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Compact Modeling Elsevier
 Improve your circuit-design potential with this expert guide to the devices and technology used in mixed analog-digital VLSI chips for such high-volume applications as hard-disk drives, wireless telephones, and consumer electronics. The book provides you with a critical understanding of device models, fabrication technology, and layout as they apply to mixed analog-digital circuits. You will learn about the many device-modeling requirements for analog work, as well as the pitfalls in models used today for computer simulators such as Spice. Also

included is information on fabrication technologies developed specifically for mixed-signal VLSI chips, plus guidance on the layout of mixed analog-digital chips for a high degree of analog-device matching and minimum digital-to-analog interference. This reference book features an intuitive introduction to MOSFET operation that will enable you to view with insight any MOSFET model ? besides thorough discussions on valuable large-signal and small-signal models. Filled with practical information, this first-of-its-kind book will help you grasp the nuances of mixed-signal VLSI-device models and layout that are crucial to the design of high-performance chips.

Parameter Extraction and Complex Nonlinear Transistor Models John Wiley

& Sons

The Book Integrated Circuits MCQ PDF Download (Electronics eBook 2023-24): MCQ Questions Chapter 1-2 & Practice Tests with Answer Key (Integrated Circuits MCQs Book & Online PDF Download) includes revision guide for problem solving with hundreds of solved MCQs. Integrated Circuits MCQ with Answers PDF book covers basic concepts, analytical and practical assessment tests. "Integrated Circuits MCQ" PDF book helps to practice test questions from exam prep notes. Integrated Circuits MCQs Book includes revision guide with verbal, quantitative, and analytical past papers, solved MCQs. Integrated Circuits Multiple Choice Questions and Answers (MCQs) PDF Download, an eBook covers solved quiz

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Mastering Electronics Workbench

Bushra Arshad

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CMOS Logic Circuit Design McGraw Hill Professional

Complete PCB Design Using OrCAD Capture and PCB Editor, Second Edition, provides practical instruction on how to use the OrCAD design suite to design and manufacture printed circuit boards. Chapters cover how to Design a PCB using OrCAD Capture and OrCAD Layout, adding PSpice simulation capabilities to a design, how to develop custom schematic parts, how to create footprints and PSpice models, and how to perform documentation, simulation and board fabrication from the same schematic design. This book is suitable for both beginners and experienced designers, providing basic principles and the program's full capabilities for optimizing designs. Presents a fully updated edition on OrCAD Capture, Version 17.2 Combines the theoretical and practical parts of PCB design Includes real-life design examples that show how and why designs work, providing a comprehensive toolset for understanding OrCAD software Provides the exact order in which a circuit and PCB are designed Introduces the IPC, JEDEC and IEEE standards relating to PCB design *SPICE for Power Electronics and Electric*

Power John Wiley & Sons

A practical guide to the effects of radiation on semiconductor components of electronic systems, and techniques for the designing, laying out, and testing of hardened integrated circuits This book teaches the fundamentals of radiation environments and their effects on electronic components, as well as how to design, lay out, and test cost-effective hardened semiconductor chips not only for today's space systems but for commercial terrestrial applications as well. It provides a historical perspective, the fundamental science of radiation, and the basics of semiconductors, as well as radiation-induced failure mechanisms in semiconductor chips. Integrated Circuits Design for Radiation Environments starts by introducing readers to semiconductors and radiation environments (including space, atmospheric, and terrestrial environments) followed by circuit design and layout. The book introduces radiation effects phenomena including single-event effects, total ionizing dose damage and displacement damage) and shows how technological solutions can address both phenomena. Describes the fundamentals of radiation environments and their effects on electronic components Teaches readers how to design, lay out and test cost-effective hardened semiconductor chips for space systems and commercial terrestrial applications Covers natural and man-made radiation environments, space systems and commercial terrestrial applications Provides up-to-date coverage of state-of-the-art of radiation hardening technology in one concise volume Includes questions and answers for the reader to test their knowledge Integrated Circuits Design for Radiation Environments will appeal to researchers and product developers in the semiconductor, space, and defense industries, as well as electronic engineers in the medical field. The book is also helpful for system, layout, process, device, reliability, applications, ESD, latchup and circuit design semiconductor engineers, along with anyone involved in micro-electronics used in harsh environments.

