

Solar Cells Reliability Testing Programs

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Abstract

This paper deals with issues of electrical characterization and testing programs, required to characterize the reliability of high efficiency solar cells. The electrical parameters specific for solar cells and the methods applied for electrical characterization by using an Automatic Test System for parametric characterization of semiconductor devices are presented. Qualification and reliability studies tests, applied to high-efficiency solar cells, are presented in the second part of this paper. A testing program is discussed that consists of a set of five groups of mechanical testing climate. All tests under discussion are combined tests, applying in the same time different stimulus. The tests are intended to emulate, as faithful is possible, the mechanical and climate stress faced by solar cells in actual operating conditions.

References:

- [1] Keithley 4200-SCS Semiconductor Characterization System, Technical Data Book.
- [2] SR EN 60904 - Photovoltaic devices.
- [3] SR EN 61215 - Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval.
- [4] SR EN 60068 - Environmental testing.