

عنوان مقاله:

Numerical Evaluation and Characterization of Single Junction Solar Cell Based on Thin-Film a-Si:H/a-SiGe:H Hetero-Structure

محل انتشار:

نوزدهمین کنفرانس مهندسی برق ایران (سال: 1390)

تعداد صفحات اصل مقاله: 6

نویسندگان:

Abdolnabi Kosarian - *Shahid Chamran University of Ahvaz*

Peyman Jelodarian

خلاصه مقاله:

In amorphous thin film p-i-n solar cell, a thick absorber layer (i-layer) can absorb more light to generate electron and hole (carriers); however, a thicker i-layer degrades the drift electric field for carrier transport. On the other hand, a thin i-layer cannot absorb enough light. Thickness of i-layer is a key parameter that can limit the performance of amorphous thin film solar cells. Introducing Ge atoms to the Si lattice in Si-based solar cells is an effective approach in improving their characteristics. Especially, current density of the cell can be enhanced without deteriorating its open circuit voltage, due to the modulation of material band-gap and the formation of a hetero-structure. This work presents a numerical evaluation of single junction solar cell based on the optimization of the Ge content in the film, thickness of i-layer, p-layer and doping concentration of p-layer in a (p-layer a-Si:H/i-layer a-SiGe:H/n-layer a-Si:H) single junction thin film solar cell for use in multijunction thin film solar cells and maximum efficiency of 18.4% is obtained

کلمات کلیدی:

Silicon-Germanium, Amorphous silicon, Amorphous solar cell, Amorphous silicon solar cell simulation, a-Si/a-SiGe

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/154087>

