

Totem Pole Pfc With Gan And Sic Power Electronics

III-Nitride Electronic Devices, Volume 102, emphasizes two major technical areas advanced by this technology: radio frequency (RF) and power electronics applications. The range of topics covered by this book provides a basic understanding of materials, devices, circuits and applications while showing the future directions of this technology. Specific chapters cover Electronic properties of III-nitride materials and basics of III-nitride HEMT, Epitaxial growth of III-nitride electronic devices, III-nitride microwave power transistors, III-nitride millimeter wave transistors, III-nitride lateral transistor power switch, III-nitride vertical devices, Physics-Based Modeling, Thermal management in III-nitride HEMT, RF/Microwave applications of III-nitride transistor/wireless power transfer, and more. Presents a complete review of III-Nitride electronic devices, from fundamental physics, to applications in two key technical areas - RF and power electronics Outlines fundamentals, reviews state-of-the-art circuits and applications, and introduces current and emerging technologies Written by a panel of academic and industry experts in each field

This book explores integrated gate drivers with emphasis on new gallium nitride (GaN) power transistors, which offer fast switching along with minimum switching losses. It serves as a comprehensive, all-in-one source for gate driver IC design, written in handbook style with systematic guidelines. The authors cover the full range from fundamentals to implementation details including topics like power stages, various kinds of gate drivers (resonant, non-resonant, current-source, voltage-source), gate drive schemes, driver supply, gate loop, gate driver power efficiency and comparison silicon versus GaN transistors. Solutions are presented on the system and circuit level for highly integrated gate drivers. Coverage includes miniaturization by higher integration of subfunctions onto the IC (buffer capacitors), as well as more efficient switching by a multi-level approach, which also improves robustness in case of extremely fast switching transitions. The discussion also includes a concept for robust operation in the highly relevant case that the gate driver is placed in distance to the power transistor. All results are widely applicable to achieve highly compact, energy efficient, and cost-effective power electronics solutions.?

The 13th IEEE International Conference on Power Electronics and Drive Systems (PEDS 2019) will be held in Toulouse, France on 9-12 July 2019. The conference is a biennial event and is recognized as one of the major series of conferences in power electronics and drive systems. PEDS 2019 continues to retain its tradition of high quality conference and will open up an opportunity for academics and industrial professionals worldwide to exchange their knowledge of the state of the art power electronics and drive technologies and applications. The 4 day programme will feature tutorials and technical paper presentations.

Whether you are a student, a newly-minted engineer entering the field of power electronics, a salesperson needing to understand a customer's needs, or a seasoned power supply designer desiring to track down a forgotten equation, this book will be a significant aid. Beginning with the basic definition of a power supply, we will traverse through voltage regulation techniques and the components necessary for their implementation, and then move on to the myriad of circuit topologies and control algorithms prevalent in modern-day design solutions. Separate chapters on feedback-loop compensation and magnetic design principles will build on this foundation, along with in-depth descriptions for dealing with regulations for electromagnetic compatibility, human safety, and energy efficiency issues. Additional chapters will describe the value proposition for digital control and the practical aspects power supply construction.

Tenth Anniversary Expanded Edition Ten years on, Jasbir K. Puar's pathbreaking Terrorist Assemblages remains one of the most influential

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queer theory texts and continues to reverberate across multiple political landscapes, activist projects, and scholarly pursuits. Puar argues that configurations of sexuality, race, gender, nation, class, and ethnicity are realigning in relation to contemporary forces of securitization, counterterrorism, and nationalism. She examines how liberal politics incorporate certain queer subjects into the fold of the nation-state, shifting queers from their construction as figures of death to subjects tied to ideas of life and productivity. This tenuous inclusion of some queer subjects depends, however, on the production of populations of Orientalized terrorist bodies. Heteronormative ideologies that the U.S. nation-state has long relied on are now accompanied by what Puar calls homonationalism—a fusing of homosexuality to U.S. pro-war, pro-imperialist agendas. As a concept and tool of biopolitical management, homonationalism is here to stay. Puar's incisive analyses of feminist and queer responses to the Abu Ghraib photographs, the decriminalization of sodomy in the wake of the Patriot Act, and the profiling of Sikh Americans and South Asian diasporic queers are not instances of a particular historical moment; rather, they are reflective of the dynamics saturating power, sexuality, race, and politics today. This Tenth Anniversary Expanded Edition features a new foreword by Tavia Nyong'o and a postscript by Puar entitled "Homonationalism in Trump Times." Nyong'o and Puar recontextualize the book in light of the current political moment while reposing its original questions to illuminate how Puar's interventions are even more vital and necessary than ever. 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 covered 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 as well as 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 the government will also explore an insight 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, electrical and information technologies.

