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Power Electronics and Variable Frequency Drives - Bimal K. Bose 1997

This original contributed volume combines the individual expertise of eleven world-renowned

professionals to provide comprehensive, authoritative coverage of state-of-the-art power electronics and AC drive technology. Featuring an extensive introductory chapter by power-

electronics expert Bimal K. Bose and more than 400 figures, **POWER ELECTRONICS AND VARIABLE FREQUENCY DRIVES** covers each of the field's component disciplines and drives--all in one complete resource. Broad in scope and unique in its presentation, this volume belongs on the bookshelf of every industry engineer, professor, graduate student, and researcher involved in this fast-growing multidisciplinary field. It is an essential for teaching, research, development, and design.

Recent Developments on Power Inverters - Ali Saghafinia 2017-06-21

This book develops some methods and structures to improve the power inverters for different applications in a single-phase or three-phase output in recent years. The reduction of the switching devices and multilevel inverters as changing structure for the power inverters and PDM and PWM methods as changing control methods for the power inverter are studied in this book. Moreover, power inverters are

developed to supply open-ended loads. Furthermore, the basic and advanced aspects of the electric drives that are control based are taught for induction motor (IM) based on power inverters suitable for both undergraduate and postgraduate levels. The main objective of this book is to provide the necessary background to improve and implement the high-performance inverters. Once the material in this book has been mastered, the reader will be able to apply these improvements in the power inverters to his or her problems for high-performance power inverters.

Power Electronics - Branko L. Dokić 2014-11-26

This book is the result of the extensive experience the authors gained through their year-long occupation at the Faculty of Electrical Engineering at the University of Banja Luka. Starting at the fundamental basics of electrical engineering, the book guides the reader into this field and covers all the relevant types of converters and regulators. Understanding is

enhanced by the given examples, exercises and solutions. Thus this book can be used as a textbook for students, for self-study or as a reference book for professionals.

Transformers and Inductors for Power Electronics - W.G. Hurley 2013-02-21

Based on the fundamentals of electromagnetics, this clear and concise text explains basic and applied principles of transformer and inductor design for power electronic applications. It details both the theory and practice of inductors and transformers employed to filter currents, store electromagnetic energy, provide physical isolation between circuits, and perform stepping up and down of DC and AC voltages. The authors present a broad range of applications from modern power conversion systems. They provide rigorous design guidelines based on a robust methodology for inductor and transformer design. They offer real design examples, informed by proven and working field examples. Key features include: emphasis on high

frequency design, including optimisation of the winding layout and treatment of non-sinusoidal waveforms a chapter on planar magnetic with analytical models and descriptions of the processing technologies analysis of the role of variable inductors, and their applications for power factor correction and solar power unique coverage on the measurements of inductance and transformer capacitance, as well as tests for core losses at high frequency worked examples in MATLAB, end-of-chapter problems, and an accompanying website containing solutions, a full set of instructors' presentations, and copies of all the figures. Covering the basics of the magnetic components of power electronic converters, this book is a comprehensive reference for students and professional engineers dealing with specialised inductor and transformer design. It is especially useful for senior undergraduate and graduate students in electrical engineering and electrical energy systems, and engineers working with power

supplies and energy conversion systems who want to update their knowledge on a field that has progressed considerably in recent years.

2019 International Conference on Robotics, Electrical and Signal Processing Techniques (ICREST) - IEEE Staff 2019-01-10

Bioengineering, Communication, Circuits, Devices & Systems, Computing & Processing (Hardware Software), Engineering Profession, Electromagnetics, Photonics & Electro Optics, Power, Energy, Industry Applications, Robotics & Control Systems, Signal Processing & Analysis

Power Electronics Applied to Industrial Systems and Transports, Volume 2 - Nicolas Patin 2015-05-11

This book provides a comprehensive overview of power electronic converters (DC / DC, DC / AC, AC / DC and AC / AC) conventionally used in industrial and transportation applications, specifically for the supply of electric machines with variable speed drop off window. From the

perspective of design and sizing, this book presents the different functions encountered in a modular way for power electronics. Power Converters and Their Control details less traditional topics such as matrix converters and multilevel converters. This book also features a case study design of an industrial controller, which is a synthesis (except the AC / AC direct conversion) of the study subjects, including sizing associated passive components.

