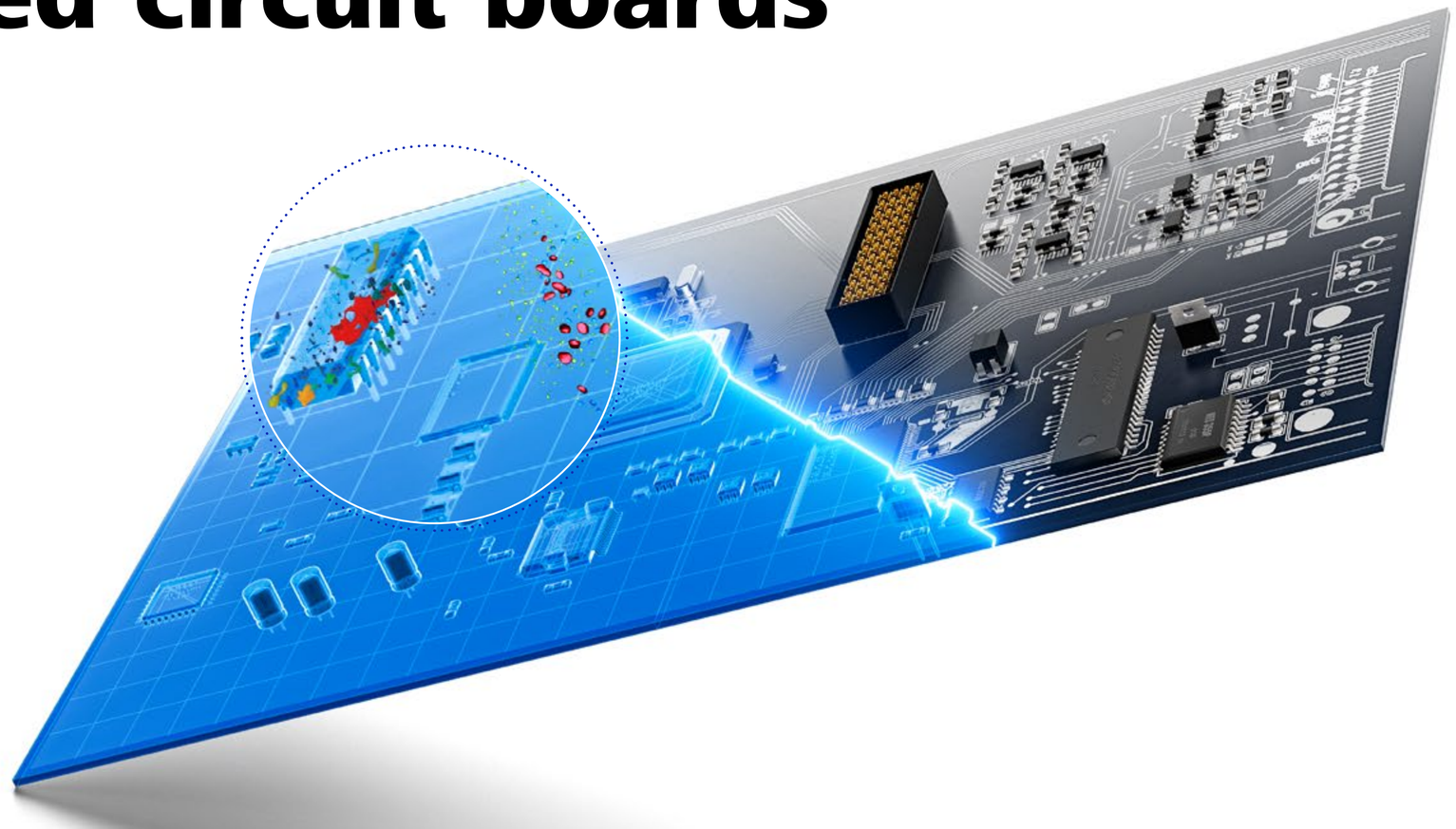
ZEISS Industrial Quality Solutions

Electrify Quality Assurance **for printed circuit boards**

Seeing beyond



Take a closer look →

Quality at Every Stage of Production

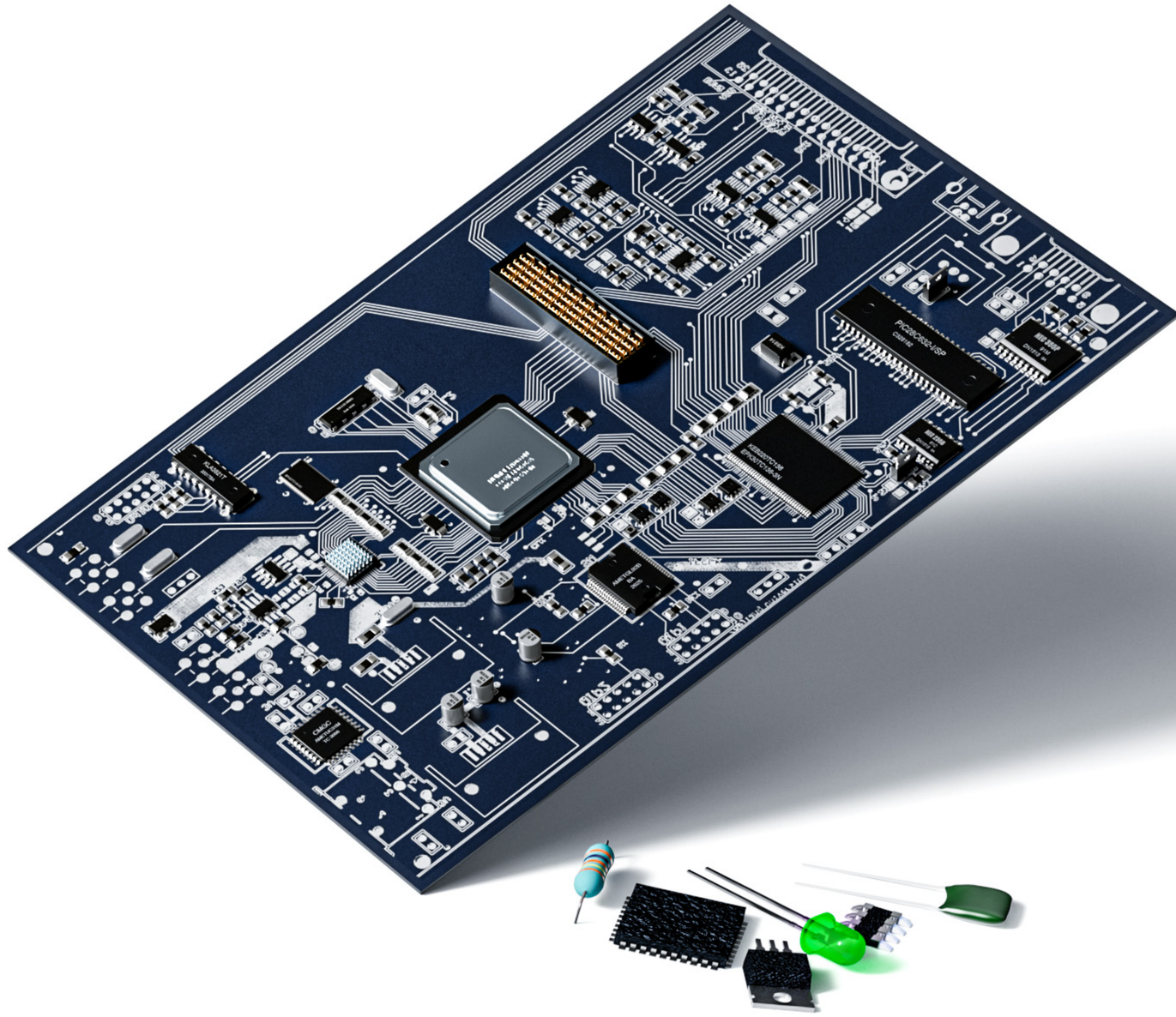
ZEISS solutions for printed circuit boards

To be truly competitive on the growing electronics market, manufacturers of printed circuit boards (PCB) and PCB assemblies (PCBA) cannot cut corners on quality. Key processes include surface morphology and roughness analysis of incoming materials, corrosion and adhesion detection on the PCB, and welding quality inspection on the PCBA. The high production throughput also means that detailed quality checks must be performed at speed.

