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## MOSFET Modeling for Circuit Analysis and Design

*World Scientific Publishing Company Incorporated This is the first book dedicated to the next generation of MOSFET models. Addressed to circuit designers with an in-depth treatment that appeals to device specialists, the book presents a fresh view of compact modeling, having completely abandoned the regional modeling approach. Both an overview of the basic physics theory required to build compact MOSFET models and a unified treatment of inversion-charge and surface-potential models are provided. The needs of digital, analog and RF designers as regards the availability of simple equations for circuit designs are taken into account. Compact expressions for hand analysis or for automatic synthesis, valid in all operating regions, are presented throughout the book. All the main expressions for computer simulation used in the new generation compact models are derived. Since designers in advanced technologies are increasingly concerned with fluctuations, the modeling of fluctuations is strongly emphasized. A unified approach for both space (matching) and time (noise) fluctuations is introduced.*

## RF Power Semiconductor Generator

# Application in Heating and Energy Utilization

Springer Nature *This is a specialized book for researchers and technicians of universities and companies who are interested in the fundamentals of RF power semiconductors, their applications and market penetration. Looking around, we see that products using vacuum tube technology are disappearing. For example, branch tube TVs have changed to liquid crystal TVs, and fluorescent light have turned into LED. The switch from vacuum tube technology to semiconductor technology has progressed remarkably. At the same time, high-precision functionalization, miniaturization and energy saving have advanced. On the other hand, there is a magnetron which is a vacuum tube device for generating microwaves. However, even this vacuum tube technology has come to be replaced by RF power semiconductor technology. In the last few years the price of semiconductors has dropped sharply and its application to microwave heating and energy fields will proceed. In some fields the transition from magnetron microwave oscillator to semiconductor microwave oscillator has already begun. From now on this development will progress remarkably. Although there are several technical books on electrical systems that explain RF power semiconductors, there are no books yet based on users' viewpoints on actual microwave heating and energy fields. In particular, none have been written about exact usage and practical cases, to answer questions such as "What are the advantages and disadvantages of RF power semiconductor oscillator?", "What kind of field can be used?" and the difficulty of the market and application. Based on these issues, this book explains the RF power semiconductors from the user's point of view by covering a very wide range of fields.*

## Energy Harvesting Technologies

Springer Science & Business Media *Energy Harvesting Technologies provides a cohesive overview of the fundamentals and current developments in the field of energy harvesting. In a well-organized structure, this volume discusses basic principles for the design and fabrication of bulk and MEMS based vibration energy systems, theory and design rules required for fabrication of efficient electronics, in addition to recent findings in thermoelectric energy harvesting systems. Combining leading research from both academia and industry onto a single platform, Energy Harvesting Technologies serves as an important reference for researchers and engineers involved with power sources, sensor networks and smart materials.*

## High-Frequency GaN Electronic

# Devices

Springer *This book brings together recent research by scientists and device engineers working on both aggressively-scaled conventional transistors as well as unconventional high-frequency device concepts in the III-N material system. Device concepts for mm-wave to THz operation based on deeply-scaled HEMTs, as well as distributed device designs based on plasma-wave propagation in polarization-induced 2DEG channels, tunneling, and hot-carrier injection are discussed in detail. In addition, advances in the underlying materials science that enable these demonstrations, and advancements in metrology that permit the accurate characterization and evaluation of these emerging device concepts are also included. Targeting readers looking to push the envelope in GaN-based electronics device research, this book provides a current, comprehensive treatment of device concepts and physical phenomenology suitable for applying GaN and related materials to emerging ultra-high-frequency applications. Offers readers an integrated treatment of the state of the art in both conventional (i.e., HEMT) scaling as well as unconventional device architectures suitable for amplification and signal generation in the mm-wave and THz regime using GaN-based devices, written by authors that are active and widely-known experts in the field; Discusses both conventional scaled HEMTs (into the deep mm-wave) as well as unconventional approaches to address the mm-wave and THz regimes; Provides “vertically integrated” coverage, including materials science that enables these recent advances, as well as device physics & design, and metrology techniques; Includes fundamental physics, as well as numerical simulations and experimental realizations.*

# Green Mobile Devices and Networks

## Energy Optimization and Scavenging Techniques

CRC Press *While battery capacity is often insufficient to keep up with the power-demanding features of the latest mobile devices, powering the functional advancement of wireless devices requires a revolution in the concept of battery life and recharge capability. Future handheld devices and wireless networks should be able to recharge themselves automaticall*

