

## Phase Shifted Full Bridge Dc Dc Power Converter Design Guide

**Soft-switching PWM full-bridge converters have been widely used in medium-to-high power dc-dc conversions for topological simplicity, easy control and high efficiency. Early works on soft-switching PWM full-bridge converter by many researchers included various topologies and modulation strategies. However, these works were scattered, and the relationship among these topologies and modulation strategies had not been revealed. This book intends to describe systematically the soft-switching techniques for pulse-width modulation (PWM) full-bridge converters, including the topologies, control and design, and it reveals the relationship among the various topologies and PWM strategies previously proposed by other researchers. The book not only presents theoretical analysis, but also gives many detailed design examples of the converters.**

**APEC focuses on the practical and applied aspects of the power electronics business. The conference addresses issues of immediate and long term importance to practicing power electronics engineer. The book is a collection of high-quality peer-reviewed research papers presented in the Proceedings of International Conference on Power Electronics and Renewable Energy Systems (ICPERES 2014) held at Rajalakshmi Engineering College, Chennai, India. These research papers provide the latest developments in the broad area of Power Electronics and Renewable Energy. The book discusses wide variety of industrial, engineering and scientific applications of the emerging techniques. It presents invited papers from the inventors/originators of new applications and advanced technologies.**

**A neural network controller is proposed which has the advantage of adaptive learning ability, and can work under the situation when the input voltage and load current fluctuate.**

**2016 6th International Conference on Intelligent and Advanced Systems (ICIAS)**

**Modern Fuzzy Control Systems and Its Applications**

**Proceedings of the International Conference on Environmental Science and Sustainable Energy Ed. by ZhaoYang Dong**

**Dual Full-Bridge DC-DC Converter for RF Power Generator Applications**

**Inductive Power Transfer Systems**

**Topologies, Control, and Design**

**Use this book as a guide. Pressman promises, even a novice can immediately design a complete switching power supply circuit. No other book has such complete instruction in one volume. Using a tutorial, how-to approach, Pressman covers every aspect of this new technology, including circuit and transformer design, using higher switching frequencies, new topologies, and integrated PWM chips. For this latest edition, Pressman has added in-depth discussion of power factor correction, high-frequency ballasts for fluorescent lamps, and low-input voltage power supplies for laptop computers.**

**Power electronics technology is still an emerging technology, and it has found its way into many applications, from renewable energy generation (i.e., wind power and solar power) to electrical vehicles (EVs), biomedical devices, and small appliances, such as laptop chargers. In the near future, electrical energy will be provided and handled by power electronics and consumed through power electronics; this not only will intensify the role of power electronics technology in power conversion processes, but also implies that power systems are undergoing a paradigm shift, from centralized distribution to distributed generation. Today, more than 1000 GW of renewable energy generation sources (photovoltaic (PV) and wind) have been installed, all of which are handled by power electronics technology. The main aim of this book is to highlight and address recent breakthroughs in the range of emerging applications in power electronics and in harmonic and electromagnetic interference (EMI) issues at device and system levels as discussed in [robust and reliable power electronics technologies, including fault prognosis and diagnosis technique stability of grid-connected converters and smart control of power electronics in devices, microgrids, and at system levels.**

**Energy conversion and conditioning technologies, power electronics, adjustable speed drives and their applications, power electronics for the smarter grid, energy efficiency, technologies for sustainable energy systems, converters and power supplies**

**The Power Electronics, Drive Systems, and Technologies Conference (PEDSTC) aims to bring together academic scientists, leading engineers, industry researchers, and scholar students to exchange and share their experiences and research results about all aspects of power electronics and electrical drives**