Annotation This conference covers all aspects of electric power engineering, including power systems, smart grid technologies, power electronics, renewable energy, and electric machines.

This book relates the recent developments in several key electrical engineering R&D labs, concentrating on power electronics switches and their use. The first sections deal with key power electronics technologies, MOSFETs and IGBTs, including series and parallel associations. The next section examines silicon carbide and its potentiality for power electronics applications and its present limitations. Then, a dedicated section presents the capacitors, key passive components in power electronics, followed by a modeling method allowing the stray inductances computation, necessary for the precise simulation of switching waveforms. Thermal behavior associated with power switches follows, and the last part proposes some interesting prospectives associated to Power Electronics integration.

This book is intended for the reader who wishes to gain a solid understanding of Phase Locked Loop architectures and their applications. It provides a unique balance between both theoretical perspectives and practical design trade-offs. Engineers faced with real world design problems will find this book to be a valuable reference providing example implementations, the underlying equations that describe synthesizer behavior, and measured results that will improve confidence that the equations are a reliable predictor of system behavior. New material in the Fourth Edition includes partially integrated loop filter implementations, voltage controlled oscillators, and modulation using the PLL.

This book presents the first comprehensive overview of the properties and fabrication methods of GaN-based power transistors, with

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contributions from the most active research groups in the field. It describes how gallium nitride has emerged as an excellent material for the fabrication of power transistors; thanks to the high energy gap, high breakdown field, and saturation velocity of GaN, these devices can reach breakdown voltages beyond the kV range, and very high switching frequencies, thus being suitable for application in power conversion systems. Based on GaN, switching-mode power converters with efficiency in excess of 99 % have been already demonstrated, thus clearing the way for massive adoption of GaN transistors in the power conversion market. This is expected to have important advantages at both the environmental and economic level, since power conversion losses account for 10 % of global electricity consumption. The first part of the book describes the properties and advantages of gallium nitride compared to conventional semiconductor materials. The second part of the book describes the techniques used for device fabrication, and the methods for GaN-on-Silicon mass production. Specific attention is paid to the three most advanced device structures: lateral transistors, vertical power devices, and nanowire-based HEMTs. Other relevant topics covered by the book are the strategies for normally-off operation, and the problems related to device reliability. The last chapter reviews the switching characteristics of GaN HEMTs based on a systems level approach. This book is a unique reference for people working in the materials, device and power electronics fields; it provides interdisciplinary information on material growth, device fabrication, reliability issues and circuit-level switching investigation.

APEC focuses on the practical and applied aspects of the power electronics business Not just a power designer s conference, APEC has something of interest for anyone involved in power electronics including Equipment OEMs that use power supplies and converters in their equipment, Designers of power supplies, dc, dc converters, motor drives, uninterruptable power supplies, inverters and any other power electronic circuits, equipments and systems, Manufacturers and suppliers of components and assemblies used in power electronics, manufacturing, quality and test engineers involved with power electronics equipment, Marketing, sales and anyone involved in the business of power electronic, Compliance engineers testing and qualifying power electronics equipment or equipment that uses power electronics Control of Power Electronic Converters and Systems examines the theory behind power electronic converter control, including operation, modeling and control of basic converters. The book explores how to manipulate components of power electronics converters and systems to produce a desired effect by controlling system variables. Advances in power electronics enable new applications to emerge and performance improvement in existing applications. These advances rely on control effectiveness, making it essential to apply appropriate control schemes to the converter and system to obtain the desired performance. Discusses different applications and their control Explains the most important controller design methods both in analog and digital Describes different important applications to be used in future industrial products Covers voltage source converters in significant detail Demonstrates applications across a much broader context

"The Battle for Khe Sanh" by Moyers S. Shore. Published by Good Press. Good Press publishes a wide range of titles that encompasses every genre. From well-known classics & literary fiction and non-fiction to forgotten?or yet undiscovered gems?of world literature, we issue the books that need to be read. Each Good Press edition has been meticulously edited and formatted to boost readability for all e-readers and devices. Our goal is to produce eBooks that are user-friendly and accessible to everyone in a high-quality digital format.

