

This book provides a comprehensive introduction to the physics of the photovoltaic cell. It is suitable for undergraduates, graduate students, and researchers new to the field. It covers: basic physics of semiconductors in photovoltaic devices; physical models of solar cell operation; characteristics and design of common types of solar cell; and approaches to ...

Photovoltaic Solar Energy. Thoroughly updated overview of photovoltaic technology, from materials to modules and systems. Volume 2 of Photovoltaic Solar Energy provides fundamental and contemporary knowledge about various photovoltaic technologies in the framework of material science, device physics of solar cells, chemistry for manufacturing, ...

This book gives a comprehensive introduction to the field of photovoltaic (PV) solar cells and modules. In thirteen chapters, it addresses a wide range of topics including the spectrum of light received by PV devices, the basic functioning of ...

These books are covering solar cell materials, photovoltaic principles, efficiency optimization, energy conversion processes, semiconductor physics, solar cell manufacturing and applications of solar cells in various industries. 1. Solar Cells 2020 by Majid Nayeripour, Mahdi Mansouri, Farnaz Orooji, Eberhard Waffenschmidt

Solar cell energy is the single most pressing issue facing humanity, with a more technologically advanced society requiring better energy resources. ... The major areas covered in this book are ...

This book covers solar cell fabrication, design and performance, properties of sunlight, and practical aspects of photovoltaic systems.

This book discusses the manufacturing processes of photovoltaic solar cells, from conventional silicon cells, to thin-film ... processes used to synthesize materials for emerging photovoltaic technologies such as thin-film and third-generation ...

This book addresses the rapidly developing class of solar cell materials and designed to provide much needed information on the fundamental principles of these materials, together with how these are employed in photovoltaic ...

This book contains a detailed and logical step-by-step explanation of thermodynamically-consistent solar cell operating physics, a comparison of advanced multi-junction CPV power plants versus combined-cycle thermal power plants in the framework of energy cascading, and a discussion of solar cell semiconductor resource limitations and the scalability of solar ...

Recently Heliatek [5], a German firm, has achieved a record conversion efficiency of 13.2% for an Organic Photovoltaic (OPV) Multi-junction (MJ) cell using small molecules. The cell has three absorber layers for absorbing light from the near infrared, red and green wavelengths, covering the major part of the solar spectrum from 450 nm to 950 nm.

Abstract. After learning the fundamental physics of pn junctions and solar cells in Chapter 3, we are ready to dive further into their electrical characteristics. In known input parameters, such as photocurrent, recombination current, and resistance components, we build a model to compute the response of the solar cell when it is illuminated and electrically biased.

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