

其它

硅太阳能电池特性及其最大功率点跟踪的仿真

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摘要:

摘要: 以LabVIEW软件为工具,在硅太阳能电池输出特性基础上建立硅太阳能电池的仿真模型,在不同日照强度的条件下对硅太阳能电池输出特性曲线的情况进行仿真,并通过软件编程使系统可以确定负载等效电阻来进行最大功率点跟踪,同时仿真硅太阳能电池暗电流对电池最大工作点和填充因子的影响.仿真结果验证了硅太阳能电池输出特性曲线的非线性特征,且特性曲线受日照强度的变化而变化,最大功率点跟踪仿真的结果表明,本系统可以很好地求解最适宜的等效负载以稳定最大功率点,并得到了匹配负载和光照强度具有反比例相关性的结论.填充因子仿真证明了硅太阳能电池暗电流对电池最大功率点产生较大影响并直接影响硅太阳能电池的填充因子.

关键词: 关键词: LabVIEW; 输出特性; 最大功率点跟踪

Simulation of characteristics of silicon solar cells and its maximum power point tracking

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Abstract:

Abstract: A model of silicon solar cells based on its output characteristic was built in this system, by using LabVIEW

as software. Output characteristics of silicon solar cells and the maximum power point tracking system were simulated under

different solar intensities. The influence of the dark current on the maximum power point and the fill factor of silicon solar

cells were also simulated. The simulation results verify the nonlinear output characteristics of silicon solar cell, and the

effectiveness of this system in determining the most appropriate load to stabilize the maximum power point of the cell. And the

conclusion that the correlation between the optimum matched resistance and the solar intensities is hyperbola, which was drawn

by analyzing the simulation results. It was also proved by the results that the dark current is a key factor to the maximum

power point and the fill factor of silicon solar cells.

Keywords: Key words: LabVIEW; output characteristic; maximum power point tracking

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