This second edition 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, it 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

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application examples demonstrating design techniques when employing GaN devices. Topics include: discussions on device-circuit interactions; practical guidance on formulating specific circuit designs when constructing power conversion systems using GaN transistors. -- Wide Bandgap Semiconductors for Power Electronic A guide to the field of wide bandgap semiconductor technology Wide Bandgap Semiconductors for Power Electronics is a comprehensive and authoritative guide to wide bandgap materials silicon carbide, gallium nitride, diamond and gallium(III) oxide. With contributions from an international panel of experts, the book offers detailed coverage of the growth of these materials, their characterization, and how they are used in a variety of power electronics devices such as transistors and diodes and in the areas of quantum information and hybrid electric vehicles. The book is filled with the most recent developments in the burgeoning field of wide bandgap semiconductor technology and includes information from cutting-edge semiconductor companies as well as material from leading universities and research institutions. By taking both scholarly and industrial perspectives, the book is designed to be a useful resource for scientists, academics, and corporate researchers and developers. This important book: Presents a review of wide bandgap materials and recent developments Links the high potential of wide bandgap semiconductors with the technological implementation capabilities Offers a unique combination of academic and industrial perspectives Meets the demand for a resource that addresses wide bandgap materials in a comprehensive manner Written for materials scientists, semiconductor physicists, electrical engineers, Wide Bandgap Semiconductors for Power Electronics provides a state of the art guide to the technology and application of SiC and related wide bandgap materials.

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.

Fundamentals of Power Semiconductor Devices provides an in-depth treatment of the physics of operation of power semiconductor devices that are commonly used by the power electronics industry. Analytical models for explaining the operation of all power semiconductor devices are shown. The treatment here focuses on silicon devices but includes the unique attributes and design requirements for emerging silicon carbide devices. The book will appeal to practicing engineers in the power semiconductor device community.

Wide-bandgap (WBG) semiconductor technology will largely replace silicon switching devices in the active power factor correction (PFC) circuit of a telecom power supply in the near future. Superior electrical characteristics of commercially available Gallium Nitride (GaN) devices make totem-pole PFC a clear winner over competing topologies in terms of efficiency. This thesis focuses on the development of a totem-pole PFC using state-of-the-art GaN devices for next-generation telecom power supplies. A detailed investigation of ac zero-crossings of this topology has successfully identified the rapid fluctuation in voltage across low-frequency MOSFET as the source of common-mode noise. An equivalent circuit accompanied by a set of equations correlate different circuit parameters with the noise generation.

Challenges associated with current reversal near zero-crossings of a synchronous totem-pole PFC are studied and a formerly unreported source of common-mode noise generation around ac zero-crossings has been investigated in detail. Many artists have fought in wars, and renowned painters have recorded heroic scenes of great battles, but those works were usually done long after the battles were waged. Artists have also been commissioned to visit, briefly, war-torn areas and make notes of the devastation and horror. Yet few artists who were members of any armed services have drawn or painted daily while they fought alongside their comrades. Edward Reep, as an official combat artist in World War II, painted and sketched while the battles of the Italian campaign raged around him. He was shelled, mortared, and strafed. At Monte Cassino, the earth trembled as he attempted to paint the historic bombing of that magnificent abbey. Later, racing into Milan with armed partisans on the fenders of his Jeep, he saw the bodies of Mussolini and his beautiful mistress cut down from the gas station where they had been hanged by their heels. That same day he witnessed at first hand the spectacle of a large German army force holed up in a high-rise office tower, waiting for the chance to surrender to the proper American brass for fear of falling into the hands of the vengeful partisans. Reep's recollections of such desperate days are made more memorable in *Combat Artist* by the many painfully vivid paintings and drawings that accompany the text. Reep's battlefield drawings show us, with unrelenting honesty, the horrors and griefs -- and the bitter comedy -- of that war fought to end wars that only spawned more.

