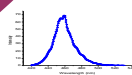
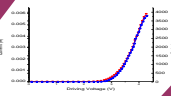
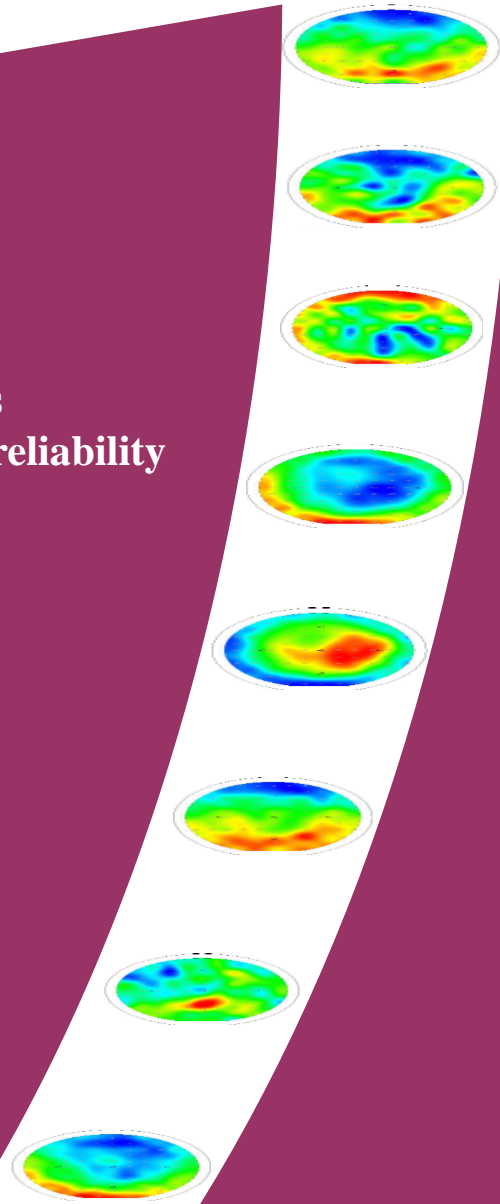


EpiEL™ Mapping Technology

- EpiEL and EL/PL combination
- Unique EL solution for LED epiwafers
- Superior versatility, productivity and reliability



EpiWafer



EpiWafer



MaxMile

Technologies, LLC

EpiEL and EL/PL Mapping Technology:

Unprecedented LED Epiwafer Characterization Solution

MaxMile Epi-wafer Electroluminescence (EpiEL) mapping technology provides a unique characterization solution for LED/LD industry. Without any costly and time-consuming device fabrication, it characterizes the electroluminescence (EL) behavior of unprocessed light emitting materials as a finished device (such as LED).

MaxMile EpiEL and EL/PL combination mapping systems combine superior performance, versatility and reliability with ease of learning and operation. They facilitate optoelectronic research & development community and industry with new capabilities and better efficiencies.

Wide Range of Applications

MaxMile EpiEL and EL/PL combination mapping systems are enabling rapid, nondestructive electroluminescence and photoluminescence mapping on epiwafer without any device fabrication. With such powerful and unique capability, MaxMile EpiEL and EL/PL combination mapping systems have the flexibility to meet versatile applications:

For fundamental and applied research & development in optoelectronics, EpiEL and EL/PL mapping systems enable:

- Fast feedback for material development
- Device properties measurement on epiwafers
- Nondestructive quick EL and wafer-level EL mapping
- “Fabless” material and system development

For industrial product development, process monitoring and quality control, EpiEL and EL/PL mapping systems provide an excellent balance between quality control and cost-effectiveness:

- Providing instant response for recipe modification, process & system optimization
- Enabling device-level quality control right after material growth
- Enabling high volume characterization ranging from wafer evaluation/screening to device sorting

Broad applicable materials: EpiEL mapping systems can be designed for characterizing electroluminescence of any type of semiconductor-based light-emitting epitaxial materials, either LD or LED material structures.

