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Nonlinear RF Circuits and Nonlinear Vector Network Analyzers Patrick Roblin 2011-06-02 With increasingly low-cost and power-efficient RF electronics demanded by today's wireless communication systems, it is essential to keep up to speed with new developments. This book presents key advances in the field that you need to know about and emerging patterns in large-signal measurement techniques, modeling and nonlinear circuit design theory supported by practical examples. Topics covered include: • Novel large-signal measurement techniques that have become available with the introduction of nonlinear vector network analyzers (NVNA), such as the LSNA, PNA-X and SWAP • Direct extraction of device models from large-signal RF dynamic loadlines • Characterization of memory effects (self-heating, traps) with pulsed RF measurements • Interactive design of power-efficient amplifiers (PA) and oscillators using ultra-fast multi-harmonic active load-pull • Volterra and poly-harmonic distortion (X-parameters) behavioral modeling • Oscillator phase noise theory • Balancing, modeling and poly-harmonic linearization of broadband RFIC modulators • Development of a frequency selective predistorter to linearize PAs

Integrated Frequency Synthesizers for Wireless Systems Andrea Leonardo Lacaita 2007-06-28 The increasingly demanding performance requirements of communications systems, as well as problems posed by the continued scaling of silicon technology, present numerous challenges for the design of frequency synthesizers in modern transceivers. This book contains everything you need to know for the efficient design of frequency synthesizers for today's communications applications. If you need to optimize performance and minimize design time, you will find this book invaluable. Using an intuitive yet rigorous approach, the authors describe simple analytical methods for the design of phase locked loop (PLL) frequency synthesizers using scaled silicon CMOS

and bipolar technologies. The entire design process, from system-level specification to layout, is covered comprehensively. Practical design examples are included, and implementation issues are addressed. A key problem-solving resource for practitioners in IC design, the book will also be of interest to researchers and graduate students in electrical engineering.

RF-Frontend Design for Process-Variation-Tolerant Receivers Pooyan Sakian 2012-02-22 This book discusses a number of challenges faced by designers of wireless receivers, given complications caused by the shrinking of electronic and mobile devices circuitry into ever-smaller sizes and the resulting complications on the manufacturability, production yield, and the end price of the products. The authors describe the impact of process technology on the performance of the end product and equip RF designers with countermeasures to cope with such problems. The mechanisms by which these problems arise are analyzed in detail and novel solutions are provided, including design guidelines for receivers with robustness to process variations and details of circuit blocks that obtain the required performance level. Describes RF receiver frontends and their building blocks from a system- and circuit-level perspective; Provides system-level analysis of a generic RF receiver frontend with robustness to process variations; Includes details of CMOS circuit design at 60GHz and reconfigurable circuits at 60GHz; Covers millimeter-wave circuit design with robustness to process variations.

Planar Microwave Engineering Thomas H. Lee 2004-08-30 Sample Text

An Introduction to Radio Frequency Engineering Christopher Coleman 2004-05-13

Originally published in 2004, this book provides a detailed introduction to radio frequency (RF) engineering, using a straightforward and easily understood approach combined with numerous worked examples, illustrations and homework problems. The author focuses on minimising the mathematics needed to grasp the subject while providing a solid theoretical foundation for the student. Emphasis is also placed on the practical aspects of radio engineering. The book provides a broad coverage of RF systems, circuit design, antennas, propagation and digital techniques. It will provide an excellent introduction to the subject for graduate students, researchers and practising engineers.

Fundamentals of High Frequency CMOS Analog Integrated Circuits Duran Leblebici

2021 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. .

Fundamentals of High-Frequency CMOS Analog Integrated Circuits Duran Leblebici 2009-05-28 Includes plenty of design examples together with the key issues encountered in real-world design scenarios, for students and practising engineers.
Radio Frequency Integrated Circuit Design John W. M. Rogers 2014-05-14 This newly revised and expanded edition of the 2003 Artech House classic, *Radio Frequency Integrated Circuit Design*, serves as an up-to-date, practical reference for complete RFIC know-how. The second edition includes numerous updates, including greater coverage of CMOS PA design, RFIC design with on-chip components, and more worked examples with simulation results. By emphasizing working designs, this book practically transports you into the authors' own RFIC lab so you can fully understand the function of each design detailed in this book. Among the RFIC designs examined are RF integrated LC-based filters, VCO automatic amplitude control loops, and fully integrated transformer-based circuits, as well as image reject mixers and power amplifiers. If you are new to RFIC design, you can benefit from the introduction to basic theory so you can quickly come up to speed on how RFICs perform and work together in a communications device. A thorough examination of RFIC technology guides you in knowing when RFICs are the right choice for designing a communication device. This leading-edge resource is packed with over 1,000 equations and more than 435 illustrations that support key topics."

