Design Of Analog Cmos Integrated Circuits

IC designers appraise currently MOS transistor geometries and currents to compromise objectives like gain-bandwidth, slew-rate, dynamic range, noise, non-linear distortion, etc. Making optimal choices is a difficult task. How to minimize for instance the power consumption of an operational amplifier without too much penalty regarding area while keeping the gain-bandwidth unaffected in the same time? Moderate inversion yields high gains, but the concomitant area increase adds parasitics that restrict bandwidth. Which methodology to use in order to come across the best compromise(s)? Is synthesis a mixture of design experience combined with cut and tries or is it a constrained multivariate optimization problem, or a mixture? Optimization algorithms are attractive from a system perspective of course, but what about low-voltage low-power circuits, requiring a more physical approach? The connections amid transistor physics and circuits are intricate and their interactions not always easy to describe in terms of existing software packages. The gm/ID synthesis methodology is adapted to CMOS analog circuits for the transconductance over drain current ratio combines most of the ingredients needed in order to determine transistors sizes and DC currents.

It follows with a thorough treatment of design operational and operational transconductance amplifiers, and concludes with a unified presentation of sample-data and continuous-time signal processing systems.

This is the only comprehensive book in the market for engineers that covers the design of CMOS and bipolar analog integrated circuits. The fifth edition retains its completeness and updates the coverage of bipolar and CMOS circuits. A thorough analysis of a new low-voltage bipolar operational amplifier has been added to Chapters 6, 7, 9, and 11. Chapter 12 has been updated to include a fully differential folded cascode operational amplifier example. With its streamlined and up-to-date coverage, more engineers will turn to this resource to explore key concepts in the field.

This textbook deals with the analysis and design of analog CMOS integrated circuits, emphasizing recent technological developments and design paradigms that students and practicing engineers need to master to succeed in today's industry. Based on the author's teaching and research experience in the past ten years, the text follows three general principles: (1) Motivate the reader by describing the significance and application of each idea with real-world problems; (2) Force the reader to look at concepts from an intuitive point of view, preparing him/her

for more complex problems; (3) Complement the intuition by rigorous analysis, confirming the results obtained by the intuitive, yet rough approach.
Using Pre-Computed Lookup Tables
CMOS Digital Integrated Circuits
CMOS Integrated Capacitive DC-DC Converters
Advances in Analog Circuits
Microelectronics
CMOS Analog and Mixed-Signal Circuit Design
Praise for CMOS: Circuit Design, Layout, and SimulationRevised Second Edition from the Technical Reviewers "A refreshing industrial flavor. Design concepts are presented as they are needed for 'just-in-time' learning. Simulating and designing circuits using SPICE is emphasized with literally hundreds of examples. Very few textbooks contain as much detail as this one. Highly recommended!" --Paul M. Furth, New Mexico State University "This book builds a solid knowledge of CMOS circuit design from the ground up. With coverage of process integration, layout, analog and digital models, noise mechanisms, memory circuits, references, amplifiers, PLLs/DLLs, dynamic circuits, and data converters, the text is an excellent reference for both experienced and novice designers alike." --Tyler J. Gomm, Design Engineer, Micron Technology, Inc. "The Second Edition builds upon the success of the first with new chapters that cover additional material such as oversampled converters and non-volatile memories. This is becoming the de facto standard textbook to have on every analog and mixed-signal designer's bookshelf." --Joe Walsh, Design Engineer, AMI Semiconductor CMOS circuits from design to implementation CMOS: Circuit Design, Layout, and Simulation, Revised Second Edition covers the practical design of both analog and digital integrated circuits, offering a vital, contemporary view of a wide range of analog/digital circuit blocks, the BSIM model, data converter architectures, and much more. This edition takes a two-path approach to the topics: design techniques are developed for both long- and short-channel CMOS technologies and then compared. The results are multidimensional explanations that allow readers to gain deep insight into the design process. Features include: Updated materials to reflect CMOS technology's movement into nanometer sizes Discussions on phase- and delay-locked loops, mixed-signal

circuits, data converters, and circuit noise More than 1,000 figures, 200 examples, and over 500 end-of-chapter problems In-depth coverage of both analog and digital circuit-level design techniques Real-world process parameters and design rules The book's Web site, CMOSedu.com, provides: solutions to the book's problems; additional homework problems without solutions; SPICE simulation examples using HSPICE, LTspice, and WinSpice; layout tools and examples for actually fabricating a chip; and videos to aid learning