**Adaptive Control of a Step-up Full-Bridge DC-DC Converter for Variable Low Input Voltage Applications**

**Applications of Power Electronics**

**2020 11th Power Electronics, Drive Systems, and Technologies Conference (PEDSTC)**

**Autonomous Control of Unmanned Aerial Vehicles**

**High-Frequency Isolated Bidirectional Dual Active Bridge DC-DC Converters with Wide Voltage Gain**

**Sustainable Energy For Smart Cities**

*Fully worked solutions with clear explanations The Pulse-width Modulated DC-DC Power Converters: Solutions Manual provides solutions to the practice problems in the text. Fully worked, each solution includes formulas and diagrams as necessary to help you understand the approach, and explanations clarify the reasoning behind the correct answer. The solutions are aligned chapter-by-chapter with the text, and provide useful guidance that can help you identify your level of comprehension. Designed to make your study time more productive, this solutions manual is an invaluable tool for anyone studying electricity and electrical engineering.*

*Written by experts, this book is based on recent research findings in high-frequency isolated bidirectional DC-DC converters with wide voltage range. It presents advanced power control methods and new isolated bidirectional DC-DC topologies to improve the performance of isolated bidirectional converters. Providing valuable insights, advanced methods and practical design guides on the DC-DC conversion that can be considered in applications such as microgrid, bidirectional EV chargers, and solid state transformers, it is a valuable resource for researchers, scientists, and engineers in the field of isolated bidirectional DC-DC converters.*

*The operational amplifier ("op amp") is the most versatile and widely used type of analog IC, used in audio and video amplifiers, signal conditioners, signal converters, oscillators, and analog computing systems. Almost every electronic device uses at least one op amp. This book is Texas Instruments' complete professional-level tutorial and reference to operational amplifier theory and applications. Among the topics covered are basic op amp physics (including reviews of current and voltage division, Thevenin's theorem, and transistor models), idealized op amp operation and configuration, feedback loop methods and models, single and dual supply operation, understanding op amp parameters, minimizing noise in op amp circuits, and practical applications such as instrumentation amplifiers, signal conditioning, oscillators, active filters, load and level conversions, and analog computing. There is also extensive coverage of circuit construction techniques, including circuit board design, grounding, input and output isolation, using decoupling capacitors, and frequency characteristics of passive components. The material in this book is applicable to all op amp ICs from all manufacturers, not just TI. Unlike textbook treatments of op amp theory that tend to focus on idealized op amp models and configuration, this title uses idealized models only when necessary to explain op amp theory. The bulk of this book is on real-world op amps and their applications; considerations such as thermal effects, circuit noise, circuit buffering, selection of appropriate op amps for a given application, and unexpected effects in passive components are all discussed in detail. Published in conjunction with Texas Instruments' "A single volume, professional-level guide to op amp theory and applications." Covers circuit board layout techniques for manufacturing op amp circuits.*

*This book constitutes the refereed post-conference proceedings of the Second EAI International Conference on Sustainable Energy For Smart Cities, SES2012, held in Portugal in December 2010. The conference was framed within the 6th Annual Smart City 860' Summit. Due to COVID-19 pandemic the conferences were held virtually. The 13 revised full papers were carefully reviewed and selected from 27 submissions. They present multidisciplinary scientific results toward answering the complex technological problems of emergent Smart Cities. The subjects related to sustainable energy, framed with the scope of smart cities and addressed along with the SES2020 conference, are crucial to guarantee an equilibrium among economic growth and environmental sustainability, as well as to contribute to reducing the impact of climate change.*

*Proceedings of the 2011 MECS International Conference on Multimedia, Software Engineering and Computing, November 26-27, Wuhan, China*

*2019 IEEE Applied Power Electronics Conference and Exposition (APEC)*

*2017 6th International Conference on Computer Applications In Electrical Engineering-Recent Advances*

*Soft Commutation Isolated DC-DC Converters*

*Novel Traction Drive Technologies of Rail Transportation*

*2016 18th European Conference on Power Electronics and Applications (EPE 16 ECCE Europe)*

*Power and Energy Engineering is one of the earliest fields that has developed within Electrical Engineering. It deals with generation, transmission and distribution of electric power. Engineers also work on a variety of power devices and on power conversion (the process of transforming power from one form into another, as in electromechanical or electrochemical processes). This conference is an excellent platform for power and energy science researchers and professionals to discuss, distribute and advance the state of research and development of the power and energy fields. It facilitates the exchange of insights and innovations between the industry and academia, each represented by leaders in their respective fields.*

