

Keysight Technologies

PS-X10-100 Solar Cell I-V Test System

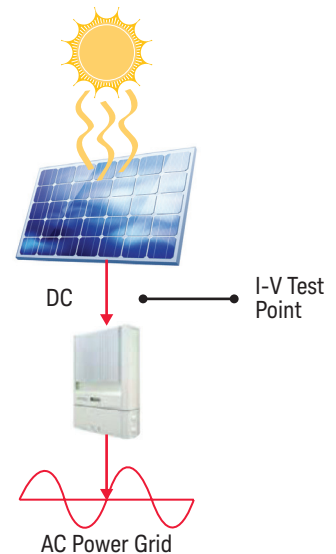
Introduction

Solar cell, technical name Photovoltaic (PV), is the booming technology which converts sunlight (Including visible or ultra violet radiation) into electricity. Due to today's growing demand for green energy, the solar cell is increasingly used in many areas, such as buildings, infrastructure and even mobile devices, as these industries become more eco-conscious. While PV devices absorb the solar irradiance and convert it into energy, the Keysight Technologies, Inc. I-V tester solution can measure the performance of various PV devices such as Silicon/ Thinfilm/ multi-junction in different power ranges. This could then be integrated with solar simulators for in-house tests. It is also suitable as a standalone for outdoor testing.

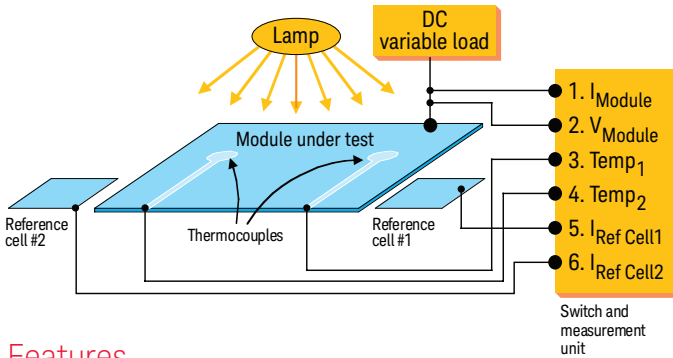


Solution

Based on Keysight N3301A based Electrical Load mainframe, this integrated solution can greatly increase the solar cell's I-V curve measure power by achieving 30A or higher efficiency and larger PV area. Further, it can apply to next generation with internal transient generator and high speed sampling digitizer which allows the sampling time to be even faster than 100 points within 10ms. With U2722A three channels 0.1nA resolution SMU, we utilize for reference cell J_s measure as solar stability monitoring during I-V measurement. As the thermal effect may contribute to any test uncertainties, additional U2355A+U2802A (Or 34970A/ 34980A as alternative) can be used as multi-channel temperature data logging for coefficient correction after post analysis. The systematic rack stack is configured as turnkey solution for measurement. The benefit of the tester itself can be separated into parts for various test needs in advance.



In addition, with Keysight VEE based platform, we provide the start up Graphical User Interface console program to provide necessary parameters.



Features

Automated test parameters include:

- P_{mpp}/ V_{mpp}/ I_{mpp}: Power/ Voltage/ Current maximum power point
- I_{sc}: Short circuit current
- V_{oc}: Open circuit voltage
- FF: Fill Factor
- R_s/ R_{sh}: Series Resistance/ Shunt Resistance
- Luminance from Reference cell
- Multi-channel temperatures from test points

Benefits Statement

- Supply easy user interfaces to access system
- Minimizes tested connectors' attrition
- Increases test efficiency & savings on test cost
- Fast test cycle time to get result
- Easy to train operators for the I-V test

System Components

- Keysight N3301A/ N3300A DC Electronic Load Mainframe with suitable modules
- Keysight U2722A Modular Source Measure Unit
- Keysight U2355A/ U2802A 31-Channel Thermocouple Signal Conditioner or 34970A
- Keysight VEE 9.0 Console Control Platform
- On-site installation and start-up assistance services
- Operational Manual: Guideline for practical test steps to avoid tedious trial-and-error procedures

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