NEWS RELEASE

Hitachi High-Tech HITACHI
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Development of a New Electron Beam Absorbed Current (EBAC) Characterization System for Scaled-down Semiconductor Devices

nanoEBAC NE4000, enabling to identify device failure locations effectively

On December 1, 2009, Hitachi High-Technologies Corporation (TSE:8036) will introduce the nanoEBAC NE4000 device characterization system for analysis of interconnect failure locations in semiconductor devices by Electron Beam Absorbed Current (EBAC) (*) technique.

The ability to characterize and locate interconnect and via opens, shorts and high resistivity problems becomes more challenging as device structures shrink to 32nm and below, while the number of metallization layers increase vertically. Conventional probing techniques for identifying and locating failures have become increasingly more difficult and time consuming for today's nanometer size structures, such as an MOS transistor.

In 2004, Hitachi High-Technologies started to deliver the device characteristic evaluation system NanoProber N-6000 that enabled measurement of the electrical characteristics of single transistors with the precisely controlled probing system that has contributed to increased efficiency in failure analysis of semiconductor devices.

The newly developed nanoEBAC NE4000 succeeds the well reputed probing technique applied on the N-6000 Nanoprober. The NE4000 detects EBAC by direct probing to LSI interconnects or pads that is synchronized with the electron beam scan and visualizes specific location of under layer wirings without any damage. The electron beam enables identification of the failure locations more precisely than the conventional probing method.

Also, Hitachi patented high performance EBAC amplifiers (electric current amplifier and differential amplifiers) enhance identification performance of failure locations such as pattern disconnections as well as high resistivity interconnect defects. Moreover, higher rate EBAC imaging is realized with the newly developed Variable-frequency band function. It is expected that the product application will expand to new electronic components and materials for size reduction in addition to the test patterns such as interconnect and via-chain of real devices.

Hitachi High-Technologies expects sales of 20 units annually and will start deliveries beginning May 2010.

■ Key features of nanoEBAC NE4000

・ Provide high quality EBAC images with Hitachi's patented high performance EBAC amplifiers
・ Intuitive GUI（Graphical User Interface）with various image and color processing functions
・ Field Proven, low chromatic aberration, Cold Field Emission (CFE) electron gun for low accelerating voltage imaging
・ 4 high precision nano-probe units
・ The compact system for electrical characteristics evaluation is suitable for not only semiconductors but also crystal materials and electric components

(*) EBAC : Electron Beam Absorbed Current
Visualize underlying interconnect failures by probing interconnect or pad in semiconductor device, detecting electron beam absorbed current absorbed in the interconnect and displaying its current signal being synchronized with electron beam scan

Fine-structured device characteristics evaluation system
nanoEBAC NE4000

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