Radio-Frequency Integrated-Circuit Engineering Cam Nguyen 2015-03-16 This book presents the theory, analysis, and design of passive and active RFICs at high frequencies to hundreds of GHz, beyond those in the traditional RF spectrum. Provides essential knowledge in EM and microwave engineering, passive and active RFICs, RFIC analysis and design techniques, and RF systems vital for RFIC students and engineers Blends analog and microwave engineering approaches for RFIC design at high frequencies Includes problems at the end of each chapter

RFID Systems Miodrag Bolic 2010-09-23 This book provides an insight into the 'hot' field of Radio Frequency Identification (RFID) Systems In this book, the authors provide an insight into the field of RFID systems with an emphasis on networking aspects and research challenges related to passive Ultra High Frequency (UHF) RFID systems. The book reviews various algorithms, protocols and design solutions that have been developed within the area, including most recent advances. In addition, authors cover a wide range of recognized problems in RFID industry, striking a balance between theoretical and practical coverage. Limitations of the technology and state-of-the-art solutions are identified and new research opportunities are addressed. Finally, the book

is authored by experts and respected researchers in the field and every chapter is peer reviewed. Key Features: Provides the most comprehensive analysis of networking aspects of RFID systems, including tag identification protocols and reader anti-collision algorithms Covers in detail major research problems of passive UHF systems such as improving reading accuracy, reading range and throughput Analyzes other "hot topics" including localization of passive RFID tags, energy harvesting, simulator and emulator design, security and privacy Discusses design of tag antennas, tag and reader circuits for passive UHF RFID systems Presents EPCGlobal architecture framework, middleware and protocols Includes an accompanying website with PowerPoint slides and solutions to the problems <http://www.site.uottawa.ca/~mbolic/RFIDBook/> This book will be an invaluable guide for researchers and graduate students in electrical engineering and computer science, and researchers and developers in telecommunication industry.

RF and Time-domain Techniques for Evaluating Novel Semiconductor Transistors Keith A. Jenkins 2021-12-15 This book presents a variety of techniques using high-frequency (RF) and time-domain measurements to understand the electrical performance of novel, modern transistors made of materials such as graphene, carbon nanotubes, and silicon-on-insulator, and using new transistor structures. The author explains how to use conventional RF and time-domain measurements to characterize the performance of the transistors. In addition, he explains how novel transistors may be subject to effects such as self-heating, period-dependent output, non-linearity, susceptibility to short-term degradation, DC-invisible structural defects, and a different response to DC and transient inputs. Readers will understand that in order to fully understand and characterize the behavior of a novel transistor, there is an arsenal of dynamic techniques available. In addition to abstract concepts, the reader will learn of practical tips required to achieve meaningful measurements, and will understand the relationship between these measurements and traditional, conventional DC characteristics.

Radio-Frequency Electronics Jon B. Hagen 2009-06-11 Covering the fundamentals applying to all radio devices, this is a perfect introduction to the subject for students and professionals.

Adaptive Multi-Standard RF Front-Ends Vojkan Vidojkovic 2008-02-07 This book investigates solutions, benefits, limitations, and costs associated with multi-standard operation of RF front-ends and their ability to adapt to variable radio environments. Next, it highlights the optimization of RF front-ends to allow maximum performance within a certain power budget, while targeting full integration. Finally, the book investigates possibilities for low-voltage, low-power circuit topologies in CMOS technology.

