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KEY=CIRCUIT - DAVENPORT SANTOS

MICROWAVE CIRCUIT ANALYSIS AND AMPLIFIER DESIGN

Prentice Hall

RF AND MICROWAVE POWER AMPLIFIER DESIGN

McGraw Hill Professional This is a rigorous tutorial on radio frequency and microwave power amplifier design, teaching the circuit design techniques that form the microelectronic backbones of modern wireless communications systems. Suitable for self-study, corporate training, or Senior/Graduate classroom use, the book combines analytical calculations and computer-aided design techniques to arm electronic engineers with every possible method to improve their designs and shorten their design time cycles.

MICROWAVE ACTIVE CIRCUIT ANALYSIS AND DESIGN

Academic Press This book teaches the skills and knowledge required by today's RF and microwave engineer in a concise, structured and systematic way. Reflecting modern developments in the field, this book focuses on active circuit design covering the latest devices and design techniques. From electromagnetic and transmission line theory and S-parameters through to amplifier and oscillator design, techniques for low noise and broadband design; This book focuses on analysis and design including up to date material on MMIC design techniques. With this book you will: Learn the basics of RF and microwave circuit analysis and design, with an emphasis on active circuits, and become familiar with the operating principles of the most common active system building blocks such as amplifiers, oscillators and mixers Be able to design transistor-based amplifiers, oscillators and mixers by means of basic design methodologies Be able to apply established graphical design tools, such as the Smith chart and feedback mappings, to the design RF and microwave active circuits Acquire a set of basic design skills and useful tools that can be employed without recourse to complex computer aided design Structured in the form of modular chapters, each covering a specific topic in a concise form suitable for delivery in a single lecture Emphasis on clear explanation and a step-by-step approach that aims to help students to easily grasp complex concepts Contains tutorial questions and problems allowing readers to test their knowledge An accompanying website containing supporting material in the form of slides and software (MATLAB) listings Unique material on negative resistance oscillator design, noise analysis and three-port design techniques Covers the latest developments in microwave active circuit design with new approaches that are not covered elsewhere

MICROWAVE CIRCUIT DESIGN USING LINEAR AND NONLINEAR TECHNIQUES

John Wiley & Sons 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.

MICROWAVE DEVICES, CIRCUITS AND SUBSYSTEMS FOR COMMUNICATIONS ENGINEERING

John Wiley & Sons 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, synthesizers 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

FUNDAMENTALS OF RF AND MICROWAVE TRANSISTOR AMPLIFIERS

John Wiley & Sons A Comprehensive and Up-to-Date Treatment of RF and Microwave Transistor Amplifiers This book provides state-of-the-art coverage of RF and microwave transistor amplifiers, including low-noise, narrowband, broadband, linear, high-power, high-efficiency, and high-voltage. Topics covered include modeling, analysis, design, packaging, and thermal and fabrication considerations. Through a unique integration of theory and practice, readers will learn to solve amplifier-related design problems ranging from matching networks to biasing and stability. More than 240 problems are included to help readers test their basic amplifier and circuit design skills-and more than half of the problems feature fully worked-out solutions. With an emphasis on theory, design, and everyday applications, this book is geared toward students, teachers, scientists, and practicing engineers who are interested in broadening their knowledge of RF and microwave transistor amplifier circuit design.

MICROWAVE TRANSISTOR AMPLIFIERS

ANALYSIS AND DESIGN

Pearson Appropriate for upper level undergraduate or graduate courses in microwave transistor amplifiers and oscillators. It would also be useful for short-courses in companies that design and produce these devices. A unified presentation of the analysis and design of microwave transistor amplifiers (and oscillators) -- using scattering parameters techniques.

RADIO-FREQUENCY AND MICROWAVE COMMUNICATION CIRCUITS

ANALYSIS AND DESIGN

John Wiley & Sons This practical book presents a top-down approach to RF and microwave circuit design, offering a detailed introduction to the technology behind the exploding wireless communications market. It describes circuits in the overall context of communications systems, and includes many worked examples of real-world devices and engineering problems. Material on CAD techniques is available via ftp.

MICROWAVE ACTIVE CIRCUIT ANALYSIS AND DESIGN

Academic Press This book teaches the necessary knowledge and skills required by today's RF and microwave engineer in a concise, structured and systematic way. Reflecting modern developments in the field, the book focuses on active circuit design covering the latest devices and design techniques. It is an ideal textbook, containing full instructor support, for a one or two semester course on RF and microwave circuit design and analysis. The book is uniquely structured in the form of 24 modular chapters, each covering a specific topic. The chapters are grouped into 8 broad subject areas. Each lecture is designed to be self-contained and builds on its predecessors From electromagnetic and transmission line theory and S-parameters through amplifier and oscillator design including special techniques for low noise and broadband design The focus is on active circuit analysis and design including up to date material on MMIC design techniques Each lecture develops the material from concept through theoretical principles to practical design methodology, supported by numerous examples Each chapter contains tutorial questions and problems to allow the reader to test their knowledge Contains supporting material in the form of slides and software (Matlab) listings

