

Solar Cell Voltage Current Characterization

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Solar Cell Array Design Handbook - Hans S. Rauschenbach 2012-12-06

Generation and Utilization of Electrical Energy - S. Sivanagaraju 2010

Generation and Utilization of Electrical Energy is a comprehensive text designed for

undergraduate courses in electrical engineering. The text introduces the reader to the generation of electrical energy and then goes on to explain how this energy can be effectively utilized for various applications like welding, electric traction, illumination, and electrolysis. The detailed explanations of practical applications

make this an ideal reference book both inside and outside the classroom.

Design, Fabrication, and Characterization of Multifunctional Nanomaterials - Sabu

Thomas 2021-11-24

Design, Fabrication, and Characterization of Multifunctional Nanomaterials covers major techniques for the design, synthesis, and development of multifunctional nanomaterials. The chapters highlight the main characterization techniques, including X-ray diffraction, scanning electron microscopy, high-resolution transmission electron microscopy, energy dispersive X-ray spectroscopy, and scanning probe microscopy. The book explores major synthesis methods and functional studies, including: Brillouin spectroscopy; Temperature-dependent Raman spectroscopic studies; Magnetic, ferroelectric, and magneto-electric coupling analysis; Organ-on-a-chip methods for testing nanomaterials; Magnetron sputtering techniques; Pulsed laser deposition techniques;

Positron annihilation spectroscopy to prove defects in nanomaterials; Electroanalytic techniques. This is an important reference source for materials science students, scientists, and engineers who are looking to increase their understanding of design and fabrication techniques for a range of multifunctional nanomaterials. Explains the major design and fabrication techniques and processes for a range of multifunctional nanomaterials; Demonstrates the design and development of magnetic, ferroelectric, multiferroic, and carbon nanomaterials for electronic applications, energy generation, and storage; Green synthesis techniques and the development of nanofibers and thin films are also emphasized.

Survey of Solar Energy Products and Services-- May 1975, Prepared for the Subcommittee on Energy Research, Development, and Demonstration Of..., June 1975 - United States. Congress. House. Science and Technology Committee 1975

Thin Film Solar Cells - K.L. Chopra 1983-07-31
"You, O Sun, are the eye of the world You are the soul of all embodied beings You are the source of all creatures You are the discipline of all engaged in work" - Translated from Mahabharata 3rd Century BC Today, energy is the lifeline and status symbol of "civilized" societies. All nations have therefore embarked upon Research and Development programs of varying magnitudes to explore and effectively utilize renewable sources of energy. Albeit a low-grade energy with large temporal and spatial variations, solar energy is abundant, cheap, clean, and renewable, and thus presents a very attractive alternative source. The direct conversion of solar energy to electricity (photovoltaic effect) via devices called solar cells has already become an established frontier area of science and technology. Born out of necessity for remote area applications, the first commercially manufactured solar cells - single-crystal silicon and thin film CdS/Cu₂S - were

available well over 20 years ago. Indeed, all space vehicles today are powered by silicon solar cells. But large-scale terrestrial applications of solar cells still await major breakthroughs in terms of discovering new and radical concepts in solar cell device structures, utilizing relatively more abundant, cheap, and even exotic materials, and inventing simpler and less energy intensive fabrication processes. No doubt, this extraordinary challenge in R/D has led to a virtual explosion of activities in the field of photovoltaics in the last several years.

Nanomaterials for Solar Cell Applications - Sabu Thomas 2019-06-12

Nanomaterials for Solar Cell Applications provides a review of recent developments in the field of nanomaterials based solar cells. It begins with a discussion of the fundamentals of nanomaterials for solar cells, including a discussion of lifecycle assessments and characterization techniques. Next, it reviews various types of solar cells, i.e., Thin film, Metal-

oxide, Nanowire, Nanorod and Nanoporous materials, and more. Other topics covered include a review of quantum dot sensitized and perovskite and polymer nanocomposites-based solar cells. This book is an ideal resource for those working in this evolving field of nanomaterials and renewable energy. Provides a well-organized approach to the use of nanomaterials for solar cell applications. Discusses the synthesis, characterization and applications of traditional and new material. Includes coverage of emerging nanomaterials, such as graphene, graphene-derivatives and perovskites.