Introducing essential notions in power electronics from both theoretical and technological perspectives Detailed chapters focusing on power supplies for electrical machinery, including a case study of full dimensioning of an industrial variable-speed drive Presented from a user's perspective to enable you to apply the theory of power electronics to practical applications

Modern Power Electronics and AC Drives - Bimal K. Bose 2002

For upper level undergraduate and graduate

level courses in electrical engineering, as well as a reference book for professionals and researchers. This text presents the basics of electrical power conversion and control through the use of power semiconductor switches. In addition, by demonstrating the practical applications of power electronics and motion control using AC electrical machines in transportation and industry, among other uses, *Modern Power Electronics and AC Drives* reflects the latest advances in industrial automation.

2016 International Conference on Computer and Communication Engineering (ICCCE) - IEEE Staff 2016-07-26

The main objective of this biennial conference (ICCCE) is to provide a forum for engineers, academicians, scientists and researchers to present the result of their research activities in the field of Computer and Communication Engineering. On this basis, the Department of Electrical and Computer Engineering, Faculty of

Engineering, International Islamic University Malaysia (IIUM) is calling to submit original technical papers for presentation at the 6th International Conference on Computer and Communication Engineering (ICCCE 2016) which addresses issues that serve the field and the global community

Thermal Reliability of Power Semiconductor Device in the Renewable Energy System - Xiong Du 2022-07-08

This book focuses on the thermal reliability of power semiconductor device by looking at the failure mechanism, thermal parameters monitoring, junction temperature estimation, lifetime evaluation, and thermal management. Theoretical analysis and experimental tests are presented to explain existing reliability improvement techniques. This book is a valuable reference for the students and researchers who pay attention to the thermal reliability design of power semiconductor device.

Communication Systems and Information

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Technology - Ming Ma 2011-06-21

This volume includes extended and revised versions of a set of selected papers from the International Conference on Electric and Electronics (EEIC 2011) , held on June 20-22 , 2011, which is jointly organized by Nanchang University, Springer, and IEEE IAS Nanchang Chapter. The objective of EEIC 2011 Volume 4 is to provide a major interdisciplinary forum for the presentation of new approaches from Communication Systems and Information Technology, to foster integration of the latest developments in scientific research. 137 related topic papers were selected into this volume. All the papers were reviewed by 2 program committee members and selected by the volume editor Prof. Ming Ma. We hope every participant can have a good opportunity to exchange their research ideas and results and to discuss the state of the art in the areas of the Communication Systems and Information Technology.

Power Electronics Design - Keith H. Sueker
2011-04-01

This book serves as an invaluable reference to Power Electronics Design, covering the application of high-power semiconductor technology to large motor drives, power supplies, power conversion equipment, electric utility auxiliaries and numerous other applications. Design engineers, design drafters and technicians in the power electronics industry, as well as students studying power electronics in various contexts, will benefit from Keith Sueker's decades of experience in the industry. With this experience, the author has put the overall power electronics design process in the context of primary electronic components and the many associated components required for a system. The seeming complexity of power electronics design is made transparent with Keith Sueker's simple, direct language and a minimum reliance on mathematics. Readers will come away with a wealth of practical design

information that has hundreds of explanatory diagrams to support it, having also seen many examples of potential pitfalls in the design process. * A down-to-earth approach, free of complex jargon and esoteric information. * Over 200 illustrations to clarify discussion points. * Examples of costly design goofs will provide invaluable cautionary advice.

Power Electronics : Devices and Circuits - V. Jagannathan (Prof.) 2011

Recent Advances in Hybrid and Electric Automotive Technologies - V. Krishna
2022-08-01

This book presents the select proceedings of International Conference on Hybrid and Electric Automotive Technologies 2021 (HEAT 2021). It cover recent innovations in electric and hybrid-electric vehicles and autonomous vehicles. Various topics covered in this volume are batteries, battery cooling methodologies, use of nano-coolants, electrified powertrain systems

and components, hybridisation infrastructure, energy storage, and many other topics of importance to the industry. The book will be useful for researchers and professionals working in the areas of automobile and vehicle engineering.

