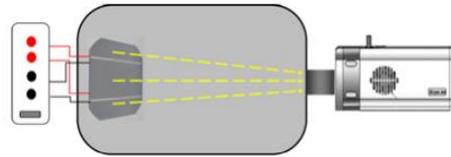
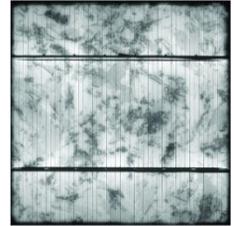




EL Testing

For Si Solar Cells using High Performance CCD



A High Performance Luminescence Imaging System for Fast Photovoltaic Solar Cell Inspection

The determination of luminescence (photo emissions) in solar cells is an important characterization tool. Typical solar cells often have defects which limit the efficiency or lifetime of a cell. Many of these defects are visualized with Luminescence Imaging. By using this technique, the manufacturing process can be optimized to produce better cells. Luminescence Imaging takes advantage of the radiative inter-band recombination of excited charge carriers in solar cells. The emitted photons can be captured with a sensitive CCD camera to obtain an image of the distribution of the radiative recombination in the cell. This distribution is determined by the local excitation level, allowing the detection of electrical losses, thus mapping the diffusion length of minority carriers. As the emitted light is low intensity and in the near infra-red range, the CCD camera has a high sensitivity wavelength from 900 to 1100 nm with little thermal noise. This CCD camera provides a very suitable resolution of 1024 x 1024 pixels.

FEATURES

- 0.2sec integration time
- Optimal NIR sensitivity ($\pm 25^{\circ}\text{C}$)
 - 88% QE at 900nm
 - 46% QE @ 1000nm
- Back-illuminated, deep depletion CCD Camera with C-Mount Thread Lens with Focal Length 17-35mm
- High dynamic range: 80dB
- Cell biasing using OAI SOURCE METER
- Reliable & Long Lifetime
- Low Maintenance

APPLICATIONS

- Electroluminescence
- Photoluminescence
- Inline Solar Cell Inspection

CONTACT: www.oainet.com

sales@oainet.com

EL CCD Camera

The EL CCD Camera is the ultimate high-performance CCD camera for electroluminescence and photoluminescence imaging for Photovoltaic (PV) Cells and Modules. This camera combines low noise electronics and optimal sensitivity in NIR.

The CCD camera offers megapixel resolution of 1024 x 1024 with a large 13µm pixel size, multi-megahertz readout speed, and robust USB 2.0 connectivity. With 88% Quantum Efficiency (QE) @ 900nm and 46% QE @ 1000nm, the integration times for EL-Imaging can be reduced down to 0.2sec which is perfect for production and fast operating PV inspection. Electroluminescence Imaging can be used to detect a multitude of defects in crystalline silicon solar cells, such as cracks, grain boundaries, broken contacts and shunts. It can also yield absolute mappings of serial resistance and diffusion length.

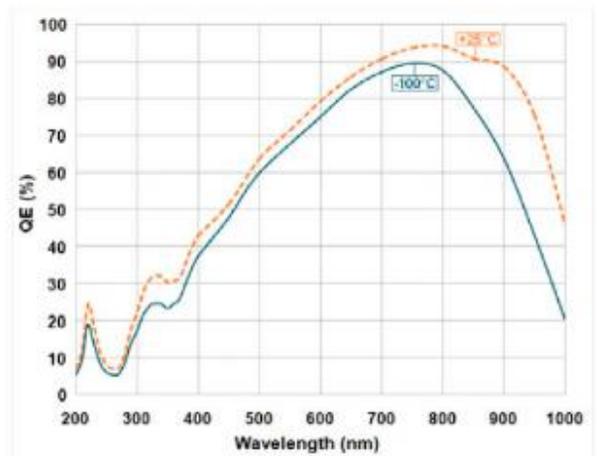
Dimension: 125.2mm (H) x 204.2mm (D) x 105mm (W)

Power: 110-220VAC 50/60Hz

Features		Benefits				
• High NIR sensitivity		• Ideally suited to luminescence emission of photovoltaic cells & modules				
• Fringe Suppression Technology™		• Minimizes fringing (etaloning) effects				
• High dynamic range		• Contrast rich imaging				
• Thermoelectric cooling		• Reduces noise and blemishes				
• Baseline clamp		• Essential for quantitative accuracy				
• Cropped sensor mode		• Specialised acquisition mode for continuous imaging with fast temporal resolution				
Resolution	Pixel Size	QE*	Read Noise	Frame Rate	Dynamic Range	Cooling**
1024 x 1024	13 x 13µm	88% @ 900nm 46% @ 1000nm	2.5e @ 2.5 MHz	2.25 fps	80db (16-bit)	-100°C

* At +25°C

** Recommended cooling temperature: -20°C



Source Meter & Cell Biasing

For Electroluminescence Imaging, the solar cells are supplied with an external excitation current by a programmable power supply, while the camera takes an image of the emitted photons. Typical exposure times are in the range of 0.2 to 60 s. A dedicated and programmable Four Quadrant OAI Source Meter (OAI Source Meter Model 220_20: ±20A / ±12V / 200W, 110/230 VAC, 50-60 Hz) allows cell biasing and assists in obtaining the luminescence images with combined electric and optic excitation.



The power supply delivers defined currents or voltages in all four quadrants of the IV characteristic, which allows for luminescence images with combined electric and optic excitation.

Power: 110-220VAC 50/60Hz

www.oainet.com
sales@oainet.com

364 S. Hillview Drive
 Milpitas, CA 95035 408-232-0600