Power Integrity for Electrical and Computer Engineers Springer Science & Business Media

Together with the internet site, this book is ideally suited for independent and remote study Web site is kept to date and guest educational institutions are invited to join in creating their own lab modules on different device aspects First such program Reputation of the authors who are leaders in the field of semiconductor electronics

Scientific Computing in Electrical Engineering SCEE 2008 CRC Press
 Complete PCB Design Using OrCad Capture and Layout provides instruction on how to use the OrCAD design suite to design and manufacture printed circuit boards. The book is written for both students and practicing engineers who need a quick tutorial on how to use the software and who need in-depth knowledge of the capabilities and limitations of the software package. There are two goals the book aims to reach: The primary goal is to show the reader how to design a PCB using OrCAD Capture and OrCAD Layout. Capture is used to build the schematic diagram of the circuit, and Layout is used to design the circuit board so that it can be manufactured. The secondary goal is to show the reader how to add PSpice simulation capabilities to the design, and how to develop custom schematic parts, footprints and PSpice models. Often times separate designs are produced for documentation, simulation and board fabrication. This book shows how to perform all three functions from the same schematic design. This approach saves time and money and ensures continuity between the design and the manufactured product. Information is presented in the exact order a circuit and PCB are designed. Straightforward, realistic examples present the how and why the designs work, providing a comprehensive toolset for understanding the OrCAD software. Introduction to the IPC, JEDEC, and IEEE standards relating to PCB design. Full-color interior and extensive illustrations allow readers to learn features of the product in the most realistic manner possible.

Proceedings Springer

The first book to deal with a broad spectrum of process and device design, and modeling issues related to semiconductor devices, bridging the gap between device modelling and process design using TCAD. Presents a comprehensive perspective of emerging fields and covers topics ranging from materials to fabrication, devices, modelling and applications. Aimed at research-and-development engineers and scientists involved in microelectronics technology and device design via Technology CAD, and TCAD engineers and developers.

Proceedings of the 1st International Conference on Electronic Engineering and Renewable Energy McGraw Hill Professional

MOSFET Modeling with SPICE Prentice Hall
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A revised guide to the theory and

implementation of CMOS analog and digital IC design. The fourth edition of CMOS: Circuit Design, Layout, and Simulation is an updated guide to the practical design of both analog and digital integrated circuits. The author—a noted expert on the topic—offers a contemporary review of a wide range of analog/digital circuit blocks including: phase-locked-loops, delta-sigma sensing circuits, voltage/current references, op-amps, the design of data converters, and switching power supplies. CMOS includes discussions that detail the trade-offs and considerations when designing at the transistor-level. The companion website contains numerous examples for many computer-aided design (CAD) tools. Using the website enables readers to recreate, modify, or simulate the design examples presented throughout the book. In addition, the author includes hundreds of end-of-chapter problems to enhance understanding of the content presented. This newly revised edition: • Provides in-depth coverage of both analog and digital transistor-level design techniques • Discusses the design of phase- and delay-locked loops, mixed-signal circuits, data converters, and circuit noise • Explores real-world process parameters, design rules, and layout examples • Contains a new chapter on Power Electronics. Written for students in electrical and computer engineering and professionals in the field, the fourth edition of CMOS: Circuit Design, Layout, and Simulation is a practical guide to understanding analog and digital transistor-level design theory and techniques.

Schematic Capture with MicroSim PSpice Springer Science & Business Media

An expert guide to understanding and making optimum use of BSIM. Used by more chip designers worldwide than any other comparable model, the Berkeley Short-Channel IGFET Model (BSIM) has, over the past few years, established itself as the de facto standard MOSFET SPICE model for circuit simulation and CMOS technology development. Yet, until now, there have been no independent expert guides or tutorials to supplement the various BSIM manuals currently available. Written by a noted expert in the field, this book fills that gap in the literature by providing a comprehensive guide to understanding and making optimal use of BSIM3 and BSIM4. Drawing upon his extensive experience designing with BSIM, William Liu provides a brief history of the model, discusses the various advantages of BSIM over other models, and explores the reasons why BSIM3 has been adopted

by the majority of circuit manufacturers. He then provides engineers with the detailed practical information and guidance they need to master all of BSIM's features. He: Summarizes key BSIM3 components. Represents the BSIM3 model with equivalent circuits for various operating conditions. Provides a comprehensive glossary of modeling terminology. Lists alphabetically BSIM3 parameters along with their meanings and relevant equations. Explores BSIM3's flaws and provides improvement suggestions. Describes all of BSIM4's improvements and new features. Provides useful SPICE files, which are available online at the Wiley ftp site.

Complete PCB Design Using OrCad Capture and Layout Springer Science & Business Media

Accompanying CD-ROM has MicroSim PSpice evaluation version 8.0, Adobe Acrobat Reader 3.0, and floppy disk copy files.

