

Passive Rf Microwave Integrated Circuits

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Passive RF Component Technology Guo'an Wang 2012 Focusing on novel materials and techniques, this pioneering volume provides engineers with a solid understanding of the design and fabrication of smart RF passive components. Professionals find comprehensive details on LCP, metal materials, ferrite materials, nanomaterials, high aspect ratio enabled materials, green materials for RFID, and on-chip silicon techniques. Moreover, this practical book offers expert guidance on how to apply these materials and techniques to design a wide range of cutting-edge RF passive components, from MEMS switch-based tunable passives and 3D passives, to metamaterial-based passives and on-chip passives. Supported with over 145 illustrations, this forward-looking resource summarizes the growing trend of smart RF passive component design and serves as a guide to the performance-improving and cost-down solutions this technology offers the next generation of wireless communications.

Advanced RF & Microwave Circuit Design Matthew M. Radmanesh 2008-06-12 RF and Microwaves is currently in the forefront as a fundamental technology in numerous industrial and commercial applications. As applications of RF and microwaves continue to evolve and as this technology becomes a common factor in the scientific and engineering communities it is imperative that university students and practicing scientists and engineers become thoroughly familiar with the measurement principles, electronics, and design fundamentals underlying this technology. RF and Microwaves is currently in the forefront as a fundamental technology in numerous industrial and commercial applications. As applications of RF and microwaves continue to evolve and as this technology becomes a common factor in the scientific and engineering communities it is imperative that university students and practicing scientists and engineers become thoroughly familiar with the measurement principles, electronics, and design fundamentals underlying this technology. Advanced RF & Microwave Circuit Design is the quickest way to master this powerful subject, and information contained within the pages of this book will make every key electronic, measurement, and design principle you need a simple task. The book introduces concepts on a wide range of materials and has several advantages over existing texts, including: 1. The presentation of a series of scientific postulates and axioms, which lays the foundation for any of the engineering sciences and is unique to this book compared with similar RF and Microwave texts. 2. The presentation of classical laws and principles of electricity and magnetism, all inter-related, conceptually and graphically. 3. There is a shift of emphasis from rigorous mathematical solutions of Maxwell's equations, and instead has been aptly placed on simple yet fundamental concepts that underlie these equations. This shift of emphasis will promote a deeper understanding of the electronics, particularly at RF/Microwave frequencies. 4. Fundamentals of electronics have been amply treated, which makes an easy transition to RF/Microwave principles and prevents a gap of knowledge in the reader's mind.

Passive Rf and Microwave Integrated Circuits Leo G. Maloratsky 1999-01-01 "In this book, Leo Maloratsky thoroughly discusses the basic concepts of RF IC devices, explains the characteristics of various devices, and examines common applications for them. Special attention is given to the properties of different fabrication materials and how they can impact device performance. There is also extensive discussion of common passive microwave structures."--BOOK JACKET.

RF and Microwave Transmitter Design Andrei Grebennikov 2011-07-12 "This book describes these new technologies (circuit design and software-oriented approaches) in all aspects of radio transmitter design including wireless telecommunication, satellite, radar, military and other specific applications"--Provided by publisher.

Passive RF Integrated Circuits Pierre Saguet 2009-12-02 This book, written by recognized experts in the field, is intended for designers of RF or microwave passive integrated circuits. It describes methods used for modeling passive circuits using the most common numerical analysis techniques (the method of moments, finite element methods, FDTD, TLM), and pays particular attention to propagation phenomena. Interconnections and packaging modeling are included, as well as an original method for multi-scale circuit modeling. Characterization and measurement methods in the time and frequency domains are the subject of two very detailed chapters. Measurement errors using Vector Network Analyzer (VNA) and appropriate corrections are detailed and the divergences between all the various parameters S, Z, Y, h, T, ABCD are given. Time domain reflectometry and its use are also covered in detail.

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.