Radio Frequency Integrated Circuits and Systems Hooman Darabi 2020-02-29 Equips students with essential industry-relevant knowledge through in-depth explanations, practical applications, examples, and exercises.

mm-Wave Silicon Power Amplifiers and Transmitters Hossein Hashemi 2016-04-04 Build high-performance, spectrally clean, energy-efficient mm-wave power amplifiers and transmitters with this cutting-edge guide to designing, modeling, analysing, implementing and testing new mm-wave systems. Suitable for students, researchers and practicing engineers, this self-contained guide provides in-depth coverage of state-of-the-art semiconductor devices and technologies, linear and nonlinear power amplifier

technologies, efficient power combining systems, circuit concepts, system architectures and system-on-a-chip realizations. The world's foremost experts from industry and academia cover all aspects of the design process, from device technologies to system architectures. Accompanied by numerous case studies highlighting practical design techniques, tradeoffs and pitfalls, this is a superb resource for those working with high-frequency systems.

Design of High-Speed Communication Circuits

Digital Radio System Design Grigorios Kalivas 2009-10-23 A systematic explanation of the principles of radio systems, Digital Radio System Design offers a balanced treatment of both digital transceiver modems and RF front-end subsystems and circuits. It provides an in-depth examination of the complete transceiver chain which helps to connect the two topics in a unified system concept. Although the book tackles such diverse fields it treats them in sufficient depth to give the designer a solid foundation and an implementation perspective. Covering the key concepts and factors that characterise and impact radio transmission and reception, the book presents topics such as receiver design, noise and distortion. Information is provided about more advanced aspects of system design such as implementation losses due to non-idealities. Providing vivid examples, illustrations and detailed case-studies, this book is an ideal introduction to digital radio systems design. Offers a balanced treatment of digital modem and RF front-end design concepts for complete transceivers Presents a diverse range of topics related to digital radio design including advanced transmission and synchronization techniques with emphasis on implementation Provides guidance on imperfections and non-idealities in radio system design Includes detailed design case-studies incorporating measurement and simulation results to illustrate the theory in practice

Switchmode RF Power Amplifiers Andrei Grebennikov 2011-04-01 A majority of people now have a digital mobile device whether it be a cell phone, laptop, or blackberry. Now that we have the mobility we want it to be more versatile and dependable; RF power amplifiers accomplish just that. These amplifiers take a small input and make it stronger and larger creating a wider area of use with a more robust signal. Switching mode RF amplifiers have been theoretically possible for decades, but were largely impractical because they distort analog signals until they are unrecognizable. However, distortion is not an issue with digital signals—like those used by WLANs and digital cell phones—and switching mode RF amplifiers have become a hot area of RF/wireless design. This book explores both the theory behind switching mode RF amplifiers and design techniques for them. *Provides essential design and implementation techniques for use in cma2000, WiMAX, and other digital mobile standards *Both authors have written several articles on the topic and are well known in the industry *Includes specific design equations to greatly simplify the design of switchmode amplifiers

Radio Frequency Integrated Circuit Design for Cognitive Radio Systems Amr Fahim 2015-03-03 This book fills an information gap on cognitive radios, since the discussion focuses on the implementation issues that are unique to cognitive radios and how to solve them at both the architecture and circuit levels. This is the first book to describe in detail cognitive radio systems, as well as the circuit implementation and architectures required to implement such systems. Throughout the book, requirements and constraints imposed by cognitive radio systems are emphasized when discussing the circuit implementation details. This is a valuable reference for anybody with background

in analog and radio frequency (RF) integrated circuit design, needing to learn more about integrated circuits requirements and implementation for cognitive radio systems. LCP for Microwave Packages and Modules Anh-Vu H. Pham 2012-06-21 A comprehensive overview of electrical design using Liquid Crystal Polymer (LCP) at package, component and system levels, providing a detailed look at everything you need to know to get up-to-speed on the subject, including successful design details, techniques and potential pitfalls.

Millimeter-Wave Circuits for 5G and Radar Gernot Hueber 2019-05-31 Discover the concepts and techniques needed to design millimeter-wave circuits for current and emerging wireless system applications.

Advances in Analog and RF IC Design for Wireless Communication Systems Gabriele Manganaro 2013-05-13 The recent and dramatic increase in demand for mobile data communication, driven by consumer devices such as smartphones and tablets, is resulting in heightened technical challenges for the wireless infrastructure that lies as a bridge in-between these mobile terminals and the wired network transferring the data between final users. Several challenges arise in the design of the electronics behind the wireless infrastructure access points, or base-stations. This Chapter provides an overview of the present state, challenges and trends in the RF, analog and mixed signal electronics for wireless infrastructure and provides a frame to orient the reader of this book to the following chapters covering the specifics of the technologies involved.

