Maximum Performance Inline 3D Automated X-ray Inspection
- Ultra-Fast Inline Automated X-ray Inspection of PCBAs
- 2D + 3D Images using multiple angled cameras
- High Speed Bi-directional Dynamic imaging
- Automated Inspection and Pass/Fail Evaluation
- User selectable X-ray power up to 130 kV/ 300 µA
- Patented 6-axis motion control for maximum flexibility
- Edge-to-edge large board inspection up to 1000 x 660 mm
- Hardware and Software Upgrade for 3D CT Capability

Intelligent Software Solution
- Rapid Automated or Manual programming
- Intelligent detection of solder and assembly defects
- Automatic Image quality enhancement for overlapping components and complex defects
- Automatic board warp compensation
- Automated 3D Slice Extraction

Defect Detection Capability

Components
- BGA/CGA/LGA
- Flip Chip
- PoP
- QFN
- Pressfit/Ventura Connectors
- 0402mm/0105in. Chip
- Fine Pitch Components/µBGA
- Gullwing and J-lead Solder Joints
- PTH

Defect Symptoms
- Head-in-Pillow
- Opens
- Bridging
- Voids
- Solder Balls
- Barrel Fill
- Insufficient/Excess Solder
- Misalignment
- Wrong Size Parts
- Reversed Polarized Capacitors
- Tombstones
- Billboards
- Missing Components

Patented 6-axis Motion Control
TRI’s unique motion control system provides clearest images of multi-layer PCBAs and overlapping components, enabling reliable automated inspection of dual-side PCB assemblies without typical shadowing issues.

BlockScan Customized Imaging
BlockScan module enhances AXI test program coverage by re-scanning selected areas of the tested board using customized system settings. This improves image quality and automated defect detection for most complex PCBAs, including fine pitch µBGAs, Press Fit and metal shielded components. Using BlockScan, TRI AXI can reliably inspect up to 3-layer PoP packages.

Multiple Resolutions in One Program
CT Inspection Upgrade

Enhanced 3D inspection with planar CT imaging can recreate a complete 3D model of each solder joint, enabling clear analysis of shape irregularities and voiding problems for reliable visual review of borderline solder joints.

Eliminate Board Warp Issues

The TR7600X SII uses multiple laser sensors to accurately measure any PCB assembly deformation and automatically adjusts component inspection parameters to compensate for local board warpage. This ensures reliable inspection of the most complex boards with overlapping and multi-layered components and heavy press-fit connectors.

Accurate Inspection Results

TRI’s X-ray systems use intelligent analysis of X-ray data to reliably identify various solder and component defects on a range of components. By automatically separating necessary 3D slices of BGAs, PoPs, PTHs, connectors and angled views of other components, the TR7600X SII can reliably identify defective areas even on the most complex PCB assemblies.

Radiation Safe Design

Designed with safety in mind, TRI’s AXI systems have full lead shielding which prevents harmful exposure in everyday use and reduces X-ray leakage below background radiation levels of 0.5 µSv/hr. The certified safety design conforms to USFDA Code of Federal Regulations Title 21, Part 1020.40.

Repair Station

The TR7600X SII collects a wide range of inspection data to offer instantaneous process monitoring and analysis. This integrated approach offers clear statistical feedback that improves defect management and enhances the efficiency of the inspection process.

Yield Management System 4.0

YMS 4.0 provides real-time inspection status across SPI, AOI and AXI systems and monitors SPC and Alarm status, and supports remote fine-tune throughout the SMT line. The centralized inspection management provides top 5 to 10 defects and defective images, OEE review and management, issue and root cause drill down line by line, by station and by process, which improves quality and productivity analysis. YMS 4.0 supports Industry 4.0 initiative.

* Optional
**X-Ray & Imaging System**

- **X-ray Source**: 130 KV max (user adjustable)
- **Image Resolutions**: 10 μm, 15 μm, 20 μm (factory setting)
- **Camera**: High-performance, ultra-sensitive Bi-directional line-scan cameras

**Inspection Functions**

- **Component Level Defects**: Missing, Misalignment, Tombstone, Billboard, Tantalum Polarity & Rotation
- **Joint Level Defects**: Insufficient/Excess Solder, Bridging, Open, Solder Ball, Non-wetting, Void & Lifted Lead

**X-Y Table & Control**

- **High-precision ball screw/servo motor with DSP-based motion controller**
- **X-Y Axis Resolution**: 1 μm

**PCB & Conveyor System**

- **TR7600X SII**
  - **Min. PCB Size**: 50 x 50 mm (1.97 x 1.97 in.)
  - **Max. PCB Size**: 900 x 460 mm (35.4 x 18.1 in.)
- **PCB Thickness**: 0.6 – 5 mm
- **PCB Transport Height**: 880 – 920 mm (34.6 – 36.2 in.)*
- **Max. PCB Weight**: 3 kg (7 lbs) [8 kg (18 lbs) optional]
- **PCB Carrier/Fixing Motor Driven/Clamping**
  - **Top**: 20 μm, 15 μm, 10 μm
  - **Bottom**: 40 mm (1.58 in.)
  - **Edge**: 3 mm (0.12 in.)

**Dimensions**

- **TR7600X SII**
  - **Dimensions (W) x (D) x (H)**: 1500 x 2060 x 1650 mm (59.1 x 81.1 x 65.0 in.)
  - **Weight**: 3250 kg (7165 lbs)
  - **Power Requirement**: 200 – 240 V Single Phase, 50/60 Hz 4 KVA
  - **Air Requirement**: 72 psi – 87 psi (5 – 6 Bar)

**Optional Accessories**

- Barcode Scanner, Repair Station, Offline Editor & Yield Management System (YMS 4.0), YMS Lite, 3D CT Upgrade Kit
- *SMEMA Compatible*

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U.S., Taiwan, China and Japan Patented: System and Method for Laminography Inspection