A comprehensive introduction to CMOS and bipolar analog IC design. The book presumes no prior knowledge of linear design, making it comprehensible to engineers with a non-analog back-ground. The emphasis is on practical design, covering the entire field with hundreds of examples to explain the choices. Concepts are presented following the history of their discovery. Content: 1. Devices Semiconductors, The Bipolar Transistor, The Integrated Circuit, Integrated NPN Transistors, The Case of the Lateral PNP Transistor, CMOS Transistors, The Substrate PNP Transistor, Diodes, Zener Diodes, Resistors, Capacitors, CMOS vs. Bipolar; 2. Simulation, DC Analysis, AC Analysis, Transient Analysis, Variations, Models, Diode Model, Bipolar Transis-tor Model, Model for the Lateral PNP Transistor, MOS Transistor Models, Resistor Models, Models for Capacitors; 3. Current Mirrors; 4. Differential Pairs; 5. Current Sources; 6. Time Out: Analog Measures, dB, RMS, Noise, Fourier Analysis, Distortion, Frequency Compensation; 7. Bandgap References; 8. Op Amps; 9. Comparators; 10. Transimpedance Amplifiers; 11. Timers and Oscillators; 12. Phase-Locked Loops; 13. Filters; 14. Power, Linear Regulators, Low Drop-Out Regulators, Switching Regulators, Linear Power Amplifiers, Switching Power Am-plifiers; 15. A to D and D to A, The Delta-Sigma Converter; 16. Odds and Ends, Gilbert Cell, Multipliers, Peak Detectors, Rectifiers and Averaging Circuits, Thermometers, Zero-Crossing Detectors; 17. Layout.

Analog-to-digital (A/D) and digital-to-analog (D/A) converters provide the link between the analog world of transducers and the digital world of signal processing, computing and other digital data collection or data processing systems. Several types of converters have been designed, each using the best available technology at a given time for a given application. For example, high-

performance bipolar and MOS technologies have resulted in the design of high-resolution or high-speed converters with applications in digital audio and video systems. In addition, high-speed bipolar technologies enable conversion speeds to reach the gigaHertz range and thus have applications in HDTV and digital oscilloscopes. Integrated Analog-to-Digital and Digital-to-Analog Converters describes in depth the theory behind and the practical design of these circuits. It describes the different techniques to improve the accuracy in high-resolution A/D and D/A converters and also special techniques to reduce the number of elements in high-speed A/D converters by repetitive use of comparators. Integrated Analog-to-Digital and Digital-to-Analog Converters is the most comprehensive book available on the subject. Starting from the basic elements of theory necessary for a complete understanding of the design of A/D and D/A converters, this book describes the design of high-speed A/D converters, high-accuracy D/A and A/D converters, sample-and-hold amplifiers, voltage and current reference sources, noise-shaping coding and sigma-delta converters. Integrated Analog-to-Digital and Digital-to-Analog Converters contains a comprehensive bibliography and index and also includes a complete set of problems. This book is ideal for use in an advanced course on the subject and is an essential reference for researchers and practicing engineers.

The essentials of analog circuit design with a unique all-region MOSFET modeling approach.

Practices and Innovations

Digital Integrated Circuits

Radio Frequency Integrated Circuits and Systems

Fundamentals of High Frequency CMOS Analog Integrated Circuits

Principles of Data Conversion System Design

Equips students with essential industry-relevant knowledge through in-depth explanations, practical applications, examples, and exercises.

Integrated circuit technology is widely used for the full integration of electronic systems. In general, these systems are realized using digital techniques implemented in CMOS technology. The low power dissipation, high packing density, high noise immunity, ease of design and the relative ease of scaling are the driving forces of CMOS technology for digital applications. Parts of these systems cannot be implemented in the digital domain and will remain analog. In order to achieve complete system integration these analog functions are preferably integrated in the same CMOS technology. An important class of analog circuits that need to be integrated in CMOS are analog filters. This book deals with very high frequency (VHF) filters,

which are filters with cut-off frequencies ranging from the low megahertz range to several hundreds of megahertz. Until recently the maximal cut-off frequencies of CMOS filters were limited to the low megahertz range. By applying the techniques presented in this book the limit could be pushed into the true VHF domain, and integrated VHF filters become feasible. Application of these VHF filters can be found in the field of communication, instrumentation and control systems. For example, pre and post filtering for high-speed AD and DA converters, signal reconstruction, signal decoding, etc. The general design philosophy used in this book is to allow only the absolute minimum of signal carrying nodes throughout the whole filter. This strategy starts at the filter synthesis level and is extended to the level of electronic circuitry. The result is a filter realization in which all capacitators (including parasitics) have a desired function. The advantage of this technique is that high frequency parasitic effects (parasitic poles/zeros) are minimally present. The book is a reference for engineers in research or development, and is suitable for use as a text for advanced courses on the subject. >