Passive RF and Microwave Integrated Circuits Leo Maloratsky 2003-12-01 The growth in RF and wireless/mobile computing devices that operate at microwave frequencies has resulted in explosive demand for integrated circuits capable of operating at such frequencies in order to accomplish functions like frequency division, phase shifting, attenuation, and isolators and circulators for antennas. This book is an introduction to such ICs, combining theory and practical applications of those devices. In addition to this combined theory and application approach, the author discusses the critical importance of differing fabrication materials on the performance of ICs at different frequencies. This is an area often overlooked when choosing ICs for RF and microwave applications, yet it can be a crucial factor in how an IC performs in a given application. Gives reader a solid background in an increasingly important area of circuit design Emphasis on combination of theoretical discussions with practical application examples In-depth discussion of critical, but often overlooked topic of different fabrication material performances at varying frequencies

MMIC--monolithic Microwave Integrated Circuits Yasuo Mitsui 1989 Status of GaAs MMIC developmental and technological trends and several application areas during the last five years are covered. Section one deals with the

status of active and passive elements typically used in monolithic ICs. Section two introduces a considerable number of up-to-date circuit and subsystem examples. Acidic paper. Book club price \$28. Annotation copyrighted by Book News, Inc., Portland, OR

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.

Microwave Integrated Circuit Components Design through MATLAB® S Raghavan 2019-11-11 MICROWAVE INTEGRATED CIRCUIT COMPONENTS DESIGN THROUGH MATLAB® This book teaches the student community microwave integrated circuit component design through MATLAB®, helping the reader to become conversant in using codes and, thereafter, commercial software for verification purposes only. Microwave circuit theory and its comparisons, transmission line networks, S-parameters, ABCD parameters, basic design parameters of planar transmission lines (striplines, microstrips, slot lines, coplanar waveguides, finlines), filter theory, Smith chart, inverted Smith chart, stability circles, noise figure circles and microwave components, are thoroughly explained in the book. The chapters are planned in such a way that readers get a thorough understanding to ensure expertise in design. Aimed at senior undergraduates, graduates and researchers in electrical engineering, electromagnetics, microwave circuit design and communications engineering, this book: • Explains basic tools for design and analysis of microwave circuits such as the Smith chart and network parameters • Gives the advantage of realizing the output without wiring the circuit by simulating through MATLAB code • Compares distributed theory with network theory • Includes microwave components, filters and amplifiers S. Raghavan was a Senior Professor (HAG) in the Department of Electronics and Communication Engineering, National Institute of Technology (NIT), Trichy, India and has 39 years of teaching and research experience at the Institute. His interests include: microwave integrated circuits, RF MEMS, Bio MEMS, metamaterial, frequency selective surfaces (FSS), substrate integrated waveguides (SIW), biomedical engineering and microwave engineering. He has established state-of-the-art MICs and microwave research laboratories at NIT, Trichy with funding from the Indian government. He is a Fellow/Senior Member in more than 24 professional societies including: IEEE (MTT, EMBS, APS), IETE, IEI, CSI, TSI, ISSS, ILA and ISOI. He is twice a recipient of the Best Teacher Award, and has received the Life Time Achievement Award, Distinguished Professor of Microwave Integrated Circuit Award and Best Researcher Award.

Microwave Solid State Circuit Design Inder Bahl 2003-04-18 Provides detailed coverage of passive and active RF and microwave circuit design. Discusses the practical aspects of microwave circuits including fabrication technologies. Includes a treatment of heterostructure and wide-band gap devices. Examines compact and low cost circuit design methodologies.

Microwave Integrated Circuits I. Kneppo 2013-10-03 Microwave Integrated Circuits provides a comprehensive overview of analysis and design methods for integrated circuits and devices in microwave systems. Passive and active devices, and linear and non-linear circuits are covered with a final chapter detailing measurement and test

techniques.

