

GE
Sensing & Inspection Technologies
phoenix|x-ray

Fully automated X-ray inspection with extremely high defect coverage

phoenix x|act

Easy and fast CAD based high-resolution automated X-ray inspection (μ AXI) for extremely high defect coverage with high magnification and repeatability



Easy and fully automated X-ray inspection



GE imagination at work

phoenix x|act inspection software:

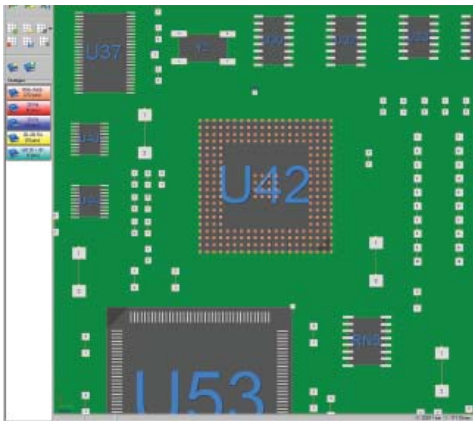
Powerful x|act software package for fast and easy CAD based programming with extremely high defect coverage

As a solution for μ AXI with extremely high defect coverage, phoenix|x-ray provides calibrated high precision offline μ AXI systems including the unique x|act software package for fast and easy CAD based programming. Small views with resolution in the micrometer range, 360° rotation and oblique viewing up to 70° with a very high repeatability ensure to meet highest quality standards. Besides the automated X-ray inspection, the μ AXI system can be used for manual failure analysis or 3D computed tomography as well.

Inline or offline inspection?

With common in-line AXI, the inspection depth is normally determined by the throughput of the SMT line. Principally, X-ray inspection takes much more time than AOI. The higher the defect coverage, the more inspection time is required. For zero defect production inspection with small fields of view with micrometer resolution, 360° rotation and oblique viewing up to 70° is essential. To ensure these higher defect coverage requirements, μ AXI has to be performed beside the production line.

Efficient CAD programming - minimized setup time

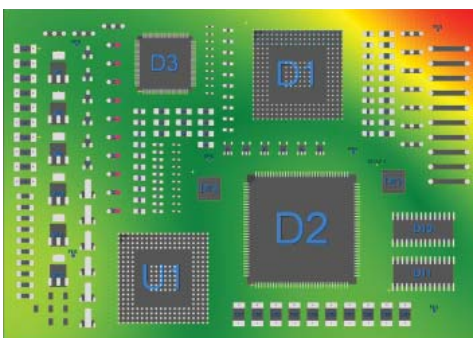


Fast and easy programming: just assign the inspection strategies and let x|act generate the automated inspection program

x|act provides not only a minimal setup time compared with conventional view based AXI - once programmed, the inspection program is portable to all x|act compatible systems.

- Import of CAD-data
- Easy and pad-based offline programming
- Specific inspection strategies for different pad types
- Fully automated generation of inspection program even in oblique view and multiple angular positions per component
- Full program portability for all x|act compatible phoenix|x-ray systems

3D auto-referencing - optimized positioning accuracy



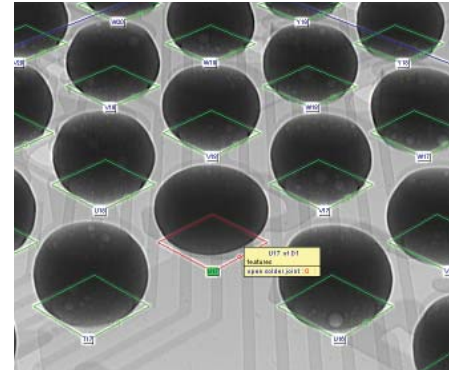
Visualization of board distortion

Automated measurement and compensation of height differences and distortion:

