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

1. Lopes, L. and A.-M. Lienhardt. A simplified nonlinear power source for simulating PV


10. Solarex MSX120, 120W PV module datasheet.
http://www.solartaos.com/PDF/PV_Panels/solarexmsx120.pdf


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