## Advanced Power Rectifier Concepts

Springer Science & Business Media *During the last decade, many new concepts have been proposed for improving the performance of power rectifiers and transistors. The results of this research are dispersed in the technical literature among journal articles and abstracts of conferences. Consequently, the information is not readily available to researchers and practicing engineers in the power device community.*

*There is no cohesive treatment of the ideas to provide an assessment of the relative merits of the ideas. Advanced Power Rectifier Concepts provides an in-depth treatment of the physics of operation of advanced power rectifiers. Analytical models for explaining the operation of all the advanced power rectifier devices will be developed. The results of numerical simulations will be provided to provide additional insight into the device physics and validate the analytical models. The results of two-dimensional simulations will be provided to corroborate the analytical models and provide greater insight into the device operation.*

## From Frequency to Time-Average-Frequency

### A Paradigm Shift in the Design of Electronic Systems

*John Wiley & Sons* Written in a simple, easy to understand style, this book will teach PLL users how to use new clock technology in their work in order to create innovative applications. Investigates the clock frequency concept from a different perspective-- at an application level Teaches engineers to use this new clocking technology to create innovations in chip/system level, through real examples extracted from commercial products

## Power Electronics Handbook

### Devices, Circuits and Applications

*Elsevier* 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

# Fundamentals of Terahertz Devices and Applications

John Wiley & Sons An authoritative and comprehensive guide to the devices and applications of Terahertz technology Terahertz (THz) technology relates to applications that span in frequency from a few hundred GHz to more than 1000 GHz. *Fundamentals of Terahertz Devices and Applications* offers a comprehensive review of the devices and applications of Terahertz technology. With contributions from a range of experts on the topic, this book contains in a single volume an inclusive review of THz devices for signal generation, detection and treatment. *Fundamentals of Terahertz Devices and Applications* offers an exploration and addresses key categories and aspects of Terahertz Technology such as: sources, detectors, transmission, electronic considerations and applications, optical (photonic) considerations and applications. Worked examples based on the contributors extensive experience highlight the chapter material presented. The text is designed for use by novices and professionals who want a better understanding of device operation and use, and is suitable for instructional purposes This important book: Offers the most relevant up-to-date research information and insight into the future developments in the technology Addresses a wide-range of categories and aspects of Terahertz technology Includes material to support courses on Terahertz Technology and more Contains illustrative worked examples Written for researchers, students, and professional engineers, *Fundamentals of Terahertz Devices and Applications* offers an in-depth exploration of the topic that is designed for both novices and professionals and can be adopted for instructional purposes.

## Voltage Regulators for Next Generation Microprocessors

Springer Science & Business Media This book deals with energy delivery challenges of the power processing unit of modern computer microprocessors. It describes in detail the consequences of current trends in miniaturization and clock frequency increase, upon the power delivery unit, referred to as voltage regulator. This is an invaluable reference for anybody needing to understand the key performance limitations and opportunities for improvement, from both a circuit and systems perspective, of state-of-the-art power solutions for next generation CPUs.

## Green Power

# Perspectives on Sustainable Electricity Generation

*CRC Press Green Power: Perspectives on Sustainable Electricity Generation provides a systematic overview of the current state of green power and renewable electrical energy production in the world. Presenting eight in-depth case studies of green power production and dissemination, it illustrates the experiences and best practices of various countries on this*

# Noise in Nanoscale Semiconductor Devices

*Springer Nature This book summarizes the state-of-the-art, regarding noise in nanometer semiconductor devices. Readers will benefit from this leading-edge research, aimed at increasing reliability based on physical microscopic models. Authors discuss the most recent developments in the understanding of point defects, e.g. via ab initio calculations or intricate measurements, which have paved the way to more physics-based noise models which are applicable to a wider range of materials and features, e.g. III-V materials, 2D materials, and multi-state defects. Describes the state-of-the-art, regarding noise in nanometer semiconductor devices; Enables readers to design more reliable semiconductor devices; Offers the most up-to-date information on point defects, based on physical microscopic models.*

# GB/T-2002, GB-2002 -- Chinese National Standard PDF-English, Catalog (year 2002)

# Chinese National Standard: GB Series of year 2002

*<https://www.chinesestandard.net> This document provides the comprehensive list of Chinese National Standards - Category: GB, GB/T Series of year 2002.*

# GB/T-2018, GB-2018 -- Chinese

# National Standard PDF-English, Catalog (year 2018)

## Chinese National Standard: GB Series of year 2018

<https://www.chinesestandard.net> This document provides the comprehensive list of Chinese National Standards - Category: GB, GB/T Series of year 2018.

