



# YSi-X



## 3D X-ray Hybrid Inspection System

Ideal for 100% inspection of onboard automotive products and many other items.  
X-ray, optical, infrared, and laser height measurement as standard equipment.

Type **HB**  
Long Life Type  
Resolution  
min. 18  $\mu\text{m}$

Type **HD**  
High Speed Type  
Resolution  
min. 7  $\mu\text{m}$

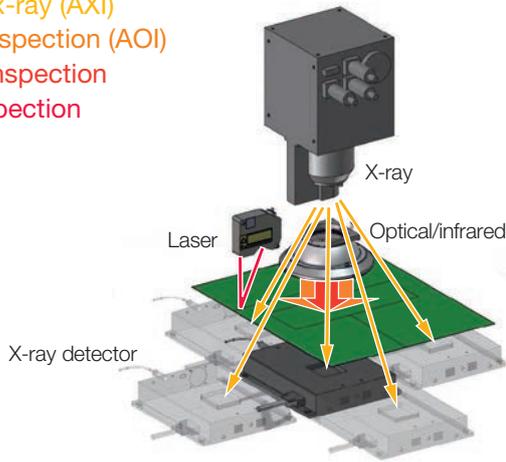
Inspection speed  
2DX 24.0  $\text{cm}^2/\text{sec}$   
3DX 4.0  $\text{cm}^2/\text{sec}$

Inspection speed  
2DX 93.7  $\text{cm}^2/\text{sec}$   
3DX 15.5  $\text{cm}^2/\text{sec}$

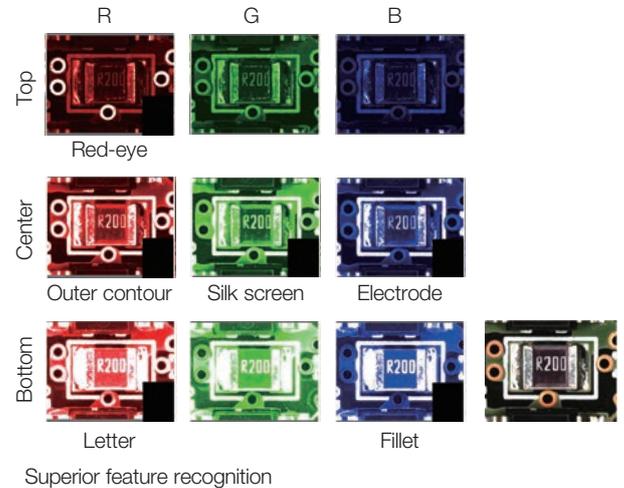
## Hybrid inspection with multiple modes for dependable results

### Equipment:

- 2D & 3D x-ray (AXI)
- Optical inspection (AOI)
- Infrared inspection
- Laser inspection



### Optical + infrared inspection

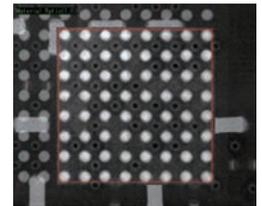


### Laser inspection



Detect raised leads or component bodies

### 3D x-ray inspection



Solder joint

## Auto-correct for PCB warping, using XYZ fiducial data

Ensures the high accuracy needed to capture images from solder-joint surfaces.



PCB warping

- Detects marks using optical inspection
- Detects copper foil height using laser
- Calculates reference plane relative to foil surface

## Data link with mounter

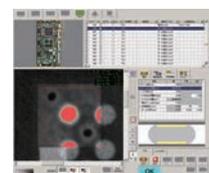
Automatically generates inspection unit data using Yamaha mounter data.

### Mounter data

- Component mounting data
- BGA pin information
- Fiducial data
- Component lead contours



Automatically imports data



Makes inspection unit data

- Assigns inspection field of view
- Automatically acquires image of good sample

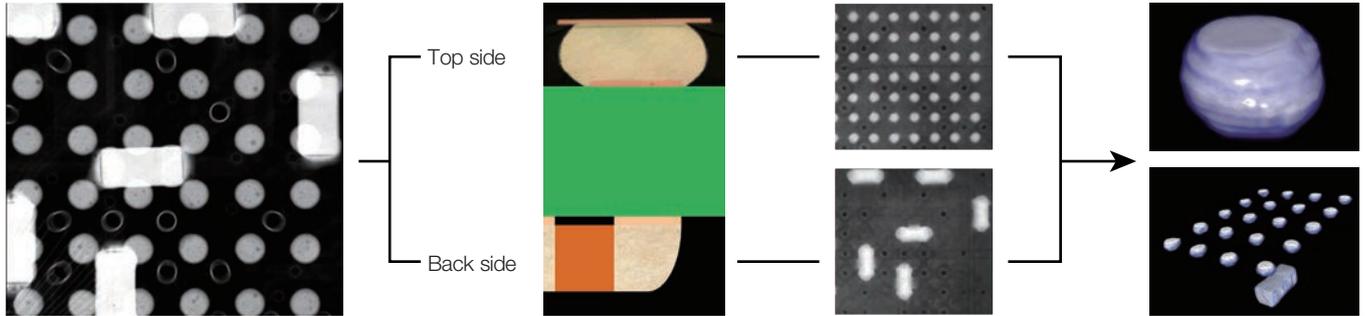
# 3DX

## 3D x-rays capture layered (tomographic) image of target

### Analyse cross-section

Digital laminography (planar computed tomography) makes a composite of multiple x-ray digital images and can capture a horizontal cross-sectional slice at

an optional height. Efficient capture of accurate 3D images, with minimal x-ray emissions, delivers unique advantages for manufacturing.



