

Power Fets And Their Applications By Edwin S Oxner

The RF and Microwave Handbook
 Materials, Applications and Reliability
 Metal-Semiconductor Schottky Barrier Junctions and Their Applications
 Proceedings of the Symposium on High Speed III-V Electronics for Wireless Applications and the Twenty-Fifth State-of-the-Art Program on Compound Semiconductors (SOTAPOCS XXV)
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 Wide Bandgap Semiconductor Power Devices
 Design and Implementation Methods
 Power Electronics Handbook

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[The RF and Microwave Handbook](#) Woodhead Publishing

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.

[Materials, Applications and Reliability](#) Springer Nature

Analysis and Application of Analog Electronic Circuits to Biomedical Instrumentation, Second Edition helps biomedical engineers understand the basic analog electronic circuits used for signal conditioning in biomedical instruments. It explains the function and design of signal conditioning systems using analog ICs—the circuits that enable ECG, EEG,

[Metal-Semiconductor Schottky Barrier Junctions and Their Applications](#) John Wiley & Sons

This book is a comprehensive exposition of FET modeling, and is a must-have resource for seasoned professionals and new graduates in the RF and microwave power amplifier design and modeling community. In it, you will find descriptions of characterization and measurement techniques, analysis methods, and the simulator implementation, model verification and validation procedures that are needed to produce a transistor model that can be used with confidence by the circuit designer. Written by semiconductor industry professionals with many years' device modeling experience in LDMOS and III-V technologies, this was the first book to address the modeling requirements specific to high-power RF transistors. A technology-independent approach is described, addressing thermal effects, scaling issues, nonlinear modeling, and in-package matching networks. These are illustrated using the current market-leading high-power RF technology, LDMOS, as well as with III-V power devices.

[Proceedings of the Symposium on High Speed III-V Electronics for Wireless Applications and the Twenty-Fifth State-of-the-Art Program on Compound Semiconductors \(SOTAPOCS XXV\)](#) Power FETs and Their Applications

MICROELECTRONIC CIRCUITS: ANALYSIS AND DESIGN, 3E combines a breadth-first approach to learning electronics with a strong emphasis on design and simulation. This book first introduces the general characteristics of circuits (ICs) in preparation for using circuit design and analysis

techniques. This edition then offers a more detailed study of devices and circuits and how they operate within ICs. More than half of the problems and examples concentrate on design and emphasize how to use computer software tools extensively. The book's proven sequence introduces electronic devices and circuits, then electronic circuits and applications, and finally, digital and analog integrated circuits. Readers learn to apply theory to real-world design problems as they master the skills to test and verify their designs. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

[Fun with the 4093 Integrated Circuit](#) S. Chand Publishing

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.

[The Power Electronics Handbook](#) Springer

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

[Devices, Circuits and Applications](#) CRC Press

Details the theory of power MOSFETs and their applications. Explains the basis of MOSFET characteristics, and the features that determine MOSFET behavior. Examines the interaction of the MOSFET device with other elements in the circuit, and how device characteristics influence circuit design. Describes several circuits at length to highlight the practical details of power MOSFET use.

[Power Electronics and Its Applications](#) Academic Press

The theme of this new textbook is the practical element of electronic circuit design. Dr O'Dell, whilst recognising that theoretical knowledge is essential, has drawn from his many years of teaching

experience to produce a book which emphasises learning by doing throughout. However, there is more to circuit design than a good theoretical foundation coupled to design itself. Where do new circuit ideas come from? This is the topic of the first chapter, and the discussion is maintained throughout the following eight chapters which deal with high and low frequency small signal circuits, opto-electronic circuits, digital circuits, oscillators, translinear circuits, and power amplifiers. In each chapter, one or more experimental circuits are described in detail for the reader to construct, a total of thirteen project exercises in all. The final chapter draws some conclusions about the fundamental problem of design in the light of the circuits that have been dealt with in the book. The book is intended for use alongside a foundation text on the theoretical basis of electronic circuit design. It is written not only for undergraduate students of electronic engineering but also for the far wider range of reader in the hard or soft sciences, in industry or in education, who have access to a simple electronics laboratory.