## Gallium Nitride and Silicon Carbide Power Technologies 4

The Electrochemical Society

### High Power Microwaves

CRC Press Following in the footsteps of its popular predecessors, *High Power Microwaves, Third Edition* continues to provide a wide-angle, integrated view of the field of high power microwaves (HPMs). This third edition includes significant updates in every chapter as well as a new chapter on beamless systems that covers nonlinear transmission lines. Written by an experimentalist, a theorist, and an applied theorist, respectively, the book offers complementary perspectives on different source types. The authors address: How HPM relates historically and technically to the conventional microwave field The possible applications for HPM and the key criteria that HPM devices have to meet in order to be applied How high power sources work, including their performance capabilities and limitations The broad fundamental issues to be addressed in the future for a wide variety of source types The book is accessible to several audiences. Researchers currently in the field can widen their understanding of HPM. Present or potential users of microwaves will discover the advantages of the dramatically higher power levels that are being made available. Newcomers to the field can pursue further research. Decision makers in direct energy acquisition and related fields, such as radar, communications, and high energy physics, can see how developments in HPM will affect them.

### Integrated Microsystems

### Electronics, Photonics, and

# Biotechnology

*CRC Press* As rapid technological developments occur in electronics, photonics, mechanics, chemistry, and biology, the demand for portable, lightweight integrated microsystems is relentless. These devices are getting exponentially smaller, increasingly used in everything from video games, hearing aids, and pacemakers to more intricate biomedical engineering and military applications. Edited by Kris Iniewski, a revolutionary in the field of advanced semiconductor materials, *Integrated Microsystems: Electronics, Photonics, and Biotechnology* focuses on techniques for optimized design and fabrication of these intelligent miniaturized devices and systems. Composed of contributions from experts in academia and industry around the world, this reference covers processes compatible with CMOS integrated circuits, which combine computation, communications, sensing, and actuation capabilities. Light on math and physics, with a greater emphasis on microsystem design and configuration and electrical engineering, this book is organized in three sections—Microelectronics and Biosystems, Photonics and Imaging, and Biotechnology and MEMs. It addresses key topics, including physical and chemical sensing, imaging, smart actuation, and data fusion and management. Using tables, figures, and equations to help illustrate concepts, contributors examine and explain the potential of emerging applications for areas including biology, nanotechnology, micro-electromechanical systems (MEMS), microfluidics, and photonics.

## Low Power Analog CMOS for Cardiac Pacemakers Design and Optimization in Bulk and SOI Technologies

*Springer Science & Business Media* *Low Power Analog CMOS for Cardiac Pacemakers* proposes new techniques for the reduction of power consumption in analog integrated circuits. Our main example is the pacemaker sense channel, which is representative of a broader class of biomedical circuits aimed at qualitatively detecting biological signals. The first and second chapters are a tutorial presentation on implantable medical devices and pacemakers from the circuit designer point of view. This is illustrated by the requirements and solutions applied in our implementation of an industrial IC for pacemakers. There from, the book discusses the means for reduction of power consumption at three levels: base technology, power-oriented analytical synthesis procedures and circuit architecture.

