

# Llc Resonant Converter For Battery Charging Applications

The proceedings of the 16th Annual Conference of China Electrotechnical Society  
 Electric Vehicle Propulsion Drives and Charging Systems  
 Proceedings of PURPLE MOUNTAIN FORUM 2019-International Forum on Smart Grid Protection and Control  
 Silicon Carbide Power Devices  
 Sneak Circuits of Power Electronic Converters  
 Energy Harvesting  
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 2020 International Conference on Computer, Electrical and Communication Engineering (ICCECE)  
 DC-DC Converter Topologies  
 Power Electronics for Electric Vehicles and Energy Storage  
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 Design and Control of Power Converters 2020  
 Sixth International Conference on Intelligent Computing and Applications  
 Power Converters, Drives and Controls for Sustainable Operations  
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 Wireless Power Transfer for Electric Vehicles: Foundations and Design Approach  
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 2021 IEEE Energy Conversion Congress and Exposition (ECCE)  
 New Topologies and Modulation Schemes for Soft-Switching Isolated DC-DC Converters  
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 INTERNATIONAL CONFERENCE ON INNOVATIONS IN COMMUNICATIONS AND COMPUTER ENGINEERING - ICICCE'15  
 Power System Dynamics and Stability  
 Power Converters for Electric Vehicles

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## HOUSTON ISRAEL

*The proceedings of the 16th Annual Conference of China Electrotechnical Society* John Wiley & Sons  
 For a one-semester senior or beginning graduate level course in power system dynamics. This text begins with the fundamental laws for basic devices and systems in a mathematical modeling context. It includes systematic derivations of standard synchronous machine models with their fundamental controls. These individual models are interconnected for system analysis and simulation. Singular perturbation is used to derive and explain reduced-order models.

### **Electric Vehicle Propulsion Drives and Charging Systems** Springer

This book provides readers with sufficient insight into battery equalization control technologies from both theoretical and engineering perspectives. Distinguished from most of the existing works that focus on the hardware design of active equalizers, this book intends to comprehensively introduce equalization control strategies for lithium-ion battery packs. The validity and reliability of the control strategies in this book have been verified by theory and experiments. This book summarizes the battery equalization technologies from the equalization system to the equalization control algorithm. From this book, readers who are interested in the area of battery management can have a broad view of cell equalization technologies. Readers who have no experience in the battery management area can learn the basic concept, analysis methods, and design principles of the cell equalization system for battery packs. Even for the readers who are occupied in this area, this book provides rich knowledge on engineering applications and future trends of battery equalization control.

*Proceedings of PURPLE MOUNTAIN FORUM 2019-International Forum on Smart Grid Protection and Control* MDPI

This book gathers outstanding papers presented at the 16th Annual Conference of China Electrotechnical Society, organized by China Electrotechnical Society (CES), held in Beijing, China, from September 24 to 26, 2021. It covers topics such as electrical technology, power systems, electromagnetic emission technology, and electrical equipment. It introduces the innovative solutions that combine ideas from multiple disciplines. The book is very much helpful and useful for the researchers, engineers, practitioners, research students, and interested readers.

### **Silicon Carbide Power Devices** Springer Nature

This text will help readers to gain knowledge about designing power electronic converters and their control for electric vehicles. It discusses the ways in which power from electric vehicle batteries is transferred to an electric motor, the technology used for charging electric vehicle batteries, and energy storage. The text covers case studies and real-life examples related to electric vehicles. The book • Discusses the latest advances and developments in the field of electric vehicles • Examines the challenges associated with the integration of renewable energy sources with electric vehicles • Highlights basic understanding of the charging infrastructure for electric vehicles • Covers concepts including the reliability of power converters in electric vehicles, and battery management systems. This book discusses the challenges, emerging technologies, and recent development of power electronics for electric vehicles. It will serve as an ideal reference text for graduate students and academic researchers in the fields of electrical engineering, electronics and communication engineering, environmental engineering, automotive engineering, and computer science.

*Sneak Circuits of Power Electronic Converters* John Wiley & Sons

An up-to-date, practical guide on upgrading from silicon to GaN, and how to use GaN transistors in power conversion systems design This updated, third edition of a popular book on GaN transistors for efficient power conversion has been substantially expanded to keep students and practicing power conversion engineers ahead of the learning curve in GaN technology advancements.