- x|act systems come standard with high precision CNC manipulation
- Local 3D height and distortion referencing by X-ray images
- Highest precision through use of multiple fiducials
- Automated correction of image chain distortion
- Extremely high positioning accuracy even at oblique viewing and rotation

Live 3D CAD overlay - at any viewing angle

- Perfect orientation through live overlay of CAD-data and inspection results also in rotated oblique inspection views
- Pad ID available at any time
- Inspection results and images include correct pad numbering for easy rework
- Easy pad identification even in manual inspection
- High reproducibility on large PCBs

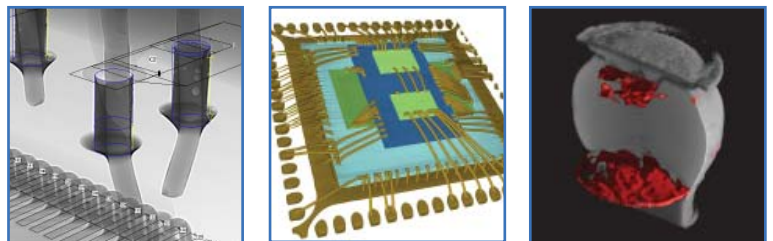


Live CAD overlay and inspection results in the X-ray live image - at any time and at any viewing angle

x|act-capable μ AXI system

The unique x|act software package is available for all phoenix micromex and phoenix nanomex systems. Both systems come standard with an open 180 kV microfocus or nanofocus X-ray tube with 15 or 20 W maximum power in order to achieve a detail detectability with up to 200 nanometer with the phoenix nanomex or 0.5 micrometer with the phoenix micromex.

The excellent combination of high-resolution 2D X-ray technology and computed tomography in one system, innovative and unique features and an extremely high positioning accuracy make these systems the effective and reliable solution for a wide spectrum of 2D and 3D inspection tasks: R&D, failure analysis, process and quality control as well as automated offline inspection.



Unique features of the phoenix nanomex

- Brilliant live inspection images due to high dynamic temperature stabilized digital GE DXR detector with 30 frames per second
- 180 kV / 15 W high-power nanofocus tube with up to 200 nanometer detail detectability
- Optionally diamond|window for up to 2 times faster data acquisition at the same high image quality level
- Optionally 3D computed tomography scans within 10 seconds



Features

The phoenix x|act software package includes a correction of CNC and image chain, inspection libraries with different check strategies and the Xe² developer version for check strategy development. x|act comes with an automatic noise reduction system. Different image processing functions optimize inspection results. Furthermore CNC measurement function and macro programming for automated inspection cycles are included.

Required data:

CAD-data of component and pad position in ASCII format

Modules

- BGA check strategy automated analysis of BGA solder joints
- PTH check strategy automated analysis of PTH solder joints
- customized check strategies customization of image processing for automated analysis
- bga|module automated analysis of BGA solder joints incl. automated wetting analysis together with ovhm (oblique view at highest magnification)
- vc|module automated inspection of IC die attach and area soldering in power electronics
- c4|module automated voiding analysis of round solder joints with background structure, such as C4 bumps
- ml|module semi automated inspection of IC multi-layer PCBs
- qfp|module Xe²module for automated analysis of QFP solder joints
- qfn|module Xe² module for automated analysis of QFN solder joints
- pth|module Xe² module for automated analysis of PTH (THT) solder joints
- quality|review repair station software for visualizing and manual review of results from an automatic program run, e.g. BGA check strategy or vc|module
- converter conversion of result files, generated by x|act, into other formats, required by third party software

Availability

- Option for phoenix micromel|x and phoenix nanomel|x systems

phoenix x|act - Your Advantages

- **Extremely high defect coverage to assure highest quality requirements**
- **Very high magnification and repeatability**
- **Minimum setup time due to easy and fast CAD-data import and programming**
- **Time and money saving by using fully automated inspection strategies**
- **Once programmed, the inspection program is portable to all x|act compatible phoenix|x-ray systems**



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