*The presentation in this paper is the efficient hybrid Dual Full-Bridge DC-DC Converter for the Radio Frequency (RF) power applications. Since there is a drawback of a large circulating current at primary side and large output filter size in a conventional Phase-Shift Full-Bridge (PSFB) converter, this hybrid Dual Full-Bridge DC-DC Converter is proposed in order to overcome those drawbacks. This proposed converter at primary side uses a serial structure of series capacitor and at a secondary side a two additional diodes that are low voltage rated are adopted together with the full bridge rectifier. This resulting structure of a proposed converter gives an advantage of circulating current reduction, providing the operation of Zero-Voltage Switching for reduction in output, all primary switches, inductor size and offers low conduction loss for the rectifier stage. Moreover, in a very wide range, the output voltage can be regulated by operational mode using this proposed converter. The total load efficiency of converter is improved as a result of above advantages.*

*This series mainly consists of conference proceedings and presents recent developments and innovations in a broad field of science and technology research. The series will focus on recent theoretical and applied science, engineering , management and technological developments with latest exposures in product and process, models, methods and applications including but not limited to artificial intelligence, computational intelligence, big data analytics, knowledge-based systems, fuzzy computing, soft computing, mathematical and statistical models, operations research and optimization, automotive, robotics, energy, environmental engineering, power, manufacturing, materials, cybernetics, system sciences, management, healthcare, bioinformatics, and other disciplines.*

*Increasing demand for efficiency and power density pushes Si-based devices to some of their inherent material limits, including those related to temperature operation, switching frequency, and blocking voltage. Recently, SiC-based power devices are promising candidates for high-power and high-frequency switching applications. Today, SiC MOSFETs are commercially available from several manufacturers.*

*Although technology affiliated with SiC MOSFETs is improving rapidly, many challenges remain, and some of them are investigated in this work. The research work in this dissertation is divided into the three following parts. Firstly, the static and switching characteristics of the state-of-the-art 1.2 kV planar and double-trench SiC MOSFETs from two different manufacturers are evaluated. The effects of different biasing voltages, DC link voltages, and gate resistances are evaluated. Additionally, the temperature-dependence of the short-circuit capability is evaluated, and the associated failure modes are analysed. Subsequently, the design and test of two different methods for overcurrent protection are proposed. The desaturation technique is applied to the SiC MOSFETs and compared to a second method that depends on the stray inductance of the devices. Finally, the benefits of using SiC devices in continuous high-frequency, high-power DC/DC converters is experimentally evaluated. In this regard, a design optimisation of a high-frequency transformer is introduced, and the impact of different core materials, conductor designs, and winding arrangements are evaluated. A ZVZCS Phase-Shift Full-Bridge unidirectional DC/DC converter is proposed, using only the parasitic leakage inductance of the transformer. Experimental results for a 10 kW, (100-250) kHz prototype indicate an efficiency of up to 98.1% for the whole converter. Furthermore, an optimized control method is proposed to minimise the circulating current in the isolated bidirectional dual active bridge DC/DC converter, based on a modified dual-phase-shift control method. This control method is also experimentally compared with traditional single-phase-shift control, yielding a significant improvement in efficiency. The experimental results confirm the theoretical analysis and show that the proposed control can enhance the overall converter efficiency and expand the ZVZCS range. Die steigende Nachfrage nach Effizienz und Leistungsdichte bringt Si-basierte Leistungsbaueteile an ihre inhärenten Materialgrenzen, die unter anderem mit der Temperaturbelastung, der Schaltfrequenz und der Blockierspannung in Zusammenhang stehen. In jüngerer Zeit sind SiC-basierte Leistungsbaueteile vielversprechende Kandidaten für Hochleistungs- und Hochfrequenzanwendungen.*

