

Can an electric field be applied to a silicon solar cell?

As the future work, the effect of an electric field in presence of a magnetic field both simultaneously applied to a silicon solar cell can be theoretically analyzed and experimentally evaluated.

Can field effect passivation reduce surface recombination losses in solar cells?

The first experimental attempts to reduce surface recombination losses in solar cells by means of the field effect passivation method were performed in the late 70s: Schwartz et al. investigated the impact of a gate voltage on the short circuit current I_{sc} of an "interdigitated back contact" (IBC) concentrator cell.

What is the effect of magnetic field on silicon PV cells?

The influence of magnetic field was evaluated in theory using a proposed 3-D model [13]. It was shown that in theory, magnetic field impose a reduction in the cell's output power. Another model dealing with magnetic field effect on a bi-facial silicon PV cell was also reported [14].

How is a magnetic field applied to three solar cells?

A magnetic field was produced and applied to the three solar cells in the direction perpendicular to the junction electric field of the cells using a solenoid with inductance of 113 mH. The strength of the magnetic field was changed from 0 to 600 mT by changing the electric current supplied to the solenoid.

What makes a good solar cell?

Our solar cells are large area top-down axial n-p junction silicon nanowires fabricated by means of Near-Field Phase-Shift Lithography (NF-PSL). We report an efficiency of 9.9% for the best cell, passivated with a $\text{SiO}_2/\text{SiN}_x$ stack. The impact of the presence of a surface fixed charge density at the silicon/oxide interface is studied.

Does DC magnetic field affect the open-circuit voltage of a solar cell?

The influence of DC magnetic field on the open-circuit voltage of a solar cell was assessed in practice by applying a DC magnetic field to a solar cell illuminated by white light [11]. The intensity of the magnetic field was in the range of 0.003 T-0.079 T, and it was observed that the cell's voltage is not affected by magnetic field.

The reverse-bias resilience of perovskite-silicon tandem solar cells under field conditions--where cell operation is influenced by varying solar spectra and the specifications ...

Analyzing photovoltaic effect of double-layer organic solar cells as a Maxwell-Wagner effect system by optical electric-field-induced second-harmonic generation measurement

Field effect (FE) a-Si:H solar cell promises an effective increase of conversion efficiency, respect to thin film

p-i-n solar cells, by the use of an inversion layer at the cell ...

perovskite solar cells (PSCs). However, state-of-the-art surface passivation techniques rely on ammonium ligands that suffer deprotonation under light and thermal stress. We developed a ...

Although many fabrication and characterization technologies of silicon solar cells have been successfully implemented in PSCs, field-effect passivation, as an efficient method that ...

Surface recombination represents a handicap for high-efficiency solar cells. This is especially important for nanowire array solar cells, where the surface-to-volume ratio is ...

This finding provides a novel concept to design solar cell by sacrificing part of sunlight to provide "extra" asymmetrical field continuously as to drive photogenerated carrier ...

In order to probe the consequence in D-A solar cells, we prepared bilayer devices incorporating either DBP or SubNc combined with a series of chloroboron subphthalocyanine (SubPc) derivatives with various ...

Field-effect doped p-n junctions have long been proposed yet substantial advances were only recently achieved with a ~18% solar cell, and a field-effect photodiode. These, however, used ...

Solar Energy Materials and Solar Cells, Volume 269, 112799, 2024. Hydrogen passivation from dielectrics plays a pivotal role in enhancing the performance of silicon solar cells. In our latest ...

Subsequently, the implications of this effect in bilayer organic solar cells with SubNc as the donor are demonstrated, showing that the external and internal quantum efficiencies in such cells are independent of the donor ...

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