

The impact on photovoltaic efficiency with regards to defect densities of amorphous silicon layers and carrier recombina

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ABSTRACT

This study involves the novel heterojunction with intrinsic thin layer (HIT) solar cell structure. Combining the advantages of both crystalline silicon and amorphous silicon, a new structure of silicon-based solar cell was proposed - the heterojunction with an intrinsic thin layer (HIT) solar cell. It has high stability and large light absorption coefficient. It is manufactured under low temperature deposit process, which results in a low cost thin film HIT solar cell with high conversion efficiency. The influence of various layer materials and interfaces on the performance of n-type c-Si based bifacial HIT solar cell has been investigated by using the Silvaco TCAD simulation software. Accordingly, the design optimization of HIT solar cell was proven.

Keywords : Amorphous Silicon、HIT(Heterojunction with Intrinsic Thin Layer)、Solar Cells、Silvaco TCAD、Simulation

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