Power Management Integrated Circuit Analysis And Design | dcb473ab8799f2614c87795042a15b5

Thermal and Power Management of Integrated Circuits
Power Integrity Modeling and Design for Semiconductors and Systems
Power Management for Wearable Electronic Devices
High Performance Analog and Power Management Circuits
Design Techniques for Modern SoC
Signal Processing and Analysis of Electrical Circuit Next-Generation ADCs
High-Performance Power Management, and Technology Considerations for Advanced Integrated Circuits
Handbook of Energy Harvesting Power Supplies and Applications
The Fourth Terminal Simulation and Optimization of Digital Circuits
Sensors and Low Power Signal Processing
High Performance Integrated Circuit Design
Power Management Techniques for Integrated Circuit Design
Physical Design for 3D Integrated Circuits
Electronic Design Automation for IC System Design
Verification, and Testing
CMOS High Efficiency On-chip Power Management
Ultra-Low Power Integrated Circuit Design
CMOS Integrated Circuit Design for Wireless Power Transfer
Power Electronics Design Handbook
Analog Circuit Design
Power Management Integrated Circuit Analysis and Design
Practical Computer Analysis of Switch Mode Power Supplies
Smart Power IC Handbook of Power Management Circuits
Integrated Circuit Test Engineering
Control Techniques for Power Converters with Integrated Circuits
Analysis and Integration of Mixed Signal, Power for Integrated Circuits
Optimization and Simulation
Power Management Integrated Circuits
Power Management Techniques for Integrated Circuit Design
On-Chip Power Delivery and Management
Three-Dimensional Integrated Circuit Design
Integrated Switching Power Converters
Extreme Low-Power Mixed Signal IC Design
Electronic Circuit Analysis and Design
Enabling the Internet of Things
Integrated Power Electronic Converters and Digital Control
Linear Circuit Design Handbook
Three-dimensional Integrated Circuit Design
Electronic Circuit Analysis
This book discusses the advantages and challenges of Body-Biasing for integrated circuits and systems, together with the deployment of the design infrastructure needed to generate this Body-Bias voltage. These new design solutions enable state of the art energy efficiency and system flexibility for the latest applications, such as Internet of Things and 5G communications. This book is based on the 18 tutorials presented during the 28th workshop on Advances in Analog Circuit Design. Expert designers present readers with information about a variety of topics at the frontier of analog circuit design, including next-generation analog-to-digital converters, high-performance power management systems and technology considerations for advanced IC design. For anyone involved in analog circuit research and development, this book will be a valuable summary of the state-of-the-art in these areas. Provides a state of the art overview of analog circuit design, written by experts from a broad industry and academic perspective and includes material that is based on high-speed analog-to-digital converters, high-performance power management systems, and technology considerations for advanced IC design. This book provides state-of-the-art power IC design techniques for silicon-based and low power IC design techniques. To create elaborate power management solutions, circuit designers require an in-depth understanding of the characteristics of each converter and regulator in the power chain. This book addresses WPT design issues at both system- and circuit-level, and serves as a handbook offering design insights for research students and engineers in the integrated power electronics area. The First Comprehensive, "Example-Rich" Guide to Power Integrity Design Professionals such as signal integrity engineers, package designers, and system architects need to thoroughly understand signal and power integrity issues in order to successfully design packages and boards for high speed systems. Now, for the first time, there's a complete guide to power integrity modeling: everything you need to know, from the basics through the state of the art. Using realistic case studies and downloadable software examples, two leading experts demonstrate today's best techniques for designing and modeling interconnects to efficiently distribute power and minimize noise. The authors carefully introduce the core concepts of power distribution design, systematically present and compare leading techniques for modeling noise, and link these techniques to specific applications. Their many examples range from the simplest (using analytical equations to compute power supply noise) through complex system-level applications. The authors introduce power delivery network components, analysis, frequency measurement, and modeling requirements. Thoroughly explain modeling of power grid planes, including plane behavior, lumped modeling, distributed circuit-based approaches, and much more. Offer in-depth coverage of simultaneous switching noise, including modeling for return currents using time-domain analysis. Introduce several leading-time domain simulation methods, such as macromodeling, and discuss their advantages and disadvantages. Present the application of the modeling methods on several advanced case studies that include high-speed servers, high-speed differential signaling, chip package analysis, materials characterization, embedded