RF Front-End: World Class Designs Janine Love 2009-03-13 All the design and development inspiration and direction a hardware engineer needs in one blockbuster book! Janine Love site editor for RF Design Line, columnist, and author has selected the very best RF design material from the Newnes portfolio and has compiled it into this volume. The result is a book covering the gamut of RF front end design from antenna and filter design fundamentals to optimized layout techniques with a strong pragmatic emphasis. In addition to specific design techniques and practices, this book also discusses various approaches to solving RF front end design problems and how to successfully apply theory to actual design tasks. The material has been selected for its timelessness as well as for its relevance to contemporary RF front end design issues. Contents: Chapter 1 Radio waves and propagation Chapter 2 RF Front End Design Chapter 3 Radio Transmission Fundamentals Chapter 4 Advanced Architectures Chapter 5 RF Power Amplifiers Chapter 6 RF Amplifiers CHAPTER 7 Basics of PA Design Chapter 8 Power Amplifiers Chapter 9 RF/IF Circuits Chapter 10 Filters Chapter 11 Transmission Lines and PCBs as Filters Chapter 12 Tuning and Matching Chapter 13 Impedance Matching Chapter 14 RF Power Linearization Techniques *Hand-picked content selected by Janine Love, RF DesignLine site editor and author *Proven best design practices for antennas, filters, and layout *Case histories and design examples get you off and running on your current project Inspiring the Youth of America J. Alex Ficarra 2018-10-31 Here at Remington, many people are curious about this powerful book commonly known as Inspiring the Youth of America. Well, as you may know, our youth today in America are in dire need of mentorship and guidance. This book is a whole new step forward for all of us as a civilization. For many years, and even today, young Americans wander aimlessly in a pool of confusion. They end up in meaningless careers with no past, no future, and nothing to hope for. Undoubtedly, the end result is misery and despair. The end result is poverty and surely a feeling of emptiness. Well, we at Remington, after interviewing over thirty thousand professionals, were surprised to find that many successful professionals were disgusted with vanity publications. They were disappointed with the meaningless dribble of a phone book-type registry that possibly required a magnifying glass just to read. But surprisingly enough, these professionals encouraged any use of their biography for humanitarian purposes. Undoubtedly, mentorship for our youth fell into that category. So there it was born. Our proudest moment as publishers was laid out before us. But there was one big problem. All these people needed to be interviewed in depth, and generic biographies certainly would not inspire. So with that, we swallowed hard, and our staff got to work. Yes, it was and still is a grueling, time-consuming mission and undertaking. But in the end, as you may witness as you read this book, the content is quite spectacular and certainly worth the effort. We would also like to mention that the participants in this book also spent much time sending us information and encouraging us to make this book worthy of their efforts. Now it was up to us to uphold the dignity of these professionals and forge forward into a future where students can explore their lives with the ability to fulfill their own potentials. With that, this book is presented to you today, and we hope that you share in our dream to build a better America from where it really matters—our youth.

Development of SiGe HBT's and Micromachined Passive Components for Monolithic Microwave Integrated Circuits Liang-Hung Lu 2001

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.

Wideband RF Technologies and Antennas in Microwave Frequencies Dr. Albert Sabban 2016-06-10 Presents wideband RF technologies and antennas in the microwave band and millimeter-wave band This book provides an up-to-date introduction to the technologies, design, and test procedures of RF components and systems at microwave frequencies. The book begins with a review of the elementary electromagnetics and antenna topics needed for students and engineers with no basic background in electromagnetic and antenna theory. These introductory chapters will allow readers to study and understand the basic design principles and features of RF and communication systems for communications and medical applications. After this introduction, the author examines MIC, MMIC, MEMS, and LTCC technologies. The text will also present information on meta-materials, design of microwave and mm wave systems, along with a look at microwave and mm wave receivers, transmitters and antennas. Discusses printed antennas for wireless communication systems and wearable antennas for communications and medical applications Presents design considerations with both computed and measured results of RF communication modules and CAD tools Includes end-of-chapter problems and exercises **Wideband RF Technologies and Antennas in Microwave Frequencies** is designed to help electrical engineers and undergraduate students to understand basic communication and RF systems definition, electromagnetic and antennas theory and fundamentals with minimum integral and differential equations. Albert Sabban, PhD, is a Senior Researcher and Lecturer at Ort Braude College Karmiel Israel. Dr. Sabban was RF and antenna specialist at communication and Biomedical Hi-tech Companies. He designed wearable compact antennas to medical systems. From 1976 to 2007, Dr. Albert Sabban worked as a senior R&D scientist and project leader in RAFAEL.