Electrical Engineering Low-Voltage/Low-Power Integrated Circuits and Systems Low-Voltage Mixed-Signal Circuits Leading experts in the field present this collection of original contributions as a practical approach to low-power analog and digital circuit theory and design, illustrated with important applications and examples. Low-Voltage/Low-Power Integrated Circuits and Systems features comprehensive coverage of the latest techniques for the design, modeling, and characterization of low-power analog and digital circuits. Low-Voltage/Low-Power Integrated Circuits and Systems will help you improve your understanding of the trade-offs between analog and digital circuits and systems. It is an invaluable resource for enhancing your designs. This book is intended for senior and graduate students. It is also intended as a key reference for designers in the semiconductor and communication industries. Highlighted applications include: Low-voltage analog filters Low-power multiplierless YUV to RGB based on human vision perception Micropower systems for implantable defibrillators and pacemakers Neuromorphic systems Low-power design in telecom circuits

This book aims to cover different aspects of Bias Temperature Instability (BTI). BTI remains as an important reliability concern for CMOS transistors and circuits. Development of BTI resilient technology relies on utilizing artefact-free stress and measurement methods and suitable physics-based models for accurate determination of degradation at end-of-life and understanding the gate insulator process impact on BTI. This book discusses different ultra-fast characterization techniques for recovery artefact free BTI measurements. It also covers different direct measurements techniques to access pre-existing and newly generated gate insulator traps responsible for BTI. The book provides a consistent physical framework for NBTI and PBTI respectively for p- and n- channel MOSFETs, consisting of trap generation and trapping. A physics-based compact model is presented to estimate measured BTI degradation in planar Si MOSFETs having differently processed SiON and HKMG gate insulators, in planar SiGe MOSFETs and also in Si FinFETs. The contents also include a detailed investigation of the gate insulator process dependence of BTI in differently processed SiON and HKMG MOSFETs. The book then goes on to discuss Reaction-Diffusion (RD) model to estimate generation of new traps for DC and AC NBTI stress and Transient Trap Occupancy Model (TTOM) to estimate charge occupancy of generated traps and their contribution to BTI degradation. Finally, a comprehensive NBTI modeling framework including TTOM enabled RD model and hole trapping to predict time evolution of BTI degradation and recovery during and after DC stress for different stress and recovery biases and temperature, during consecutive arbitrary stress and recovery cycles and during AC stress at different frequency and duty cycle. The contents of this book should prove useful to academia and professionals alike.

Designing Analog Chips

Analysis and Design

Low-Voltage/Low-Power Integrated Circuits and Systems

The Design of CMOS Radio-Frequency Integrated Circuits

CMOS Analog Integrated Circuits

DESIGN OF ANALOG CMOS

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.

This modern, pedagogic textbook from leading author Behzad Razavi provides a comprehensive and rigorous introduction to CMOS PLL design, featuring intuitive presentation of theoretical concepts, extensive circuit simulations, over 200 worked examples, and 250 end-of-chapter problems. The perfect text for senior undergraduate and graduate students.

By helping students develop an intuitive understanding of the subject, Microelectronics teaches them to think like engineers. The second edition of Razavi's Microelectronics retains its hallmark emphasis on analysis by inspection and building students' design intuition, and it incorporates a host of new pedagogical features that make it easier to teach and learn from, including: application sidebars, self-check problems with answers, simulation problems with SPICE and MULTISIM, and an expanded problem set that is organized by degree of difficulty and more clearly associated with specific chapter sections.

This hands-on guide contains a fresh approach to efficient and insight-driven integrated circuit design in nanoscale-CMOS. With downloadable MATLAB code and over forty detailed worked examples, this is essential reading for professional engineers, researchers, and graduate students in analog circuit design.