As a leading supplier of quality solutions, ZEISS offers inspiring innovations and services for your PCB production process. Reliable ZEISS systems are used by PCB manufacturers across the globe.

- **Connected microscopy from ZEISS improves analytical efficiency and time to market**
- **Excellent sample preparation speed and quality with ZEISS Crossbeam**
- **ZEISS Xradia Versa ultra-high resolution CT for optimized development and production**
- **Fast ablation in laser chamber with dual beam electron microscopy**

Discover details →

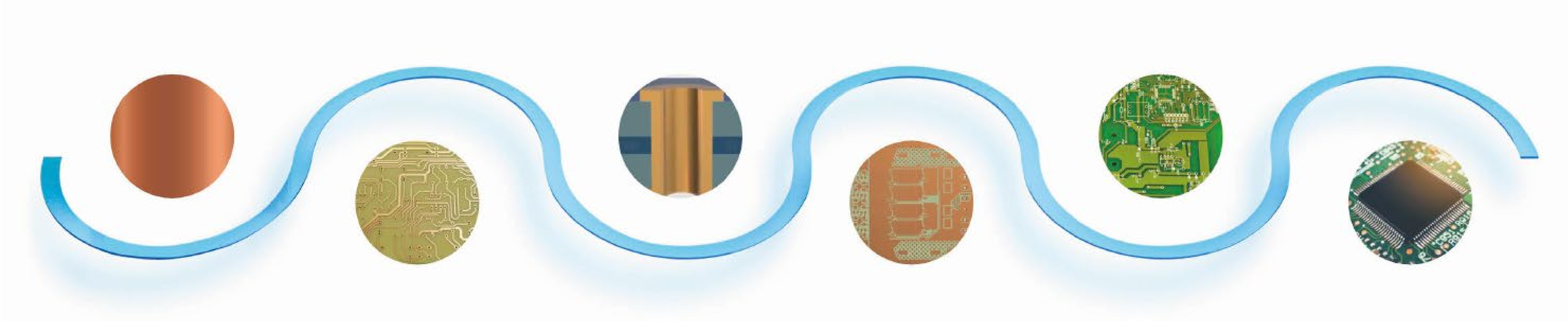


Identifying Challenges, Providing Solutions

Manufacturing processes and quality requirements

From printed circuit board (PCB) to PCB assembly (PCBA), the manufacturing process comprises a number of complex procedures. Whether quality control of incoming substrate materials or surface finishing of PCBs, each step poses a number of quality assurance challenges.

One-stop quality solutions from ZEISS provide full coverage of the entire process, including substrate quality control, PCB manufacturing, and PCB assembly. Click the blue buttons in the graphic to find out more.



→ Incoming Quality Control

→ PCB Manufacturing Process

→ PCB Assembly (PCBA)

Incoming Quality Control

Quality Challenges

- Monitor surface roughness of copper foil to ensure it provides the necessary low transmission loss and high binding force
- Analyze surface morphology of copper foil and resin, which affects the binding force between them