Concepts and Applications of MICROWAVE ENGINEERING SANJAY KUMAR 2014-04-02 The book is primarily designed to cater to the needs of undergraduate and postgraduate students of Electronics and Communication Engineering and allied branches. The book has been written keeping average students in mind. This well-organised and lucidly written text gives a comprehensive view of microwave concepts covering its vast spectrum, transmission line, network analysis, microwave tubes, microwave solid-state devices, microwave measurement techniques, microwave antenna theories, radars and satellite communication. **KEY FEATURES** • A fairly large number of well-labelled diagrams provides practical understanding of the concepts. • Solved numerical problems aptly crafted and placed right after conceptual discussion provide better comprehension of the subject matter. • Chapter summary highlights important points for quick recap and revision before examination. • About 200 MCQs with answers help students to prepare for competitive examinations. • Appropriate number of unsolved numerical problems with answers improves problem solving skill of students. • Simplified complex mathematical derivations by synthesising them in smaller parts for easy grasping. Audience Undergraduate and Postgraduate students of Electronics and Communication Engineering and allied branches

Analysis Methods for RF Microwave and Millimeter Wave Planar Transmission Line S Oliver William 2017-06-03 The last two decades have seen important progress in the development of methods for the analysis of microwave and millimeter-wave passive structures, which contributed greatly to microwave integrated circuit design while also stimulating the development of new planar transmission lines. This timely and authoritative work introduces microwave engineers to the most commonly used techniques for analyzing microwave planar transmission line structures. Designed to be easily accessible to readers with only a fundamental background in electromagnetic theory, the book provides clear explanations of the theory and applications of Green's function, the conformal-mapping method, spectral domain methods, variational methods, and the mode-matching methods. Coverage for each method is self-contained and supplemented with problems and solutions as well as useful figures.

Microwave Integrated Circuits and Interfaces Chris J. Georgopoulos 1990 The TECH EDGE Series is a new generation of handbooks designed for the general electronic community covering a variety of topics & applications.

Each book is narrow in scope, yet packed to provide the latest in technological developments &/or solutions to today's engineering problems. Approximately 125 pages of text, illustrations, tables & figures. TECH EDGE books can be bought either individually, as a series, or at group discounts. The first installment of the TECH EDGE Series is a six-book set on RF & Microwaves. Presenting theory while stressing practical aspects & design examples, each book treats pertinent interface problems that most other publications are not concerned with. Nearly 700 pages of text, graphs, figures & tables make up this complete series. This book addresses the important & timely subject of microwave integrated circuits (MICs) of both the hybrid & the more recent monolithic (MMICs) type. The book covers the evolution of Microwave IC technology & the problems it solves as applied to microwave systems.

