

Method to determine the single curve IV characteristic parameter of solar cell

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Solar cell I-V characteristics curves are basically representation of relationship between the current and voltage at the existing conditions of irradiance and temperature. I-V curves provide the information required to configure a solar system. The parameters values of V_{oc} , I_{sc} , V_m , I_m and P_m , which can be experimentally measured. However, the circuit parameters reverse saturation current density (I_0), ideality factor (n), series resistance (R_s) and shunt resistance (R_{sh}) at a certain solar irradiance and ambient temperature can be obtained by solving the governing equations of the solar cell. The purpose of this paper is to determine the I_0 , n , R_s , and R_{sh} by the single IV-curve and the standard model of solar cell under different the irradiance intensity level (600-1000 W/m², temperature 25 °C) is being done in this paper. From the results of these experiments we found that, the value of I_0 is between 4.78×10^{-5} A to 7.19×10^{-5} A and n of between values is 1.33 to 1.39. The increasing of I_0 and n are caused by the increase in the recombination current at high irradiance intensity. On the other hand the parasitic resistance of R_s and R_{sh} are decrease at high intensity irradiance.

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