Advanced Multilevel Converters and Applications in Grid Integration - Ali Iftekhhar Maswood 2019-01-04

A comprehensive survey of advanced multilevel converter design, control, operation and grid-connected applications Advanced Multilevel Converters and Applications in Grid Integration presents a comprehensive review of the core principles of advanced multilevel converters, which require fewer components and provide higher power conversion efficiency and output power quality. The authors - noted experts in the field - explain in detail the operation principles and control strategies and present the mathematical expressions and design procedures of their components. The text

examines the advantages and disadvantages compared to the classical multilevel and two level power converters. The authors also include examples of the industrial applications of the advanced multilevel converters and offer thoughtful explanations on their control strategies. *Advanced Multilevel Converters and Applications in Grid Integration* provides a clear understanding of the gap difference between research conducted and the current industrial needs. This important guide: Puts the focus on the new challenges and topics in related areas such as modulation methods, harmonic analysis, voltage balancing and balanced current injection. Makes a strong link between the fundamental concepts of power converters and advances multilevel converter topologies and examines their control strategies, together with practical engineering considerations. Provides a valid reference for further developments in the multilevel converters design issue. Contains simulations files for further study. Written for

university students in electrical engineering, researchers in areas of multilevel converters, high-power converters and engineers and operators in power industry. *Advanced Multilevel Converters and Applications in Grid Integration* offers a comprehensive review of the core principles of advanced multilevel converters, with contributions from noted experts in the field.

Introduction to Power Electronics - D. Fewson
1998-03-27

Building on solid state device and electromagnetic contributions to the series, this text book introduces modern power electronics, that is the application of semiconductor devices to the control and conversion of electrical power. The increased availability of solid state power switches has created a very rapid expansion in applications, from the relatively low power control of domestic equipment, to high power control of industrial processes and very high power control along transmission lines.

This text provides a comprehensive introduction to the entire range of devices and examines their applications, assuming only the minimum mathematical and electronic background. It covers a full year's course in power electronics. Numerous exercises, worked examples and self assessments are included to facilitate self study and distance learning.

Solar Hybrid Systems - Ahmet Aktas 2021-04-23
Solar Hybrid Systems: Design and Application discusses the key power generation characteristics of solar systems and explores the growing need for hybrid systems. The authors use real-life examples to explain the disadvantages of solar systems without hybridization and to demonstrate the various applications hybrid solar systems can be used for, paying special attention to its integration with energy storage systems. The book also discusses the impact of hybridization and how this can improve power generation quality along with investigating novel and advanced hybrid

solar systems. This is a useful reference for engineers and researchers involved in both the development and application of hybrid solar systems, and features topics such as solutions for the intermittence of renewable energy sources; on-grid and off-grid solar hybrid systems; the simulation, design and application of hybrid solar systems; the role of energy storage systems in solar hybrid applications; and the future of electric vehicles using solar hybrid systems. Demonstrates the benefits of hybrid solar systems and why they are needed Features practical advice on designing hybrid solar systems Includes key findings and real-world examples to illustrate the applications of hybrid solar systems

Introduction to Modern Power Electronics - Andrzej M. Trzynadlowski 2015-10-19
Provides comprehensive coverage of the basic principles and methods of electric power conversion and the latest developments in the field This book constitutes a comprehensive

overview of the modern power electronics. Various semiconductor power switches are described, complementary components and systems are presented, and power electronic converters that process power for a variety of applications are explained in detail. This third edition updates all chapters, including new concepts in modern power electronics. New to this edition is extended coverage of matrix converters, multilevel inverters, and applications of the Z-source in cascaded power converters. The book is accompanied by a website hosting an instructor's manual, a PowerPoint presentation, and a set of PSpice files for simulation of a variety of power electronic converters. Introduction to Modern Power Electronics, Third Edition: Discusses power conversion types: ac-to-dc, ac-to-ac, dc-to-dc, and dc-to-ac Reviews advanced control methods used in today's power electronic converters Includes an extensive body of examples, exercises, computer assignments, and

simulations Introduction to Modern Power Electronics, Third Edition is written for undergraduate and graduate engineering students interested in modern power electronics and renewable energy systems. The book can also serve as a reference tool for practicing electrical and industrial engineers.