Acknowledging that GaN transistors are not one-to-one replacements for the current MOSFET

technology, this book serves as a practical guide for understanding basic GaN transistor construction, characteristics, and applications. Included are discussions on the fundamental physics of these power semiconductors, layout, and other circuit design considerations, as well as specific application examples demonstrating design techniques when employing GaN devices. GaN Transistors for Efficient Power Conversion, 3rd Edition brings key updates to the chapters of Driving GaN Transistors; Modeling, Simulation, and Measurement of GaN Transistors; DC-DC Power Conversion; Envelope Tracking; and Highly Resonant Wireless Energy Transfer. It also offers new chapters on Thermal Management, Multilevel Converters, and Lidar, and revises many others throughout. Written by leaders in the power semiconductor field and industry pioneers in GaN power transistor technology and applications Updated with 35% new material, including three new chapters on Thermal Management, Multilevel Converters, Wireless Power, and Lidar Features practical guidance on formulating specific circuit designs when constructing power conversion systems using GaN transistors A valuable resource for professional engineers, systems designers, and electrical engineering students who need to fully understand the state-of-the-art GaN Transistors for Efficient Power Conversion, 3rd Edition is an essential learning tool and reference guide that enables power conversion engineers to design energy-efficient, smaller, and more cost-effective products using GaN transistors.

### **Energy Harvesting** CRC Press

In recent years, lithium-ion batteries (LIBs) have been increasingly contributing to the development of novel engineering systems with energy storage requirements. LIBs are playing an essential role in our society, as they are being used in a wide variety of applications, ranging from consumer electronics, electric mobility, renewable energy storage, biomedical applications, or aerospace systems. Despite the remarkable achievements and applicability of LIBs, there are several features within this technology that require further research and improvements. In this book, a collection of 10 original research papers addresses some of those key features, including: battery testing methodologies, state of charge and state of health monitoring, and system-level power electronics applications. One key aspect to emphasize when it comes to this book is the multidisciplinary nature of the selected papers. The presented research was developed at university departments, institutes and organizations of different disciplines, including Electrical Engineering, Control Engineering, Computer Science or Material Science, to name a few examples. The overall result is a book that represents a coherent collection of multidisciplinary works within the prominent field of LIBs.

### **Control of Power Electronic Converters and Systems: Volume 4** John Wiley & Sons

A complete all-in-one reference on the important interdisciplinary topic of Battery Systems Engineering Focusing on the interdisciplinary area of battery systems engineering, this book provides the background, models, solution techniques, and systems theory that are necessary for the development of advanced battery management systems. It covers the topic from the perspective of basic electrochemistry as well as systems engineering topics and provides a basis for battery modeling for system engineering of electric and hybrid electric vehicle platforms. This original approach gives a useful overview for systems engineers in chemical, mechanical, electrical, or aerospace engineering who are interested in learning more about batteries and how to use them effectively. Chemists, material scientists, and mathematical modelers can also benefit from this book by learning how their expertise affects battery management. Approaches a topic which has experienced phenomenal growth in recent years Topics covered include: Electrochemistry; Governing Equations; Discretization Methods; System Response and Battery Management Systems Include tables, illustrations, photographs, graphs, worked examples, homework problems, and references, to thoroughly illustrate key material Ideal for engineers working in the mechanical, electrical, and chemical fields as well as graduate students in these areas A valuable resource for Scientists and Engineers working in the battery or electric vehicle industries, Graduate students in

mechanical engineering, electrical engineering, chemical engineering.

**2020 International Conference on Computer, Electrical and Communication Engineering (ICCECE)** Springer Nature

**POWER CONVERTERS, DRIVES AND CONTROLS FOR SUSTAINABLE OPERATIONS** Written and edited by a group of experts in the field, this groundbreaking reference work sets the standard for engineers, students, and professionals working with power converters, drives, and controls, offering the scientific community a way towards combating sustainable operations. The future of energy and power generation is complex. Demand is increasing, and the demand for cleaner energy and electric vehicles (EVs) is increasing with it. With this increase in demand comes an increase in the demand for power converters. Part one of this book is on switched-mode converters and deals with the need for power converters, their topologies, principles of operation, their steady-state performance, and applications. Conventional topologies like buck, boost, buck-boost converters, inverters, multilevel inverters, and derived topologies are covered in part one with their applications in fuel cells, photovoltaics (PVs), and EVs. Part two is concerned with electrical machines and converters used for EV applications. Standards for EV, charging infrastructure, and wireless charging methodologies are addressed. The last part deals with the dynamic model of the switched-mode converters. In any DC-DC converter, it is imperative to control the output voltage as desired. Such a control may be achieved in a variety of ways. While several types of control strategies are being evolved, the popular method of control is through the duty cycle of the switch at a constant switching frequency. This part of the book briefly reviews the conventional control theory and builds on the same to develop advanced techniques in the closed-loop control of switch mode power converters (SMPC), such as sliding mode control, passivity-based control, model predictive control (MPC), fuzzy logic control (FLC), and backstepping control. A standard reference work for veteran engineers, scientists, and technicians, this outstanding new volume is also a valuable introduction to new hires and students. Useful to academics, researchers, engineers, students, technicians, and other industry professionals, it is a must-have for any library.