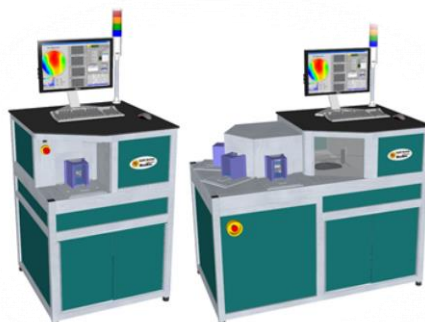
Proprietary EL/PL and EpiEL probe technology enables nondestructive device-level characterization on LED epiwafers

Smart vision and robot design, fully loaded automation system

Simultaneous mapping, curve and statistic drawings provide intuitive and comprehensive information

Customized system configuration maximizes customer's investment

Superior system design enables wide range of applications for any types of light-emitting epiwafers



Graphic system control, highly-automated operation and auto-report generation enable ease of use

Latest PC with large widescreen LCD monitor provides instantaneous data acquisition and management

EpiEL and EL/PL mapping systems

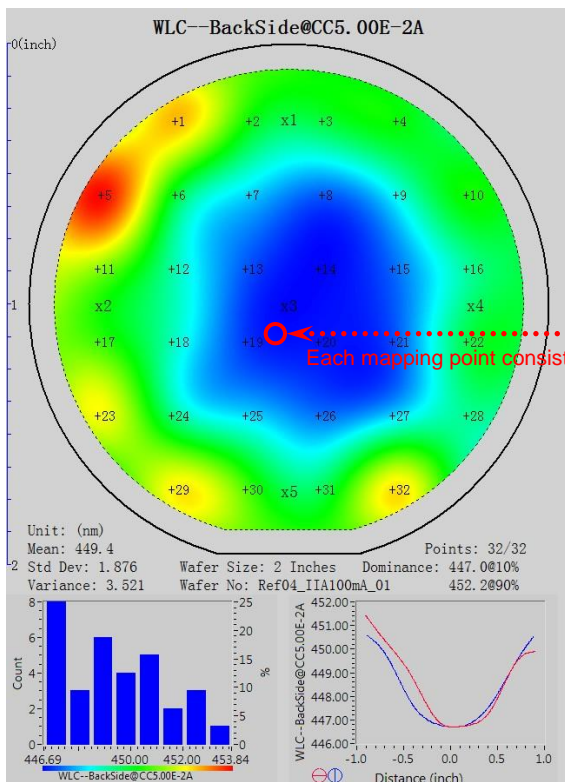
EpiEL: Electroluminescence on Epiwafer

Genuine Value and Productivity

EpiEL and EL/PL mapping systems have numerous features (see right sidebar) that make it not only easy to operate but also easy to learn. The genuine value and productivity of EpiEL and EL/PL mapping systems are attributed to its superior capability of photo- & electro-luminescence on epi-wafer, the number of curves and mapping images you can generate, and the quality of the results you can obtain. From intuitive operation and graphic system control to highly automated scanning, EpiEL and EL/PL mapping systems provide the productivity you want to exceed.