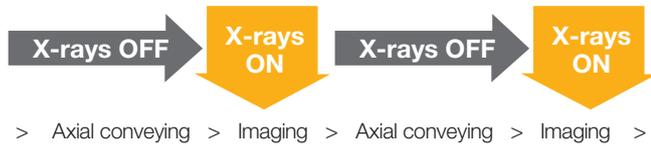
2DX

Vertical cross section

Extracts 3D images of solder connections only, for inspection of BGA joints

### Safe, economical, easy to maintain

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

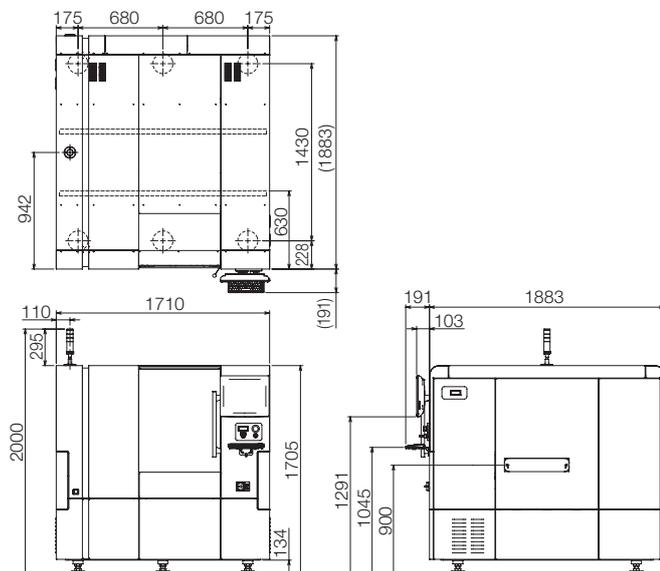


X-ray source & x-ray detector material renewal fee service contracts are also available.

Contact us for inquiries regarding conditions and price, etc.



### External dimensions



### Exposure safety

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

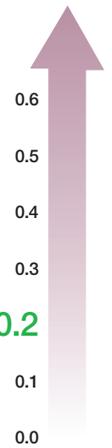
Legal limit (worldwide criteria) → 0.6

Most company specifications → 0.5

- Minimal imaging via digital laminography
- Safety enclosure reduces exposure to one-third of legal limit
- High-strength steel frame design

→ 0.2

Exposure  $\mu\text{Sv/h}$



**Specifications**
**YSi-X**

PCB	Size range	L 100 × W 50 to L 560 × W 460 mm	
	Mounted components	Upper edge 40 mm, lower edge 80 mm (40 mm during inline)	
	Warpage	2.0 mm or less	
	Weight	2.0 kg or less (> 2 kg on request)	
X-ray inspection		<b>Type HB</b>	<b>Type HD</b>
	X-ray detector	Direct conversion panel method long service life type	FOS flat panel system high speed type
	Resolution	18/27/36/54 μm	7/12/19/27/54 μm
	Maximum field of view	52 × 45 mm	62 × 78 mm
	Inspection speed 2DX	24.0 cm <sup>2</sup> /sec	93.7 cm <sup>2</sup> /sec
	Inspection speed 3DX	4.0 cm <sup>2</sup> /sec	15.5 cm <sup>2</sup> /sec
	Method	3D sliced images through digital laminography (planar CT)	
	X-ray source	Microfocus sealed tube	
	Tube voltage	0–130 kV	
	Inspection region	3D: L 510 × W 460 mm, 2D: L 560 × W 460 mm	
Optical inspection			
	Inspection speed	0.4 sec./visual field	
	Resolution	10 or 19 μm (selection)	
	Lighting	3-step dome lighting, upper stage RGB & infrared, mid-stage RGB, lower stage RGB	
	Image capture system inspection region	Digital color camera, telecentric lens L 560 × W 460 mm	
Laser inspection	Resolution/method	5 μm (height direction)/triangulation distance measurement by laser spot light	
	Inspection region	L 510 × W 360 mm	
X-ray leakage quantity		Less than 0.2 μSv/h	
Power supply/air supply source		3-phase AC 200/208/220/240/380/400/416 V ±10% 50/60 Hz/0.4 MPa or more	
External dimensions		L 1,720 × D 1,883 × H 1,705 mm (excluding protrusions)	
Weight		Approx. 2,900 kg	

Specifications and appearance are subject to change without prior notice.

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