Elements of Power Electronics - Philip Krein
2015-11-05

Building on the tradition of its classic first edition, the long-awaited second edition of Elements of Power Electronics provides comprehensive coverage of the subject at a level suitable for undergraduate engineering students, students in advanced degree programs, and novices in the field. It establishes a fundamental engineering basis for power electronics analysis, design, and implementation, offering broad and in-depth coverage of basic material. Streamlined throughout to reflect new innovations in technology, the second edition also features

updates on renewable and alternative energy. Elements of Power Electronics features a unifying framework that includes the physical implications of circuit laws, switching circuit analysis, and the basis for converter operation and control. It discusses dc-dc, ac-dc, dc-ac, and ac-ac conversion tasks and principles of resonant converters and discontinuous converters. The text also addresses magnetic device design, thermal management and drivers for power semiconductors, control system aspects of converters, and both small-signal and geometric controls. Models for real devices and components—including capacitors, inductors, wire connections, and power semiconductors—are developed in depth, while newly expanded examples show students how to use tools like Mathcad, Matlab, and Mathematica to aid in the analysis and design of conversion circuits. Features: *More than 160 examples and 350 chapter problems support the presented concepts *An extensive Companion Website

includes additional problems, laboratory materials, selected solutions for students, computer-based examples, and analysis tools for Mathcad, Matlab, and Mathematica

Controlling Radiated Emissions by Design -

Michel Mardiguian 2014-05-28

The 3rd edition of *Controlling Radiated Emissions by Design* has been updated to reflect the latest changes in the field. New to this edition is material on aspects of technical advance, specifically long term energy efficiency, energy saving, RF pollution control, etc. This book retains the step-by-step approach for incorporating EMC into every new design, from the ground up. It describes the selection of quieter IC technologies, their implementation into a noise-free printed circuit layout, and the gathering of all these into low radiation packaging, including I/O filtering, connectors and cables considerations. All guidelines are supported by thorough and comprehensive calculated examples. Design engineers, EMC

specialists and technicians will benefit from learning about the development of more efficient and economical control of emissions.

The Power Electronics Handbook - Timothy L. Skvarenina 2018-10-03

Less expensive, lighter, and smaller than its electromechanical counterparts, power electronics lie at the very heart of controlling and converting electric energy, which in turn lies at the heart of making that energy useful. From household appliances to space-faring vehicles, the applications of power electronics are virtually limitless. Until now, however, the same could not be said for access to up-to-date reference books devoted to power electronics. Written by engineers for engineers, The Power Electronics Handbook covers the full range of relevant topics, from basic principles to cutting-edge applications. Compiled from contributions by an international panel of experts and full of illustrations, this is not a theoretical tome, but a practical and enlightening presentation of the

usefulness and variety of technologies that encompass the field. For modern and emerging applications, power electronic devices and systems must be small, efficient, lightweight, controllable, reliable, and economical. The Power Electronics Handbook is your key to understanding those devices, incorporating them into controllable circuits, and implementing those systems into applications from virtually every area of electrical engineering.

Pulse Width Modulation for Power Converters - D. Grahame Holmes 2003-10-03

* The first single volume resource for researchers in the field who previously had to depend on separate papers and conference records to attain a working knowledge of the subject. * Brings together the field's diverse approaches into an integrated and comprehensive theory of PWM

Fault Detection and Diagnosis - Constantin Volosencu 2018-11-07

This book offers a selection of papers in the field

of fault detection and diagnosis, promoting new research results in the field, which come to join other publications in the literature. Authors from countries of four continents: United States of America, South Africa, China, India, Algeria and Croatia published worked examples and case studies resulting from their research in the field. Fault detection and diagnosis has a great importance in all industrial processes, to assure the monitoring, maintenance and repair of the complex processes, including all hardware, firmware and software. The book has four sections, determined by the application domain and the methods used: 1. Hybrid Computing Systems, 2. Power Systems, 3. Power Electronics and 4. Kalman Filtering. In the first section, the readers will find a technical report on fault diagnosis of hybrid computing systems, based on the chaotic-map method that uses the exponential divergence and wide Fourier properties of the trajectories, combined with memory allocations and assignments. In the

second section, two chapters are included: one of them presents a study on preventive maintenance and fault detection for wind turbine generators using statistical models and the second chapter presents a technical report on fault diagnosis for turbo-generators, based on the mechanical-electrical intersectional characteristics. The third section contains a technical report that presents some techniques of detection and localization of open-circuit faults in a three-phase voltage source inverter fed induction motor. The fourth section presents a theoretical study on the application of distributed discrete-time linear Kalman filtering with decentralized structure of sensors in fault residual generation.