New Capability and Better Efficiencies

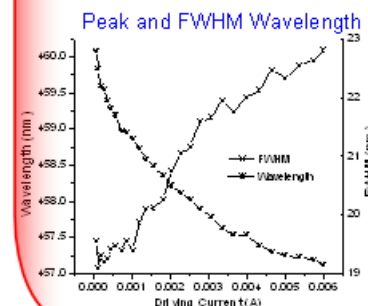
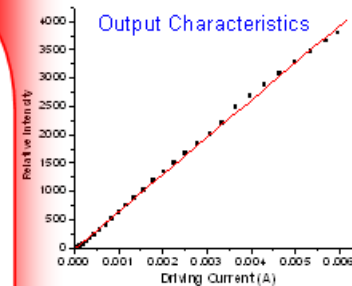
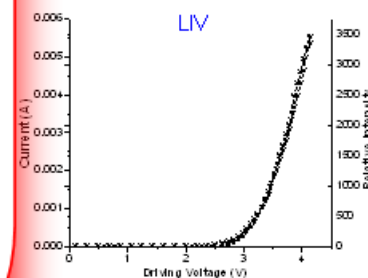
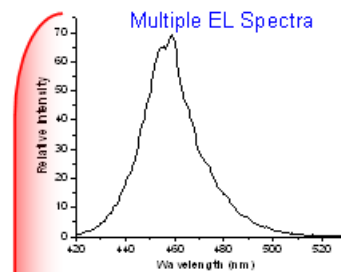
MaxMile provides innovative nondestructive test & evaluation for semiconductor industry. EpiEL and EL/PL mapping technology is an unprecedented electro- & photo- luminescence solution for optoelectronic business (especially solid state lighting). An investment in an EpiEL mapping system is to own new capability and to realize better efficiencies.



Over 20 types of EpiEL mappings and its statistic drawings can be generated from device-level curves measured directly from epiwafers

Key Features

- EpiEL: EL on Epiwafers
- Easy to learn and use
- Quick EL and EL mapping
- Nondestructive and rapid
- One solid station design for optimum measurement quality
- Graphic system control
- Intuitive system software
- One-click operation
- No sample preparation for high productivity
- Automated probe initialization
- Automated wafer-size recognition
- One large screen display for increased ease of use and productivity
- Highly customized system configuration
- Different probes for versatile test needs
- Changes easily among different types of EpiEL probes
- Auto-report generation
- Highly flexible in presenting test results
- Fully automated robot system
- Support wafer up to 12 inches
- Extensive suite of data analysis software



EpiEL and EL/PL Mapping Systems

Specifications

Wafer size: 2-8 inches (option up to 12 inches)

Functions: EpiEL, PL, EL/PL, IV, Reverse, Warpage, Film thickness*, GaN/Si, Test temperature control*.

Spectral Detection Range: UV to NIR (default 200nm-800nm)

Spectral resolution: 0.5-2 nm, depending configuration

EpiEL Probe type: Type I, Type IA, Type II, Type IIA, Type III, Type IIIA, and Type SiA

Excitation sources: EL: Keithley SourceMeter; PL: 405nm standard*.

Current measurement: >10e-12A

Control units and OS: PC-based EpiEL station run on 64bit Microsoft Windows 7/8

Sampling points/Steps: all EL, PL sampling points can be configured by user.

Measurement time: about 1-12 minutes per wafer, depending on test setting; PL scanning: up to 50 points per second.

Report generation and data presentation: HTML (Brief/Abbreviated/Full) /XML/CSV/TXT

Mapping color encoding: rainbow, gradient, binary, temperature, gray, or any type specified by end user

Power Supply: 10A/110VAC or 5A/220VAC Max; vacuum needed for robot system

Ambient Condition: Temperature: 15 °C-30 °C; Relative humidity: 30%-70% without condensation

Warranty: one year

Delivery: up to 3 months depending on system options; installation and operating training will be provided at customer site.

Types of EL mappings:

Wavelength--WLP/WLD/WLC, FWHM, blue shift, and blue shift rate.

Intensity--radiometric/photometric power, slope efficiency.

Electrical--measured Vf, measured If, device Vf, device If, turn-on voltage, reverse current/voltage, threshold voltage, on-resistance, top resistance, forward leakage, series resistance, ideality factor n, etc.

Types of PL mappings:

Wavelength--WLP/WLD/WLC (peak/dominant/center) wavelength, FWHM.

Intensity--radiometric/photometric power

Types of other mappings: Warpage, Film thickness*

Types of Curves: EL/PL spectrum; LIV--current/emissive intensity vs. voltage; Output intensity vs. driving current; Wavelength & FWHM vs. driving current; Reverse IV.

CVD Wafer Layout Mapping for all above measurement items, from either mapping or quick tests.



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