Control of Power Electronic Converters, Volume Two gives the theory behind power electronic converter control and discusses the operation, modelling and control of basic converters. The main components of power electronics systems that produce a desired effect (energy conversion, robot motion, etc.) by controlling system variables (voltages and currents) are thoroughly covered. Both small (mobile phones, computer power supplies) and very large systems (trains, wind turbines, high voltage power lines) and their power ranges, from the Watt to the Gigawatt, are presented and explored. Users will find a focused resource on how to apply innovative control techniques for power converters and drives. Discusses different applications and their control Explains the most important controller design methods, both in analog and digital Describes different, but important, applications that can be used in future industrial products Covers voltage source converters in significant detail Demonstrates applications across a much broader context

This textbook is the first of its kind to comprehensively describe the energy Internet, a vast network that efficiently supplies electricity to anyone anywhere and is an internet based wide area network for information and energy fusion. The chapters are organized into five parts: Architecture and Design, Energy Switching and Routing, Information and Communication, Energy Management Systems and Energy Market and Trading, and capture the spectrum of this exponential transformation, while also presenting the plethora of open problems that this transformation poses for

researchers from mixed academic backgrounds. The scope includes key technologies on distributed energy sources, microgrids, energy storage, solar and wind energy, power grid, smart grid, power quality, power electronics, data centers, distributed computing and networking, cloud computing and big data, and software-defined networking. The book presents the basic principles of energy internet and emphasizes the current research trends in the field of energy Internet at an advanced level. It includes instructor materials, case-studies, and worked examples throughout. This is an ideal resource for students in advanced graduate-level courses and special topics in energy, information and control systems, and is a useful tool for utility engineers who seek an intuitive understanding of the emerging applications of energy Internet.

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.

Power Electronics Application Conference and Exposition (PEAC) is an international conference for presentation and discussion of the state of art in power electronics and energy conversion, mainly in power supply and related areas The world s industry, research, and academia are cordially invited to participate in an array of presentations, tutorials, Exhibitions and social activities for the advancement of science, technology, engineering education, and fellowship Technical interests of the conference are included but not limited to Switching Power Supply Inverter and UPS Power Devices and System Integrations High Frequency Magnetic and Integrated Magnetic Modeling, control, Simulation, EMI and Reliability Conversion Technologies for Renewable Energy and Energy Saving Power Electronics Applied to Transmission and Distribution Systems Power Electronics Applied to Electric Vehicles and Railway Systems Lighting electronics

As silicon reaches its theoretical performance limits for power electronics, industry is shifting toward wide-bandgap

materials like Gallium Nitride (GaN), whose properties provide clear benefits in power converters for consumer and industrial electronics. In over 150 pages covering the technology, its applications, markets and future potential, this book delves into GaN technology and its importance for power electronics professionals engaged with its implementation in power devices. The properties of GaN, such as low leakage current, significantly reduced power losses, higher power density and the ability to tolerate higher operating temperatures, all from a device smaller than its silicon-only equivalent, provide design advantages allowing previously unimaginable application performance. As an alternative to silicon, GaN can provide clear benefits in power converters for consumer and industrial electronics; chargers for wireless devices, including 5G; driver circuits for motor control; and power switches in automotive and space applications. The book also explores why GaN-based devices hold the key to addressing the energy efficiency agenda, a key strategic initiative in increasingly power-reliant industries such as data centers, electric vehicles, and renewable energy systems. Highly efficient residential and commercial energy storage systems using GaN technology will enable distribution, local storage, and on-demand access to renewable energy. Continued progress in the battery market will lead to declining battery costs and the development of smaller batteries that pair with GaN technology-based converters and inverters. Thermal management is critical in power electronics, and high efficiency in higher-power systems is always a focus. With GaN, a 50% reduction in losses can be achieved, reducing the costs and area required to manage heat. The book delves into GaN's electrical characteristics and how these can be exploited in power devices. There are also chapters that cross into the key applications for GaN devices for several markets such as space, automotive, audio, motor control and data centers. Each chapter provides a comprehensive overview of the subject matter for anyone who wants to stay on the leading edge of power electronics.

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.