Essential DC/DC Converters CRC Press

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.

Power GaN Devices Tata McGraw-Hill Education

GaN Power Devices and Applications, provides an update on gallium nitride (GaN) technology and applications by leading experts. It includes detailed descriptions of the latest examples of GaN's usage in power supplies, lidar systems, motor drives, and space applications.

Electronic Circuit Design John Wiley & Sons

I may observe that recent developments in power electronics have proceeded in two different directions, namely, low power range power supplies using high frequency PWM technique and medium to high power range energy control systems to serve specific Purpose.

RF MEMS and Their Applications CRC Press

DC/DC conversion techniques have undergone rapid development in recent decades. With the pioneering work of authors Fang Lin Luo and Hong Ye, DC/DC converters have now been sorted into their six generations, and by a rough count, over 500 different topologies currently exist, with more being developed each year. Advanced DC/DC Converters offers a concise, practical presentation of DC/DC converters, summarizing the spectrum of conversion technologies and presenting many new ideas and more than 100 new topologies. The treatment begins with background material on DC/DC conversion and discussions on voltage lift and super-lift converters. It then proceeds through each generation, including the groundbreaking sixth generation--converters developed by the authors that can be cascaded for high voltage transfer gain. More than 320 figures, 60 tables, and 500 formulae allow you to more easily grasp the overall structure of advanced DC/DC converters, provide fast access to precise data, and help you quickly determine the values of your own circuit components. Nowhere else in the literature are DC/DC converters so logically sorted and systematically introduced. Nowhere else can you find detailed information on prototype topologies that represent a major contribution to modern power engineering.

Nanoscale Devices Springer Science & Business Media

Designs in nanoelectronics often lead to challenging simulation problems and include strong feedback couplings. Industry demands provisions for variability in order to guarantee quality and yield. It also requires the incorporation of higher abstraction levels to allow for system simulation in order to shorten the design cycles, while at the same time preserving accuracy. The methods developed here promote a methodology for circuit-and-system-level modelling and simulation based on best practice rules, which are used to deal with coupled electromagnetic field-circuit-heat problems, as well as coupled electro-thermal-stress problems that emerge in nanoelectronic designs. This book covers: (1) advanced monolithic/multirate/co-simulation techniques, which are combined with envelope/wavelet approaches to create efficient and robust simulation techniques for strongly coupled systems that exploit the different dynamics of sub-systems within multiphysics problems, and which allow designers to predict reliability and ageing; (2) new generalized techniques in Uncertainty Quantification (UQ) for coupled problems to include a variability capability such that robust design and optimization, worst case analysis, and yield estimation with tiny failure probabilities are possible (including large deviations like 6-sigma); (3) enhanced sparse, parametric Model Order Reduction techniques with a posteriori error estimation for coupled problems and for UQ to reduce the complexity of the sub-systems while ensuring that the operational and coupling parameters can still be varied and that the reduced models offer higher abstraction levels that can be efficiently simulated. All the new algorithms produced were implemented, transferred and tested by the EDA vendor MAGWEL. Validation was conducted on industrial designs provided by end-users from the semiconductor industry, who shared their feedback, contributed to the measurements, and supplied both material data and process data. In closing, a thorough comparison to measurements on real devices was made in order to demonstrate the algorithms' industrial applicability.

New Technical Books Cambridge University Press

Microelectromechanical systems (MEMS) refer to a collection of micro-sensors and actuators, which can react to environmental change under micro-circuit control. The integration of MEMS into traditional Radio Frequency (RF) circuits has resulted in systems with superior performance levels

and lower manufacturing costs. The incorporation of MEMS based fabrication technologies into micro and millimeter wave systems offers viable routes to ICs with MEMS actuators, antennas, switches and transmission lines. The resultant systems operate with an increased bandwidth and increased radiation efficiency and have considerable scope for implementation within the expanding area of wireless personal communication devices. This text provides leading edge coverage of this increasingly important area and highlights the overlapping information requirements of the RF and MEMS research and development communities. * Provides an introduction to micromachining techniques and their use in the fabrication of micro switches, capacitors and inductors * Includes coverage of MEMS devices for wireless and Bluetooth enabled systems Essential reading for RF Circuit design practitioners and researchers requiring an introduction to MEMS technologies, as well as practitioners and researchers in MEMS and silicon technology requiring an introduction to RF circuit design.