Silicon Solar Cell Process Development, Fabrication and Analysis - Joseph A. Minahan
1979

Characterization Techniques for Perovskite Solar Cell Materials - Meysam Pazoki
2019-11-14
Characterization Techniques for Perovskite

Solar Cell Materials: Characterization of Recently Emerged Perovskite Solar Cell Materials to Provide an Understanding of the Fundamental Physics on the Nano Scale and Optimize the Operation of the Device Towards Stable and Low-Cost Photovoltaic Technology explores the characterization of nanocrystals of the perovskite film, related interfaces, and the overall impacts of these properties on device efficiency. Included is a collection of both main and research techniques for perovskite solar cells. For the first time, readers will have a complete reference of different characterization techniques, all housed in a work written by highly experienced experts. Explores various characterization techniques for perovskite solar cells and discusses both their strengths and weaknesses. Discusses material synthesis and device fabrication of perovskite solar cells. Includes a comparison throughout the work on how to distinguish one perovskite solar cell from another.

Organic Solar Cells - Wolfgang Tress

2014-11-22

This book covers in a textbook-like fashion the basics of organic solar cells, addressing the limits of photovoltaic energy conversion and giving a well-illustrated introduction to molecular electronics with focus on the working principle and characterization of organic solar cells. Further chapters based on the author's dissertation focus on the electrical processes in organic solar cells by presenting a detailed drift-diffusion approach to describe exciton separation and charge-carrier transport and extraction. The results, although elaborated on small-molecule solar cells and with focus on the zinc phthalocyanine: C60 material system, are of general nature. They propose and demonstrate experimental approaches for getting a deeper understanding of the dominating processes in amorphous thin-film based solar cells in general. The main focus is on the interpretation of the current-voltage characteristics (J-V curve). This

very standard measurement technique for a solar cell reflects the electrical processes in the device. Comparing experimental to simulation data, the author discusses the reasons for S-Shaped J-V curves, the role of charge carrier mobilities and energy barriers at interfaces, the dominating recombination mechanisms, the charge carrier generation profile, and other efficiency-limiting processes in organic solar cells. The book concludes with an illustrative guideline on how to identify reasons for changes in the J-V curve. This book is a suitable introduction for students in engineering, physics, material science, and chemistry starting in the field of organic or hybrid thin-film photovoltaics. It is just as valuable for professionals and experimentalists who analyze solar cell devices.

Scientific and Technical Aerospace Reports - 1981

[The Origins of Non-ideal Current Voltage](#)

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Characteristics of Silicon Solar Cells - Jan Bauer 2009

In this work the origins of non-ideal current-voltage characteristics of multicrystalline silicon solar cells are investigated and new lock-in thermography methods are introduced. Based on the ideal current-voltage characteristic of solar cells, the physical origins of the non-idealities are shown. At first, the influences of the serial- and parallel (shunt) resistance and the diffusion- and recombination current on the current-voltage characteristic in forward biased solar cells are described. Furthermore, investigations on SiC precipitates causing very low shunt resistances and their growth are shown. The main part of this work deals with the non-ideal behavior of solar cells biased in reverse direction. The origins of electrical breakdown, the characterization of the breakdown sites, and a description of new lock-in thermography methods for imaging the physical parameters of breakdown sites are given.

SERI Photovoltaic Advanced Research and Development Bibliography, 1982-1985 - 1986

Crystalline Silicon Solar Cells - Saleem Hussain Zaidi 2021-08-02

This book focuses on crystalline silicon solar cell science and technology. It is written from the perspective of an experimentalist with extensive hands-on experience in modeling, fabrication, and characterization. A practical approach to solar cell fabrication is presented in terms of its three components: materials, electrical, and optical. The materials section describes wafer processing methods including saw damage removal, texturing, diffusion, and surface passivation. The electrical section focuses on formation of ohmic contacts on n and p-doped surfaces. The optical section illustrates light interaction with textured silicon surfaces in terms of geometrical, diffractive and physical optics, transmission, and surface photovoltage (SPV) spectroscopy. A final chapter analyzes

performance of solar cells, fabricated with a wide range of process parameters. A brief economic analysis on the merits of crystalline silicon-based photovoltaic technology as a cottage industry is also included./div This professional reference will be an important resource for practicing engineers and technicians working with solar cell and PV manufacturing and renewable energy technologies, as well as upper-level engineering and material science students. Presents a practical approach to solar cell fabrication, and characterization; Offers modular methodology with detailed equipment and process parameters supported by experimental results; Includes processing diagrams and tables for 16% efficient solar cell fabrication.