Power Electronics and Motor Drives - Bimal K. Bose 2020-11-13

Power Electronics and Motor Drives: Advances and Trends, Second Edition is the perfect resource to keep the electrical engineer up-to-speed on the latest advancements in

technologies, equipment and applications. Carefully structured to include both traditional topics for entry-level and more advanced applications for the experienced engineer, this reference sheds light on the rapidly growing field of power electronic operations. New content covers converters, machine models and new control methods such as fuzzy logic and neural network control. This reference will help engineers further understand recent technologies and gain practical understanding with its inclusion of many industrial applications. Further supported by a glossary per chapter, this book gives engineers and researchers a critical reference to learn from real-world examples and make future decisions on power electronic technology and applications. Provides many practical examples of industrial applications Updates on the newest electronic topics with content added on fuzzy logic and neural networks Presents information from an expert with decades of research and industrial

experience

Extremal Optimization - Yong-Zai Lu

2018-09-03

Extremal Optimization: Fundamentals, Algorithms, and Applications introduces state-of-the-art extremal optimization (EO) and modified EO (MEO) solutions from fundamentals, methodologies, and algorithms to applications based on numerous classic publications and the authors' recent original research results. It promotes the movement of EO from academic study to practical applications. The book covers four aspects, beginning with a general review of real-world optimization problems and popular solutions with a focus on computational complexity, such as "NP-hard" and the "phase transitions" occurring on the search landscape. Next, it introduces computational extremal dynamics and its applications in EO from principles, mechanisms, and algorithms to the experiments on some benchmark problems such as TSP, spin glass, Max-SAT (maximum

satisfiability), and graph partition. It then presents studies on the fundamental features of search dynamics and mechanisms in EO with a focus on self-organized optimization, evolutionary probability distribution, and structure features (e.g., backbones), which are based on the authors' recent research results. Finally, it discusses applications of EO and MEO in multiobjective optimization, systems modeling, intelligent control, and production scheduling. The authors present the advanced features of EO in solving NP-hard problems through problem formulation, algorithms, and simulation studies on popular benchmarks and industrial applications. They also focus on the development of MEO and its applications. This book can be used as a reference for graduate students, research developers, and practical engineers who work on developing optimization solutions for those complex systems with hardness that cannot be solved with mathematical optimization or other

computational intelligence, such as evolutionary computations.

Advances in Power Systems and Energy Management - Amik Garg 2017-06-29

This book is a collection of research articles and critical review articles, describing the overall approach to energy management. The book emphasizes the technical issues that drive energy efficiency in context of power systems. This book contains case studies with and without solutions on modelling, simulation and optimization techniques. It covers some innovative topics such as medium voltage (MV) back-to-back (BTB) system, cost optimization of a ring frame unit in textile industry, rectenna for radio frequency (RF) energy harvesting, ecology and energy dimension in infrastructural designs, 2.4 kW three-phase inverter for aircraft application, study of automatic generation control (AGC) in a two area hydrothermal power system, energy-efficient and reliable depth-based routing protocol for underwater wireless

sensor network, and power line communication using LabVIEW. This book is primarily targeted at researchers and senior graduate students, but is also highly useful for the industry professional and scientists.

Grid Converters for Photovoltaic and Wind Power Systems - Remus Teodorescu

2011-07-28

Grid converters are the key player in renewable energy integration. The high penetration of renewable energy systems is calling for new more stringent grid requirements. As a consequence, the grid converters should be able to exhibit advanced functions like: dynamic control of active and reactive power, operation within a wide range of voltage and frequency, voltage ride-through capability, reactive current injection during faults, grid services support. This book explains the topologies, modulation and control of grid converters for both photovoltaic and wind power applications. In addition to power electronics, this book focuses

on the specific applications in photovoltaic wind power systems where grid condition is an essential factor. With a review of the most recent grid requirements for photovoltaic and wind power systems, the book discusses these other relevant issues: modern grid inverter topologies for photovoltaic and wind turbines islanding detection methods for photovoltaic systems synchronization techniques based on second order generalized integrators (SOGI) advanced synchronization techniques with robust operation under grid unbalance condition grid filter design and active damping techniques power control under grid fault conditions, considering both positive and negative sequences Grid Converters for Photovoltaic and Wind Power Systems is intended as a coursebook for graduated students with a background in electrical engineering and also for professionals in the evolving renewable energy industry. For people from academia interested in adopting the course, a set of slides

