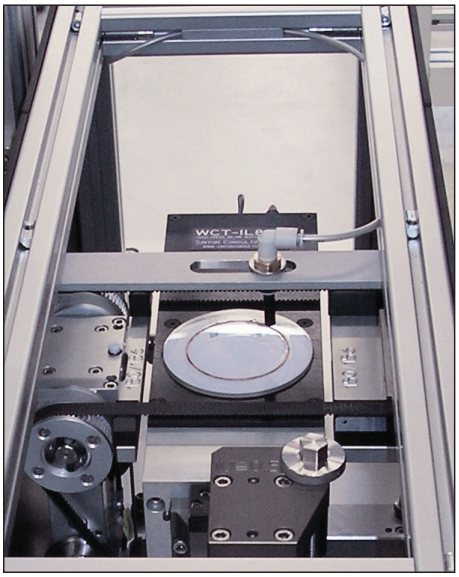
Sinton instruments

PRODUCT NOTE

IL-800: Inline Wafer-Lifetime Testing



Customer implementation of the IL-800 instrument in an inline application. (courtesy S. Rein)

Fast inline testing with no compromises. Monitor wafer lifetime, sheet resistance and trapping with the comprehensive accuracy of an offline tool and an optimized industrial software package.

Product Overview

The calibrated measurements that have been developed for the Sinton WCT-120 offline lifetime tester can be applied inline, to accomplish sophisticated process monitoring in an industrial production line.

The IL-800 offers a single large-area measurement of wafer lifetime which balances the effects of grain boundaries or growth variations. The measurement unit with its integrated excitation source may be mounted under or over a wafer track, to characterize each passing wafer with our calibrated non-contact sensor.

IL-800 System Capabilities

Primary application: Step-by-step monitoring and optimization of the production line, using measurements on product wafers at key stages in the process

Example applications:

- Monitoring incoming wafer quality (lifetime, sheet resistance, and trapping)
- Monitoring phosphorus diffusion quality
- Early detection of wafer contamination from water, chemicals, furnaces, or wafer handling during the process
- Maintaining optimal surface passivation quality from the nitride deposition

Key Features

- Industrial software package suitable for integration with production-line automation
- Calibrated carrier-lifetime versus injection level that allows process monitoring using the same metrics used to predict and optimize cell efficiency, including lifetime and emitter saturation current densities

Integration Overview

We welcome inquiries from automation vendors who require a reliable and cost-effective inline lifetime measurement, with professional support and training. We also work directly with R&D and other small fabs and their choice of automation supplier to integrate the IL-800 into any metrology workstation.

The standard operating software has allowances for rapid prototyping and testing upon delivery. In the automated mode, the software client offers vital wafer results to a server database, using options such as a TCP or Profibus interface. Sinton Instruments' characteristic reports of minority-carrier dependent lifetime are also standard.

IL-800 Specifications

Instrument Specifications

Available measurements
- Lifetime
- Sheet resistance
- Emitter saturation current density
- Trap density

Lifetime measurement range
- 100 ns to greater than 10 ms

Measurement (analysis) modes
- QSSPC, transient, and generalized lifetime analysis

Sheet resistance measurement range
- 3–1000 (undoped) Ohms/sq

Available light bias range
- 0–100 suns

Typical calibrated injection range
- 10^{13}–10^{16} cm^{-3}

Available spectrum
- White-light and IR illumination

Sensor area
- 80-mm diameter

Sample size, standard configuration
- 125–210 mm

Wafer thickness range
- 10–1000 µm

Throughput
- 3600 wafers/hour in standard configuration

Wafer transport (not provided)
- Belt or pick-and-place compatible

Wafer timing (optimal)
- 250 ms at rest over (or under) measurement head

Warranty
- One-year limited warranty on all parts and software

CE

Facility Requirements

Ambient operating temperature
- 20°C–25°C

Power requirements
- IL-800: 40 W
- Computer with monitor: 200 W
- Light source: 200 W

Space requirements (L x W x H)
- Inline IL-800: 200 x 90 x 288 mm
- CPU: approx. 345 x 180 x 345 mm
- Flash: 270 x 195 x 100 mm
- Power supply: 180 x 127 x 75 mm
- Signal processing hardware: 190 x 169 x 55 mm

Universal mains voltage
- 100–240 VAC 50/60 Hz

Special facilities requirements

None

Mounting
- Machine drawings available upon request

IL-800 System Components

- IL-800 instrument with signal processing unit, signal cables
- Integrated 850-nm IR-pass Schott glass filter
- High-throughput flashlamp with power supply
- Computer with Windows OS dedicated monitor
- Sinton Instruments data acquisition and analysis software package installed and pre-configured
- High-resolution, high-speed data acquisition with simultaneous sampling and common-mode rejection

Purchasing Information

For a quote, please contact quotes@sintoninstruments.com

We are happy to accommodate custom requirements. Please inquire about a quote for your specific needs.

Quotes are valid for 60 days. Please allow 10 weeks for delivery from date of purchase order.

For our full product line, visit our website at: www.sintoninstruments.com

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