Asymmetric Passive Components in Microwave Integrated Circuits Hee-Ran Ahn 2006-09-01 This book examines the new and important technology of asymmetric passive components for miniaturized microwave passive circuits. The asymmetric design methods and ideas set forth by the author are groundbreaking and have not been treated in previous works. Readers discover how these design methods reduce the circuit size of microwave integrated circuits and are also critical to reducing the cost of equipment such as cellular phones, radars, antennas, automobiles, and robots. An introductory chapter on the history of asymmetric passive components, which began with asymmetric ring hybrids first described by the author, sets the background for the book. It lays a solid foundation with a chapter examining microwave circuit parameters such as scattering, ABCD, impedance, admittance, and image. A valuable feature of this chapter is a conversion table between the various circuit matrices characterizing two-port networks terminated in arbitrary impedances. The correct conversion has also never been treated in previous works. Next, the author sets forth a thorough treatment of asymmetric passive component design, which covers the basic and indispensable elements for integration with other active or passive devices, including: * Asymmetric ring hybrids * Asymmetric branch-line hybrids * Asymmetric three-port power dividers and N-way power dividers * Asymmetric ring hybrid phase shifters and attenuators * Asymmetric ring filters and asymmetric impedance transformers With its focus on the principles of circuit element design, this is a must-have graduate-level textbook for students in microwave engineering, as well as a reference for design engineers who want to learn the new and powerful design method for asymmetric passive components.

Si-RF Technology Ayan Karmakar 2019-05-10 This book discusses the recent research developments of various passive microwave circuits on silicon substrate and demonstrated operations catering for multiple frequency bands. It covers the design, modelling, process fabrication and characterization aspects with practical examples. The book will be of use to researchers and engineers working in the field of RF or microwave engineering, who can use the techniques and approaches effectively without having to refer to multiple sources.

Microwave Devices, Circuits and Subsystems for Communications Engineering Ian A. Glover 2006-05-01 **Microwave Devices, Circuits and Subsystems for Communications Engineering** provides a detailed treatment of the common microwave elements found in modern microwave communications systems. The treatment is thorough without being unnecessarily mathematical. The emphasis is on acquiring a conceptual understanding of the techniques and technologies discussed and the practical design criteria required to apply these in real engineering situations. Key topics addressed include: Microwave diode and transistor equivalent circuits Microwave transmission line technologies and microstrip design Network methods and s-parameter measurements Smith chart and related design techniques Broadband and low-noise amplifier design Mixer theory and design Microwave filter design Oscillators, synthesisers and phase locked loops Each chapter is written by specialists in their field and the whole is edited by experience authors whose expertise spans the fields of communications systems engineering and microwave circuit design. **Microwave Devices, Circuits and Subsystems for Communications Engineering** is suitable for senior electrical, electronic or telecommunications engineering undergraduate students, first year postgraduate students and experienced engineers seeking a conversion or

refresher text. Includes a companion website featuring: Solutions to selected problems Electronic versions of the figures Sample chapter

Radar RF Circuit Design Nickolas Kingsley 2016-03-01 This authoritative new resource presents practical techniques for optimizing RF and microwave circuits for applications in radar systems design with an emphasis on current and emerging technologies. Professionals learn how to design RF components for radar systems and how to choose appropriate materials and packaging methods. This book explains how to integrate components while avoiding higher-level assembly issues and troubleshooting problems on the measurement bench. Theory and practical information are provided while addressing topics ranging from heat removal to digital circuit integration. This book is divided into three sections: the first section introduces the basics of microwave design, including transmission line theory and common materials used in RF circuits. The methods for creating accurate device models for both passive and active circuits are presented. The second part details the design of power amplifiers, low noise amplifiers, and passive elements. Both conventional and state-of-the-art design techniques are included with ample 'tips and tricks.' The last section concludes with a focus on component integration providing details on design methods for military operations, high manufacturing yield, and preventing measurement issues.

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.

