

Abstract

Potential induced degradation (PID) is a performance limiting defect that profoundly impacts the power output of Photovoltaic (PV) modules. PID occurs because of leakage current between the solar cells and the aluminium frame. The leakage current develops due to high potential difference between the string voltage and the ground. In this work, PID is induced in a mono-crystalline and a multi-crystalline module and the severity is determined by current-voltage (I–V) measurements and Electroluminescence (EL) imaging. The Power dropped by 12.6% and 18.7% after 96 h of PID stress. The extracted parameters from the I–V curves show that the shunt resistance decreases and series resistance increases after the induction of PID. EL imaging was done at 10% of short circuit current (I_{sc}) (low injection levels), manifesting as checkerboard like intensity distribution and distinct bimodal intensity histogram. The results of this study demonstrate different PID detection characterisation techniques in PV modules.