Abstract

This paper presents a circuit based simulation model for a solar photovoltaic (PV) module to examine the estimated electrical performance parameters with the changes of environmental parameter such as solar irradiation and temperature. Modeling and simulation of a solar PV module is presented based on Shockley diode equations. The Solarex MSX 120, a typical 120W PV module is chosen for model performance evaluation. The mathematical model for the chosen module is implemented on matlab with respect to various temperatures, solar irradiations, diode quality factors and model series resistances and obtained I-V and P-V characteristics curves were compared with the manufacturer’s published curves which show precise correspondence to the model.

References

Modeling of Double Diode Solar Photovoltaic Module using Matlab

2003: IEEE.


Index Terms

Computer Science

Applied Mathematics

Keywords
Photovoltaic module, Solar irradiation, Modeling and behavior of PV cell, Temperature, Performance parameter, Photocurrent, I-V and P-V characteristics, MSX120 PV module, Double diode.