# Energy Harvesting for Wireless Sensor Networks

## Technology, Components and System Design

*Walter de Gruyter GmbH & Co KG Wireless sensors and sensor networks (WSNs) are nowadays becoming increasingly important due to their decisive advantages. Different trends towards the Internet of Things (IoT), Industry 4.0 and 5G Networks address massive sensing and admit to have wireless sensors delivering measurement data directly to the Web in a reliable and easy manner. These sensors can only be supported, if sufficient energy efficiency and flexible solutions are developed for energy-aware wireless sensor nodes. In the last years, different possibilities for energy harvesting have been investigated showing a high level of maturity. This book gives therefore an overview on fundamentals and techniques for energy harvesting and energy transfer from different points of view. Different techniques and methods for energy transfer, management and energy saving on network level are reported together with selected interesting applications. The book is interesting for researchers, developers and students in the field of sensors, wireless sensors, WSNs, IoT and manifold application fields using related technologies. The book is organized in four major parts. The first part of the book introduces essential fundamentals and methods, while the second part focusses on vibration converters and hybridization. The third part is dedicated to wireless energy transfer, including both RF and inductive energy transfer. Finally, the fourth part of the book treats energy saving and management strategies. The main contents are: Essential fundamentals and methods of wireless sensors Energy harvesting from vibration Hybrid vibration energy converters Electromagnetic transducers Piezoelectric transducers Magneto-electric transducers Non-linear broadband converters Energy transfer via magnetic fields RF energy transfer Energy saving techniques Energy management strategies Energy management on network level Applications in agriculture Applications in structural health monitoring Application in power grids Prof. Dr. Olfa Kanoun is professor for measurement and sensor technology at Chemnitz university of technology. She is specialist in the field of sensors and sensor systems design.*

# Wireless Power Transfer and Data Communication for Neural Implants

## Case Study: Epilepsy Monitoring

Springer This book presents new circuits and systems for implantable biomedical applications targeting neural recording. The authors describe a system design adapted to conform to the requirements of an epilepsy monitoring system. Throughout the book, these requirements are reflected in terms of implant size, power consumption, and data rate. In addition to theoretical background which explains the relevant technical challenges, the authors provide practical, step-by-step solutions to these problems. Readers will gain understanding of the numerical values in such a system, enabling projections for feasibility of new projects.

## Physics and Technology of Crystalline Oxide Semiconductor CAAC-IGZO

### Application to LSI

John Wiley & Sons This book describes the application of c-axis aligned crystalline In-Ga-Zn oxide (CAAC-IGZO) technology in large-scale integration (LSI) circuits. The applications include Non-volatile Oxide Semiconductor Random Access Memory (NOSRAM), Dynamic Oxide Semiconductor Random Access Memory (DOSRAM), central processing unit (CPU), field-programmable gate array (FPGA), image sensors, and etc. The book also covers the device physics (e.g., off-state characteristics) of the CAAC-IGZO field effect transistors (FETs) and process technology for a hybrid structure of CAAC-IGZO and Si FETs. It explains an extremely low off-state current technology utilized in the LSI circuits, demonstrating reduced power consumption in LSI prototypes fabricated by the hybrid process. A further two books in the series will describe the fundamentals; and the specific application of CAAC-IGZO to LCD and OLED displays. Key features:

- Outlines the physics and characteristics of CAAC-IGZO FETs that contribute to favorable operations of LSI devices.
- Explains the application of CAAC-IGZO to LSI devices, highlighting attributes including low off-state current, low power consumption, and excellent charge retention.
- Describes the NOSRAM, DOSRAM, CPU, FPGA, image sensors, and etc., referring to prototype chips fabricated by a hybrid process of CAAC-IGZO and Si FETs.

## Applications of Energy Harvesting Technologies in Buildings

Artech House This timely new resource explores the available energy sources within commercial and residential buildings and the available technologies for energy

harvesting. Energy harvesting within built environments is presented using strong research and commercial examples. This book includes clear and concise case studies on solar cell powered sensor nodes for emotion monitoring systems in ambient assistive living environments and inductive/RF power transfers. Thermoelectric energy harvesting and power management circuit design, airflow and vibration energy harvesting is also explored. The book concludes with a look at the future of energy harvesting in buildings.

## Dynamics and Control of Switched Electronic Systems

## Advanced Perspectives for Modeling, Simulation and Control of Power Converters

Springer Science & Business Media The increased efficiency and quality constraints imposed on electrical energy systems have inspired a renewed research interest in the study of formal approaches to the analysis and control of power electronics converters. Switched systems represent a useful framework for modeling these converters and the peculiarities of their operating conditions and control goals justify the specific classification of "switched electronic systems". Indeed, idealized switched models of power converters introduce problems not commonly encountered when analyzing generic switched models or non-switched electrical networks. In that sense the analysis of switched electronic systems represents a source for new ideas and benchmarks for switched and hybrid systems generally. *Dynamics and Control of Switched Electronic Systems* draws on the expertise of an international group of expert contributors to give an overview of recent advances in the modeling, simulation and control of switched electronic systems. The reader is provided with a well-organized source of references and a mathematically-based report of the state of the art in analysis and design techniques for switched power converters. Intuitive language, realistic illustrative examples and numerical simulations help the reader to come to grips with the rigorous presentation of many promising directions of research such as: converter topologies and modulation techniques; continuous-time, discrete-time and hybrid models; modern control strategies for power converters; and challenges in numerical simulation. The guidance and information imparted in this text will be appreciated by engineers, and applied mathematicians working on system and circuit theory, control systems development, and electronic and energy conversion systems design.