decoupling capacitors, and electromagnetic bandgap structures. This book's system-level focus and practical examples will make it indispensable for every student and professional concerned with power integrity, including electrical engineers, system designers, signal integrity engineers, and materials scientists. It will also be valuable to developers building software that helps to analyze high-speed systems. This book enables design engineers to be more effective in designing discrete and integrated circuits by helping them understand the role of analog devices in their circuit design. Analog elements are at the heart of many important functions in both discrete and integrated circuits, but from a design perspective the analog components are often the most difficult to understand. Examples include operational amplifiers, D/A and A/D converters and active filters. Effective circuit design requires a strong understanding of the operation of these analog devices and how they affect circuit design. Comprehensive coverage of analog circuit components for the practicing engineer Market-validated design information for all major types of linear circuits Includes practical advice on how to read op amp data sheets and how to choose off-the-shelf op amps Full chapter covering printed circuit board design issues This book describes the design of CMOS circuits for ultra-low power consumption including analog, radio frequency (RF), and digital signal processing (DSP). The book describes issues from on-chip power supplies and at test points to complete systems for low power devices. Provides a valuable introduction to ultra-low power circuit design, aimed at practicing design engineers; Describes all key building blocks of ultra-low power circuits, from a systems perspective: Applies circuits and systems described to real product examples such as hearing aids and capsule endoscopes. In Thermal and Power Management of Integrated Circuits, power and thermal management issues in integrated circuits during normal operating conditions and stress operating conditions are addressed. Thermal management in VLSI circuits is becoming an integral part of the design, test, and manufacturing. Proper thermal management is the key to achieve high performance, quality and reliability. Performance and reliability of integrated circuits are strong functions of the junction temperature. A small increase in junction temperature may result in significant reduction in the device lifetime. This book reviews the significance of the junction temperature as a reliability measure under normal and burn-in conditions. The latest research in the area of electro-thermal modeling of integrated circuits will also be presented. Recent models and associated CAD tools are covered and various techniques at the circuit and system level are reviewed. Subsequently, the authors provide an insight into the concept of thermal runway and how it may best be avoided. A section on low temperature operation of integrated circuits concludes the book. This book describes the fundamentals and principles of energy harvesting and provides the necessary theory and background to develop energy harvesting power supplies. It explains the overall system design and gives quantitative assumptions on environmental energy. It explains different system blocks for an energy harvesting supply and the trade-offs. The text covers in detail different energy transducer technologies such as piezoelectric, electrodynamic, and thermoelectric generators and solar cells from the material to the component level and explains the appropriate power management circuits required in these systems. Furthermore, it describes and compares storage elements such as secondary batteries and supercapacitors to select the most appropriate one for the application. Besides power supplies that use ambient energy, the book presents systems that use electromagnetic fields in the radio frequency range. Finally, it discusses different application fields and presents examples of self-powered electronic systems to illustrate the content of the preceding chapters. This book describes methods for distributing power in high speed, high complexity integrated circuits with power levels exceeding many tens of watts and power supplies below a volt. It provides a broad and cohesive treatment of power management systems and related technology requirements, including both circuit network models and device power delivery and management considerations. By using both circuit network models and device power delivery and management considerations, including both circuit network models and device power delivery and management considerations, providing insight and intuition into the behavior and design of on-chip power distribution systems. Organized into subareas to provide a more intuitive flow to the reader, this fourth edition adds more than a hundred pages of new content, including inductance models for interdigitated structures, design strategies for multi-layer power grids, advanced methods for efficient power grid design and analysis, and methodologies for simultaneously placing on-chip multiple power supplies and decoupling capacitors. The additional emphasis of this material is on managing the complexity of on-chip power distribution networks. Design flexibility and power consumption addition to the cost, have always been...