Microwave Circuits for 24 GHz Automotive Radar in Silicon-based Technologies Vadim Issakov 2010-08-05 There are continuous efforts focussed on improving road traffic safety worldwide. Numerous vehicle safety features have been invented and standardized over the past decades. Particularly interesting are the driver assistance systems, since these can considerably reduce the number of accidents by supporting drivers' perception of their surroundings. Many driver assistance features rely on radar-based sensors. Nowadays the commercially available automotive front-end sensors are comprised of discrete components, thus making the radar modules highly-priced and suitable for integration only in premium class vehicles. Realization of low-cost radar front-end circuits would enable their implementation in inexpensive economy cars, considerably contributing to traffic safety. Cost reduction requires high-level integration of the microwave front-end circuitry, specifically analog and digital circuit blocks co-located on a single chip. Recent developments of silicon-based technologies, e.g. CMOS and SiGe:C bipolar, make them suitable for realization of microwave sensors.

Additionally, these technologies offer the necessary integration capability. However, the required output power and temperature stability, necessary for automotive radar sensor products, have not yet been achieved in standard digital CMOS technologies. On the other hand, SiGe bipolar technology offers excellent high-frequency characteristics and necessary output power for automotive applications, but has lower potential for realization of digital blocks than CMOS.

CMOS-MEMS Henry Baltès 2008-07-11

Wireless Radio-Frequency Standards and System Design: Advanced Techniques Cornetta, Gianluca 2012-01-31 Radio-frequency (RF) integrated circuits in CMOS technology are gaining increasing popularity in the commercial world, and CMOS technology has become the dominant technology for applications such as GPS receivers, GSM cellular transceivers, wireless LAN, and wireless short-range personal area networks based on IEEE 802.15.1 (Bluetooth) or IEEE 802.15.4 (ZigBee)

standards. Furthermore, the increasing interest in wireless technologies and the widespread of wireless communications has prompted an ever increasing demand for radio frequency transceivers. *Wireless Radio-Frequency Standards and System Design: Advanced Techniques* provides perspectives on radio-frequency circuit and systems design, covering recent topics and developments in the RF area. Exploring topics such as LNA linearization, behavioral modeling and co-simulation of analog and mixed-signal complex blocks for RF applications, integrated passive devices for RF-ICs and baseband design techniques and wireless standards, this is a comprehensive reference for students as well as practicing professionals.

The Design of CMOS Radio-Frequency Integrated Circuits Thomas H. Lee 2004 This book, first published in 2004, is an expanded and revised edition of Tom Lee's acclaimed RFIC text.

High-Frequency Integrated Circuits Sorin Voinigescu 2013-02-28 A transistor-level, design-intensive overview of high speed and high frequency monolithic integrated circuits for wireless and broadband systems from 2 GHz to 200 GHz, this comprehensive text covers high-speed, RF, mm-wave, and optical fibre circuits using nanoscale CMOS, SiGe BiCMOS, and III-V technologies. Step-by-step design methodologies, end-of chapter problems, and practical simulation and design projects are provided, making this an ideal resource for senior undergraduate and graduate courses in circuit design. With an emphasis on device-circuit topology interaction and optimization, it gives circuit designers and students alike an in-depth understanding of device structures and process limitations affecting circuit performance.

High-Frequency Integrated Circuits South Asia Edition Sorin Voinigescu 2017-04-01 A transistor-level, design-intensive overview of high speed and high frequency monolithic integrated circuits for wireless and broadband systems from 2 GHz to 200 GHz, this comprehensive text covers high-speed, RF, mm-wave, and optical fibre circuits using nanoscale CMOS, SiGe BiCMOS, and III-V technologies. Step-by-step design methodologies, end-of chapter problems, and practical simulation and design projects are provided, making this an ideal resource for senior undergraduate and graduate courses in circuit design. With an emphasis on device-circuit topology interaction and optimization, it gives circuit designers and students alike an in-depth understanding of device structures and process limitations affecting circuit performance.