Power FETs and Their Applications John Wiley & Sons

Power FETs and Their Applications Prentice Hall Fet Technology and Application CRC Press

Power MOSFETs Newnes

Power Semiconductor Devices Theory and Applications Vít???zslav Benda Czech Technical University, Prague, Czech Republic John Gowar Duncan A. Grant University of Bristol, UK Recent advances in robotics, automatic control and power conditioning systems have prompted research into increasingly sophisticated power semiconductor devices. This cutting-edge text explores the design, physical processes and applications performance of current power semiconductor devices. The extensive scope covers the complete range of discrete and integrated devices now available. Features include: * Use of physical models to explain the device structures and functions without complicated mathematical techniques * Explanation of the structure, function, characteristics and features of the most important discrete and integrated power devices * Demonstration of the influence of construction and technological parameters on important device characteristics * Sections on power modules and conditions for reliable operation plus a look at future materials and devices This valuable reference encompassing the structure, operation and application of power semiconductor devices will benefit both practising electronics engineers and students of power electronics.

Modeling and Characterization of RF and Microwave Power FETs CRC Press

The two major broad applications of electrical energy are information processing and energy processing. Hence, it is no wonder that electric machines have occupied a large and revered space in the field of electrical engineering. Such an important topic requires a careful approach, and Charles A. Gross' Electric Machines offers the most balanced, application-oriented, and modern perspective on electromagnetic machines available. Written in a style that is both accessible and authoritative, this book explores all aspects of electromagnetic-mechanical (EM) machines. Rather than viewing the EM machine in isolation, the author treats the machine as part of an integrated system of source, controller, motor, and load. The discussion progresses systematically through basic machine physics and principles of operation to real-world applications and relevant control issues for each type of machine presented. Coverage ranges from DC, induction, and synchronous machines to specialized machines such as transformers, translational machines, and microelectromechanical systems (MEMS). Stimulating example applications include electric vehicles, wind energy, and vertical transportation. Numerous example problems illustrate and reinforce the concepts discussed. Along with appendices filled with unit conversions and background material, Electric Machines is a succinct, in-depth, and complete guide to understanding electric machines for novel applications.

Patents Springer Science & Business Media

Full of projects based on the 4093 CMOS IC, CMOS Projects and Experiments will be of great interest to hobbyists and students. Readers will have the opportunity to learn how to apply CMOS ICs in their six primary uses while building these well-documented projects. CMOS Projects and Experiments includes instructions to build over 100 unusual and useful projects. They include audio and RF devices, lamps, LEDs, timers, alarms, inverters and much more. This book offers hobbyists and students a satisfying, practical way of learning about a hot topic in electronics today. Among the devices you can build using this book are a touch-controlled oscillator, a light-controlled oscillator, insect repellent, a metronome, a Morse code tone generator, a CW transmitter, a two-tone siren, a neon-lamp flasher, an auto turn-off relay, a turn-off timer, a touch-controlled motor, a bistable sonic relay, a coin tosser, a freezer alarm, an ultraviolet lamp, a simple fluorescent lamp inverter, a nerve stimulator, and an experimental high-voltage generator.

A Systems Engineering Approach Prentice Hall

This book provides the reader with some insights into the many styles of field effect transistors (FETs) being used. It offers a rudimentary understanding of their operation and performance. The book explains the complex terminology that defines the various FET parameters.

Physics, Modeling, and Their Application CRC Press

The primary aim of this book is to discuss various aspects of nanoscale device design and their applications including transport mechanism, modeling, and circuit applications. . Provides a platform for modeling and analysis of state-of-the-art devices in nanoscale regime, reviews issues related to optimizing the sub-nanometer device performance and addresses simulation aspect and/or fabrication process of devices Also, includes design problems at the end of each chapter

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