# Modern Microwave and Millimeter-Wave Power Electronics

Wiley-IEEE Press "This book familiarizes the R & D and academic communities with the capabilities and limitations of MVED and highlights the exciting scientific breakthroughs of the past decade that are dramatically increasing the compactness, efficiency, cost-effectiveness, and reliability of this entire class of devices."--Jacket.

# Advanced Radio Frequency Identification Design and Applications

BoD - Books on Demand Radio Frequency Identification (RFID) is a modern wireless data transmission and reception technique for applications including automatic identification, asset tracking and security surveillance. This book focuses on the advances in RFID tag antenna and ASIC design, novel chipless RFID tag design, security protocol enhancements along with some novel applications of RFID.

# Embedded Systems

# Theory and Design Methodology

BoD - Books on Demand Nowadays, embedded systems - the computer systems that are embedded in various kinds of devices and play an important role of specific control functions, have permitted various aspects of industry. Therefore, we can hardly discuss our life and society from now onwards without referring to embedded systems. For wide-ranging embedded systems to continue their growth, a number of high-quality fundamental and applied researches are indispensable. This book contains 19 excellent chapters and addresses a wide spectrum of research topics on embedded systems, including basic researches, theoretical studies, and practical work. Embedded systems can be made only after fusing miscellaneous technologies together. Various technologies condensed in this book will be helpful to researchers and engineers around the world.

# Noise in Solid State Devices and Circuits

Wiley-Interscience Gives basic and up-to-date information about noise sources in electronic devices. Demonstrates how this information can be used to calculate the

noise performance, in particular the noise figure, of electronic circuits using these devices. Optimization procedures, both for the circuits and for the devices, are then devised based on these data. Gives an elementary treatment of thermal noise, diffusion noise, and velocity-fluctuation noise, including quantum effects in thermal noise and maser noise.

## Microgrids

# Architectures and Control

John Wiley & Sons *Microgrids are the most innovative area in the electric power industry today. Future microgrids could exist as energy-balanced cells within existing power distribution grids or stand-alone power networks within small communities. A definitive presentation on all aspects of microgrids, this text examines the operation of microgrids - their control concepts and advanced architectures including multi-microgrids. It takes a logical approach to overview the purpose and the technical aspects of microgrids, discussing the social, economic and environmental benefits to power system operation. The book also presents microgrid design and control issues, including protection and explaining how to implement centralized and decentralized control strategies. Key features: original, state-of-the-art research material written by internationally respected contributors unique case studies demonstrating success stories from real-world pilot sites from Europe, the Americas, Japan and China examines market and regulatory settings for microgrids, and provides evaluation results under standard test conditions a look to the future - technical solutions to maximize the value of distributed energy along with the principles and criteria for developing commercial and regulatory frameworks for microgrids Offering broad yet balanced coverage, this volume is an entry point to this very topical area of power delivery for electric power engineers familiar with medium and low voltage distribution systems, utility operators in microgrids, power systems researchers and academics. It is also a useful reference for system planners and operators, manufacturers and network operators, government regulators, and postgraduate power systems students. CONTRIBUTORS Thomas Degner Aris Dimeas Alfred Engler Nuno Gil Asier Gil de Muro Guillermo Jiménez-Estévez George Kariniotakis George Korres André Madureira Meiqin Mao Chris Marnay Jose Miguel Yarza Satoshi Morozumi Alexander Oudalov Frank van Overbeeke Rodrigo Palma Behnke Joao Abel Pecas Lopes Fernanda Resende John Romankiewicz Christine Schwaegerl Nikos Soultanis Liang Tao Antonis Tsikalakis*