the most important issues in design of integrated circuits (ICs), and are the main concerns of this research, as well. Energy Consumption: Power dissipation (P) and energy consumption are - diss pecially important when there is a limited amount of power budget limited source of energy. Very common examples are portable systems where the battery life time depends on system power consumption. Many different techniques have been - veloped to reduce or control power consumption in the IC design issue. The primary reason is that the power budget is so restricted that very specific circuit and system level design technique are needed to satisfy the requirements. Circuits employed in applications such as wireless sensor networks (WSN), wearable battery powered systems [1], and implantable circuits for biol- ical applications need to consume the entire amount of power available in the system for a long time without the need for charging for recharging battery[2,4]. Using powersuppytchniques such as energyharvesting[5] and printable batteries [6], is another reason for reducing power dissipation. Dev- ing special design techniques for implementing low power circuits [7–9], as well as dynamic power management (DPM) schemes [10] are the two main approaches to control the system power consumption. Design Flexibility: Design flexibility is the other important issue in modern in- grated systems. This book begins with the premise that energy demands are directing scientists towards ever-greener methods of power management, so highly integrated power control ICs (integrated chip) are increasingly in demand for further reducing power consumption. A timely and comprehensive reference guide for IC designers dealing with the increasingly widespread demand for integrated low power management includes new topics such as LED lighting, fast transient response, DVS-tracking and design with advanced technology nodes Leading author (Chen) is an active and renowned contributor to the power management IC design field, and has extensive industry experience Accompanying website includes presentation files with book illustrations, lecture notes, simulation circuits, solution manuals, instructors' manuals, and program downloadsThe first of two volumes in the Electronic Design Automation for Integrated Circuits Handbook series, Electronic Design Automation for ICs provides advanced circuit design, logic synthesis, statistical timing, circuit level techniques, power management, low power circuits & technology, system level techniques, power & timing optimization techniques, self-timed circuits, low power circuit analysis & optimization, and low power design studies. This book will introduce various power management integrated circuits (IC) design techniques to build future energy-efficient "green" electronics. The goal is to achieve high efficiency, which is essential to meet consumers' growing need for longer battery lives. The focus is to study topologies amiable for full-chip implementation (few external components) in the mainstream CMOS technology, which will reduce the physical size and the manufacturing cost of the devices. This comprehensive book focuses on DC–DC switching power supply circuits, which are receiving attention as a key technology in green IT, especially in the automotive and consumer electronics industries. It covers buck converters, isolated converters, PFC converters, their modeling and analysis, several control methods, passive components, and their recent applications (on-chip power supplies, DC–DC and AC–DC converter applications, single-inductor multi-output DC–DC converters, energy harvest applications, wireless power delivery, charge pump circuits, and power amplifiers). The contents are well balanced as the authors are from both academia and industry and include pioneers and inventors of hysteretic PWM control.A timely one-stop pioneering book presenting all four major power management integrated circuits Existing analog IC books usually cover only one of these ICs. There is no book yet that covers all four major integrated power management circuits. This book fills the void. This self-contained book discusses all fundamental concepts in switching converters, low dropout regulators, charge pumps and voltage references, low power circuit analysis & optimization, and low power design studies. This book will introduce various power management integrated circuits (IC) design techniques to build future energy-efficient "green" electronics. The goal is to achieve high efficiency, which is essential to meet consumers' growing need for longer battery lives. The focus is to study topologies amiable for full-chip implementation (few external components) in the mainstream CMOS technology, which will reduce the physical size and the manufacturing cost of the devices. This comprehensive book focuses on DC–DC switching power supply circuits, which are receiving attention as a key technology in green IT, especially in the automotive and consumer electronics industries. 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the Power Electronics Design Handbook is the integration of component and system theory with practical applications, particularly energy-saving low-power applications. Many chapters also include a section that looks forward to future developments in that area. References for further information or more in-depth technical reading are also included. Nihal Kularatna is a principal research engineer with the Arthur C. Clarke Foundation in Sri Lanka. He is also the author of Electronic Test and Measuring Instruments, a comprehensive text on testing and measurement. The book is intended to be a useful guide to further reading.”Three-dimensional integrated circuit design has become a viable and necessary solution for the difficult issue of on-chip interconnect. Vasilis Pavlidis and Eby Friedman have provided the first unified treatment of these circuits - focusing on effective design methodologies to facilitate fabrication processes. Three-dimensional or vertical integration boosts performance and extends the capabilities of modern integrated circuits. Various 3-D circuit architectures are discussed in detail - including processors and memory systems, FPGAs, and on-chip networks. This book provides the reader with the knowledge and toolkit needed to enhance the performance and functionality of