ICOS™ T890
Packaged IC Inspection and Metrology
ICOS™ T890

Largest Device Range

+ Leads: TSOP, QFP

+ Balls: BGA, CSP, WLP

+ Pads: QFN, BCC

+ Lands: LGA

+ PoP: Interconnect

With the T890, KLA’s ICOS division introduces a new standard in the inspection of packaged semiconductor ICs. The tool was designed to address the many new challenges the industry is facing: increase in device complexity, decrease of time-to-market and tougher quality requirements. It consolidates decades of experience, research and development into one single tool—making it the most accurate inspection machine on the market today.
Floor Plan

4 Inspection Stations
To cope with the increased complexity of semiconductor devices and higher sensitivity requirements, the T890 is the first of its kind, equipped with four optical stations, each performing a specific inspection task.

COO: Process Parallelism
High-throughput operation of four independent inspection stations, with parallel operation of the top inspection and sorting stations, enables cost-effective component inspection.
Packaged IC Inspection and Metrology

Increased Sensitivity

SIGMA: Groundbreaking 3D Metrology
The new-generation ICOS 3D module provides unprecedented inspection capability at unseen accuracy.

- Best accuracy in back end industry
- 3D inspection of any object: balls, leads, passive devices, solder pads, etc.
- 3D scan of surfaces to detect and measure dents, bulges
- Multirow inspection of TSOP and QFP devices
- Embedded SPECTRUM+ 2D inspection
- Accurate component height measurement

SPECTRUM+: Advanced 2D Inspection
SPECTRUM+ is the latest-generation 2D Package Visual Inspection module. It can be applied to inspect both the top and bottom of the device. It can also be embedded inside the SIGMA module.

- Very high-resolution capability
- Large FOV with increased homogeneity
- Color inspection to find defects like discoloration on EMI shields, exposed bond wire, plating defects, etc.
- Embedded xCrack™ option to detect fine cracks in silicon or mold
- Color review imaging

HS5S+ and SPECTRUM+ 5S
High-speed, device side inspection is available in different resolutions and with or without color inspection depending on production requirements.

Top 3D Inspection
The T890 allows users to perform top 3D inspection fully embedded in the floor plan of the tool. Multiple inspections are available, such as capacitor height, dent underfill and top PoP 3D inspection.
Packaged IC Metrology

2D & 3D Metrology

BGA, CSP, SGA Balls and Solder Pads
The BGA/CSP ball inspection system inspects BGA and CSP devices for critical items such as coplanarity, ball presence, position, offset, pitch, extra ball, body width, ball damage and discolored balls.

Generic Shapes
With the latest SIGMA 3D metrology, it is possible to inspect generic features on the device such as passive components and surface dents.

LGA Lands
The LGA 3D measurement inspects the correctness of the LGA pad grid by measuring 2D and 3D items such as pad coplanarity, offset, pitch and width.

QFN Pads Lands
This application inspects QFN and other “leadless” packages. The system measures pad position, size, pitch, etc. In addition, it checks body size and edge straightness to control the sawing process.

QFP/SOP Leads
The Lead 3D application performs 3D inspection of all gull wing components. It can inspect for items such as lead coplanarity, offset, skew, pitch, length, width, span, sweep, slant, terminal dimension, body standoff and foot angle.
Packaged IC Inspection

Top & Bottom Package Visual Inspection (PVI)

**SPECTRUM+**

State-of-the-art inspection of the package surface. This option scans the device for voids, scratches, pits, package incomplete fill, nonhomogenous molding, foreign material, chips and similar defects. Due to the highly flexible illumination, a variety of surface materials can be inspected: plastic mold, exposed silicon, metal surfaces, substrate, etc.

**xCrack+™**

This option on SPECTRUM+ allows the detection of μcracks in silicon or mold.

**Color Inspection**

With this option, defects like discoloration on EMI shields, exposed wire bond copper, plating defects, etc., can be detected.
5S Inspection
With the High-Speed 5S+ and SPECTRUM+ options, the sides of the devices can be inspected for voids, delamination, cracks, etc.

Top 3D PoP Inspection
2D+3D inspection of PoP lands or balls.

Passive Device Inspection
The PVI software allows for easy setup of complex passive device matrices on flip-chip BGA. Passive devices are inspected for presence/absence, chip-out and cracks.
Maintaining system productivity is an integral part of KLA's yield optimization solution. Efforts in this area include system maintenance, global supply chain management, cost reduction and obsolescence mitigation, system relocation, performance and productivity enhancements, and certified tool resale.

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