Radar RF Circuit Design, Second Edition Nickolas Kingsley 2022-02-28 This new edition of a previous bestseller gives you practical techniques for optimizing RF and microwave circuits for applications in radar systems design, with an emphasis on current and emerging technologies. Completely updated with new material, the book shows you how to design RF components for radar systems and how to choose appropriate materials and packaging methods. It takes you through classic techniques, to the state of the art, and finally to emerging technologies. You will learn: How to design high-frequency circuits for use in radar applications How to integrate components while avoiding higher-level assembly issues and troubleshooting problems on the measurement bench How to properly simulate, build, assemble, and test high-frequency circuits How to debug issues with hardware on the bench How to connect microwave theory to practical circuit design Theory and practical information are provided while addressing topics ranging from heat removal to digital circuit integration. The book serves as a teaching aid for classic techniques that are still relevant today. It also demonstrates how these techniques are serving as the foundation for technologies to come. You will be equipped to consider future needs and emerging enabling technologies and confidently think (and design) outside the box to ensure future needs are met. The book also shows you how to incorporate modern design techniques often overlooked or underused, and will help you to better understand the capabilities and limitations of today's technology and the emerging technologies that are on the horizon to mitigate those limitations. This is a must-have resource for system-level radar designers who want to up their game in RF/microwave component design. It is also a great tool for RF/microwave engineers tasked or interested in designing components for radar systems. Students and new designers of radar components will also benefit and be well prepared to start designing immediately.

Rectenna: Wireless Energy Harvesting System Binod Kumar Kanaujia 2021-05-22 This book covers the theory, modeling, and implementation of different RF energy harvesting systems. RF energy harvesting is the best choice among the existing renewable energy sources, in terms of availability, cost, size, and integration with other systems. The device used for harvesting RF energy is called rectenna. A rectenna can work at the microwave, millimeter-wave, and terahertz waves. It also has the capability to operate at optical frequencies to be used for 6G and beyond communication systems. This book covers all aspects of wireless power transfer (WPT)/wireless energy harvesting (WEH), basics, theoretical concepts, and advanced developments occurring in the field of energy harvesting. It also covers the design theory for different types of antenna, rectifier, and impedance

matching circuits used in RF energy harvesting systems. Different future and present applications, such as charging of vehicles, smart medical health care, self-driven e-vehicles, self-sustainable home automation system, and wireless drones, have also been discussed in detail.

Microwave Integrated Circuits István Kása 1991 Recent years have seen the development of techniques leading to microwave integrated circuits, which are now applied in practically all kinds of microwave equipment. This book is structured to present the general aspects of microwave integrated circuits, and by outlining the principal design methods, to aid the reader in solving specific design problems, without ever becoming merely a collection of formulae and tables. In the references, important basic papers about the evolution of specific fields are mentioned, together with papers discussing significant recent trends. After a survey of technological aspects, several kinds of passive linear integrated circuits are presented first through a discussion of the applicable types of transmission lines, directional couplers, filters and some non-reciprocal devices. This is followed by a discussion of active circuits and nonlinear circuits. Microwave integrated circuits are mainly used to form complex subsystems with many semiconductors, so the main properties of the oscillators, amplifiers and mixers applied in these subsystems are also dealt with. The book is aimed primarily at engineers, technicians and university students who would like to become familiar with this field.

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

Microwave and RF Engineering Roberto Sorrentino 2010-04-30 An essential text for both students and professionals, combining detailed theory with clear practical guidance This outstanding book explores a large spectrum of topics within microwave and radio frequency (RF) engineering, encompassing electromagnetic theory, microwave circuits and components. It provides thorough descriptions of the most common microwave test instruments and advises on semiconductor device modelling. With examples taken from the authors' own experience, this book also covers: network and signal theory; electronic technology with guided electromagnetic propagation; microwave circuits such as linear and non-linear circuits, resonant circuits and cavities, monolithic microwave circuits (MMICs), wireless architectures and integrated circuits; passive microwave components, control components; microwave filters and matching networks. Simulation files are included in a CD Rom, found inside the book. Microwave and RF Engineering presents up-to-date research and applications at different levels of difficulty, creating a useful tool for a first approach to the subject as well as for subsequent in-depth study. It is therefore indispensable reading for advanced professionals and designers who operate at high frequencies as well as senior students who are first approaching the subject.