is available for download from the website.
www.wiley.com/go/grid_converters

Power Magnetic Devices - Scott D. Sudhoff
2014-01-30

Presents a multi-objective design approach to the many power magnetic devices in use today
Power Magnetic Devices: A Multi-Objective Design Approach addresses the design of power magnetic devices—including inductors, transformers, electromagnets, and rotating electric machinery—using a structured design approach based on formal single- and multi-objective optimization. The book opens with a discussion of evolutionary-computing-based optimization. Magnetic analysis techniques useful to the design of all the devices considered in the book are then set forth. This material is then used for inductor design so readers can start the design process. Core loss is next considered; this material is used to support transformer design. A chapter on force and torque production feeds into a chapter on

electromagnet design. This is followed by chapters on rotating machinery and the design of a permanent magnet AC machine. Finally, enhancements to the design process including thermal analysis and AC conductor losses due to skin and proximity effects are set forth.
Power Magnetic Devices: Focuses on the design process as it relates to power magnetic devices such as inductors, transformers, electromagnets, and rotating machinery Offers a structured design approach based on single- and multi-objective optimization Helps experienced designers take advantage of new techniques which can yield superior designs with less engineering time Provides numerous case studies throughout the book to facilitate readers' comprehension of the analysis and design process Includes Powerpoint-slide-based student and instructor lecture notes and MATLAB-based examples, toolboxes, and design codes Designed to support the educational needs of students,
Power Magnetic Devices: A Multi-Objective

Design Approach also serves as a valuable reference tool for practicing engineers and designers. MATLAB examples are available via the book support site.

Single-DC-Source Multilevel Inverters - Hani Vahedi 2019-03-23

The purpose of this book is to distinguish the single-de-source multilevel inverter topologies and to teach their control, switching and voltage balancing. It includes new information on voltage balancing and control of multilevel inverters. The book answers some important questions about the revolution of power electronics converters: 1- Why multilevel inverter are better than 2-level ones? 2- Why single-de-source multilevel inverters are a matter of interest? 3- What are the redundant switching states and what do they do? 4- How to use redundant switching states in control and voltage balancing? 5- What are the applications of single-de-source multilevel inverters?

Power Electronics - Ned Mohan 1995

Application Manual Power Semiconductors - 2015

Power Electronics and Its Applications - Alok Jain 2004

Power Electronics Handbook - Muhammad H. Rashid 2010-07-19

Power electronics, which is a rapidly growing area in terms of research and applications, uses modern electronics technology to convert electric power from one form to another, such as ac-dc, dc-dc, dc-ac, and ac-ac with a variable output magnitude and frequency. Power electronics has many applications in our every day life such as air-conditioners, electric cars, sub-way trains, motor drives, renewable energy sources and power supplies for computers. This book covers all aspects of switching devices, converter circuit topologies, control techniques, analytical methods and some examples of their applications. * 25% new content * Reorganized

and revised into 8 sections comprising 43 chapters * Coverage of numerous applications, including uninterruptable power supplies and automotive electrical systems * New content in power generation and distribution, including solar power, fuel cells, wind turbines, and flexible transmission

Control in Power Electronics - Marian P. Kazmierkowski 2002-08-30

The authors were originally brought together to share research and applications through the international Danfoss Professor Programme at Aalborg University in Denmark. Personal computers would be unwieldy and inefficient without power electronic dc supplies. Portable communication devices and computers would also be impractical. High-performance lighting systems, motor controls, and a wide range of industrial controls depend on power electronics. In the near future we can expect strong growth in automotive applications, dc power supplies for communication systems, portable applications,

and high-end converters. We are approaching a time when all electrical energy will be processed and controlled through power electronics somewhere in the path from generation to end use. The most up-to-date information available is presented in the text Written by a world renowned leader in the field

Power Electronics and Motor Drive Systems - Stefanos Manias 2016-11-08

Power Electronics and Motor Drive Systems is designed to aid electrical engineers, researchers, and students to analyze and address common problems in state-of-the-art power electronics technologies. Author Stefanos Manias supplies a detailed discussion of the theory of power electronics circuits and electronic power conversion technology systems, with common problems and methods of analysis to critically evaluate results. These theories are reinforced by simulation examples using well-known and widely available software programs, including SPICE, PSIM, and

MATLAB/SIMULINK. Manias expertly analyzes power electronic circuits with basic power semiconductor devices, as well as the new power electronic converters. He also clearly and comprehensively provides an analysis of modulation and output voltage, current control techniques, passive and active filtering, and the characteristics and gating circuits of different power semiconductor switches, such as BJTs, IGBTs, MOSFETs, IGCTs, MCTs and GTOs. Includes step-by-step analysis of power electronic systems Reinforced by simulation examples using SPICE, PSIM, and MATLAB/SIMULINK Provides 110 common problems and solutions in power electronics technologies