Chalcogenide Photovoltaics - Roland Scheer
2011-03-31

This first comprehensive description of the most important material properties and device aspects closes the gap between general books on

solar cells and journal articles on chalcogenide-based photovoltaics. Written by two very renowned authors with years of practical experience in the field, the book covers II-VI and I-III-VI₂ materials as well as energy conversion at heterojunctions. It also discusses the latest semiconductor heterojunction models and presents modern analysis concepts. Thin film technology is explained with an emphasis on current and future techniques for mass production, and the book closes with a compendium of failure analysis in photovoltaic thin film modules. With its overview of the semiconductor physics and technology needed, this practical book is ideal for students, researchers, and manufacturers, as well as for the growing number of engineers and researchers working in companies and institutes on chalcogenide photovoltaics.

2019 14th IEEE International Conference on Electronic Measurement and Instruments (ICEMI) - IEEE Staff 2019-11

The international conference on electronic measurement & instruments (ICEMI) is sponsored by IEEE Beijing Section and China Instrument and Control Society and held every two years ICEMI dedicated to the electronic test of devices, modules and systems which is covering the complete cycle from design verification, test, diagnosis, failure analysis and back to process and design improvement The purpose of the ICEMI is to provide excellent opportunities for scientists, engineers, and participants throughout the world to present the latest research results and to exchange their views or experience

Thin Film Solar Cells - Jef Poortmans

2006-10-02

Thin-film solar cells are either emerging or about to emerge from the research laboratory to become commercially available devices finding practical various applications. Currently no textbook outlining the basic theoretical background, methods of fabrication and

applications currently exist. Thus, this book aims to present for the first time an in-depth overview of this topic covering a broad range of thin-film solar cell technologies including both organic and inorganic materials, presented in a systematic fashion, by the scientific leaders in the respective domains. It covers a broad range of related topics, from physical principles to design, fabrication, characterization, and applications of novel photovoltaic devices.

Energy Research and Development and Small Business - United States. Congress. Senate. Select Committee on Small Business 1975

Applied Photovoltaics - Stuart R. Wenham

2013-01-11

The new edition of this thoroughly considered textbook provides a reliable, accessible and comprehensive guide for students of photovoltaic applications and renewable energy engineering. Written by a group of award-

winning authors it is brimming with information and is carefully designed to meet the needs of its readers. Along with exercises and references at the end of each chapter, it features a set of detailed technical appendices that provide essential equations, data sources and standards. The new edition has been fully updated with the latest information on photovoltaic cells, modules, applications and policy. Starting from basics with 'The Characteristics of Sunlight' the reader is guided step-by-step through semiconductors and p-n junctions; the behaviour of solar cells; cell properties and design; and PV cell interconnection and module fabrication. The book covers stand-alone photovoltaic systems; specific purpose photovoltaic systems; remote area power supply systems; grid-connected photovoltaic systems and water pumping. Applied Photovoltaics is highly illustrated and very accessible, providing the reader with all the information needed to start working with photovoltaics.

Photovoltaic Solar Energy - Angèle Reinders
2017-02-06

Solar PV is now the third most important renewable energy source, after hydro and wind power, in terms of global installed capacity. Bringing together the expertise of international PV specialists Photovoltaic Solar Energy: From Fundamentals to Applications provides a comprehensive and up-to-date account of existing PV technologies in conjunction with an assessment of technological developments. Key features: Written by leading specialists active in concurrent developments in material sciences, solar cell research and application-driven R&D. Provides a basic knowledge base in light, photons and solar irradiance and basic functional principles of PV. Covers characterization techniques, economics and applications of PV such as silicon, thin-film and hybrid solar cells. Presents a compendium of PV technologies including: crystalline silicon technologies; chalcogenide thin film solar cells;

thin-film silicon based PV technologies; organic PV and III-Vs; PV concentrator technologies; space technologies and economics, life-cycle and user aspects of PV technologies. Each chapter presents basic principles and formulas as well as major technological developments in a contemporary context with a look at future developments in this rapidly changing field of science and engineering. Ideal for industrial engineers and scientists beginning careers in PV as well as graduate students undertaking PV research and high-level undergraduate students. Energy: a Continuing Bibliography with Indexes - 1976