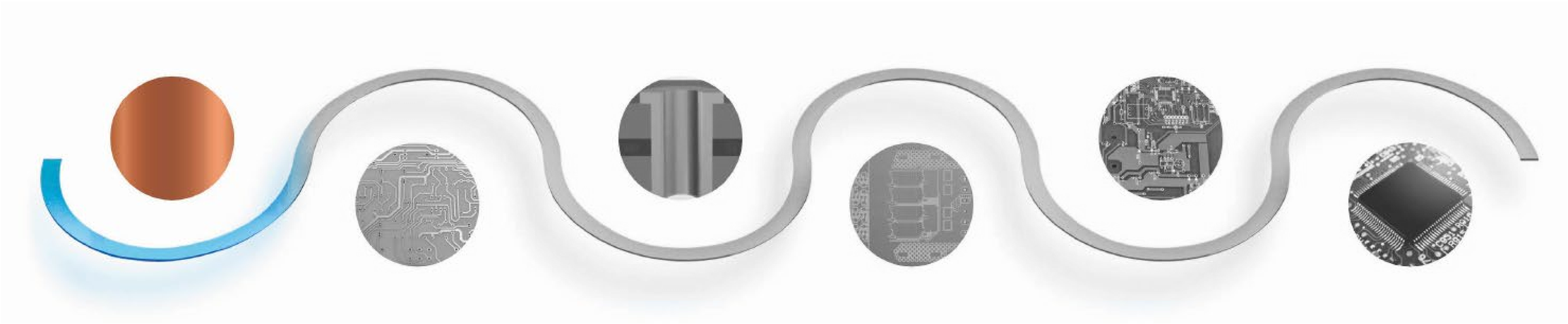
ZEISS Solutions

- Scanning electron microscope ZEISS EVO for surface morphology analysis of copper and resin plates
- Confocal microscope ZEISS Smartproof 5 for rapid analysis of surface roughness

ZEISS Systems

ZEISS EVO

ZEISS Smartproof 5



→ Incoming Quality Control | → PCB Manufacturing Process | → PCB Assembly (PCBA)

PCB Manufacturing Process

Quality Challenges

- During PCB pattern manufacturing, dry film adhesion affects precision of line etching
- Rapid 3D size measurement of conductor and connecting hole is needed to reduce sample preparation requirements and improve detection efficiency
- Surface finish process affects subsequent weldability, rapid measurement of element content, and process quality control

ZEISS Solutions

- High-resolution metallographic section analysis using optical microscope ZEISS Axioscope
- Rapid check of line width and spacing with digital microscope ZEISS Smartzoom 5
- Confocal microscope ZEISS Smartproof 5 for determining size of blind hole and through hole, plus roughness detection
- Swift examination and analysis of dry film adhesion, desmear, and nickel corrosion with scanning electron microscope ZEISS EVO

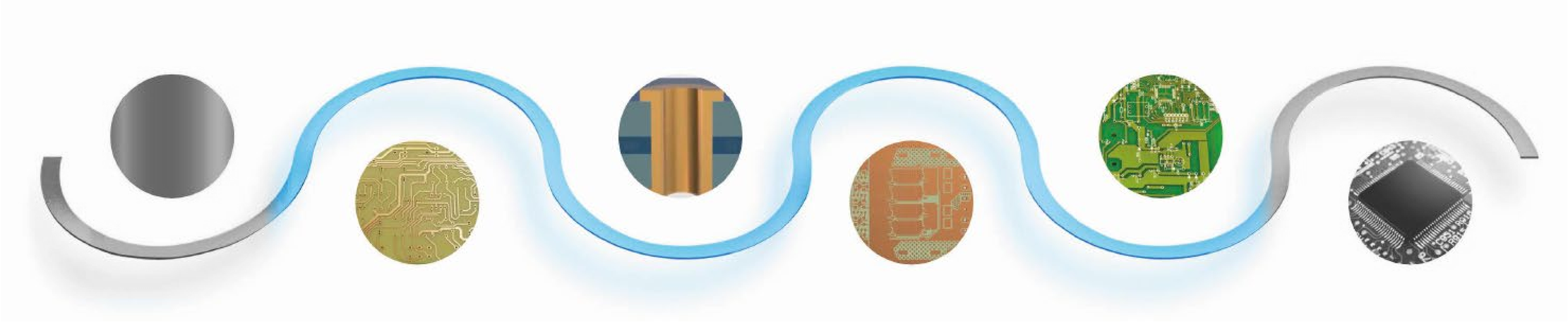
ZEISS Systems

ZEISS Axioscope

ZEISS EVO

ZEISS Smartproof 5

ZEISS Smartzoom 5



→ Incoming Quality Control
→ PCB Manufacturing Process
→ PCB Assembly (PCBA)

PCB Assembly (PCBA)

Quality Challenges

- High daily production requires quick dimensional measurement and surface defect inspection on the welded foot
- Identify the cause of solder joint issues in order to improve the welding process

ZEISS Solutions

- Quick inspection of welding quality with digital microscope ZEISS Smartzoom 5
- Welding size detection using optical imaging solution ZEISS O-DETECT
- Rapid detection of IMC layer thickness via scanning electron microscope ZEISS EVO
- Ultra-high resolution X-ray microscope ZEISS Xradia Versa
- Dual beam electron microscope ZEISS Crossbeam