**DC-DC Converter Topologies** CRC Press

**Control of Power Electronic Converters and Systems, Volume Four** covers emerging topics in the control of power electronics and converters not covered in previous volumes, including emerging power converter topologies, storage systems, battery chargers and the smart transformer. This updated edition specifically focuses on emerging power converter topologies and discusses very recent advances and topics with applications in power electronics and formidable probable dynamics. Chapters include modeling of power converters and their control, with supportive simulations and additional experimental results. Anyone looking for fundamental knowledge regarding new trends in power electronics by application, and also ready to use models and methodologies in their design, control and testing will find this the next invaluable resource in this highly regarded series. - Combines essential control design methods and trends with different applications of power converter topologies - Includes global perspectives, case studies and real examples from different applications and their control - Features ready-to-use models and methodologies in power electronic application, their design, control and testing

**Power Electronics for Electric Vehicles and Energy Storage** Academic Press

Today, there is a great deal of attention focused on sustainable growth worldwide. The increase in efficiency in the use of energy may even, in this historical moment, bring greater benefit than the use of renewable energies. Electricity appears to be the most sustainable of energies and the most promising hope for a planet capable of growing without compromising its own health and that of its inhabitants. Power electronics and electrical drives are the key technologies that will allow energy savings through the reduction of energy losses in many applications. This Special Issue has collected several scientific contributions related to energy efficiency in electrical equipment. Some articles are dedicated to the use and optimization of permanent magnet motors, which allow obtaining the highest level of efficiency. Most of the contributions describe the energy improvements that can be achieved with power electronics and the use of suitable control techniques. Last but not least, some articles describe interesting solutions for hybrid vehicles, which were created mainly to save energy in the smartest way possible.

**Advanced Battery Technologies** MDPI

In recent years, lithium-ion batteries (LIBs) have been increasingly contributing to the development of novel engineering systems with energy storage requirements. LIBs are playing an essential role in our society, as they are being used in a wide variety of applications, ranging from consumer electronics, electric mobility, renewable energy storage, biomedical applications, or aerospace systems. Despite the remarkable achievements and applicability of LIBs, there are several features within this technology that require further research and improvements. In this book, a collection of 10 original research papers addresses some of those key features, including: battery testing methodologies, state of charge and state of health monitoring, and system-level power electronics applications. One key aspect to emphasize when it comes to this book is the multidisciplinary nature of the selected papers. The presented research was developed at university departments, institutes and organizations of different disciplines, including Electrical Engineering, Control Engineering, Computer Science or Material Science, to name a few examples. The overall result is a book that represents a coherent collection of multidisciplinary works within the prominent field of LIBs.

**Fundamentals of Power Semiconductor Devices** Springer Nature

A comprehensive look at DC-DC converters and advanced power converter topologies for all skills levels As it can be rare for source voltage to meet the requirements of a Direct Current (DC) load, DC-DC converters are essential to access service. DC-DC power converters employ power semiconductor devices (like MOSFETs and IGBTs) as switches and passive elements such as capacitors, inductors, and transformers to alter the voltage provided by a DC source into the necessary DC voltage as is required by a DC load. This source can be a battery, solar panels, fuel cells, or a DC bus voltage fed by rectified AC utility voltage. As the many components of DC-DC converters can be differently arranged into circuit structures called topologies, there are as many possible circuit topologies as there are possible combinations of circuit elements. Focusing on DC-DC switch-mode power converters ranging from 50 W to 10kW, DC-DC Converter Topologies provides a

survey of all converter topology types within this power range. General principles are described for each topology type using a representative converter as an example. Variations that can be found that differ from the example are then examined, with a helpful discussion of comparisons when relevant. A broad range of topics is covered within the book, from simple, low-power converters to complex, high-power converters and everywhere in between. DC-DC Converter Topologies readers will also find: A detailed discussion of four key DC-DC converter topologies Description of isolated two-switch pulse-width modulated (PWM) topologies including push-pull, half-bridge, and interleaved converters An exploration of high-gain converters such as coupled inductors, voltage multipliers, and switched capacitor converters This book provides the tools so that a non-expert will be equipped to deal with the vast array of DC-DC converters that presently exist. As such, DC-DC Converter Topologies is a useful reference for electrical engineers, professors, and graduate students studying in the field.