*Aktuell sind SiC-MOSFETs von mehreren Herstellern im Handel erhältlich. Obwohl sich die Technologie der SiC-MOSFETs verbessert, werden viele Herausforderungen bestehen bleiben. Einige dieser Herausforderungen werden in dieser Arbeit untersucht. Die Untersuchungen in dieser Dissertation gliedern sich in die drei folgenden Teile: Im ersten Teil erfolgt die statische und die transiente Charakterisierung von SiC-MOSFETs verschiedener Hersteller. Die Auswirkungen unterschiedlicher Gatespannungen, Zwischenkreisspannungen und Temperaturn werden analysiert. Die Ergebnisse der Charakterisierung zeigen, dass die Bauteile überlegene Schaltleistungen unter verschiedenen Betriebsbedingungen aufweisen. Darüber hinaus wird der Einsatz der internen SiC-Bodydioden in einem DC/DC-Wandler untersucht, wobei die Unterschiede zwischen Planar- und Doppel-trench-Bauteilen aufgezeigt werden. Das Reverse-Recovery-Verhalten wird unter Berücksichtigung der Gehäusetemperatur, der Schaltgeschwindigkeit, des Durchlassstroms und der angelegten Spannung bewertet. Anhand der Messergebnisse wird die Sperrschichttemperatur geschätzt, damit ein sicherer Betrieb gewährleistet ist. Ein einfaches elektrothermisches Modell wird vorgestellt, um die maximal zulässige Schaltfrequenz auf der Grundlage des thermischen Designs der SiC-Bauteile abzuschätzen. Anhand dieser Ergebnisse werden hart- und weichschaltende Umrichter konzipiert und die Bauteile werden im Dauerbetrieb mit einer sehr hohen Schaltfrequenz von 1 MHz untersucht. Danach werden die SiC-MOSFETs im Dauerbetrieb in einem 10 kW / 100-250 kHz Tiefsetzsteller betrieben. Dabei wird die Synchronrichtung, die Verwendung der internen Diode und die Verwendung einer externen Schottky-Diode verglichen. Außerdem wird die Parallelisierung von SiC-MOSFETs untersucht, bevor die Parallelschaltung der verschiedenen Bauelemente ebenso im kontinuierlichen Konverterbetrieb verglichen wird. Es wird der Einfluss der häufigsten Parametervariationen auf die statische und dynamische Stromaufteilung der Transistoren analysiert, was zeigt, dass eine Parallelisierung von SiC-MOSFETs möglich ist. Anschließend wird ein analytisches Modell der SiC-MOSFETs zur Schaltverlustoptimierung vorgeschlagen. Das analytische Modell zeigt eine relativ enge Übereinstimmung mit den Messergebnissen unter verschiedenen Testbedingungen. Das vorgeschlagene Modell bildet die Schwingungen sowohl beim Ein- als auch beim Ausschalten effektiv nach. Dies wurde durch die Berücksichtigung der wichtigsten parasitären Elemente in Strom- und Gatekreisläufen erreicht. Im zweiten Teil wird eine umfassende Bewertung der Kurzschlussfestigkeit mit Fokus auf verschiedene Ausfallmodi der planaren und double-trench SiC-MOSFETs durchgeführt. Die Auswirkungen unterschiedlicher Gatespannungen, Zwischenkreisspannungen und Gate-Widerstände werden ausgewertet. Zusätzlich wird die temperaturabhängige Kurzschlussfähigkeit ausgewertet und die zugehörigen Fehlerfälle werden analysiert. Anschließend wird die Auslegung und Prüfung von zwei verschiedenen Verfahren zum Übersstromschutz evaluiert. Die „Desaturation“-Technik wird auf SiC-MOSFETs angewendet und mit einer zweiten Methode verglichen, welche die parasitäre Induktivität der Bauelemente nutzt. Schließlich wird der Nutzen des Einsatzes von SiC-Bauteilen in kontinuierlichen Hochfrequenz-Hochleistungs-DC/DC-Wandlern experimentell untersucht. In diesem Zusammenhang wird eine Designoptimierung eines Hochfrequenztransformators vorgestellt und der Einfluss verschiedener Kernmaterialien, Leiterauführungen und Wicklungsanordnungen wird bewertet. Es wird ein unidirektionaler ZVZCS Vollbrücken-DC/DC-Wandler vorgestellt, der nur die parasitäre Streuinduktivität des Transformators verwendet. Experimentelle Ergebnisse für einen 10 kW, (100-250) kHz Prototyp zeigen einen Wirkungsgrad von bis zu 98,1% für den gesamten Umrichter. Abschließend wird ein optimiertes Regelverfahren verwendet, welches auf einem modifizierten Dual-Phase-Shift-Regelverfahren basiert, um den Kreisstrom im isolierten bidirektionalen Dual-Aktiv-Brücken-DC/DC-Wandler zu minimieren. Diese Regelmethode wird experimentell mit der herkömmlichen Single-Phase-Shift-Regelung verglichen. Hierbei zeigt sich eine deutliche Effizienzsteigerung durch die neue Regelmethode. Die experimentellen Ergebnisse bestätigen die theoretische Analyse und zeigen, dass die vorgeschlagene Regelung den Gesamtwirkungsgrad des Umrichters erhöhen und den ZVZCS-Bereich erweitern kann.*

