

Analysis of BSF Layer N-GaAs/P-GaAs/P+-GaAs Solar Cell

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Abstract : Back surface field GaAs with n-p-p+ structures are found to have better characteristics than the conventional solar cells. A theory, based on the transport of both minority carriers under the charge neutrality condition, has been developed in the present paper which explains behavior of the back surface field solar cells. That is reported with an efficiency of 25,05% ($J_{sc}=33.5\text{mA/cm}^2$, $V_{co}=0.87\text{v}$ and fill factor 86% under AM1.5 global conditions). We present the effect of technological parameters of the p+ layer on the conversion efficiency on the solar cell. Good agreement is achieved between our results and the simulation results given the variation of the equivalent recombination velocity to p+ layer as a function of BSF thickness and BSF doping.

Keywords : back surface field, GaAs, solar cell, technological parameters

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