

# Carrier Conducting Path in the Crystalline Silicon Solar Cells

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Current-voltage (I-V) measurements of crystalline silicon solar cells was conducted under dark conditions with the temperature range of 260 K~350 K. Using the calculation method, we extracted the crucial factors of ideality factor ( $n$ ) and activation energy ( $E_a$ ) to investigate the carrier conducting path in the space charge region (SCR) and the quasi-neutral region (QNR). Values of  $n$  were decreased with increasing temperature in both SCR and QNR. We also conformed that the value of  $E_a$  of SCR was larger than that of QNR about 0.4 eV. The temperature dependence of  $n$  indicates that the carrier conducting path is dominated by carrier recombination-generation in the SCR region than in the QNR region.

**Keywords:** Solar cells, Ideality factor, Activation energy