Fundamentals of Bias Temperature Instability in MOS Transistors

Systematic Design of Analog CMOS Circuits

Integrated Analog-To-Digital and Digital-To-Analog Converters

Design of Analog Integrated Circuits and Systems

Analysis and Design of Analog Integrated Circuits, 5th Edition

Design and Optimization in Bulk and SOI Technologies

The purpose of this book is to provide a complete working knowledge of the Complementary Metal-Oxide Semiconductor (CMOS) analog and mixed-signal circuit design, which can be applied for System on Chip (SOC) or Application-Specific Standard Product (ASSP) development. It begins with an introduction to the CMOS analog and mixed-signal circuit design with further coverage of basic devices, such as the Metal-Oxide Semiconductor Field-Effect Transistor (MOSFET) with both long- and short-channel operations, photo devices, fitting

ratio, etc. Seven chapters focus on the CMOS analog and mixed-signal circuit design of amplifiers, low power amplifiers, voltage regulator-reference, data converters, dynamic analog circuits, color and image sensors, and peripheral (oscillators and Input/Output [I/O]) circuits, and Integrated Circuit (IC) layout and packaging. Features: Provides practical knowledge of CMOS analog and mixed-signal circuit design Includes recent research in CMOS color and image sensor technology Discusses sub-blocks of typical analog and mixed-signal IC products Illustrates several design examples of analog circuits together with layout Describes integrating based CMOS color circuit

Beginning with discussions on the operation of electronic devices and analysis of the nucleus of digital design, the text addresses: the impact of interconnect, design for low power, issues in timing and clocking, design methodologies, and the effect of design automation on the digital design perspective.

Fundamentals of Microelectronics, 2nd Edition is designed to build a strong foundation in both design and analysis of electronic circuits this text offers conceptual understanding and mastery of the material by using modern examples to motivate and prepare readers for advanced courses and their careers. The books unique problem-solving framework enables readers to deconstruct complex problems into components that they are familiar with which builds the confidence and intuitive skills needed for success.

The fourth edition of CMOS Digital Integrated Circuits: Analysis and Design continues the well-established tradition of the earlier editions by offering the most comprehensive coverage of digital CMOS circuit design, as well as addressing state-of-the-art technology issues highlighted by the widespread use of nanometer-scale CMOS technologies. In this latest edition, virtually all chapters have been re-written, the transistor model equations and device parameters have been revised to reflect the sigificant changes that must be taken into account for new technology generations, and the material has been reinforced with up-to-date examples. The broad-ranging coverage of this textbook starts with the fundamentals of CMOS process technology, and continues with MOS transistor models, basic CMOS gates, interconnect effects, dynamic circuits, memory circuits, arithmetic building blocks, clock and I/O circuits, low power design techniques, design for manufacturability and design for testability.

Low Power Analog CMOS for Cardiac Pacemakers

From Circuit Level to Architecture Level

CMOS

Integrated Circuits

The gm/ID Methodology, a sizing tool for low-voltage analog CMOS Circuits

Design of CMOS Phase-Locked Loops

High-speed, power-efficient analog integrated circuits can be used as standalone devices or to interface modern digital signal processors and micro-controllers in various applications, including multimedia, communication, instrumentation, and

control systems. New architectures and low device geometry of complementary metaloxidesemiconductor (CMOS) technologies have accelerated the movement toward system on a chip design, which merges analog circuits with digital, and radio-frequency components.

Analog CMOS integrated circuits are in widespread use for communications, entertainment, multimedia, biomedical, and many other applications that interface with the physical world. Although analog CMOS design is greatly complicated by the design choices of drain current, channel width, and channel length present for every MOS device in a circuit, these design choices afford significant opportunities for optimizing circuit performance. This book addresses tradeoffs and optimization of device and circuit performance for selections of the drain current, inversion coefficient, and channel length, where channel width is implicitly considered. The inversion coefficient is used as a technology independent measure of MOS inversion that permits design freely in weak, moderate, and strong inversion. This book details the significant performance tradeoffs available in analog CMOS design and guides the designer towards optimum design by describing: An interpretation of MOS modeling for the analog designer, motivated by the EKV MOS model, using tabulated hand expressions and figures that give performance and tradeoffs for the design choices of drain current, inversion coefficient, and channel length; performance includes effective gate-source bias and drain-source saturation voltages, transconductance efficiency, transconductance distortion, normalized drain-source conductance, capacitances, gain and bandwidth measures, thermal and flicker noise, mismatch, and gate and drain leakage current Measured data that validates the inclusion of important small-geometry effects like velocity saturation, vertical-field mobility reduction, drain-induced barrier lowering, and inversion-level increases in gate-referred, flicker noise voltage In-depth treatment of moderate inversion, which offers low bias compliance voltages, high transconductance efficiency, and good immunity to velocity saturation effects for circuits designed in modern, low-voltage processes Fabricated design examples that include operational transconductance amplifiers optimized for various tradeoffs in DC and AC performance, and micropower, low-noise preamplifiers optimized for minimum thermal and flicker noise A design spreadsheet, available at the book web site, that facilitates rapid, optimum design of MOS devices and circuits Tradeoffs and Optimization in Analog CMOS Design is the first book dedicated to this important topic. It will help practicing analog circuit designers and advanced students of electrical engineering build design intuition, rapidly optimize circuit performance during initial design, and minimize trial-and-error circuit simulations.

