

QuickSun[®] 550Ei

Versatile quality control testing system



- Class A+A+A+ solar simulator with 105 x 205 cm test area
- EL imaging and analysis with 200 μm resolution
- True leakage current measurements with nA scale sensitivity



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QuickSun 550Ei is a versatile testing system for qualifying of PV modules with dimensions up to 105 x 205 cm². Basic set up includes a top class solar simulator which measures modules in sunny side up position enabling e.g. soiling simulations. Several additional measurement methods can be integrated to the same system including high resolution EL imaging with analysis software from one of the most recognized EL system suppliers. Also hot spot revealing IR images can be recorded by applying either forward or reverse bias current, and true nA scale leakage current measurements can be performed with sensitive enough instruments.

A detailed test report is included with every simulator proving Class A+A+A+ performance with respect to spectrum, irradiance non-uniformity and short term instability (STI). Long term instability (LTI) is also within Class A+ tolerances during the 40 ms long flash pulse. A feedback controlled electronic load and sampling unit measures voltage, current and irradiance signals when module is swept e.g. from short circuit to open circuit. Both forward and/or backward voltage sweeps including their slope rate can be adjusted freely and also a combined IV graph is calculated automatically. This enables accurate measurement of very high capacitance and top efficiency c-Si modules. Applied test procedures and reports comply fully with the standards IEC 60904-1 and IEC 60904-9 as inspected and proved by SGS Fimko Ltd.

EL Imaging

EL-images having 200 µm pixel resolution are recorded with six 8.3 Mpixel NIR ccd cameras. This enables software based automatic image analysis in order to identify and categorize small faults like microcracks and finger interruptions. If automatic analysis is not required cost effective 500 µm resolution EL picture can be recorded with two corresponding ccd cameras. A 850 W power supply can provide upto 14 A even to 72 cell modules. Typical exposure times vary between 5–20 seconds depending on the desired image quality.

Electrical Safety

QuickSun 550Ei has the capability to perform insulation resistance, dielectric withstand and ground con-

tinuity tests as stipulated in the applicable UL and IEC standards.

Actual leakage current of PV modules is a few hundred nano amperes with a typical 4 KV test voltage while the widely applied dielectric withstand test acceptance criteria is 50 µA. QuickSun 550Ei surpasses this minimum requirement and measures true insulation resistance and leakage currents accurately with sensitive enough instruments. This enables run time diagnosis of both contacting reliability and real module leakage characteristics.

Electrical characteristics

Contacting	J-Box / contact adapter; 4-wire / Kelvin	Frame; probes to drainage holes
Load	feedback controlled MOSFET	adjustable bias 0 – 4.5 V
Voltage sweep	linear and double slope alternatives	Isc -> Voc, Voc -> Isc; average of both
Voltage measurement	1 – 100 V (other scales on request)	accuracy 0.2 % / 512 samples
Current measurement	0.5 – 25 A (other scales on request)	accuracy 0.2 % / 512 samples
Irradiance control	100 – 1200 W/m ²	resolution 1 W/m ² / 512 samples
Module temperature (IR)	RT – 75 °C	accuracy 1 °C
Monitor cell temperature	RT – 75 °C	accuracy 1 °C
Pmp repeatability	< 0.1% (1σ/ave)	
Average flash tube life time	300 000 flashes	
Operation temperature	15 – 35 °C	
Main utilities	3~, 400 Vac, 3 x 16 A, 50-60 Hz	CDA 4 – 6 bar
Dimensions, weight	310 x 180 x 250 cm	850 – 1100 kg, depending on options