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(54) **SINGLE P-N JUNCTION TANDEM PHOTOVOLTAIC DEVICE**

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(57) **ABSTRACT**

A single P-N junction solar cell is provided having two depletion regions for charge separation while allowing the electrons and holes to recombine such that the voltages associated with both depletion regions of the solar cell will add together. The single p-n junction solar cell includes an alloy of either InGaN or InAlN formed on one side of the P-N junction with Si formed on the other side in order to produce characteristics of a two junction (2J) tandem solar cell through only a single P-N junction. A single P-N junction solar cell having tandem solar cell characteristics will achieve power conversion efficiencies exceeding 30%.

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