Top-down approach to practical, tool-independent, digital circuit design, reflecting how circuits are designed.

This book, first published in 2004, is an expanded and revised edition of Tom Lee's acclaimed RFIC text.

Low-Voltage Mixed-Signal Circuits

Tradeoffs and Optimization in Analog CMOS Design

Design of Analog Cmos Integrated Circuits

Circuit Design, Layout, and Simulation

Analog IC Design Techniques for Nanopower Biomedical Signal Processing

Digital Integrated Circuit Design

This book highlights key design issues and challenges to guarantee the development of successful applications of analog circuits. Researchers around the world share acquired experience and insights to develop advances in analog circuit design,

modeling and simulation. The key contributions of the sixteen chapters focus on recent advances in analog circuits to accomplish academic or industrial target specifications.
This textbook is ideal for senior undergraduate and graduate courses in RF CMOS circuits, RF circuit design, and high-frequency analog circuit design. It is aimed at electronics engineering students, as well as IC design engineers in the field, who wish to gain a deeper understanding of circuit fundamentals and go beyond the widely-used automated design procedures. A design-centric approach is adopted in order to bridge the gap between fundamental analog electronic circuits textbooks and more advanced RF IC design texts. The structure and operation of the building blocks of high-frequency ICs are introduced in a systematic manner, with an emphasis on transistor-level operation, the influence of device characteristics and parasitic effects, and input-output behavior in the time and frequency domains. This second edition has been revised extensively to expand and clarify some of the key topics and to provide a wide range of design examples and problems. New material has been added for basic coverage of core topics, such as wide-band LNAs, noise feedback concept and noise cancellation, inductive-compensated band widening techniques for flat-gain or flat-delay characteristics, and basic communication system concepts that exploit the convergence and co-existence of Analog and Digital building blocks in RF systems. A new chapter (Chapter 5) has been added on Noise and Linearity, addressing key topics in a comprehensive manner. All of the other chapters have also been revised and largely re-written, with the addition of numerous solved design examples and exercise problems.
Designed for senior undergraduate and graduate courses in RF CMOS circuits, RF circuit design, and high-frequency analog circuit design; Uses simple circuit models to enable a robust understanding of high-frequency design fundamentals; Employs solved design examples to familiarize the reader with the design flow, starting with knowledge-based and model-based hand-design and progressing to SPICE simulations; Introduces fine-tuning procedures in circuit design with an emphasis on key trade-offs; Demonstrates key criteria and parameters that are used to describe system-level performance. .
As the requirements for low power consumption and very small physical dimensions in portable, wearable and implantable medical devices are calling for integrated circuit design techniques using MOSFETs operating in the subthreshold regime, this book first revisits some well-known circuit techniques that use CMOS devices biased in subthreshold in order to establish nanopower integrated circuit designs. Based on the these

findings, this book shows the development of a class-AB current-mode sample-and-hold circuit with an order of magnitude improvement in its figure of merit compared to other state-of-the-art designs. Also, the concepts and design procedures of 1) single-branch filters 2) follower-integrator-based lowpass filters and 3) modular transconductance reduction techniques for very low frequency filters are presented. Finally, to serve the requirement of a very large signal swing in an energy-based action potential detector, a nanopower class-AB current-mode analog multiplier is designed to handle input current amplitudes of more than 10 times the bias current of the multiplier circuit. The invented filter circuits have been fabricated in a standard 0.18 µ CMOS process in order to verify our circuit concepts and design procedures. Their experimental results are reported.