## MOS Devices for Low-Voltage and Low-Energy Applications

John Wiley & Sons *Helps readers understand the physics behind MOS devices for low-voltage and low-energy applications • Based on timely published and unpublished work written by expert authors • Discusses various promising MOS devices*

applicable to low-energy environmental and biomedical uses • Describes the physical effects (quantum, tunneling) of MOS devices • Demonstrates the performance of devices, helping readers to choose right devices applicable to an industrial or consumer environment • Addresses some Ge-based devices and other compound-material-based devices for high-frequency applications and future development of high performance devices. 'Seemingly innocuous everyday devices such as smartphones, tablets and services such as on-line gaming or internet keyword searches consume vast amounts of energy. Even when in standby mode, all these devices consume energy. The upcoming "Internet of Things" (IoT) is expected to deploy 60 billion electronic devices spread out in our homes, cars and cities. Britain is already consuming up to 16 per cent of all its power through internet use and this rate is doubling every four years. According to The UK's Daily Mail May (2015), if usage rates continue, all of Britain's power supply could be consumed by internet use in just 20 years. In 2013, U.S. data centers consumed an estimated 91 billion kilowatt-hours of electricity, corresponding to the power generated by seventeen 1000-megawatt nuclear power plants. Data center electricity consumption is projected to increase to roughly 140 billion kilowatt-hours annually by 2020, the equivalent annual output of 50 nuclear power plants. (Natural Resources Defense Council, USA, Feb. 2015) All these examples stress the urgent need for developing electronic devices that consume as little energy as possible. The book "MOS Devices for Low-Voltage and Low-Energy Applications" explores the different transistor options that can be utilized to achieve that goal. It describes in detail the physics and performance of transistors that can be operated at low voltage and consume little power, such as subthreshold operation in bulk transistors, fully depleted SOI devices, tunnel FETs, multigate and gate-all-around MOSFETs. Examples of low-energy circuits making use of these devices are given as well. The book "MOS Devices for Low-Voltage and Low-Energy Applications" is a good reference for graduate students, researchers, semiconductor and electrical engineers who will design the electronic systems of tomorrow.' --- Dr. Jean-Pierre Colinge, Taiwan Semiconductor Manufacturing Company (TSMC) "The authors present a creative way to show how different MOS devices can be used for low-voltage and low-power applications. They start with Bulk MOSFET, following with SOI MOSFET, FinFET, gate-all-around MOSFET, Tunnel-FET and others. It is presented the physics behind the devices, models, simulations, experimental results and applications. This book is interesting for researchers, graduate and undergraduate students. The low-energy field is an important topic for integrated circuits in the future and none can stay out of this." --- Prof. Joao A. Martino, University of Sao Paulo, Brazil

## Integrated Circuit and System Design. Power and Timing

# Modeling, Optimization and Simulation

## 17th International Workshop, PATMOS 2007, Gothenburg, Sweden, September 3-5, 2007, Proceedings

*Springer Science & Business Media* Welcome to the proceedings of PATMOS 2007, the 17 in a series of international workshops. PATMOS 2007 was organized by Chalmers University of Technology with IEEE Sweden Chapter of the Solid-State Circuit Society technical - sponsorship and IEEE CEDA sponsorship. Over the years, PATMOS has evolved into an important European event, where - searchers from both industry and academia discuss and investigate the emerging challenges in future and contemporary applications, design methodologies, and tools - quired for the development of the upcoming generations of integrated circuits and systems. The technical program of PATMOS 2007 consisted of state-of-the-art technical contributions, three invited talks and an industrial session on design challenges in real-life projects. The technical program focused on timing, performance and power consumption, as well as architectural aspects with particular emphasis on modeling, design, characterization, analysis and optimization in the nanometer era. The Technical Program Committee, with the assistance of additional expert - viewers, selected the 55 papers presented at PATMOS. The papers were organized into 9 technical sessions and 3 poster sessions. As is always the case with the PATMOS workshops, full papers were required, and several reviews were received per manuscript.

## Noise in Radio-Frequency Electronics and its Measurement

*John Wiley & Sons* The ability of wireless communication devices to transmit reliable information is fundamentally limited by sources of noise related to the electronic components in use. *Noise in Radio-Frequency Electronics and its Measurement* has five chapters that address the theoretical aspects of this subject, and concludes with a series of exercises and solutions. The book examines the origin and sources of noise inside electronic radio-frequency circuits, their impact in telecommunications, their modeling and their measurement. Particular attention is dedicated to the

*origins, establishment and significance of formulas that are used when the noise characteristics of an electronic circuit are modeled or measured. This book instructs the reader in the application of the examined methods and their adaptation to solving problems, as well as how to comfortably use the presented formulas.*

