

Solar Cell LifeTime Test System

VS - 9310 SolarCell

A Completed Solar Cell life time test system consists of:

- Multi_Channel Programmable Power Source
- Solar Simulator, and Photodiode Sensor
- Computer with Data Acquisition Software
- Test Device Holder & Jig

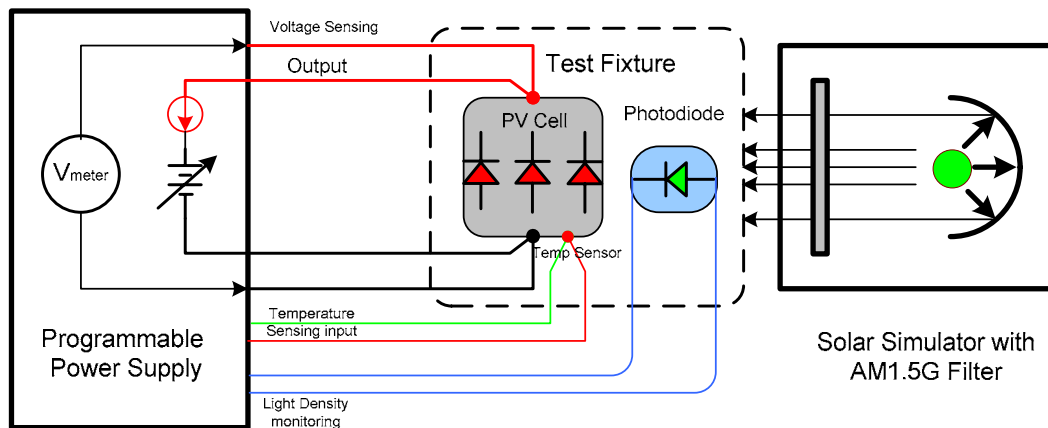


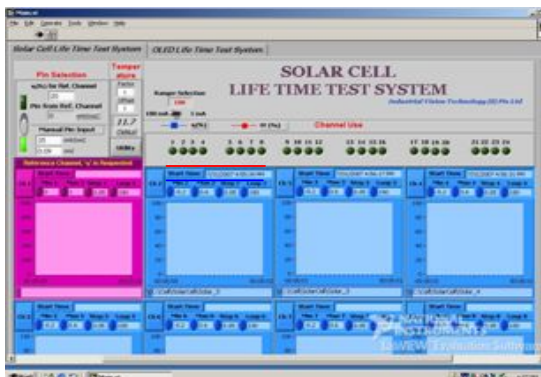
Figure: 1 Test System Configuration

Programmable Power Supply with 24 channel output

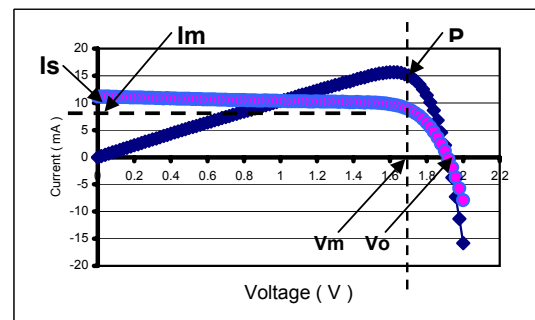
- Voltage Output Range:** 0 --- 20VDC, 0 -- 40VDC (option)
- Current Output Range:** 0 --- 10mA/100mA/1A 3 ranges of options;
- Resolution & Accuracy:** 0.02% FS; 0.1% FS + 0.05% Reading
- Temperature meas. Sensor:** Platinum Flat Film Pt100
- Temp. meas. Accuracy:** ±1% with resolution: 0.1°C
- No of Device:** Maximum 24 Test devices

Computer with Data Acquisition Software

PV Cell Conversion efficiency: η , and Fill factory: FF are calculated and being monitored.



- the PV Cell conversion efficiency: $\eta = P_m / P_{in}$
- the PV Cell Fill factor (FF) given by: $FF = I_{m} V_m / I_{sc} V_{oc}$



Solar Simulator

There are three class of Solar simulator:

	Class A	Class B	Class C
Spectral Match	0.75 - 1.25	0.6 - 1.4	0.4 - 2.0
Non Uniformity	$\leq \pm 2\%$	$\leq \pm 5\%$	$\leq \pm 10\%$
Temporal Instability	$\leq \pm 2\%$	$\leq \pm 5\%$	$\leq \pm 10\%$

Typical Output: >1000W/m², Full spectrum: 250 -- 2500 nm, with AM 1.5G filter

Adjustable Range: $\pm 20\%$ continuously adjusting, to change filter if more than $\pm 20\%$

The class B or C is recommended for life Time test purpose.

Light Density Sensor (Si-Photodiode)

A Si photodiode with its sensitivity close to spectral Luminous efficiency $V(\lambda)$ can be used as light density sensor, to monitor the light density changes due to the lifetime of Xenon Lamp.



Figure. 4 Photo sensor

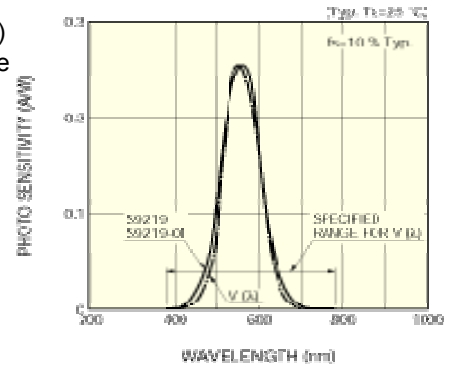


Figure. 5 Spectral Response

Test Jig

To achieve an accurate measurement of Voltage, and current, the effect of contact resistance and wires' resistance must be minimized.

A customized design jig with the Spring and gold plating contact probe makes the electric contact reliable, durable.

To keep the test device with temperature of 25°C, some special cares must be taken:

- Cooled isothermal hold down block assembly together with PV Cell
- Temperature sensor placed near the PV cell;
- Monitoring the Temperature real time;



PV Cell device Holder

For future information, Please contact:

Manufactory:

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