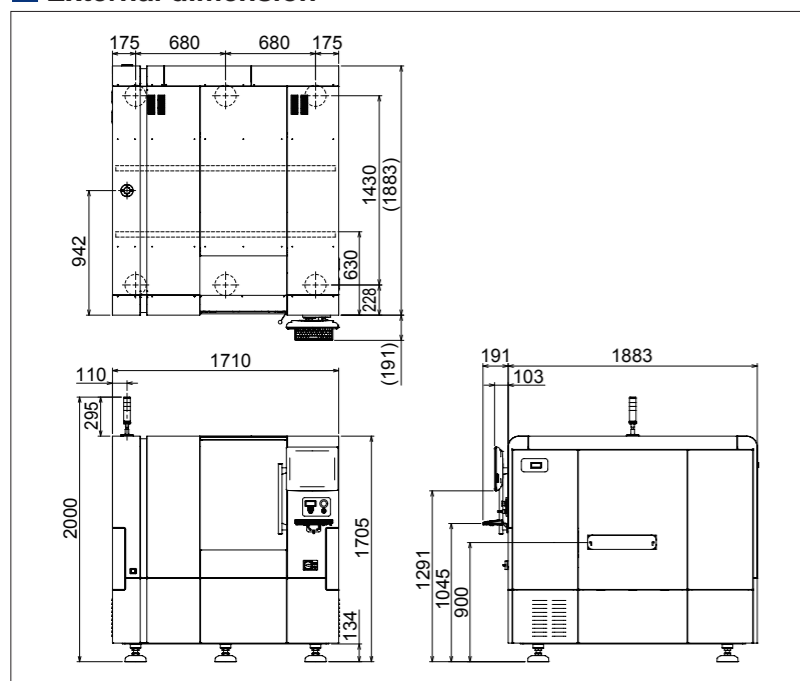
Model	YSi-X (Model : KLC-000)	
Applicable PCB	Size	L100 × W50 to L560 × W460mm
	Mounted components	Upper edge 40mm, lower edge 80mm (40mm during inline)
	Curvature	2.0mm or less
	Weight	2.0kg or less
X-ray inspection	Inspection speed	3DX : 3.3 sec. / visual field, 2DX : 0.5 sec. / visual field
	Resolution	12/ 19 / 27/ 54μm (switchable per each visual field)
	Method	3D sliced images through digital laminography
	X-ray source	Microfocus sealed tube (max. 130KV, rated 125KV)
	X-ray detector	Direct conversion panel method
	Inspection region (PCB center section)	3D : L510 × W460mm, 2D : L560 × W460mm
Optical inspection	Inspection speed	0.4 sec. / visual field
	Resolution	19μm
	Lighting	3-step dome lighting, upper stage RGB & infrared, mid-stage RGB, lower stage RGB
	Image capture system	Digital color camera, telecentric lens
	Inspection region (PCB center section)	L560 × W460mm
Laser inspection	Resolution	5μm (height direction)
	Method	Triangulation distance measurement by laser spot light
	Inspection region (PCB center section)	L510 × W360mm
X-ray leakage quantity	Less than 0.2μSv/h	
Power supply	3-phase AC 200/208/220/240/380/400/416V ±10% 50/60Hz	
Air supply source	0.4MPa or more	
External dimensions (excluding protrusions)	L1,710 × D1,883 × H1,705mm	
Weight	Approx. 2,900kg	

JUST FIT SOLUTION No.1

YSi-X

3D X-ray Hybrid Inspection System

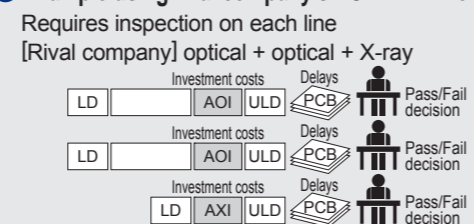
External dimension



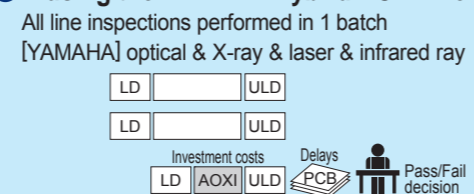
Line usage concept image

Using the YAMAHA Hybrid AOXI allows setting up a simple production line with minimal staff, delays, and investment.