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

GaN is considered the most promising material candidate in next-generation power device applications, owing to its unique material properties, for example, bandgap, high breakdown field, and high electron mobility. Therefore, GaN power device technologies are listed as the top priority to be developed in many countries, including the United States, the European Union, Japan, and China. This book presents a comprehensive overview of GaN power device technologies, for example, material growth, property analysis, device structure design, fabrication process, reliability, failure analysis, and packaging. It provides useful information to both students and researchers in academic and related industries working on GaN power devices. GaN wafer growth technology is from Enkris Semiconductor, currently one of the leading players in commercial GaN wafers. Chapters 3 and 7, on the GaN transistor fabrication process and GaN vertical power devices, are edited by Dr. Zhihong Liu, who has been working on GaN devices for more than ten years. Chapters 2 and 5, on the characteristics of polarization effects and the original demonstration of AlGaIn/GaN heterojunction field-effect transistors, are written by researchers from Southwest Jiaotong University. Chapters 6, 8, and 9, on surface passivation, reliability, and package technologies, are edited by a group of researchers from the Southern University of Science and Technology of China.

SiC and GaN devices have been around for some time. The first dedicated international conference on SiC and related devices, "ICSCRM," was held in Washington, DC, in 1987. But only recently, the commercialization of SiC and GaN devices has happened. Due to its material properties, Si as a semiconductor has limitations in high-temperature, high-voltage, and high-frequency regimes. With the help of SiC and GaN devices, it is possible to realize more efficient power systems. Devices manufactured from SiC and GaN have already been impacting different areas with their ability to outperform Si devices. Some of the examples are the telecommunications, automotive/locomotive, power, and renewable energy industries. To achieve the carbon emission targets set by different countries, it is inevitable to use these new technologies. This book attempts to cover all the important facets related to wide bandgap semiconductor technology, including new challenges posed by it. This book is intended for graduate students, researchers, engineers, and technology experts who have been working in the exciting fields of SiC and GaN power devices. EI2 2018 focus on the innovative technologies and practical implementations around 2 EIs (EI2 in abbreviation) Energy Internet and Energy System Integration, which can be interpreted as multiple energy supply system or energy high effective utilization or energy system enrolled with Internet and the related concept The conference aims to promote the integration, openness, and coordination of various energy resources and shaping a green, low carbon, economical energy ecosystem

Totem-pole Power Factor Correction Rectifier with Gallium-Nitride Devices for Telecom Power Supply

The Energy Internet: An Open Energy Platform to Transform Legacy Power Systems into Open Innovation and Global Economic Engines is an innovative concept that changes the way people generate, distribute and consume electrical energy. With the potential to transform the infrastructure of the electric grid, the book challenges existing power systems, presenting innovative and pioneering theories and technologies that will challenge existing norms on generation and consumption. Researchers, academics, engineers, consultants and policymakers will gain a thorough understanding of the Energy Internet that includes a thorough dissemination of case studies from the USA, China, Japan, Germany and the U.K. The book's editors provide analysis of various enabling technologies and technical solutions, such as control theory, communication, and the social and economic aspects that are central to obtaining a clear appreciation of the potential of this complex infrastructure. Presents the first complete resource on the innovative concept of the Energy Internet Provides a clear analysis of the architecture of the Energy Internet to ensure an understanding of the technologies behind generating, distributing and consuming electricity in this way Includes a variety of global case studies of real-world implementation and pilot projects to thoroughly demonstrate the theoretical, technological and economic considerations

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

IEEE ECCE 2020 brings together practicing engineers, researchers, entrepreneurs and other professionals for interactive and multi disciplinary discussions on the latest advances in energy conversion technologies The Conference provides a unique platform for promoting your organization

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

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.

This book demonstrates to readers why Gallium Nitride (GaN) transistors have a superior performance as compared to the already mature Silicon technology. The new GaN-based transistors here described enable both high frequency and high efficiency power conversion, leading to smaller and more efficient power systems. Coverage includes i) GaN substrates and device physics; ii) innovative GaN -transistors structure (lateral and vertical); iii) reliability and robustness of GaN-power transistors; iv) impact of parasitic on GaN based power conversion, v) new power converter architectures and vi) GaN in switched mode power conversion. Provides single-source reference to Gallium Nitride (GaN)-based technologies, from the material level to circuit level, both for power conversions architectures and switched mode power amplifiers; Demonstrates how GaN is a superior technology for switching devices, enabling both high frequency, high efficiency and lower cost power conversion; Enables design of smaller, cheaper and more efficient power supplies.

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