Designing Bipolar Transistor Radio Frequency Integrated Circuits Allen A. Sweet 2007-12-01 If you're looking for an in-depth and up-to-date understanding bipolar transistor RFIC design, this practical resource is a smart choice. Unlike most books on the market that focus on GaAs MESFET or silicon CMOS process technology, this unique volume is dedicated exclusively to RFIC designs based on bipolar technology. Until now, critical GaAs HBT and SiGe HBT process technologies have been largely neglected in reference books. This book fills this gap, offering you a detailed treatment of this increasingly important topic. You discover a wide range of circuit topologies that are optimized for maximum performance with bipolar devices. From discussions of key applications (Bluetooth, UWB, GPS, WiMax) and architectures... to in-depth coverage of fabrication technologies and amplifier design... to a look at performance tradeoffs and production costs, this book arms you with complete design know-how for your

challenging work in the field.

Analysis Methods for RF, Microwave, and Millimeter-Wave Planar Transmission Line Structures Cam Nguyen

2003-06-11 A one-stop reference to the major techniques for analyzing microwave planar transmission line structures. The last two decades have seen important progress in the development of methods for the analysis of microwave and millimeter-wave passive structures, which contributed greatly to microwave integrated circuit design while also stimulating the development of new planar transmission lines. This timely and authoritative work introduces microwave engineers to the most commonly used techniques for analyzing microwave planar transmission line structures. Designed to be easily accessible to readers with only a fundamental background in electromagnetic theory, the book provides clear explanations of the theory and applications of Green's function, the conformal-mapping method, spectral domain methods, variational methods, and the mode-matching methods. Coverage for each method is self-contained and supplemented with problems and solutions as well as useful figures. In addition to providing detailed formulations of the methods under discussion, this highly practical book also demonstrates how to apply the principles of electromagnetic theory to the analysis of microwave boundary value problems, customize methods for specific needs, and develop new techniques. *Analysis Methods for RF, Microwave, and Millimeter-Wave Planar Transmission Line Structures* is an excellent working resource for anyone involved in the design and engineering of RF, microwave, and millimeter-wave integrated circuits.

Passive Radio Frequency and Microwave Integrated Circuits Leo G. Maloratsky 2004 The growth in RF and wireless/mobile computing devices that operate at microwave frequencies has resulted in explosive demand for integrated circuits capable of operating at such frequencies in order to accomplish functions like frequency division, phase shifting, attenuation, and isolators and circulators for antennas. This book is an introduction to such ICs, combining theory and practical applications of those devices. In addition to this combined theory and application approach, the author discusses the critical importance of differing fabrication materials on the performance of ICs at different frequencies. This is an area often overlooked when choosing ICs for RF and microwave applications, yet it can be a crucial factor in how an IC performs in a given application. Gives reader a solid background in an increasingly important area of circuit design. Emphasis on combination of theoretical discussions with practical application examples. In-depth discussion of critical, but often overlooked topic of different fabrication material performances at varying frequencies.

Chipless and Conventional Radio Frequency Identification: Systems for Ubiquitous Tagging Chandra Karmakar, Nemaï 2012-05-31 Radio Frequency Identification (RFID) is a wireless tracking and data capturing technique for automatic identification, tracking, security surveillance, logistics, and supply chain management. RFID tags, which have been successfully employed in many industries including retail and healthcare, have provided a multitude of benefits but also currently remain very costly. *Chipless and Conventional Radio Frequency Identification: Systems for Ubiquitous Tagging* explores the use of conventional RFID technology as well as chipless RFID technology, which provides a cheaper method of implementation, opening many doors for a variety of applications and industries. This practical reference, designed for researchers and practitioners, investigates the growing field of RFID and its promising future.

Microwave Integrated Circuits I. Kneppo 2012-12-06 *Microwave Integrated Circuits* provides a comprehensive overview of analysis and design methods for integrated circuits and devices in microwave systems. Passive and active devices, and linear and non-linear circuits are covered with a final chapter detailing measurement and test techniques.