**Design and Control of Power Converters 2020** CRC Press

This book is devoted to resonant energy conversion in power electronics. It is a practical, systematic guide to the analysis and design of various dc-dc resonant inverters, high-frequency rectifiers, and dc-dc resonant converters that are building blocks of many of today's high-frequency energy processors. Designed to function as both a superior senior-to-graduate level textbook for electrical engineering courses 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.

**Sixth International Conference on Intelligent Computing and Applications** World Scientific

This book presents original, peer-reviewed research papers from the 4th Purple Mountain Forum -International Forum on Smart Grid Protection and Control (PMF2019-SGPC), held in Nanjing, China on August 17-18, 2019. Addressing the latest research hotspots in the power industry, such as renewable energy integration, flexible interconnection of large scale power grids, integrated energy system, and cyber physical power systems, the papers share the latest research findings and practical application examples of the new theories, methodologies and algorithms in these areas. As such book a valuable reference for researchers, engineers, and university students.

**Power Converters, Drives and Controls for Sustainable Operations** Springer Nature

This book is focused on the fundamental aspects of analysis, modeling and design of digital control loops around high-frequency switched-mode power converters in a systematic and rigorous manner Comprehensive treatment of digital control theory for power converters Verilog and VHDL sample codes are provided Enables readers to successfully analyze, model, design, and implement voltage, current, or multi-loop digital feedback loops around switched-mode power converters Practical examples are used throughout the book to illustrate applications of the techniques developed Matlab examples are also provided

**9th International Conference on Robotic, Vision, Signal Processing and Power Applications** CRC Press

This book presents the peer-reviewed proceedings of the Sixth International Conference on Intelligent Computing and Applications (ICICA 2020), held at Government College of Engineering, Keonjhar, Odisha, India, during December 22-24, 2020. The book includes the latest research on advanced computational methodologies such as neural networks, fuzzy systems, evolutionary algorithms, hybrid intelligent systems, uncertain reasoning techniques, and other machine learning methods and their applications to decision-making and problem-solving in mobile and wireless communication networks.

**Wireless Power Transfer for Electric Vehicles: Foundations and Design Approach** John Wiley & Sons

ICCECE is an international conference hosted by Techno India University, Kolkata covering research aspects in Computer, Electrical and Communication Engineering The conference invites International and SAARC Participants to present research papers

**Power Electronics in Renewable Energy Systems and Smart Grid** International Journal For Trends in Engineering and Technology

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

**Advances in High-Efficiency LLC Resonant Converters** MDPI

This book gathers outstanding papers presented at the 16th Annual Conference of China Electrotechnical Society, organized by China Electrotechnical Society (CES), held in Beijing, China, from September 24 to 26, 2021. It covers topics such as electrical technology, power systems, electromagnetic emission technology, and electrical equipment. It introduces the innovative solutions that combine ideas from multiple disciplines. The book is very much helpful and useful for the researchers, engineers, practitioners, research students, and interested readers.

**2021 IEEE Energy Conversion Congress and Exposition (ECCE)** CRC Press

Power semiconductor devices are widely used for the control and management of electrical energy. The improving performance of power devices has enabled cost reductions and efficiency increases resulting in lower fossil fuel usage and less environmental pollution. This book provides the first cohesive treatment of the physics and design of silicon carbide power devices with an emphasis on unipolar structures. It uses the results of extensive numerical simulations to elucidate the operating principles of these important devices. Sample Chapter(s). Chapter 1: Introduction (72 KB). Contents: Material Properties and Technology; Breakdown Voltage; PiN Rectifiers; Schottky Rectifiers; Shielded Schottky Rectifiers; Metal-Semiconductor Field Effect Transistors; The Baliga-Pair Configuration; Planar Power MOSFETs; Shielded Planar MOSFETs; Trench-Gate Power MOSFETs; Shielded Trench-Gate MOSFETs; Charge Coupled Structures; Integral Diodes; Lateral High Voltage FETs; Synopsis. Readership: For practising engineers working on power devices, and as a supplementary textbook for a graduate level course on power devices.

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