

SERIS' PV Module Testing Laboratory offers World-Class Level of Measurement and Testing Services

The PV Module Testing (PVMT) Laboratory at the Solar Energy Research Institute of Singapore (SERIS) is a national laboratory accredited under ISO/IEC 17025:2005 for the provision of high-precision PV module testing and measurement. In December 2017, SERIS' PVMT Lab has reduced the measurement uncertainty of the maximum power measurement of crystalline silicon based PV modules to a world-class level of 1.6%. According to the ISO/IEC requirements, this outstanding value is an "expanded uncertainty", which means it provides a certified 95% confidence that the power of the module under test falls within the measured value plus or minus 1.6%. This value is significantly better than the previous value of $\pm 1.8\%$ reached by SERIS in 2016. Our precision measurement service has improved in both measurement repeatability and spectral mismatch correction. We are able to conduct this measurement on single-cell mini-modules and larger modules with up to 72 solar cells. The PVMT Laboratory can now better serve the PV manufacturers by providing the most precise characterization of Golden modules, which are used in their PV module factories for the calibration of their solar simulators.

Audited and accredited by SAC (Singapore Accreditation Council), SERIS' PVMT Lab issues reports to industry in compliance to IEC 17025:2005 requirements.

The PVMT Lab also offers other PV module test services, such as electroluminescence imaging, spectral responsivity, angle of incidence measurements, "PAN file" tests subjecting modules to different irradiances and temperatures, measurement of the temperature coefficients, characterization of bifacial modules with differing albedo, etc.

Other industry relevant tests for PV modules at the PVMT Lab include:

- Certification of PV modules under the latest IEC 61215 and IEC 61730 editions;
- SERIS Quality Checking (SQC) – a module quality test methodology designed for solar panel selection in PV systems before, during and after operation;
- Fault analysis and ranking of modules, components and accessories;
- Conduct indoor testing such as temperature tests, for fast single-day measurements

Based in Singapore, the PVMT Lab is a core element of SERIS' mission to be the Centre of Excellence for PV module testing in the tropics. For example, we conduct comparison challenge testing of Potential Induced Degradation (PID) of PV modules under both indoor and tropical outdoor conditions.

Our recent investments into equipment upgrades and staff training for performance analysis and module safety testing put us in a strong position to serve the PV industry.

For more information on SERIS' Testing and Consultancy services, please visit the SERIS website at www.seris.sg. For enquiries, please send an email to seris-info@nus.edu.sg.

1 December 2017