## DC Power Supplies

# Power Management and Surge Protection for Power Electronic Systems

*CRC Press As we increasingly use electronic devices to direct our daily lives, so grows our dependence on reliable energy sources to power them. Because modern electronic systems demand steady, efficient, reliable DC voltage sources—often at a sub-1V level—commercial AC lines, batteries, and other common resources no longer suffice. New technologies also require intricate techniques to protect against natural and manmade disasters. Still, despite its importance, practical information on this critical subject remains hard to find. Using simple, accessible language to balance coverage of theoretical and practical aspects, DC Power Supplies, Power Management and Surge Protection details the essentials of power electronics circuits applicable to low-power systems, including modern portable devices. A summary of underlying principles and essential design points, it compares academic research and industry publications and reviews DC power supply fundamentals, including linear and low-dropout regulators. Content also addresses common switching regulator topologies, exploring resonant conversion approaches. Coverage includes other important topics such as: Control aspects and control theory Digital control and control ICs used in switching regulators Power management and energy efficiency Overall power conversion stage and basic protection strategies for higher reliability Battery management and comparison of battery chemistries and charge/discharge management Surge and transient protection of circuits designed with modern semiconductors based on submicron dimension transistors This specialized design resource explores applicable fundamental elements of power sources, with numerous cited references and discussion of commercial components and manufacturers. Regardless of their previous experience level, this information will greatly aid designers, researchers, and academics who, study, design, and produce the viable new power sources needed to propel our modern electronic world. CRC Press Authors Speak Nihal Kularatna introduces his book. Watch the video*

## Advances in Embedded and Fan-

# Out Wafer Level Packaging Technologies

*Wiley-IEEE Press Examines the advantages of Embedded and FO-WLP technologies, potential application spaces, package structures available in the industry, process flows, and material challenges Embedded and fan-out wafer level packaging (FO-WLP) technologies have been developed across the industry over the past 15 years and have been in high volume manufacturing for nearly a decade. This book covers the advances that have been made in this new packaging technology and discusses the many benefits it provides to the electronic packaging industry and supply chain. It provides a compact overview of the major types of technologies offered in this field, on what is available, how it is processed, what is driving its development, and the pros and cons. Filled with contributions from some of the field's leading experts, Advances in Embedded and Fan-Out Wafer Level Packaging Technologies begins with a look at the history of the technology. It then goes on to examine the biggest technology and marketing trends. Other sections are dedicated to chip-first FO-WLP, chip-last FO-WLP, embedded die packaging, materials challenges, equipment challenges, and resulting technology fusions. Discusses specific company standards and their development results Content relates to practice as well as to contemporary and future challenges in electronics system integration and packaging Advances in Embedded and Fan-Out Wafer Level Packaging Technologies will appeal to microelectronic packaging engineers, managers, and decision makers working in OEMs, IDMs, IFMs, OSATs, silicon foundries, materials suppliers, equipment suppliers, and CAD tool suppliers. It is also an excellent book for professors and graduate students working in microelectronic packaging research.*

# Handbook of Microwave and Radar Engineering

*Springer Nature This comprehensive handbook provides readers with a single-source reference to the theoretical fundamentals, physical mechanisms and principles of operation of all known microwave devices and various radars. The author discusses proven methods of computation and design development, process, schematic, schematic-technical and construction peculiarities of each breed of the microwave devices, as well as the most popular and original technical solutions for radars. Coverage also includes the history of creation of the most widely used radars, as well as guidelines for their potential upgrading. Offers readers a comprehensive, systematized view of all contemporary knowledge, acquired during the last 20 years, on radars and related disciplines; Provides a single-source reference on the physical mechanisms and principles of operation of the basic components of radio location devices, including theoretical aspects of designing the necessary, high-efficiency electronic devices and systems, as well as key, practical methods of computation*

and design; Presents complex topics using simple language, minimizing mathematics.

## Behavioral Modeling and Predistortion of Wideband Wireless Transmitters

John Wiley & Sons Covers theoretical and practical aspects related to the behavioral modelling and predistortion of wireless transmitters and power amplifiers. It includes simulation software that enables the users to apply the theory presented in the book. In the first section, the reader is given the general background of nonlinear dynamic systems along with their behavioral modelling from all its aspects. In the second part, a comprehensive compilation of behavioral models formulations and structures is provided including memory polynomial based models, box oriented models such as Hammerstein-based and Wiener-based models, and neural networks-based models. The book will be a valuable resource for design engineers, industrial engineers, applications engineers, postgraduate students, and researchers working on power amplifiers modelling, linearization, and design.