three-dimensional circuits and related applications. - Book Jacket:When designing switch-mode power supplies (SMPSs), engineers need much more than simple "recipes" for analysis. Such plug-and-go instructions are not at all helpful for simulating larger and more complex circuits and systems. Offering more than merely a "cookbook," Practical Computer Analysis of Switch Mode Power Supplies provides a thorough understanding of the essential requirements for analyzing SMPS performance characteristics. It demonstrates the power of the circuit averaging technique when used with powerful computer circuit simulation programs. The book begins with SMPS fundamentals and the basics of circuit averaging, reviewing basic topologies and explaining all of the various modes of operation and control. The author then discusses the general analysis requirements of power supplies and how to develop the general types of SMPS models, demonstrating the use of SPICE for analysis. He examines the basic first-order analyses generally associated with SMPS performance along with a detailed method for developing SMPS and Filter models for use with the circuit PWM and PMOSFET models. Practical Computer Analysis of Switch Mode Power Supplies builds a strong foundation on the principles of SMPS analysis, enabling further development and advancement of the techniques while supplying meaningful insight into the process. This Special Issue with 35 published articles shows the significance of the topic “Signal Processing and Analysis of Electrical Circuit”. This topic has been gaining increasing attention in recent times. The presented articles can be categorized into four different areas: signal processing and analysis methods of electrical circuits; electrical measurement technology; applications of signal processing of electrical equipment; fault diagnosis of electrical circuits. It is a fact that the development of electrical systems, circuit and systems has been accelerating. Electronics applications related to electrical circuits and signal processing methods have gained noticeable attention in recent times. The methods of signal processing and electrical circuits are widely used by engineers and scientists all over the world. The constituent papers represent a significant contribution to electronics and present applications that can be used in industry. Further improvements to the presented approaches are required for realizing their full potential. The book will address the state-of-the-art in integrated circuit design in the context of emerging systems. New exciting opportunities in body area networks, wireless communications, data networking, and optical imaging are discussed. Emerging materials that can take system performance beyond standard CMOS, like Silicon on Insulator (SOI), Silicon Germanium (SiGe), and Indium Phosphide (InP) are explored. Three-dimensional (3-D) CMOS integration and co-integration with sensor technology are described as well. The book is a must for anyone serious about circuit design for future technologies. The book is written by top notch experts in industry and academia. The intended audience is practicing engineers with background in circuit design supplementing the content. The book will also be used as a recommended reading and supplementary material in graduate course curriculum. Their job titles might be: design engineer, product manager, marketing manager, design team leader, etc. The book will also be used by graduate students. Many of the chapter authors are University Professors. Analog circuit and system design today is more than ever before. With the growth of digital systems, wireless communications, complex industrial and automotive systems, designers are challenged to develop sophisticated analog solutions. This new book source of circuit design and circuit design solutions will aid circuit designers to today’s in-depth challenges in circuit design and application solutions that you can apply in today’s demanding designs. Covers the fundamentals of linear/analog circuit and system design to guide engineers with their design challenges Based on the Application Notes of Linear Technology, the foremost designer of high performance analog products, readers will gain practical insights into design techniques and practice Broad range of topics, including power management tutorials, switching regulator design, linear regulator design, data conversion, signal conditioning, and high frequency/RF design Contributions include the leading lights in analog design, Robert Dobkin, Jim Williams and Carl Nelson, among others.This book describes the structured design and optimization of efficient, analog processing integrated circuits. The approach is multidisciplinary, covering the monolithic integration of IC design techniques, power electronics and control theory. In particular, this book enables readers to conceive, synthesize, design and implement integrated circuits with high-density high-efficiency on-chip switching power regulators. Topics covered encompass the structured design of the on-chip power supply, efficiency optimization, IC-compatible power inductors and capacitors, power MOSFET switches and efficient switching drives in standard CMOS technologies.Electronic Circuit Analysis is designed to serve students of a two-semester undergraduate course on electronic circuit analysis. It builds on the subject from its basic principles over fifteen chapters, providing detailed coverage on the design and analysis of electronic circuits.Physical Design for 3D Integrated Circuits reveals how to effectively and optimally design 3D integrated circuits (ICs). It also analyzes the design tools for 3D circuits while exploiting the benefits of 3D physical design. This book begins by offering an overview of physical design, covering specific topics in-depth at a comprehensive reference: Contains extensive coverage of the physical design of 2.5D/3D ICs and monolithic 3D ICs Supply-state-of-the-art solutions for challenges unique to 3D circuit design Features contributions from renowned experts in their respective fields Physical Design for 3D Integrated Circuits provides a single, convenient source of cutting-edge information for those pursuing 2.5D/3D technology. This book illustrates some of the recent state-of-the-art advances in Analog and Power Management circuit design. Coverage includes