High-Frequency Integrated Circuits Sorin Voinigescu 2013-02-28 A transistor-level, design-intensive overview of high speed and high frequency monolithic integrated circuits for wireless and broadband systems from 2 GHz to 200 GHz, this comprehensive text covers high-speed, RF, mm-wave and optical fiber circuits using nanoscale CMOS, SiGe BiCMOS and III-V technologies. Step-by-step design methodologies, end-of-chapter problems and practical simulation and design projects are provided, making this an ideal resource for senior undergraduate and graduate courses in circuit design. With an emphasis on device-circuit topology interaction and optimization, it gives circuit designers and students alike an in-depth understanding of device structures and process limitations affecting circuit performance.

Planar Microwave Engineering Thomas H. Lee 2004-08-30 Modern wireless communications hardware is underpinned by RF and microwave design techniques. This insightful book contains a wealth of circuit layouts, design tips, and practical measurement techniques for building and testing practical gigahertz systems. The book covers everything you need to know to design, build, and test a high-frequency circuit.

Microstrip components are discussed, including tricks for extracting good performance from cheap materials. Connectors and cables are also described, as are discrete passive components, antennas, low-noise amplifiers, oscillators, and frequency synthesizers. Practical measurement techniques are presented in detail, including the use of network analyzers, sampling oscilloscopes, spectrum analyzers, and noise figure meters. Throughout the focus is practical, and many worked examples and design projects are included. There is also a CD-ROM that contains a variety of design and analysis programs. The book is packed with indispensable information for students taking courses on RF or microwave circuits and for practising engineers.

Millimeter-Wave Circuits for 5G and Radar Gernot Hueber 2019-05-31 Discover the concepts, architectures, components, tools, and techniques needed to design millimeter-wave circuits for current and emerging wireless system applications. Focusing on applications in 5G, connectivity, radar, and more, leading experts in radio frequency integrated circuit (RFIC) design provide a comprehensive treatment of cutting-edge physical-layer technologies for radio frequency (RF) transceivers - specifically RF, analog, mixed-signal, and digital circuits and architectures. The full design chain is covered, from system design requirements through to building blocks, transceivers, and process technology. Gain insight into the key novelties of 5G through authoritative chapters on massive MIMO and phased arrays, and learn about the very latest technology developments, such as FinFET logic process technology for RF and millimeter-wave applications. This is an essential reading and an excellent reference for high-frequency circuit designers in both academia and industry.

Design of CMOS Phase-Locked Loops Behzad Razavi 2019-12-31 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.

Low-Voltage CMOS RF Frequency Synthesizers Howard Cam Luong 2004-08-26 A frequency synthesizer is one of the most critical building blocks in any wireless transceiver system. Its design is getting more and more challenging as the demand for low-voltage low-power high-frequency wireless systems continuously grows. As the supply voltage is decreased, many existing design techniques are no longer applicable. This book provides the reader with architectures and design techniques to enable CMOS frequency synthesizers to operate at low supply voltage at high frequency with good phase noise and low power consumption. In addition to updating the reader on many of these techniques in depth, this book will also introduce useful guidelines and step-by-step procedure on behaviour simulations of frequency synthesizers. Finally, three successfully demonstrated CMOS synthesizer prototypes with detailed design consideration and description will be elaborated to illustrate potential applications of the architectures and design techniques described. For engineers, managers and researchers working in radio-frequency integrated-circuit design for wireless applications.

The Design of CMOS Radio-Frequency Integrated Circuits Thomas H. Lee 1998-01-13 This comprehensive and insightful book sets out in detail how to design gigahertz-speed radio-frequency integrated circuits in CMOS technology. Starting with a history of radio to establish a foundation and to differentiate the discrete era from the IC age, the book reviews passive RLC networks, the characteristics of IC components and

transistor models. The design of high-frequency tuned and broadband amplifiers follows, with an emphasis on approximate methods that provide important design insight as a complement to simulation results. Key RF building blocks, such as low-noise amplifiers (LNAs), mixers, power amplifiers, high spectral purity oscillators and frequency synthesizers are studied in detail. The book closes with an examination of transceiver architectures. With over 350 circuit diagrams and illustrations, and many homework problems, this will be an ideal textbook for anyone taking advanced undergraduate or graduate courses in RF electronics, as well as a useful reference for practising engineers.