ZEISS Systems

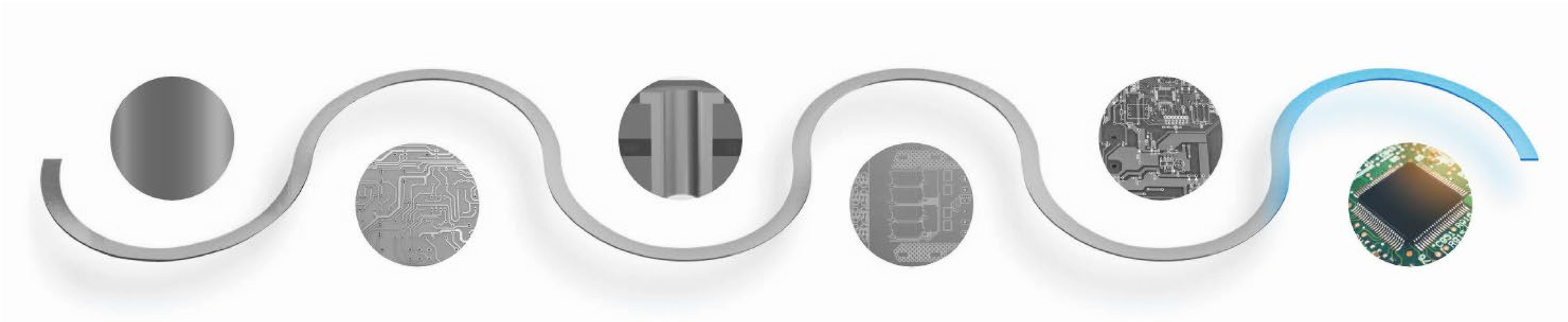
ZEISS Crossbeam

ZEISS EVO

ZEISS O-DETECT

ZEISS Smartzoom 5

ZEISS Xradia Versa



→ Incoming Quality Control
→ PCB Manufacturing Process
→ PCB Assembly (PCBA)

Portfolio

ZEISS O-DETECT
The new generation of optical metrology

High-quality camera and flexible lighting for fast, intuitive, and precise measurement. Ideal for components that are best left untouched.

Explore online

ZEISS EVO
SEM for industrial quality and failure analysis

Provides high-quality data, especially for challenging samples. Particle classification based on elemental composition reveals contamination source.

Explore online

ZEISS Xradia Versa
Top resolution and contrast

Extends the boundaries of non-destructive 3D X-ray imaging with industry-leading resolution and contrast, extensive filtering, and in-situ analysis.

Explore online

ZEISS Axioscope
Research and routine in the materials lab

Cost-effective upright light microscope for key imaging requirements. Meets high demands in terms of usability, reproducibility, and automation.

Explore online

ZEISS Smartproof 5
Repeatable inspection and documentation workflows

Fast confocal technology for roughness and topography measurements on sensitive surfaces combined with light microscopy imaging and documentation.

Explore online

ZEISS Crossbeam
High-throughput 3D analysis and sample preparation

FE-SEM imaging and analytical performance with the processing ability of a FIB. High-quality sample preparation and comprehensive 3D characterization.

Explore online

ZEISS Smartzoom 5
Fully automated for intuitive QC and QA

Smart digital microscope for quality applications in just about any industry. Features easy setup, simple operation, and numerous integrated components.