design of advanced low-power/low-voltage analog circuits, small-signal and pole-zero analysis of multi-stage amplifiers, state-of-the-art frequency compensation topologies, and advanced power management circuits and control techniques. Readers will benefit from detailed small-signal techniques for complex multi-stage amplifiers and low-drop-out regulator analysis. The power management chapter goes into detail the challenges in the design of modern power management circuits, including low dropout voltage regulators, switched-capacitor DC-DC converters and inductor-based DC-DC converters. This book offers the first comprehensive view on integrated circuit and system design for the Internet of Things (IoT), and in particular for the tiny nodes at its edge. The authors provide a fresh perspective on how the IoT will evolve based on recent and foreseeable trends in the semiconductor industry, highlighting the key challenges and system innovation that will allow the development of what the book describes what the IoT really means from the design point of view, and how the constraints imposed by applications translate into integrated circuit requirements and design guidelines. Chapter contributions equally come from industry and academia. Providing a system perspective on IoT nodes, this book focuses on state-of-the-art design techniques for IoT applications, encompassing the fundamental sub-systems encountered in Systems on Chip for IoT: ultra-low power digital architectures and circuits low- and zero-leakage memories (including emerging technologies) circuits for hardware security and authentication System design methodologies on-chip power management and energy harvesting Ultra-low power analog interfaces and analog-digital conversion short-range radios miniaturized battery technologies packaging and assembly of IoT integrated systems (on silicon and non-silicon substrates). As a common thread, all chapters conclude with a prospective view on the foreseeable evolution of the related node technologies for the IoT. The concepts developed in this book are exemplified by two IoT node demonstrations from industry. The unique balance between breadth and depth of the book enables expert readers quickly to develop an understanding of the specific challenges and state-of-the-art solutions for IoT, as well as their evolution in the foreseeable future provides non-experts with a comprehensive introduction to integrated circuit design for IoT, and serves as an excellent starting point for further learning, thanks to the broad coverage of topics and selected references makes it very well suited for practicing engineers and scientists working in the hardware and chip design for IoT, and as textbook for senior undergraduate, graduate and postgraduate students (familiar with electronic and digital circuits). This book descripts new, fuzzy logic-based mathematical apparatus, which enables readers to work with continuous variables, while implementing whole circuit simulations with speed, similar to gate-level simulators and accuracy, similar to circuit-level simulators. The author demonstrates new developed principles of digital integrated circuit simulation and optimization that consider external and internal destabilizing factors, influencing the operation of digital ICS. The discussion includes factors including radiation, ambient electromagnetic fields, and climatic conditions, as well as non-ideality of interconnects and power rails. Using the book and the software provided with it, the reader can build
his/her own tester arrangement to investigate key aspects of analog-, digital- and mixed system circuits Plan of attack based on traditional testing, circuit design and circuit manufacture allows the reader to appreciate a testing regime from the point of view of all the participating interests. Worked examples based on theoretical bookwork, practical experimentation and simulation exercises teach the reader how to test circuits thoroughly and effectively.

Power Management Integrated Circuits and Technologies delivers a modern treatise on mixed-signal integrated circuit design for power management. Comprised of chapters authored by leading researchers from industry and academia, this definitive text: Describes circuit- and architectural-level innovations that meet advanced power and speed capabilities Explores hybrid inductive-capacitive converters for wide-range dynamic voltage scaling Presents innovative control techniques for single inductor dual output (SIDO) and single inductor multiple output (SIMO) converters Discusses cutting-edge design techniques including switching converters for analog/RF loads Compares the use of GaAs pHEMTs to CMOS devices for efficient high-frequency switching converters Thus, Power Management Integrated Circuits and Technologies provides comprehensive, state-of-the-art coverage of this exciting and emerging field of engineering.

Three-Dimensional Integrated Circuit Design, Second Edition, expands the original with more than twice as much new content, adding the latest developments in circuit models, temperature considerations, power management, memory issues, and heterogeneous integration. 3-D IC experts Pavlidis, Savvidis, and Friedman cover the full product development cycle throughout the book, emphasizing not only physical design, but also algorithms and system-level considerations to increase speed while conserving energy. A handy, comprehensive reference or a practical design guide, this book provides effective solutions to specific challenging problems concerning the design of three-dimensional integrated circuits. Expanded with new chapters and updates based on the latest research in 3-D integration: Manufacturing techniques for 3-D ICs with TSVs Electrical modeling and closed-form expressions of through silicon via Substrate noise coupling in heterogeneous 3-D ICs Design of 3-D ICs with inductive links Synchronization in 3-D ICs Variation effects on 3-D ICs Correlation of WDI variations for intra-tile buffers and wires Offers practical guidance on designing 3-D heterogeneous systems Provides power delivery of 3-D ICs Demonstrates the use of 3-D ICs within heterogeneous systems that include a variety of materials, devices, processors, GPU-CPU integration, and more Provides experimental case studies in power delivery, synchronization, and thermal characterization.