*Transformer and Inductor Design Handbook, Third Edition*

*Proceedings of ICETRES 2014*

*Proceedings of the 5th International Conference on Electrical Engineering and Information Technologies for Rail Transportation (EITRT) 2021*

*Design Reference*

*2019 IEEE Asia Power and Energy Engineering Conference (APEEC)*

*Theory, Modeling and Control*

Two-stage single-phase converters, including two-stage standard converter modules are connected in series or parallel at the input and output sides, to meet the demands of various applications. This book focuses on the control strategies for the series-parallel conversion systems with DC-DC converters and DC-AC inverters as the basic modules, respectively, to achieve input voltage/current sharing and output voltage/current sharing among the constituent modules. The detailed theoretical analysis with design examples and experimental validations are presented. This book is essential and valuable reference for graduate students and academics majoring in power electronics and engineers engaged in developing DC-DC converters, DC-AC inverters and power electronics transformers.

This book describes the operation and analysis of soft-commutated isolated DC-DC converters used in the design of high efficiency and high power density equipment. It explains the basic principles behind first- and second-order circuits with power switches to enable readers to understand the importance of these converters in high efficiency and high power density power supply design for residential, commercial, industrial and medical use as well as in aerospace equipment. With each chapter featuring a different power converter topology, the book covers the most important resonant converters, including series resonant converters; resonant LLC converters; soft commutation pulse width modulation converters; zero voltage switching; and zero current switching. Each topic is presented with full analysis, a showcase of the power stages of the converters, exercises and their solutions as well as simulation results, which mainly focus on the commutation analysis and output characteristic. This book is a valuable source of information for professionals working in power electronics, power conversion and design of high efficiency and high power density DC-DC converters and switch mode power supplies. The book also serves as a point of reference for engineers responsible for development projects and equipment in companies and research centers and a text for advanced students.

Design, Control and Application of Modular Multilevel Converters for HVDC Transmission Systems is a comprehensive guide to semiconductor technologies applicable for MMC design, component sizing control, modulation, and application of the MMC technology for HVDC transmission. Separated into three distinct parts, the first offers an overview of MMC technology, including information on converter component sizing, Control and Communication, Protection and Fault Management, and Generic Modelling and Simulation. The second covers the applications of MMC in offshore WPP, including planning, technical and economic requirements and optimization options, fault management, dynamic and transient stability. Finally, the third chapter explores the applications of MMC in HVDC transmission and Multi Terminal configurations, including Supergrids. Key features: Unique coverage of the offshore application and optimization of MMC-HVDC schemes for the export of offshore wind energy to the mainland. Comprehensive explanation of MMC application in HVDC and MTDC transmission technology. Detailed description of MMC components, control and modulation, different modeling approaches, converter dynamics under steady-state and fault contingencies including application and housing of MMC in HVDC schemes for onshore and offshore. Analysis of DC fault detection and protection technologies, system studies required for the integration of HVDC terminals to offshore wind power plants, and commissioning procedures for onshore and offshore HVDC terminals. A set of self-explanatory simulation models for HVDC test cases is available to download from the companion website. This book provides essential reading for graduate students and researchers, as well as field engineers and professionals who require an in-depth understanding of MMC technology.