Solar Energy Update - 1984

Advanced Characterization Techniques for Thin Film Solar Cells - Daniel Abou-Ras 2016-07-13
The book focuses on advanced characterization methods for thin-film solar cells that have proven their relevance both for academic and

corporate photovoltaic research and development. After an introduction to thin-film photovoltaics, highly experienced experts report on device and materials characterization methods such as electroluminescence analysis, capacitance spectroscopy, and various microscopy methods. In the final part of the book simulation techniques are presented which are used for ab-initio calculations of relevant semiconductors and for device simulations in 1D, 2D and 3D. Building on a proven concept, this new edition also covers thermography, transient optoelectronic methods, and absorption and photocurrent spectroscopy. *Recent Developments in Photovoltaic Materials and Devices* - Natarajan Prabakaran 2019-02-13
This book covers the recent advances in solar photovoltaic materials and their innovative applications. Many problems in material science are explored for enhancing the understanding of solar cells and the development of more efficient, less costly, and more stable cells. This

book is crucial and relevant at this juncture and provides a historical overview focusing primarily on the exciting developments in the last decade. This book primarily covers the different Maximum Power Point Tracking control techniques that have led to the improved speed of response of solar photovoltaics, augmented search accuracy, and superior control in the presence of perturbations such as sudden variations in illumination and temperature. Furthermore, the optimal design of a photovoltaic system based on two different approaches such as consumed power and economics is discussed.

Printed Electronics - Zheng Cui 2016-04-12

This book provides an overview of the newly emerged and highly interdisciplinary field of printed electronics • Provides an overview of the latest developments and research results in the field of printed electronics • Topics addressed include: organic printable electronic materials, inorganic printable electronic materials, printing

processes and equipments for electronic manufacturing, printable transistors, printable photovoltaic devices, printable lighting and display, encapsulation and packaging of printed electronic devices, and applications of printed electronics • Discusses the principles of the above topics, with support of examples and graphic illustrations • Serves both as an advanced introductory to the topic and as an aid for professional development into the new field • Includes end of chapter references and links to further reading

Solar Cells—Advances in Research and Application: 2013 Edition - 2013-06-21

Solar Cells—Advances in Research and Application: 2013 Edition is a

ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Hybrid Solar Cells. The editors have built *Solar Cells—Advances in Research and Application: 2013 Edition* on the vast information databases of ScholarlyNews.™ You

can expect the information about Hybrid Solar Cells in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of *Solar Cells—Advances in Research and Application: 2013 Edition* has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

The Physics of Solar Cells - Jenny Nelson
2003-05-09

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 increasing solar cell efficiency. The text explains the terms and concepts of solar cell device physics and shows the reader how to formulate and solve relevant physical problems. Exercises and worked solutions are included.

[Solar Cells Based on Colloidal Nanocrystals](#) -
Holger Borchert 2014-04-01

This book presents a new system of solar cells. Colloidal nanocrystals possess many physical and chemical properties which can be manipulated by advanced control over structural features like the particle size. One application field is photovoltaics where colloidal semiconductor nanocrystals are explored as components of photo-active layers which can be produced from liquid media, often in combination with conductive polymers. The further development of this interdisciplinary

field of research requires a deep understanding of the physics and chemistry of colloidal nanocrystals, conducting polymers and photovoltaic devices. This book aims at bridging gaps between the involved scientific disciplines and presents important fundamentals and the current state of research of relevant materials and different types of nanoparticle-based solar cells. The book will be of interest to researchers and PhD students. Moreover, it may also serve to accompany specialized lectures in related areas.

Materials analysis methods for examination of solar cells - 1980

Energy - 1977

Origins of Non-Ideal Current-Voltage Characteristics of Si Solar Cells - Jan Bauer 2012
Solar cells made from multicrystalline silicon material may suffer from defects affecting the power conversion. Such detrimental effects manifest themselves in current-voltage

characteristics of the cells showing deviations from the ideal case. In this book a large variety of defects and the corresponding mechanisms, which influence the solar cell performance, are discussed. Several defects affecting mainly the forward current-voltage characteristic are reviewed. The main focus is on the breakdown behavior of solar cells, i.e. on the reverse current of solar cells. Spatially resolved lock-in thermography methods are presented for the quantitative analysis of the physical parameters of breakdown sites in solar cells, such as temperature coefficient and reverse current. The physical mechanisms behind the different breakdown types, namely early breakdown, defect-induced breakdown, and avalanche breakdown, are described in detail. The book is addressed to scientists and engineers working in the field of solar cells and solar cell materials.