Enhanced Phase-Locked Loop Structures for Power and Energy Applications - Masoud Karimi-Ghartema 2014-03-21

Filling the gap in the market dedicated to PLL structures for power systems Internationally recognized expert Dr. Masoud Karimi-

Ghartemani brings over twenty years of experience working with PLL structures to Enhanced Phase-Locked Loop Structures for Power and Energy Applications, the only book on the market specifically dedicated to PLL architectures as they apply to power engineering. As technology has grown and spread to new devices, PLL has increased in significance for power systems and the devices that connect with the power grid. This book discusses the PLL structures that are directly applicable to power systems using simple language, making it easily digestible for a wide audience of engineers, technicians, and graduate students. Enhanced phase-locked loop (EPLL) has become the most widely utilized architecture over the past decade, and many books lack explanation of the structural differences between PLL and EPLL. This book discusses those differences and also provides detailed instructions on using EPLL for both single-phase applications and three-phase

applications. The book's major topics include: A basic look at PLL and its standard structure A full explanation of EPLL EPLL extensions and modifications Digital implementation of EPLL Extensions of EPLL to three-phase structures Dr. Karimi-Ghartemani provides basic analysis that helps readers understand each of the structures presented without requiring complicated mathematical proofs. His book is filled with illustrated examples and simulations that connect theory to the real world, making Enhanced Phase-Locked Loop Structures for Power and Energy Applications an ideal reference for anyone working with inverters, rectifiers, and related technologies.

High-Power Converters and AC Drives - Bin Wu
2007-01-29

This book presents the latest cutting-edge technology in high-power converters and medium voltage drives, and provides a complete analysis of various converter topologies, modulation techniques, practical drive

configurations, and advanced control schemes. Supplemented with more than 250 illustrations, the author illustrates key concepts with simulations and experiments. Practical problems, along with accompanying solutions, are presented to help you tackle real-world issues.

Electrical Drives - Jens Weidauer 2014-07-07
From the point of view of a user this book covers all aspects of modern electrical drives. It is aimed at both users, who wish to understand, design, use, and maintain electrical drives, as well as specialists, technicians, engineers, and students, who wish to gain a comprehensive overview of electrical drives. Jens Weidauer and Richard Messer describe the principles of electrical drives, their design, and application, through to complex automation solutions. In the process, they introduce the entire spectrum of drive solutions available and their main applications. A special aspect is the combination of multiple drives to form a drive system, as well

as the integration of drives into automation solutions. In simple and clear language, and supported with many diagrams, complex relationships are described and presented in an easy-to-understand way. The authors deliberately avoid a comprehensive mathematical treatment of their subject and instead focus on a coherent description of the active principles and relationships. As a result, the reader will be in a position to understand electrical drives as a whole and to solve drive-related problems in everyday professional life.

Power Electronic Converters for Solar Photovoltaic Systems - Ashok L. Kumar
2020-11-20

Power Electronic Converters for Solar Photovoltaic Systems provides design and implementation procedures for power electronic converters and advanced controllers to improve standalone and grid environment solar photovoltaics performance. Sections cover performance and improvement of solar

photovoltaics under various conditions with the aid of intelligent controllers, allowing readers to better understand the nuances of power electronic converters for renewable energy systems. With algorithm development and real-time implementation procedures, this reference is useful for those interested in power electronics for performance improvement in distributed energy resources, design of advanced controllers, and measurement of critical parameters surrounding renewable energy systems. By providing a complete solution for performance improvement in solar PV with novel control techniques, this book will appeal to researchers and engineers working in power electronic converters, renewable energy, and power quality. Includes simulation studies and photovoltaic performance analysis Uses case studies as a reference for design and research Covers different varieties of power converters, from fundamentals to implementation
Electromagnetic Interference Issues in Power

Electronics and Power Systems - Firuz Zare
2011-11-25

This E-Book focuses on conducted and radiated emission noise generated by different power converters such as Switch Mode power Supplies

and DC-AC Inverters. EMI filter design and different approaches to predict common mode and differential mode noise are

Principles of Electric Machines and Power Electronics - Paresh Chandra Sen 2021-02-25