ESD Steven H. Voldman 2006-11-02 With the growth of high-speed telecommunications and wireless technology, it is becoming increasingly important for engineers to understand radio frequency (RF) applications and their sensitivity to electrostatic discharge (ESD) phenomena. This enables the development of ESD design methods for RF technology, leading to increased protection against electrical overstress (EOS) and ESD. ESD: RF Technology and Circuits: Presents methods for co-synthesizing ESD networks for RF applications to achieve improved performance and ESD protection of semiconductor chips; discusses RF ESD design methods of capacitance load transformation, matching network co-synthesis, capacitance shunts, inductive shunts, impedance isolation, load cancellation methods, distributed loads, emitter degeneration, buffering and ballasting; examines ESD protection and design of active and passive elements in RF complementary metal-oxide-semiconductor (CMOS), RF laterally-diffused metal oxide semiconductor (LDMOS), RF BiCMOS Silicon Germanium (SiGe), RF BiCMOS Silicon Germanium Carbon (SiGeC), and Gallium Arsenide technology; gives information on RF ESD testing methodologies, RF degradation effects, and failure mechanisms for devices, circuits and systems; highlights RF ESD mixed-signal design integration of digital, analog and RF circuitry; sets out examples of RF ESD design computer aided design methodologies; covers state-of-the-art RF ESD input circuits, as well as voltage-triggered to RC-triggered ESD power clamps networks in RF technologies, as well as off-chip protection concepts. Following the authors series of books on ESD, this book will be a thorough overview of ESD in RF technology for RF semiconductor chip and ESD engineers. Device and circuit engineers working in the RF domain, and quality, reliability and failure analysis engineers will also find it a valuable reference in the rapidly growing area of RF ESD design. In addition, it will appeal to graduate students in RF microwave technology and RF circuit design.

Modern RF and Microwave Measurement Techniques Valeria Teppati 2013-06-20 A comprehensive, hands-on review of the most up-to-date techniques in RF and microwave measurement, including practical advice on deployment challenges.

Microwave Electronics Giovanni Ghione 2017-11-30 A self-contained guide to microwave electronics, covering passive and active components, linear, low-noise and power amplifiers, microwave measurements, and CAD techniques. It is the ideal text for graduate and senior undergraduate students taking courses in microwave and radio-frequency electronics, as well as professional microwave engineers.

Fast Techniques for Integrated Circuit Design Mikael Sahrling 2019-08-15 Learn how to use estimation techniques to solve real-world IC design problems and accelerate design processes with this practical guide.

Radio Frequency Integrated Circuits and Technologies Frank Ellinger 2008-09-11 The

striking feature of this book is its coverage of the upper GHz domain. However, the latest technologies, applications and broad range of circuits are discussed. Design examples are provided including cookbook-like optimization strategies. This state-of-the-art book is valuable for researchers as well as for engineers in industry. Furthermore, the book serves as fruitful basis for lectures in the area of IC design. LNA-ESD Co-Design for Fully Integrated CMOS Wireless Receivers Paul Leroux 2006-03-30 LNA-ESD Co-Design for Fully Integrated CMOS Wireless Receivers fits in the quest for complete CMOS integration of wireless receiver front-ends. With a combined discussion of both RF and ESD performance, it tackles one of the final obstacles on the road to CMOS integration. The book is conceived as a design guide for those actively involved in the design of CMOS wireless receivers. The book starts with a comprehensive introduction to the performance requirements of low-noise amplifiers in wireless receivers. Several popular topologies are explained and compared with respect to future technology and frequency scaling. The ESD requirements are introduced and related to the state-of-the-art protection devices and circuits. LNA-ESD Co-Design for Fully Integrated CMOS Wireless Receivers provides an extensive theoretical treatment of the performance of CMOS low-noise amplifiers in the presence of ESD-protection circuitry. The influence of the ESD-protection parasitics on noise figure, gain, linearity, and matching are investigated. Several RF-ESD co-design solutions are discussed allowing both high RF-performance and good ESD-immunity for frequencies up to and beyond 5 GHz. Special attention is also paid to the layout of both active and passive components. LNA-ESD Co-Design for Fully Integrated CMOS Wireless Receivers offers the reader intuitive insight in the LNA's behavior, as well as the necessary mathematical background to optimize its performance. All material is experimentally verified with several CMOS implementations, among which a fully integrated GPS receiver front-end. The book is essential reading for RF design engineers and researchers in the field and is also suitable as a text book for an advanced course on the subject.