Illumination characteristics of silicon photovoltaic cells

Do thin-film silicon solar cells achieve 20% efficiency in LED illumination?
Thin-film silicon solar cells' performance is assessed for different light sources. PV parameters are dependent on light source and illumination intensity. Thin-film amorphous silicon solar cell reaches 20% efficiencyin LED illumination. Experimental characteristics are correlated to basic theoretical predictions.

Are solar cells based on light source and illumination intensity?
PV parameters are dependent on light source and illumination intensity. Thin-film amorphous silicon solar cell reaches 20% efficiency in LED illumination. Experimental characteristics are correlated to basic theoretical predictions. The performance of a solar cell is inherently dependent on the illumination spectrum and intensity.

How does illumination affect the performance of a solar cell?
The performance of a solar cell is inherently dependent on the illumination spectrum and intensity. Therefore standard characterization under AM1.5 illumination represents only one point in a large parameter space.

Which solar cells can be characterized at illuminations other than AM1.5?
Characterizing solar cells at illuminations other than AM1.5 have been reported for various solar cell types: crystalline silicon,thin-film silicon and also for organic solar cells .

How does light intensity affect a solar cell?
Changing the light intensity incident on a solar cell changes all solar cell parameters,including the short-circuit current,the open-circuit voltage,the FF,the efficiency and the impact of series and shunt resistances.

Can thin-film silicon solar cells be used in portable electronics?
In view of potential applications in portable electronics, obtaining reference data on the performance under varying light sources and illumination intensity for a comprehensive set of thin-film silicon solar cells (TFSC) is a primary motivation of our study.

DOI: 10.1016/J.EGYPRO.2013.07.084 Corpus ID: 4711393; Effect of Illumination Intensity on Solar Cells Parameters @article{Chegaar2013EffectOI, title={Effect of Illumination Intensity on ...

In addition, illumination dependencies of photovoltaic parameters provide deeper understanding of the operation and limitations of thin-film silicon solar cell for both indoor and ...

The electrical performance of a crystalline silicon photovoltaic cell model with non-uniform illumination profile generated by the CPC-PV cell concentrator is compared to ...

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The characteristics of bifacial solar cells with different rear structures were investigated under front, rear and bifacial illumination with an intensity of 0.4-4.2 suns. Five kinds of solar cells, ...

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 applied voltages in the dark and under ...

The photovoltaic properties of a monocrystalline silicon solar cell were investigated under dark and various illuminations and were modeled by MATLAB programs.

This work presents the influence of the irradiance intensity level on different parameters (ideality factor, saturation current, series resistance, shunt resistance...) of polycrystalline silicon...

1839: Photovoltaic Effect Discovered: Becquerel"s initial discovery is serendipitous; he is only 19 years old when he observes the photovoltaic effect. 1883: First Solar Cell: Fritts" solar cell, ...

This work presents the influence of the irradiance intensity level on different parameters (ideality factor, saturation current, series resistance, shunt resistance...) of ...

Impedance spectroscopy characterisation of highly efficient silicon solar cells under different light illumination intensities Ivan Mora-Sero,a Germa Garcia-Belmonte,a Pablo P. Boix,a Miguel A ...

Photovoltaic parameters of silicon solar cell were measured under white light intensities. In Figs. 2a and b, the characteristics of the I vs V and P vs V curves are shown, ...

The I-V characteristics of silicon solar cell at room temperature are shown in above graph. Power delivered is equal to the product of current and voltage of the solar cell. ...

3 Estimating the Effect of Sun Tracking on Energy Generation by Solar PV Modules; 4 Efficiency Measurement of Standalone Solar PV System; 5 Dark and Illuminated ...

The excitation is composed of a biasing light that drives the cell to a proper injection-level and a superposed small-signal sinusoidal illumination. The theoretical analysis is based in the classic ...

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 ...

Steady improvement in the performance of photovoltaic devices requires an in-depth understanding of their operation and the knowledge of their various properties and ...

Silicon dioxide (SiO 2) is widely used to improve the surface passivation properties of silicon solar cells.To

minimize solar cell potential-induced degradation when the ...

Khan et al [2] applied the variation of slopes of the I-V curves of a cell at short circuit and open circuit conditions to determine the parameters of the cell, namely the series ...

The current-voltage characteristic curve, also known as the I-V curve, is an essential characteristic of solar cells, which is used to illustrate the relationship between the ...

Changing the light intensity incident on a solar cell changes all solar cell parameters, including the short-circuit current, the open-circuit voltage, the FF, the efficiency and the impact of series ...

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