Explore online

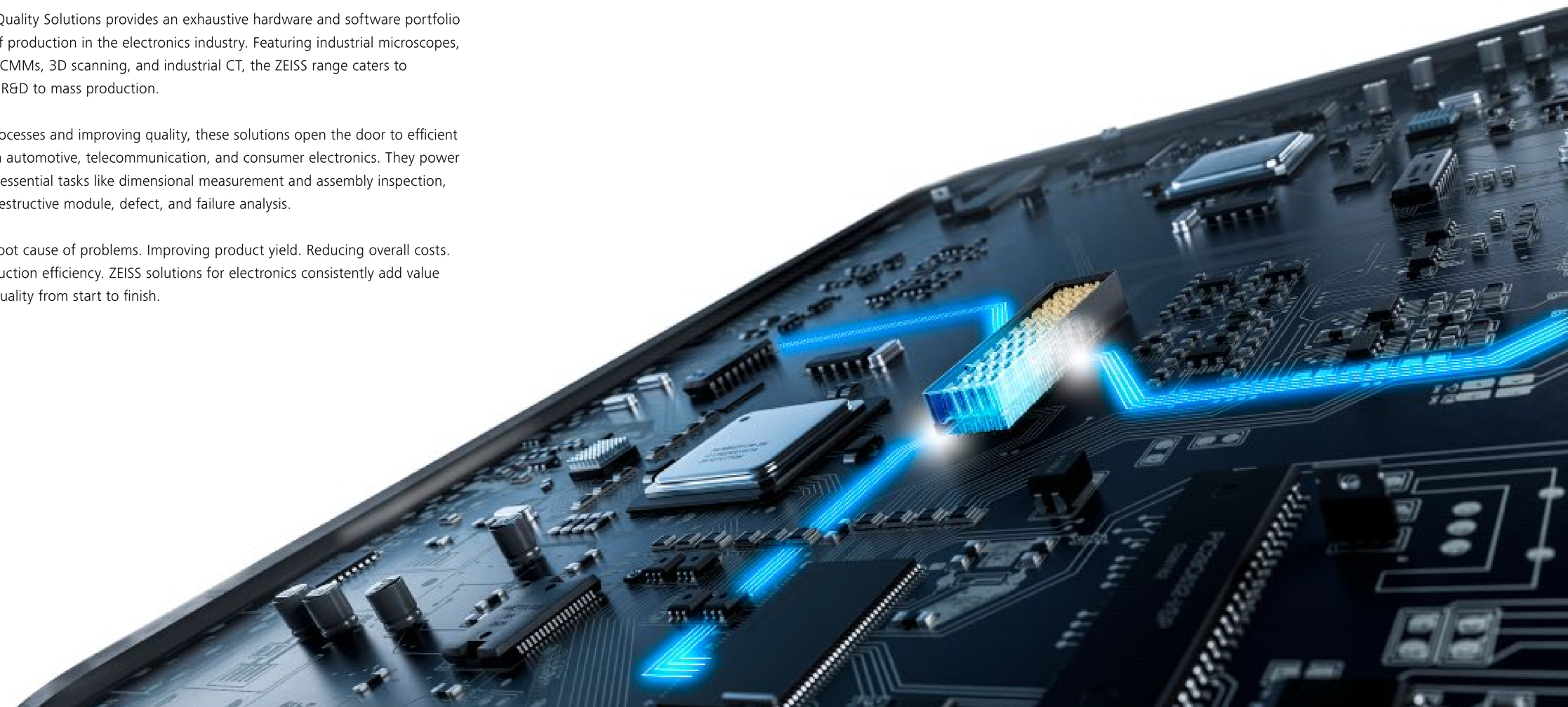
Consistent Quality in an Evolving Industry

Lasting success in electronics with ZEISS

ZEISS Industrial Quality Solutions provides an exhaustive hardware and software portfolio for each stage of production in the electronics industry. Featuring industrial microscopes, optical systems, CMMs, 3D scanning, and industrial CT, the ZEISS range caters to everything from R&D to mass production.

By optimizing processes and improving quality, these solutions open the door to efficient quality control in automotive, telecommunication, and consumer electronics. They power a wide range of essential tasks like dimensional measurement and assembly inspection, as well as non-destructive module, defect, and failure analysis.

Identifying the root cause of problems. Improving product yield. Reducing overall costs. Optimizing production efficiency. ZEISS solutions for electronics consistently add value while ensuring quality from start to finish.



Your global partner –
present in all regions

63
ZEISS Quality
Excellence Centers

32
Sales & Service
Organizations

100
Business Partners

10
Production Sites

As electrical connector module parts are rarely produced in a single location, measurement and inspection issues can occur in any country and at any supplier. Our global network of application engineers and service technicians provide quality assurance solutions to help you keep traceability and quality at a consistently high level. Boasting a comprehensive knowledge base and the world's most accurate measuring machines, ZEISS strives to exceeds expectations around the globe.

Find your perfect solution today.
Get in contact with our global experts.

info.metrololgy.us@zeiss.com