RF and Microwave Passive and Active Technologies Mike Golio 2018-10-03 In the high frequency world, the passive technologies required to realize RF and microwave functionality present distinctive challenges. SAW filters, dielectric resonators, MEMS, and waveguide do not have counterparts in the low frequency or digital

environment. Even when conventional lumped components can be used in high frequency applications, their behavior does not resemble that observed at lower frequencies. *RF and Microwave Passive and Active Technologies* provides detailed information about a wide range of component technologies used in modern RF and microwave systems. Updated chapters include new material on such technologies as MEMS, device packaging, surface acoustic wave (SAW) filters, bipolar junction and heterojunction transistors, and high mobility electron transistors (HMETs). The book also features a completely rewritten section on wide bandgap transistors.

Integrated Microwave Front-ends with Avionics Applications Leo G. Maloratsky 2012 This highly practical resource offers you an in-depth understanding of microwave front end integration and how it is applied in the avionics field. You find detailed guidance on circuit integration, including coverage of component miniaturization, hybrid and monolithic integrated circuits, and 3D design. The book addresses system integration with discussions on the combination of different avionic systems, single antenna design, top/bottom front end combination, and integration of passive and active antenna modules. This first-of-its-kind volume features unique material on novel structures of avionics front end, novel transmission lines, elements, and devices, as well as new strategies for microwave front-end design. Supported with nearly 200 illustrations and more than 160 equations, this book is a valuable professional reference and also serves well as a postgraduate textbook.

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 author's 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."

Handbook of RF, Microwave, and Millimeter-wave Components Leonid Alekseevich Belov 2012 This unique and comprehensive resource offers you a detailed treatment of the operations principles, key parameters, and specific characteristics of active and passive RF, microwave, and millimeter-wave components. The book covers both linear and nonlinear components that are used in a wide range of application areas, from communications and information sciences, to avionics, space, and military engineering. This practical book presents descriptions and clear examples and of the best materials and products used in the field, including laminates, prepregs, substrates; microstrip, coaxial and waveguide transmission lines; fixed and rotating connectors; matching and adjusting elements; frequency filters; phase shifters; and ferrite gates and circulators. Moreover, the book offers you in-depth discussions on microwave switches and matrices, including MEMS technology, solid state and vacuum amplifiers, mixers, modulators and demodulators, and oscillation sources. You also find coverage of the stable frequency synthesizer structure and sources of modulated or noisy signals. Greatly adding to the usefulness of this volume is the inclusion of more than 700 Internet addresses of manufacturers from across the globe.

Microwave Circuit Design Using Linear and Nonlinear Techniques George D. Vendelin 2005-10-03 The ultimate handbook on microwave circuit design with CAD. Full of tips and insights from seasoned industry veterans, *Microwave Circuit Design* offers practical, proven advice on improving the design quality of microwave passive and active circuits-while cutting costs and time. Covering all levels of microwave circuit design from the

elementary to the very advanced, the book systematically presents computer-aided methods for linear and nonlinear designs used in the design and manufacture of microwave amplifiers, oscillators, and mixers. Using the newest CAD tools, the book shows how to design transistor and diode circuits, and also details CAD's usefulness in microwave integrated circuit (MIC) and monolithic microwave integrated circuit (MMIC) technology. Applications of nonlinear SPICE programs, now available for microwave CAD, are described. State-of-the-art coverage includes microwave transistors (HEMTs, MODFETs, MESFETs, HBTs, and more), high-power amplifier

design, oscillator design including feedback topologies, phase noise and examples, and more. The techniques presented are illustrated with several MMIC designs, including a wideband amplifier, a low-noise amplifier, and an MMIC mixer. This unique, one-stop handbook also features a major case study of an actual anticollision radar transceiver, which is compared in detail against CAD predictions; examples of actual circuit designs with photographs of completed circuits; and tables of design formulae.