This thesis shows the implementation of a novel control scheme DC-DC converter. The converter is a phase-shifted full-bridge PWM converter that is designed to operate as a front stage of a power conversion system where the input is a variable low voltage high current source. The converter is designed to step-up the low voltage input to an acceptable level that can be inverted to a 120/240 VAC 60Hz voltage for residential power. A DSP based adaptive control model is developed, taking into account line variations introduced by the input source while providing very good load dynamics for the converter in both discontinuous and continuous conduction modes. The adaptive controller is implemented using two voltage sensors that read the input and the output voltages of the converter. The controller's bandwidth is comparable to current mode control, without the need for an expensive current sensor, yet providing the noise immunity seen in voltage mode controllers. The intended input source was a fuel cell but in its absence a DC supply is utilized instead. The system is simulated for both discontinuous and continuous conduction modes and implemented and demonstrated for the continuous conduction mode. The test results are shown to match the simulation results very closely.

*Flexible Resources for Smart Cities*

*Intelligent Robotics and Applications*

*New Topologies and Modulation Schemes for Soft-Switching Isolated DC-DC Converters*

*On the perspectives of SiC MOSFETs in high-frequency and high-power isolated DC/DC converters*

*A Thesis*

*ESSE 2017*

Fundamentals of Power Electronics, Third Edition, is an up-to-date and authoritative text and reference book on power electronics. This new edition retains the original objective and philosophy of focusing on the fundamental principles, models, and technical requirements needed for designing practical power electronic systems while adding new edition include: new material on switching loss mechanisms and their modeling; wide bandgap semiconductor devices; a more rigorous treatment of averaging; explanation of the Nyquist stability criterion; incorporation of the Tan and Middlebrook model for current programmed control; a new chapter on digital control of switching converter; design-oriented analysis including feedback and extra-element theorems; average current control; new material on input filter design; new treatment of averaged switch modeling, simulation, and indirect power; and sampling effects in DCM, CPM, and digital control. Fundamentals of Power Electronics, Third Edition, is intended for use in a variety of fields for both senior undergraduates and first-year graduate students interested in converter circuits and electronics, control systems, and magnetic and power systems. It will also be an invaluable reference for professionals working in power electronics, power conversion, and analog and digital electronics. Includes an increased number of illustrations including three completely new chapters: Includes key principles and a rigorous treatment of topics.

Extensively revised and expanded to present the state-of-the-art in the field of magnetic design, this third edition presents a practical approach to transformer and inductor design and covers extensively essential topics such as the area product, Ap, and core geometry, Kg. The book provides complete information on magnetic materials and presents all the key components for the design of lightweight, high-frequency aerospace transformers or low-frequency commercial transformers. Written by a specialist with more than 47 years of experience in the field, this volume covers magnetic design theory with all of the relevant formulas.

The Electrical and Electronics Engineering Department of Universiti Teknologi PETRONAS (UTP) is proud to organise the 6th International Conference on Intelligent & Advanced Systems (ICIAS2016) from 15th to 17th August, 2016. This conference is the continuation of ICIAS2014 which was successfully held at the premier Kuala Lumpur Convention Centre. The venue for our upcoming ICIAS2016 conference. The conference is technically co sponsored by the IEEE Malaysia Chapters. The ICIAS2016 conference aims at bringing together experts and researchers in intelligent and advanced systems.

