

FEASIBILITY STUDY OF COMMERCIAL SILICON SOLAR PV MODULE BASED LOW- CONCENTRATION PHOTOVOLTAIC SYSTEM

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ABSTRACT

A concentrator photovoltaic (CPV) system has a potential for further cost reduction of solar Photovoltaic (PV) power as compared to flat panel PV. In this work a piecewise linear parabolic trough is designed to reflect the solar radiation with uniform intensity on the PV module receiver system. Silicon solar PV module based CPV system is modeled and simulation is done to study the variation of output power, open-circuit voltage and short-circuit current with respect to module temperature and irradiance. These simulation results are experimentally validated using a CPV (CR ~ 8) system developed in laboratory. The results confirms that the commercially available silicon solar PV module performs satisfactorily upto ~ 8 Sun concentration.

KEYWORDS: Concentrator Photovoltaics (CPV), Current-Voltage Characteristics, Modeling, Simulation.