

# FMT-500: Light I-V Testing for Modules



Advanced analysis of solar modules including light I-V and Suns-Voc data. Capability to accurately measure high-efficiency modules.

## Product Overview

The FMT instrument has been designed to have the highest possible accuracy for measuring high-efficiency silicon solar modules. This is accomplished using a patented multiflash technology.

The standard analysis includes the commonly reported parameters for module testers, but is supplemented with the Suns-Voc analysis that precisely indicates the source of power loss due to shunt and series resistance effects.

## FMT System Capabilities

Primary application:

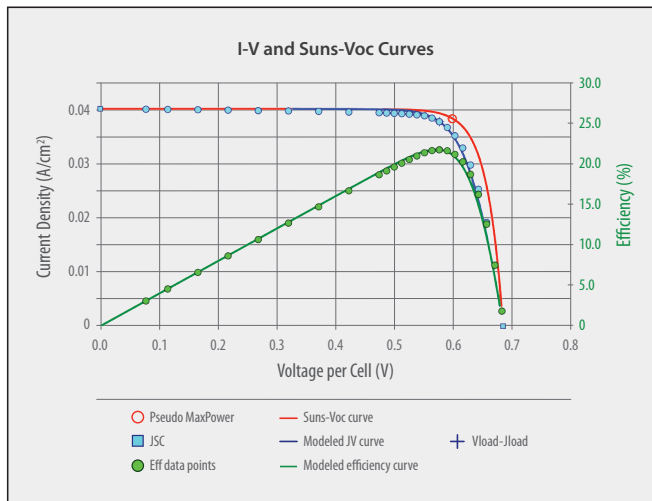
- One-sun flash module testing

Analysis techniques:

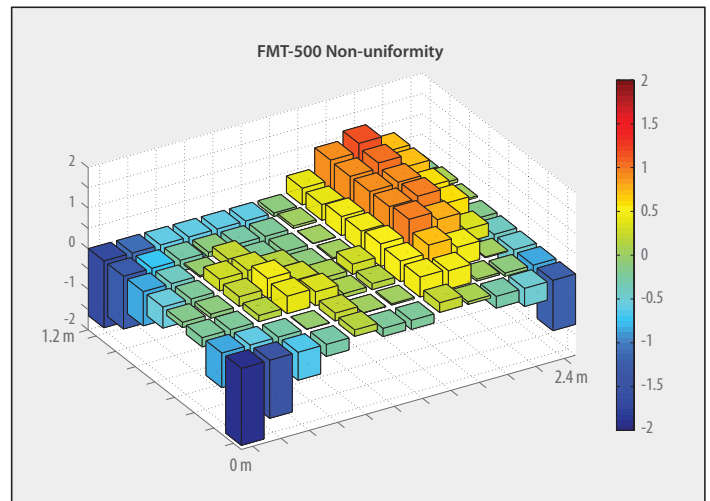
- Suns-Voc curve
- 3-point production testing utilizing Suns-Voc,  $J_{sc}$ ,  $V_{load}$
- Efficiency versus intensity characteristic
- I-V curves at multiple intensities

Measures any crystalline silicon module, including high-capacitance, high-efficiency modules, using patented electronic load technology.

Over 20 GW of product has been tested to date using the FMT instrument. It is also ideal for R&D.



The FMT interface displays both I-V and Suns-Voc data. This permits direct comparisons of module data to cell data and quick identification of series resistance, shunting, and cell mismatch.



The FMT-500 illumination area non-uniformity is Class A ( $\pm 2\%$ ) non-uniformity over a 1.2 x 2.4 m test area. The figure above shows data from a setup that achieved Class A ( $\pm 2\%$ ) non-uniformity over 1.2 x 2.4 m.

## FMT-500 Specifications

### Instrument Specifications

#### Available measurements

- Voc, Isc, Vmp, Imp, FF, Rs, Rsh
- Suns-Voc and lifetime
- I-V curves at multiple intensities (multisuns analysis)
- Efficiency versus intensity characteristic

#### Measurement modes

- Full I-V
- 3-point measurement (Voc, Isc, Vload)
- Hunt for Vmp (optimized sequence to take data at Vmp)
- Isc only
- Vload only

#### Accurate measurement of high capacitance cells

- Standard

#### Current range

- 0–50 A

#### Voltage range

- 0–120 V (higher range available)

#### Available intensity range

- 0.2–1.2 suns

#### Simulator class

- Class A non-uniformity over 1.2 x 2.4 m
- Class A temporal stability
- Class C spectrum standard (Class A available)

#### Warranty

- One-year limited warranty on all parts and software



### Facility Requirements

#### Ambient operating temperature

- 20°C–25°C

#### Power requirements

- Computer with monitor: 200 W
- Light source: 1.5 kW, 15 A

#### Dimensions

- 5-m distance from source to module required for Class A non-uniformity
- Computer: 47 x 14 x 42 cm (L x W x H)
- Load box: 54.6 x 48.2 x 4.5 cm (L x W x H)
- Flash power supply: 54 x 48 x 22 cm (L x W x H)

#### Universal mains voltage

- 100–240 VAC 50/60 Hz

#### Special facilities requirements

- Darkened room or tunnel (2.5 x 2.5 m cross section typical)



High-throughput flash power supply.

### FMT Components

- Electronic load and current, voltage interconnections
- Programmable flashlamp and supply
- Windows PC with installed, configured software and monitor
- Sinton Instruments data acquisition and analysis software package
- High-resolution, high-speed data acquisition with simultaneous I-V-illumination sampling

### Purchasing Information

For a quote, please contact [quotes@sintoninstruments.com](mailto: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.

For our full product line, visit our website at: [www.sintoninstruments.com](http://www.sintoninstruments.com)