Unmanned aerial vehicles (UAVs) are being increasingly used in different applications in both military and civilian domains. These applications include surveillance, reconnaissance, remote sensing, target acquisition, border patrol, infrastructure monitoring, aerial imaging, industrial inspection, and emergency medical aid. Vehicles that can be controlled autonomously and react to events without direct intervention by humans. Although some UAVs are able to perform increasingly complex autonomous manoeuvres, most UAVs are not fully autonomous; instead, they are mostly operated remotely by humans. To make UAVs fully autonomous, many technological and algorithmic developments are necessary. This volume presents key challenges associated with the autonomous control of unmanned aerial vehicles, and propose solution methodologies to address such challenges, analyse the proposed methodologies, and evaluate their performance.

*Solutions Manual*

*Power Electronics and Renewable Energy Systems*

*Fundamentals of Power Electronics*

*Second Harmonic Current Reduction Techniques for Single-Phase Power Electronics Converter Systems*

*Second EAI International Conference, SES2020, Viana do Castelo, Portugal, December 4, 2020, Proceedings*

*Design and Control of Power Converters 2020*

This book paves the road for researchers from various areas of engineering working in the realm of smart cities to discuss the intersections in these areas when it comes to infrastructure and its flexibility. The authors lay out models, algorithms and frameworks related to the 'smartness' in the future smart cities. In particular, manufacturing firms, electric generation, transmission and distribution utilities, hardware and software computer companies, automation and control manufacturing firms, and other industries will be able to use this book to enhance their energy operations, improve their comfort and privacy, as well as to increase the benefit from the electrical system. The book pertains to researchers, professionals, and R&D in an array of industries.

This book is devoted to resonant energy conversion in power electronics. It is a practical, systems-level guide to the analysis and design of various dc-dc resonant inverters, high-frequency crystal filters, and dc-dc resonant converters that are building block of many of today's high-frequency energy processing devices. Designed to function as both a superior graduate-level textbook and a valuable professional reference for practicing engineers, it provides students and engineers with a solid grasp of existing high-frequency technology while acquainting them with a number of easy-to-use tools for the analysis and design of resonant power circuits. Resonant power conversion technology is now a very hot area and in the center of the renewable energy and energy harvesting technologies.

In this book, nine papers focusing on different fields of power electronics are gathered, all of which are in line with the present trends in research and industry. Given the generality of the Special Issue, the covered topics range from electrothermal models and losses models in semiconductor devices and magnetics to converters used in high-power applications. In this last case, the papers address specific problems such as the distortion due to zero-current detection or fault investigation using the fast Fourier transform, all being focused on analyzing the topologies of high-power high-density applications, such as the dual active bridge or the H-bridge multilevel inverter. All the papers provide enough insight in the analyzed issues to be used as the starting point of any research. Experimental or simulation results are presented to validate and help with the understanding of the proposed ideas. To summarize, this book will help the reader to solve specific problems in industrial equipment or to increase their knowledge in specific fields.

This book gathers papers presented at the 9th International Conference on Computer Engineering and Networks (CyberNet2019), held in Changsha, China, on October 18-20, 2019. It examines innovations in the fields of computer engineering and networking and explores important, state-of-the-art developments in areas such as Information Security, Information Hiding and Cryptography, Cyber Security, and Intelligent Computing and Applications. The book also covers emerging topics in computer engineering and networking, along with their applications, and discusses how to improve productivity by using the latest advanced technologies, and examines innovation in the fields of computer engineering and networking, particularly in intelligent computing and security.

