Amplitude-frequency characteristics of silicon photovoltaic cells

Is the impedance of a monocrystalline silicon solar cell mainly resistive?
The analysis of the impedance showed that the phase angle increases from negative to positive values. The phase spectra of the impedance for the monocrystalline silicon solar cell under dark and illumination conditions at high frequencies reached zero,indicating that the impedance was mainly resistive.

Do different types of solar cells have different HPM response characteristics?
In this paper, the different HPM response characteristics of two kinds of solar cells are comparatively researched by simulation. The results show that there are similarities and differences in hot spot distribution and damage mechanisms between both kinds of solar cell, which are related to the amplitude of HPM.

What is inductive behaviour in a silicon solar cell?
At high FB condition,an inductive behaviour is observed in the high frequency range. For a silicon solar cell,inductance has no meaningbut the use of inductive element in the equivalent circuit improves the determination of physical parameters.

How to determine dynamic impedance of a solar cell?
The dynamic impedance of the solar cell can be then be determined using the FFT techniqueand the output response. The measurement period required is smaller than the one for the impedance spectroscopy with ac sinusoidal signal because the impedance locus is obtained using few square wave inputs.

Which spectra are obtained at 25 °C for silicon solar cells?
Garland et al. reported IS spectraobtained at 25 °C for silicon solar cells with controlled variation of DC bias. Fig. 6 represents the complex Nyquist spectra as a function of applied bias where the line and symbols represent the theoretical and experimental data,respectively.

Can a polycrystalline silicon solar cell work under low concentration?
The results shown here along with J-V characteristics confirm that the commercially available polycrystalline silicon solar cell can work satisfactorily under low concentration(<3.5 suns),whereas at high concentration the dominance of QNR over SCR can lead to decrease in the ? of a solar cell.

The results show that there are similarities and differences in hot spot distribution and damage mechanisms between both kinds of solar cell, which are related to the ...

The results shown here along with J-V characteristics confirm that the commercially available polycrystalline silicon solar cell can work satisfactorily under low ...

Keywords: Silicon solar cell, Silicon material, Crystalline silicon, Thin-film silicon, Next generation solar cell,

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High efficiency solar cell DOI: 10.3938/jkps.65.355

Impedance measurements on the silicon solar cell showed a decrease of the magnitude of Z? in its values with the increase of light illumination, which could be interpreted ...

Figure Fig. 5. (Color online) The variation of HPM sinusoidal signal with time and the variation of peak temperature of the silicon solar cell under injecting this signal with time. Figure Fig. 6. (Color online) The GaAs solar cell when it is burned ...

The aforementioned research shows that the noise in solar cells mainly manifests as 1/f noise, microplasma noise, and G-R noise. According to the mechanism of the ...

This article examines the best fraction of indium (x) and critical depth (H) of a single junction tandem photovoltaic (PV) cell (InxGa1-xN) in the vein to optimize its electrical ...

ferences in hot spot distribution and damage mechanisms between both kinds of solar cell, which are related to the amp- litude of HPM. In addition, the duty cycle of repetition frequency ...

Figure 2 (b) presents the photovoltaic characteristics of planar Si p-n junction solar cell with 4-layer FLG transparent electrode under AM 1.5G light irradiation. Apparently, ...

Various cell crack modes (with or without electrically inactive cell areas) can be induced in crystalline silicon photovoltaic (PV) cells within a PV module through natural ...

Abstract The effect of irradiation with low-energy protons on the pulse characteristics of silicon photovoltaic structures is studied. Bipolar rectangular voltage pulses ...

2.1 Quantum efficiency of solar cells. The quantum efficiency ((Q_e)) of a solar cell is the ratio of charge carrier produced at the external circuit of the cell (electronic device) ...

In this study, we show that IS provides valuable information about the factors determining the photoelectric characteristics of a heterojunction silicon (Si) solar cell at various ...

Applying excitations of different frequencies and intensities the device can be characterized on by measuring the phase-shift and amplitude dependence on the frequency.

This estimate, evaluates the silicon wafer-based PV market at about 92% of total commercial PV cell types and also indicates increasing penetration of silicon based PV. Thus, there is a ...

In this paper, the current voltage (I-V), imaginary part-real part (-Z"" vs. Z"), and conductance-frequency

(G-F) measurements were realized to analyze the electrical properties ...

This type of solar cell includes: (1) free-standing silicon "membrane" cells made from thinning a silicon wafer, (2) silicon solar cells formed by transfer of a silicon layer or solar cell structure ...

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