Lab on the Web John Wiley & Sons

All model parameters are fundamentally coupled together, so that directly measured individual parameters, although widely used and accepted, may initially only serve as good estimates. This comprehensive resource presents all aspects concerning the modeling of semiconductor field-effect device parameters based on gallium-arsenide (GaAs) and gallium nitride (GaN) technology. Metal-semiconductor field-effect transistors (MESFETs), high electron mobility transistors (HEMTs) and heterojunction bipolar transistors (HBTs), their structures and functions, and existing transistor models are also classified. The Shockley model is presented in order to give insight into semiconductor field-effect transistor (FET) device physics and explain the relationship between geometric and material parameters and device performance. Extraction of trapping and thermal time constants is discussed. A special section is devoted to standard nonlinear FET models applied to large-signal measurements, including static-/pulsed-DC and single-/two-tone stimulation. High power measurement setups for signal waveform measurement, wideband source-/load-pull measurement (including envelope source-/load pull) are also included, along with high-power intermodulation distortion (IMD) measurement setup (including envelope load-pull). Written by a world-renowned expert in the field, this book is the first to cover all aspects of semiconductor FET device modeling in a single volume.

Analog VLSI Neural Networks John Wiley & Sons

This book is a unique combination of a basic guide to general analog circuit simulation and a SPICE OPUS software manual, which may be used as a textbook or self-study reference. The book is divided into three parts: mathematical theory of circuit analysis, a crash course on SPICE OPUS, and a complete SPICE OPUS reference guide. All simulations as well as the free simulator software may be directly downloaded from the SPICE OPUS homepage: www.spiceopus.si. Circuit Simulation with SPICE OPUS is intended for a wide audience of undergraduate and graduate students, researchers, and practitioners in electrical and systems engineering, circuit design, and simulation development.

Integrated Circuit Design for Radiation Environments Springer Science & Business Media

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

Mixed Analog-digital VLSI Devices and Technology Wiley-IEEE Press

Shows readers how to gain the competitive edge in the integrated circuit marketplace This book offers a wholly

unique perspective on the digital design kit. It points to hidden value in the safety margins of standard-cell libraries and shows design engineers and managers how to use this knowledge to beat the competition. Engineering the CMOS Library reveals step by step how the generic, foundry-provided standard-cell library is built, and how to extract value from existing std-cells and EDA tools in order to produce tighter-margined, smaller, faster, less power-hungry, and more yield-producing integrated circuits. It explores all aspects of the digital design kit, including the different views of CMOS std-cell libraries along with coverage of IO libraries, memory compilers, and small analog blocks. Readers will learn: How to work with oversized std-cell libraries to improve profitability while maintaining safety How functions usually found in std-cell libraries cover the design environment, and how to add any missing functions How to harness the characterization technique used by vendors to add characterization without having to get it from the vendor How to use verification and validation techniques to ensure proper descriptive views and even fix inconsistencies in vendor release views How to correct for possible conflicts arising from multiple versions and different vendor sources in any given integrated circuit design Complete with real-world case studies, examples, and suggestions for further research, Engineering the CMOS Library will help readers become more astute designers. *Semiconductor Devices* John Wiley & Sons This book examines in detail how a semiconductor device is designed and fabricated to satisfy best the requirements of the target application. The author presents and explains both basic and state-of-art semiconductor industry standards used in large/small signal equivalent circuit models for semiconductor devices that electronics engineers routinely use in their design calculations. The presentation includes

detailed, step-by-step information on how a semiconductor device is fabricated, and the very sophisticated supporting technologies used in the process flow. The author also explains how standard laboratory equipment can be used to extract useful performance metrics of a semiconductor device.

Complete PCB Design Using OrCAD

Capture and PCB Editor Academic Press

This title introduces state-of-the-art design principles for SOI circuit design, and is primarily concerned with circuit-related issues. It considers SOI material in terms of implementation that is promising or has been used elsewhere in circuit development, with historical perspective where appropriate.

CMOS Test and Evaluation John Wiley & Sons

This is an up-to-date treatment of the analysis and design of CMOS integrated digital logic circuits. The self-contained book covers all of the important digital circuit design styles found in modern CMOS chips, emphasizing solving design problems using the various logic styles available in CMOS.

MOSFET Models for SPICE Simulation World Scientific

This book will help CMOS circuit designers make the best possible use of SPICE models, and will prepare them for new models that may soon be introduced. Introduces SPICE modeling and its use in CMOS circuit design. Presents the formalism of model building and the semiconductor physics of MOS structures. Covers each important SPICE model, showing how to choose the appropriate model. Discusses the popular HSPICE Level 28, as well as Levels 1-3, BSIM 1-3, and MOS Model 9. Presents techniques for accounting for systematic process variations. Describes new model candidates, including the Power-Lane Model, the PCIM Model, and the EKV Model. Includes extensive examples throughout. Practicing engineers and scientists in the semiconductor industry; engineering faculty and students.

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