This advanced text and reference covers the design and implementation of integrated circuits for analog-to-digital and digital-to-analog conversion. It begins with basic concepts and systematically leads the reader to advanced topics, describing design issues and techniques at both circuit and system level. Gain a system-level perspective of data conversion units and their trade-offs with this state-of-the art book. Topics covered include: sampling circuits and architectures, D/A and A/D architectures; comparator and op amp design; calibration techniques; testing and characterization; and more!

High-Speed and Power-Efficient Design, Second Edition

Characterization Methods, Process and Materials Impact, DC and AC Modeling

Design of Analog CMOS Integrated Circuits

A Design Perspective

Analog Circuit Design

Analog CMOS Integrated Circuit Design

Discover a fresh approach to efficient and insight-driven analog integrated circuit design in nanoscale-CMOS with this hands-on guide. Expert authors present a sizing methodology that employs SPICE-generated lookup tables, enabling close agreement between hand analysis and simulation. This enables the exploration of analog circuit tradeoffs using the gm/ID ratio as a central variable in script-based design flows, and eliminates time-consuming iterations in a circuit simulator. Supported by downloadable MATLAB code, and including over forty detailed worked examples, this book will provide professional analog circuit designers, researchers, and graduate students with the theoretical know-how and practical tools needed to acquire a systematic and re-use oriented design style for analog integrated circuits in modern CMOS.

Market_Desc: Engineers Special Features: " Updates the coverage of bipolar technologies" Enhances the discussion of biCMOS" Provides a more unified treatment of digital and analog circuit design while strengthening the coverage of CMOS" Removes the chapter on non-linear analog circuits" Adds a new operational amplifier example to chapter 11 About The Book: This is the only comprehensive book in the market for engineers that covers CMOS, bipolar technologies, and biCMOS integrated circuits. The fifth edition retains its completeness, updates the coverage of

bipolar technologies, and enhances the discussion of biCMOS. It provides a more unified treatment of digital and analog circuit design while strengthening the coverage of CMOS. The chapter on non-linear analog circuits has been removed and chapter 11 has been updated to include an operational amplifier example. With its streamlined and up-to-date coverage, more engineers can turn to this resource to explore key concepts in the field.

Analog Circuit Design is based on the yearly Advances in Analog Circuit Design workshop. The aim of the workshop is to bring together designers of advanced analogue and RF circuits for the purpose of studying and discussing new possibilities and future developments in this field. Selected topics for AACD 2007 were: (1) Sensors, Actuators and Power Drivers for the Automotive and Industrial Environment; (2) Integrated PA's from Wireline to RF; (3) Very High Frequency Front Ends.

The 2nd Edition of Analog Integrated Circuit Design focuses on more coverage about several types of circuits that have increased in importance in the past decade. Furthermore, the text is enhanced with material on CMOS IC device modeling, updated processing layout and expanded coverage to reflect technical innovations. CMOS devices and circuits have more influence in this edition as well as a reduced amount of text on BiCMOS and bipolar information. New chapters include topics on frequency response of analog ICs and basic theory of feedback amplifiers.

Fundamentals of Microelectronics

ANALYSIS AND DESIGN OF ANALOG INTEGRATED CIRCUITS, 5TH ED, ISV

CMOS analog circuit design

The semi-empirical and compact model approaches

CMOS Analog Design Using All-Region MOSFET Modeling

Design and Implementation of Fully-Integrated Inductive DC-DC Converters in Standard CMOS

This book provides a detailed analysis of all aspects of capacitive DC-DC converter design: topology selection, control loop design and noise mitigation. Readers will benefit from the authors' systematic overview that starts from the ground up, in-depth circuit analysis and a thorough review of recently proposed techniques and design methodologies. Not only design techniques are discussed, but also implementation in CMOS is shown, by pinpointing the technological opportunities of CMOS and demonstrating the implementation based on four state-of-the-art prototypes.

CMOS DC-DC Converters aims to provide a comprehensive dissertation on the matter of monolithic inductive Direct-Current to Direct-Current (DC-DC) converters. For this purpose seven chapters are defined which will allow the designer to gain specific knowledge on the design and implementation of monolithic inductive DC-DC converters, starting from the very basics.

Analog CMOS Filters for Very High Frequencies

From VLSI Architectures to CMOS Fabrication

Sensors, Actuators and Power Drivers; Integrated Power Amplifiers from Wireline to RF; Very High Frequency Front Ends

Analog Integrated Circuit Design

VLSI Design Techniques for Analog and Digital Circuits