## Physics and Technology of Crystalline Oxide Semiconductor CAAC-IGZO Fundamentals

John Wiley & Sons Electronic devices based on oxide semiconductors are the focus of much attention, with crystalline materials generating huge commercial success. Indium-gallium-zinc oxide (IGZO) transistors have a higher mobility than amorphous silicon transistors, and an extremely low off-state current. C-axis aligned crystalline (CAAC) IGZO enables aggressive down-scaling, high reliability, and process simplification of transistors in displays and LSI devices. This original book introduces the CAAC-IGZO structure, and describes the physics and technology of this new class of oxide materials. It explains the crystallographic classification and characteristics of crystalline oxide semiconductors, their crystallographic characteristics and physical properties, and how this unique material has made a major contribution to the field of oxide semiconductor thin films. Two further books in this series describe applications of CAAC-IGZO in flat-panel displays and LSI devices. Key features: Introduces the unique and revolutionary, yet relatively unknown crystalline oxide semiconductor CAAC-IGZO Presents crystallographic overviews of IGZO and related compounds. Offers an in-depth understanding of CAAC-IGZO. Explains the fabrication

*method of CAAC-IGZO thin films. Presents the physical properties and latest data to support high-reliability crystalline IGZO based on hands-on experience. Describes the manufacturing process the CAAC-IGZO transistors and introduces the device application using CAAC-IGZO.*

## Electromagnetic Interference and Compatibility

*MDPI Recent progress in the fields of Electrical and Electronic Engineering has created new application scenarios and new Electromagnetic Compatibility (EMC) challenges, along with novel tools and methodologies to address them. This volume, which collects the contributions published in the "Electromagnetic Interference and Compatibility" Special Issue of MDPI Electronics, provides a vivid picture of current research trends and new developments in the rapidly evolving, broad area of EMC, including contributions on EMC issues in digital communications, power electronics, and analog integrated circuits and sensors, along with signal and power integrity and electromagnetic interference (EMI) suppression properties of materials.*

## Energy Efficient Computing & Electronics

### Devices to Systems

*CRC Press In our abundant computing infrastructure, performance improvements across most all application spaces are now severely limited by the energy dissipation involved in processing, storing, and moving data. The exponential increase in the volume of data to be handled by our computational infrastructure is driven in large part by unstructured data from countless sources. This book explores revolutionary device concepts, associated circuits, and architectures that will greatly extend the practical engineering limits of energy-efficient computation from device to circuit to system level. With chapters written by international experts in their corresponding field, the text investigates new approaches to lower energy requirements in computing. Features • Has a comprehensive coverage of various technologies • Written by international experts in their corresponding field • Covers revolutionary concepts at the device, circuit, and system levels*

## Silicon Carbide and Related Materials - 2005

# Proceedings of the International Conference on Silicon Carbide and Related Materials - 2005 : Pittsburgh, Pennsylvania, USA : September 18-23 2005

*Trans Tech Publication Silicon Carbide (SiC), Gallium Nitride (GaN) and Diamond are examples of wide-bandgap semiconductors having chemical, electrical and optical properties which make them very attractive for the fabrication of high-power and high-frequency electronic devices, as well as light-emitters and sensors which have to operate under harsh conditions.*

## Continuous-Time Low-Pass Filters for Integrated Wideband Radio Receivers

*Springer Science & Business Media This book presents a new filter design approach and concentrates on the circuit techniques that can be utilized when designing continuous-time low-pass filters in modern ultra-deep-submicron CMOS technologies for integrated wideband radio receivers. Coverage includes system-level issues related to the design and implementation of a complete single-chip radio receiver and related to the design and implementation of a filter circuit as a part of a complete single-chip radio receiver. Presents a new filter design approach, emphasizing low-voltage circuit solutions that can be implemented in modern, ultra-deep-submicron CMOS technologies;Includes filter circuit implementations designed as a part of a single-chip radio receiver in modern 1.2V 0.13um and 65nm CMOS;Describes design and implementation of a continuous-time low-pass filter for a multicarrier WCDMA base-station;Emphasizes system-level considerations throughout.*