Example using rival company's AOI + AXI line



If using the YAMAHA Hybrid AOXI line



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JUST FIT SOLUTION No.1

3D X-ray Hybrid Inspection System

YSi-X

5 FUNCTIONS IN 1 UNIT INCLUDING 3D X-RAY, 2D X-RAY, OPTICAL, INFRARED, & LASER!

Inspection speed	3D-X : 3.3 sec. / visual field 2D-X : 0.5 sec. / visual field OPTICAL : 0.4 sec. / visual field
Resolution	2D-X & 3D-X : 54μm, 27μm, 19μm, 12μm OPTICAL & INFRARED : 19μm LASER HEIGHT MEASUREMENT : 5μm
PCB sizes	L100×W50 to L560×W460mm
Component height	UPPER EDGE 40mm, LOWER EDGE 80mm <small>Note 1</small>
X-ray exposure	Less than 0.2μSv/h



Note 1: 40mm during inline operation

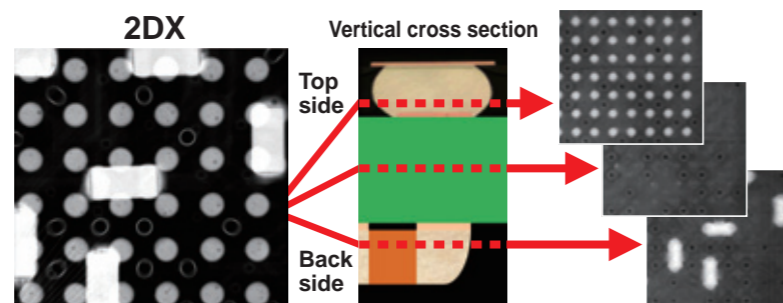
Feature 1 3D X-ray Inspection

Inspects board by digital laminography Note

This inspection checks the BGA soldering and so extracts 3D images of just the solder connection.

* This technology makes a composite of multiple X-ray digital images and acquires horizontal slice cross sections at an optional height. A unique feature is efficient capture of 3D contour images with minimal X-ray emissions.

● Extracted image of solder protruding 0.2mm above PCB surface



● Actual inspection examples [BGA P1.0mm]

Makes highly accurate inspections of BGA connections at 45° inclination angle on connection.

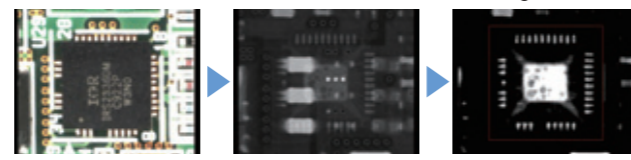


Sample component contour

Results extracted for solder connection

● Actual inspection examples [QFN P0.5mm]

YSi-X inspects by extracting a 3D x-ray image of its cross section of the solder even on QFN backsides having terminals.