*Design and Implementation of a Bidirectional Phase-Shift Full-Bridge DC-DC Converter with Clamp Circuits*

*Volume 1*

*Power-Switching Converters, Third Edition*

*Advances in Multimedia, Software Engineering and Computing Vol.1*

*Proceedings of the 9th International Conference on Computer Engineering and Networks*

*Op Amps for Everyone*

*Fundamentals of Power ElectronicsSpringer Nature*

This book reflects the latest research trends, methods and experimental results in the field of electrical and information technologies for rail transportation, which covers abundant state-of-the-art research theories and ideas. As a vital field of research that is highly relevant to current developments in a number of technological domains, the subjects it covers include intelligent computing, information processing, communication technology, automatic control, etc. The objective of the proceedings is to provide a major interdisciplinary forum for researchers, engineers, academicians and industrial professionals to present the most innovative research and development in the field of rail transportation electrical and information technologies. Engineers and researchers in academia, industry and government will also explore an insightful view of the solutions that combine ideas from multiple disciplines in this field. The volumes serve as an excellent reference work for researchers and graduate students working on rail transportation and electrical and information technologies.

Control systems play an important role in engineering. Fuzzy logic is the natural choice for designing control applications and is the most popular and appropriate for the control of home and industrial appliances. Academic and industrial experts are constantly researching and proposing innovative and effective fuzzy control systems. This book is an edited volume and has 21 innovative chapters arranged into five sections covering applications of fuzzy control systems in energy and power systems, navigation systems, imaging, and industrial engineering. Overall, this book provides a rich set of modern fuzzy control systems and their applications and will be a useful resource for the graduate students, researchers, and practicing engineers in the field of electrical engineering.

One of the first books to describe and provide both theoretical and practical analyses on IPT technology illustrated throughout with figures, circuit topologies, design examples, simulation/experimental results, and questions and answers. Addresses a fast moving technology with applications in transport, telecommunications and industry. Accompanying website includes MATLAB examples, exercises, problems and solutions.

*Resonant Power Converters*

*A Neural Network Controller for a Class of Phase-shifted Full-bridge DC-DC Converter*

*Control of Series-Parallel Conversion Systems*

*Soft-Switching PWM Full-Bridge Converters*

*Design, Control, and Application of Modular Multilevel Converters for HVDC Transmission Systems*

*2021 National Power Electronics Conference (NPEC)*

MSE2011 is an integrated conference concentrating its focus upon Multimedia, Software Engineering, Computing and Education. In the proceeding, you can learn much more knowledge about Multimedia, Software Engineering, Computing and Education of researchers all around the world. The main role of the proceeding is to be used as an exchange pillar for researchers who are working in the mentioned field. In order to meet high standard of Springer, AISC series, the organization committee has made their efforts to do the following things. Firstly, poor quality paper has been refused after reviewing course; Secondly, periodically review meetings have been held around the reviewers about five times for exchanging reviewing suggestions. Finally, the conference organization had several preliminary sessions before the conference. Through efforts of different people and departments, the conference will be successful and fruitful.

Significantly expanded and updated with extensive revisions, new material, and a new chapter on emerging applications of switching converters, Power-Switching Converters, Third Edition offers the same trusted, accessible, and comprehensive information as its bestselling predecessors. Similar to the two previous editions, this book can be used for an introductory as well as a more advanced course. Chapters begin with an introduction to switching converters and basic switching converter topologies. Entry-level chapters continue with the analysis of resonant converters, isolated switching converter, and the control schemes of switching converters. Skipping to chapters 10 and 11, the subject matter involves an examination of interleaved converters and switched capacitor converters to round out and complete the overview of switching converter topologies. More detailed chapters include the continuous time-modeling and discrete-time modeling of switching converters as well as analog control and digital control. Advanced material covers tools for the simulation of switching converters (including both PSpice and Matlab simulations) and the basic concepts necessary to understand various actual and emerging applications for switching converters, such as power factor correction, LED drivers, low-noise converters, and switching converters topologies for solar and fuel cells. The final chapter contains several complete design examples, including experimental design tools that may be used as technical references or for class laboratory projects. Supplementary information is available at cresspay.com including slides, PSpice examples (designed to run on the OCAD 9.2 student version and PSIM software) and MATLAB scripts. Continuing the august tradition of its predecessors, Power-Switching Converters, Third Edition provides introductory and advanced information on all aspects of power switching converters to give students the solid foundation and applicable knowledge required to advance in this growing field.