This book offers an overview of power electronic applications in the study of power integrated circuit (IC) design, collecting novel research ideas and insights into fast transient response to prevent the output voltage from dropping significantly at the undershoot. It also discusses techniques and training to save energy and increase load efficiency, as well as fast transient response and high efficiency, which are the most important factors for consumer products that implement power IC. Lastly, the book focuses on power electronics for system loop analysis and optimal compensation design to help users and engineers implement their applications. The book is a valuable resource for university researchers, power IC R&D engineers, application engineers and graduate students in power electronics who wish to learn about the power IC design principles, methods, system behavior, and applications in consumer products. Low-power sensors and their applications in various fields ranging from military to civilian lives have made tremendous progress in the recent years. Low-power and extended battery life are the key focuses for long term, reliable and easy operation of these sensors. Sensors and Low Power Signal Processing provides a general overview of a sensor’s working principle and a discussion of the emerging sensor technologies including chemical, electro-chemical and MEMS based sensors. Also included is a discussion on design challenges associated with low-power analog circuits and the schemes to overcome them. Finally, a short discussion of some of the simple wireless telemetry schemes best suited for low-power sensor applications and sensor packaging issues is discussed. Applications and sensor prototypes included are environmental monitoring, health care monitoring and issues related to the development of sensor prototypes and associated electronics to achieve high signal-to-noise ratio will also be presented. This book begins with the premise that energy demands are pushing scientists towards ever-greener methods of power management, so highly integrated power control ICs (integrated chip/circuit) are increasingly in demand for further reducing power consumption. A timely and comprehensive reference guide for IC designers dealing with the increasingly widespread demand for integrated low power management includes new topics such as LED lighting, fast transient response, DVS-tracking and design with advanced technology nodes Leading author (Chen) is an active and renowned contributor to the power management IC design field, and has extensive industry experience Accompanying website includes presentation files with book illustrations, lecture notes, simulation circuits, solution manuals, instructors’ manuals, and program downloads.

This book provides a survey of the state of the art of technology and future trends in the new family of Smart Power ICs and describes design and applications in a variety of fields ranging from automotive to telecommunications, reliability evaluation and qualification procedures. The book is a valuable source of information and reference for both power IC design specialists and to all those concerned with applications, the development of digital circuits and with system architecture. New Techniques and Tools for Ensuring On-Chip Power Integrity—Down to Nanoscale As chips continue to scale, power integrity issues are introducing unexpected project complexity and cost. In this book, two leading industry innovators thoroughly discuss the power integrity challenges that engineers face in designing at nanoscale levels, introduce new analysis and management techniques for addressing these issues, and provide breakthrough tools for hands-on problem solving. Rai Nair and Dr. Donald Bennett first provide a complete foundational understanding of power integrity, including ULSI issues, practical aspects of power delivery, and the benefits of a total power integrity approach to optimizing chip physical designs. They introduce advanced device simulation network modeling, design, and analysis techniques that highlight abstraction and physics-based analysis, while also incorporating traditional circuit- and field-solver based approaches. They also present advanced design techniques and the latest advanced knowledge and experience, and help designers anticipate emerging challenges associated with increased integration. Anasim RLCsim.exe, a new tool for power integrity aware floorplanning, is downloadable for free at anasim.com/category/software. The authors Systematically explore power integrity implications, analysis, and management for integrated circuits Present practical examples and industry best practices for a broad spectrum of chip design applications Discuss distributed and high-bandwidth voltage regulation, differential power path design, and the significance of on-chip inductance to power integrity Review both traditional and advanced modeling techniques for integrated circuit power integrity analysis, and introduce continuum modeling for chip, package, and board interactions for power delivery to EMI, and bring together industry best practices and examples. Introduction to advanced concepts for power integrity management, including non-linear capacitance devices, impedance modulation, and active noise regulation Power Integrity Analysis and Management for Integrated Circuits’ coverage of both fundamentals and advanced techniques will make this book indispensable to all engineers responsible for signal integrity, power integrity, hardware, or system design—especially those working at the nanoscale level.