Energy Research Abstracts - 1989

Semiconductor Material and Device

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Characterization - Dieter K. Schroder
2015-06-29

This Third Edition updates a landmark text with the latest findings. The Third Edition of the internationally lauded *Semiconductor Material and Device Characterization* brings the text fully up-to-date with the latest developments in the field and includes new pedagogical tools to assist readers. Not only does the Third Edition set forth all the latest measurement techniques, but it also examines new interpretations and new applications of existing techniques.

Semiconductor Material and Device Characterization remains the sole text dedicated to characterization techniques for measuring semiconductor materials and devices. Coverage includes the full range of electrical and optical characterization methods, including the more specialized chemical and physical techniques. Readers familiar with the previous two editions will discover a thoroughly revised and updated Third Edition, including: Updated and revised

figures and examples reflecting the most current data and information. 260 new references offering access to the latest research and discussions in specialized topics. New problems and review questions at the end of each chapter to test readers' understanding of the material. In addition, readers will find fully updated and revised sections in each chapter. Plus, two new chapters have been added: Charge-Based and Probe Characterization introduces charge-based measurement and Kelvin probes. This chapter also examines probe-based measurements, including scanning capacitance, scanning Kelvin force, scanning spreading resistance, and ballistic electron emission microscopy. Reliability and Failure Analysis examines failure times and distribution functions, and discusses electromigration, hot carriers, gate oxide integrity, negative bias temperature instability, stress-induced leakage current, and electrostatic discharge. Written by an internationally recognized authority in the field, *Semiconductor*

Material and Device Characterization remains essential reading for graduate students as well as for professionals working in the field of semiconductor devices and materials. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.

Spatially Resolved Characterization in Thin-Film Photovoltaics - Matevž Bokalič

2015-01-22

The book is devoted to the spatial characterization of solar cells and PV modules. It is written both as a monograph as well as a succinct guide for the state-of-the-art spatial characterization techniques and approaches. Amongst the approaches discussed are visual imaging, electro- and photo-luminescence imaging, thermography, and light beam induced mapping techniques. Emphasis is given on the luminescence image acquisition and interpretation due to its great potential. Characterization techniques are accompanied by

simulation tools. The contents are aimed at a readership of students and senior researchers in R&D as well as engineers in industry who are newcomers to the spatial characterization of either solar cells or PV modules. The concepts and approaches presented herein are based on but not limited to case studies of real thin-film PV devices. Key features: □ Review of spatially resolved characterization techniques and accompanying SPICE simulations in photovoltaics □ Use of spatially resolved characterization techniques and their combinations for the identification of inhomogeneities in small area CdTe and dye-sensitized solar cells □ Case studies of electroluminescence imaging of commercial PV modules (c-Si, CIGS, CdTe, a-Si, tandem and triple junction thin-film-Si) The contents are aimed at a readership of students and senior researchers in R&D as well as engineers in industry who are newcomers to the spatial characterization of either solar cells or PV

modules. The concepts and approaches presented herein are based on but not limited to case studies of real thin-film PV devices. Key features: □ Review of spatially resolved characterization techniques and accompanying SPICE simulations in photovoltaics □ Use of spatially resolved characterization techniques and their combinations for the identification of inhomogeneities in small area CdTe and dye-sensitized solar cells □ Case studies of electroluminescence imaging of commercial PV modules (c-Si, CIGS, CdTe, a-Si, tandem and triple junction thin-film-Si)

ISTFA 2009 - 2009-01-01

Printbegrænsninger: Der kan printes 10 sider ad gangen og max. 40 sider pr. session

Hybrid Perovskite Solar Cells - Hiroyuki Fujiwara 2022-01-10

Unparalleled coverage of the most vibrant research field in photovoltaics! Hybrid perovskites, revolutionary game-changing semiconductor materials, have every favorable

optoelectronic characteristic necessary for realizing high efficiency solar cells. The remarkable features of hybrid perovskite photovoltaics, such as superior material properties, easy material fabrication by solution-based processing, large-area device fabrication by an inkjet technology, and simple solar cell structures, have brought enormous attentions, leading to a rapid development of the solar cell technology at a pace never before seen in solar cell history. Hybrid Perovskite Solar Cells: Characteristics and Operation covers extensive topics of hybrid perovskite solar cells, providing easy-to-read descriptions for the fundamental characteristics of unique hybrid perovskite materials (Part I) as well as the principles and applications of hybrid perovskite solar cells (Part II). Both basic and advanced concepts of hybrid perovskite devices are treated thoroughly in this book; in particular, explanatory descriptions for general physical and chemical aspects of hybrid perovskite photovoltaics are included to provide

fundamental understanding. This comprehensive book is highly suitable for graduate school students and researchers who are not familiar with hybrid perovskite materials and devices, allowing the accumulation of the accurate knowledge from the basic to the advanced levels.