QFN optical image

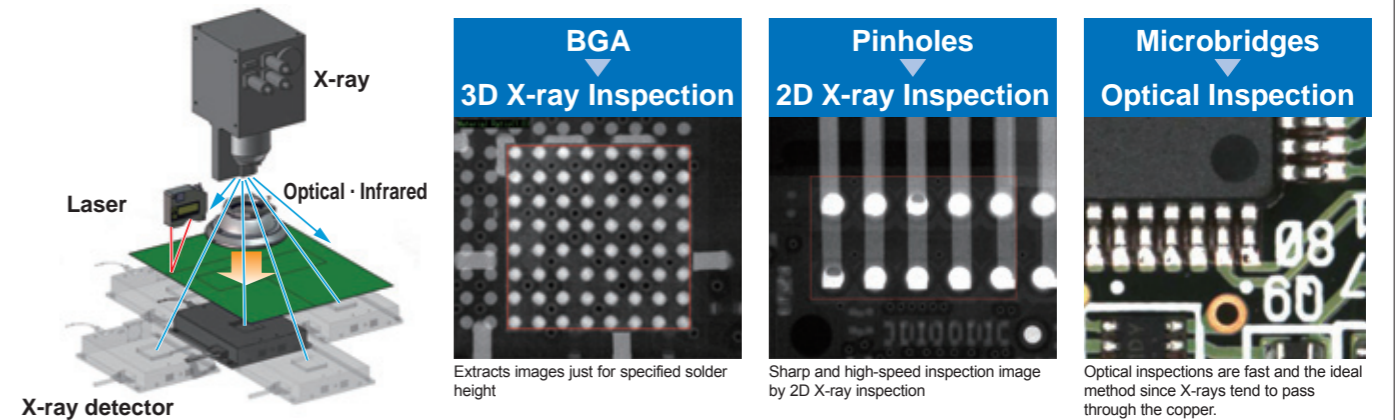
Image of components on backside of board

Extracted image of solder cross section

Feature 2 Hybrid

Equipped with 3D X-ray, 2D X-ray, Optical, Laser and Infrared inspection functions.

YSi-X inspects PCBs using the ideal technique for each section by utilizing up to 5 types of inspection functions.



X-ray detector

Extracts images just for specified solder height

Sharp and high-speed inspection image by 2D X-ray inspection

Optical inspections are fast and the ideal method since X-rays tend to pass through the copper.

Does a complete inspection on just 1 unit!

Does a complete optical & X-ray inspection with 1 unit and 1 process so you get:

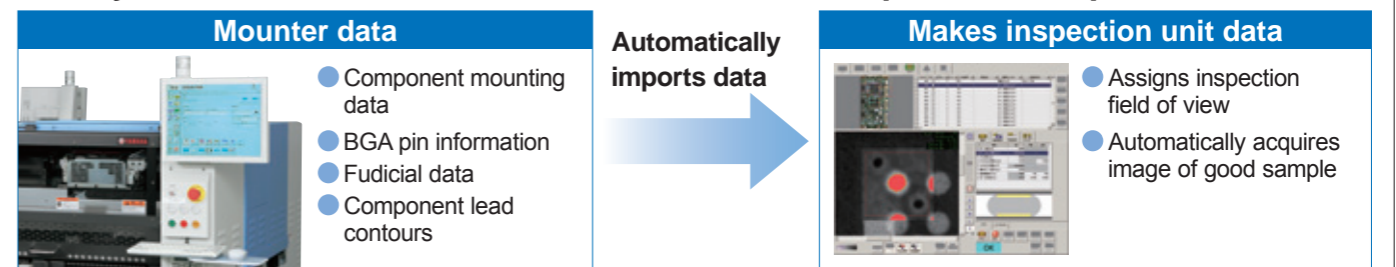
Small footprint & Economy

Does it all with just 1 inspection program

Only needs 1 judging operator

Feature 3 Simple to Use

Easily load data from the YS series mounter and import it as inspection unit data



Feature 4 Eco-Friendly

Employs direct panel X-ray detector

Detects X-rays in electrical signals without conversion to light (4-year service life at full-drive operation Note)

Note: Under conditions of resolution 27μm, cycle time 30 seconds, operating rate 70%, 24 hours per day, 250 days per year

Eco-friendly operation since digital laminography by 3D reduces imaging to an absolute minimum

Using pulse X-rays allows minimal product exposure to X-rays along with minimal X-ray source and detector wear

Turns X-rays OFF while conveying PCB and captures images only of required sections



Feature 5 Safety & Confidence

Safety first design gives peace of mind even during shipping or earthquakes.

