



MICROELECTRONICS

Nikon Metrology



Microelectronics

Smaller, cheaper, faster - these are the ever-present concerns of microelectronic device manufacturers. In this industry, each new generation of products must outperform its predecessors while in smaller package sizes and without a significant increase in costs.

These manufacturing rules also affect each of the components involved in their fabrication including

- Transistors
- Capacitors
- Inductors
- Resistors
- Diodes

As the size of these devices continues to decrease, so does the need for increasingly powerful measurement techniques rise to analyze ever more densely populated circuit boards. At smaller scales, the effect of every imperfection becomes magnified, while new design complications, such as electrostatic forces, begin to have a measurable impact on performance.

To monitor the quality of design and production in this environment, a combination of microscopy systems is often used. Included among these are:

- stereomicroscopy and optical light microscopy or general fault finding and the inspection of bonds;
- transmitted and reflected light metallurgical microscopy for wafer inspection; and video measuring systems for detailed metrology analysis and reporting;
- wafer and mask inspection microscope system for reflected light defect identification

The addition of high resolution digital cameras and intuitive yet powerful analysis software can further improve quality control, helping manufacturers to be ready for the production of the next generation of chips and even greater engineering requirements.

Key techniques and instruments: stereomicroscopy, transmitted and reflected light illumination, inverted microscopes, video measuring systems, digital cameras, NIS-Elements.