Solar Photovoltaics Engineering. A Power Quality Analysis Using Matlab Simulation Case Studies - Akhil Gupta 2016-10-26

The solar Photovoltaic (PV) technology is gaining significant levels and is going to contribute a major share of total generated electricity in the coming years. PV technology is becoming a promising alternative source for fossil fuels. However, Power Quality (PQ) is the major concern that occurs between the grid and an end user. Any typical electrical distribution system exhibits a passive characteristic with respect to power flows when power flows from a substation to load. However, with inclusion of solar PV generators, this behaviour tends to be changed.

The main characteristics related to PQ, such as voltage level, frequency, power factor and Total Harmonic Distortion (THD), may be affected. This book presents the analysis of PQ with the integration of grid-connected PV systems as distributed generation. The role of Maximum Power Point Tracking (MPPT) technique is investigated through implementing few basic MPPT techniques. Using the Matlab-simulation platform, the analysis of PQ is demonstrated. This analysis is based on real measurements of THD, Voltage levels, Current levels, DC voltage levels, real power and reactive power flows.

Solar Cells - Leonid A. Kosyachenko 2011-11-02
The third book of four-volume edition of 'Solar Cells' is devoted to solar cells based on silicon wafers, i.e., the main material used in today's photovoltaics. The volume includes the chapters that present new results of research aimed to improve efficiency, to reduce consumption of materials and to lower cost of wafer-based silicon solar cells as well as new methods of

research and testing of the devices. Light trapping design in c-Si and mc-Si solar cells, solar-energy conversion as a function of the geometric-concentration factor, design criteria for spacecraft solar arrays are considered in several chapters. A system for the micrometric characterization of solar cells, for identifying the electrical parameters of PV solar generators, a new model for extracting the physical parameters of solar cells, LBIC method for characterization of solar cells, non-idealities in the I-V characteristic of the PV generators are discussed in other chapters of the volume.

Green Information and Communication Systems for a Sustainable Future - Rajshree Srivastava
2020-11-19

Green Information and Communication Systems for a Sustainable Future covers the fundamental concepts, applications, algorithms, protocols, new trends, challenges, and research results in the area of Green Information and Communication Systems. This book provides the

reader with up-to-date information on core and specialized issues, making it highly suitable for both the novice and the experienced researcher in the field. The book covers theoretical and practical perspectives on network design. It includes how green ICT initiatives and applications can play a major role in reducing CO₂ emissions, and focuses on industry and how it can promote awareness and implementation of Green ICT. The book discusses scholarship and research in green and sustainable IT for business and organizations and uses the power of IT to usher sustainability into other parts of an organization. Business and management educators, management researchers, doctoral scholars, university teaching personnel and policy makers as well as members of higher academic research organizations will all discover this book to be an indispensable guide to Green Information and Communication Systems. It will also serve as a key resource for Industrial and Management training organizations all over the

world.

Materials Concepts for Solar Cells - Thomas Dittrich 2018-01-30

A modern challenge is for solar cell materials to enable the highest solar energy conversion efficiencies, at costs as low as possible, and at an energy balance as sustainable as necessary in the future. This textbook explains the principles, concepts and materials used in solar cells. It combines basic knowledge about solar cells and the demanded criteria for the materials with a comprehensive introduction into each of the four classes of materials for solar cells, i.e. solar cells based on crystalline silicon, epitaxial layer systems of III-V semiconductors, thin-film absorbers on foreign substrates, and nano-composite absorbers. In this sense, it bridges a gap between basic literature on the physics of solar cells and books specialized on certain types of solar cells. The last five years had several

breakthroughs in photovoltaics and in the research on solar cells and solar cell materials. We consider them in this second edition. For example, the high potential of crystalline silicon with charge-selective hetero-junctions and alkaline treatments of thin-film absorbers, based on chalcopyrite, enabled new records. Research activities were boosted by the class of hybrid organic-inorganic metal halide perovskites, a promising newcomer in the field. This is essential reading for students interested in solar cells and materials for solar cells. It encourages students to solve tasks at the end of each chapter. It has been well applied for postgraduate students with background in materials science, engineering, chemistry or physics.

Microelectronics Failure Analysis - EDFAS Desk Reference Committee 2011

Includes bibliographical references and index.