SPI-SUN SIMULATOR™ 350i

Photovoltaic Module Tester

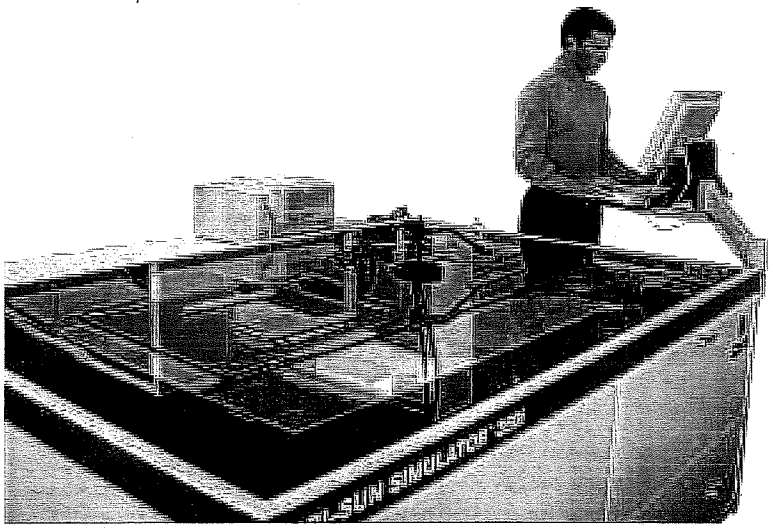
The SPI-SUN SIMULATOR™ 350i tests photovoltaic modules under simulated Air Mass 1.5 Global terrestrial conditions. The system's unique upward-facing illumination and low height make it ideal for incorporation into an automated module assembly line.

A filtered, repetitively pulsed xenon light source closely matches the solar spectrum while avoiding the excessive solar cell heating associated with continuous sources. The spectrum is carefully filtered to meet ASTM and IEC Class A spectral distributions, facilitating the testing of thin film as well as crystalline silicon materials.

A calibrated reference solar cell is coupled to the electronic circuitry to monitor illumination intensity and control pulse-to-pulse consistency. A computer-controlled electronic load automatically varies the module current to plot the I-V curve. The module temperature is measured during testing to allow temperature compensation of the I-V data. A graphical interface based on Microsoft Windows™ makes operation user friendly.

Features and Benefits

- Low height, upward illumination and small footprint allow integration into automated module assembly lines
- Measures the following parameters:
  - *I-V curve*
  - *Open-circuit voltage*
  - *Short-circuit current*
  - *Load current and power at fixed voltage*
  - *Peak power*
  - *Current and voltage at peak power*
  - *Fill factor*
  - *Cell and module efficiency*
  - *Module temperature*
- *Sorts modules into ten user-friendly categories*
- Uniformity of illumination ±3% over entire test area
- Pulsed xenon light source
  - *Low duty cycle prevents module heating*
  - *Filtered to ASTM E927 and IEC 60904-9 Class A spectrum*
  - *Variable intensity from 70 to 110 mW/cm², measured by calibrated reference cell*
- Four-wire module connection for increased measurement accuracy
- Computer control system with touch screen, printer and graphical software package
- Modem and ethernet connections and pcAnywhere™ for remote service and support
- Software provides system diagnostics and saves module parameters and IV curves to databases
- Tests either crystalline or thin film modules and cells



SPI-SUN SIMULATOR™ 350i

CE

spire Solar

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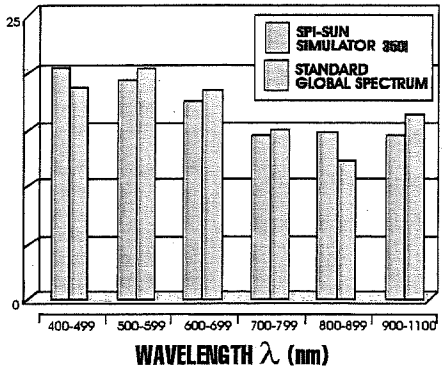
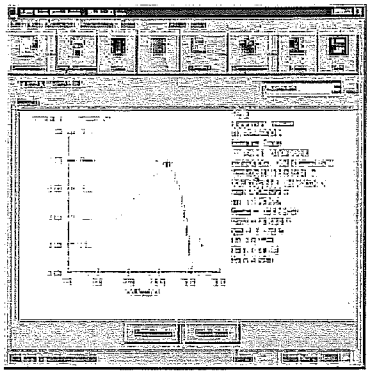
Pulsed Xenon vs. AM1.5 Solar Spectrum





Graphical User Interface

SPI-SUN SIMULATOR™ 350i Specifications

1. Maximum Module Dimensions: *(other SPI-SUN SIMULATOR™ sizes are available)*
   Length ..... *162 cm (64 in)*
   Width ..... *102 cm (40 in)*

2. Light Source:
   Long-arc pulsed xenon lamp, filtered to AM1.5 Global spectrum (ASTM E927and IEC 60904-9)

   Full area intensity ..... *70 to 110 mW/cm²*
   Lamp lifetime, nominal ..... *10,000,000 flashes*

3. Illumination Uniformity: ..... *±3% over 162 cm x 102 cm area*

4. Measurement Range:
   Voltage (three ranges) ..... *0 to 150 V*
   Current (three ranges) ..... *0 to 20 A*

5. Resolution: *(lowest range)*
   Voltage ..... *0.5 mV*
   Current ..... *0.05 mA*

6. Equipment Dimensions: *(excluding computer swing arm)*
   Width ..... *198 cm (78 in)*
   Depth ..... *229 cm (90 in)*
   Height ..... *91 cm (36 in)*

7. Equipment Weight, Approx. Net: .....*955 kg (2100 lbs)*

8. Utilities Requirements:
   Electricity ..... *190 - 240 VAC, 20 A, 50/60 Hz, single phase*
   Compressed air .....*140 l/min at 550 kPa (5 scfm at 80 psi)*

Options

- *Automatic module electrical probing*
- *Filtered calibrated reference cell for testing amorphous silicon modules*
- *Special voltage and current measurement ranges*
- *Label printer with software*
- *Automated module loading and unloading*
- *Barcode reader for module serial number*
- *Interface for automation handshake*

For additional information or design and application assistance, please call, fax or email us at the numbers below.

Rev-11/02

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