RF AND MICROWAVE CIRCUITS, MEASUREMENTS, AND MODELING

CRC Press Highlighting the challenges RF and microwave circuit designers face in their day-to-day tasks, RF and Microwave Circuits, Measurements, and Modeling explores RF and microwave circuit designs in terms of performance and critical design specifications. The book discusses transmitters and receivers first in terms of functional circuit block and then examines each block individually. Separate articles consider fundamental amplifier issues, low noise amplifiers, power amplifiers for handset applications and high power, power amplifiers. Additional chapters cover other circuit functions including oscillators, mixers, modulators, phase locked loops, filters and multiplexers. New chapters discuss high-power PAs, bit error rate testing, and nonlinear modeling of heterojunction bipolar transistors, while other chapters feature new and updated material that reflects recent progress in such

areas as high-volume testing, transmitters and receivers, and CAD tools. The unique behavior and requirements associated with RF and microwave systems establishes a need for unique and complex models and simulation tools. The required toolset for a microwave circuit designer includes unique device models, both 2D and 3D electromagnetic simulators, as well as frequency domain based small signal and large signal circuit and system simulators. This unique suite of tools requires a design procedure that is also distinctive. This book examines not only the distinct design tools of the microwave circuit designer, but also the design procedures that must be followed to use them effectively.

MICROWAVE AND WIRELESS SYNTHESIZERS

THEORY AND DESIGN

John Wiley & Sons The new edition of the leading resource on designing digital frequency synthesizers from microwave and wireless applications, fully updated to reflect the most modern integrated circuits and semiconductors *Microwave and Wireless Synthesizers: Theory and Design, Second Edition*, remains the standard text on the subject by providing complete and up-to-date coverage of both practical and theoretical aspects of modern frequency synthesizers and their components. Featuring contributions from leading experts in the field, this classic volume describes loop fundamentals, noise and spurious responses, special loops, loop components, multiloop synthesizers, and more. Practical synthesizer examples illustrate the design of a high-performance hybrid synthesizer and performance measurement techniques—offering readers clear instruction on the various design steps and design rules. The second edition includes extensively revised content throughout, including a modern approach to dealing with the noise and spurious response of loops and updated material on digital signal processing and architectures. Reflecting today's technology, new practical and validated examples cover a combination of analog and digital synthesizers and hybrid systems. Enhanced and expanded chapters discuss implementations of direct digital synthesis (DDS) architectures, the voltage-controlled oscillator (VCO), crystal and other high-Q based oscillators, arbitrary waveform generation, vector signal generation, and other current tools and techniques. Now requiring no additional literature to be useful, this comprehensive, one-stop resource: Provides a fully reviewed, updated, and enhanced presentation of microwave and wireless synthesizers Presents a clear mathematical method for designing oscillators for best noise performance at both RF and microwave frequencies Contains new illustrations, figures, diagrams, and examples Includes extensive appendices to aid in calculating phase noise in free-running oscillators, designing VHF and UHF oscillators with CAD software, using state-of-the-art synthesizer chips, and generating millimeter wave frequencies using the delay line principle Containing numerous designs of proven circuits and more than 500 relevant citations from scientific journal and papers, *Microwave and Wireless Synthesizers: Theory and Design, Second Edition*, is a must-have reference for engineers working in the field of radio communication, and the perfect textbook for advanced electri

INTRODUCTION TO COMPUTER METHODS FOR MICROWAVE CIRCUIT ANALYSIS AND DESIGN

Artech House Microwave Library Discusses theory and design of pulsed Doppler radar and MTI with details on clutter, clutter modelling and theory of optimum processing, and covers topics related to the application of special Doppler signal processing techniques that provide unique features within a radar system.

RF TRANSCEIVER DESIGN FOR MIMO WIRELESS COMMUNICATIONS

Springer Science & Business Media This practical resource offers a thorough examination of RF transceiver design for MIMO communications. Offering a practical view on MIMO wireless systems, this book extends fundamental concepts on classic wireless transceiver design techniques to MIMO transceivers. This helps reader gain a very comprehensive understanding of the subject. This in-depth volume describes many theoretical and implementation challenges on MIMO transceivers and provides the practical solutions for these issues. This comprehensive book provides thorough descriptions of MIMO theoretical concepts, MIMO single carrier and OFDM modulation, RF transceiver design concepts, power amplifier, MIMO transmitter design techniques and their RF impairments, MIMO receiver design methods, RF impairments study including nonlinearity, DC-offset, I/Q imbalance and phase noise and their compensation in OFDM and MIMO techniques. In addition, it provides the most practical techniques to realize RF front-ends in MIMO systems. This book is supported with many design equations and illustrations. The first book dedicated to RF Transceiver design for MIMO systems, this volume serves as a current, one-stop guide offering you cost-effective solutions for your challenging projects in the field.

MICROWAVE ACTIVE DEVICES AND CIRCUITS FOR COMMUNICATION

Springer The book discusses active devices and circuits for microwave communications. It begins with the basics of device physics and then explores the design of microwave communication systems including analysis and the implementation of different circuits. In addition to classic topics in microwave active devices, such as p-i-n diodes, Schottky diodes, step recovery diodes, BJT, HBT, MESFET, HFET, and various microwave circuits like switch, phase shifter, attenuator, detector, amplifier, multiplier and mixer, the book also covers modern areas such as Class-F power amplifiers, direct frequency modulators, linearizers, and equalizers. Most of the examples are based on practical devices available in commercial markets and the circuits presented are operational. The book uses analytical methods to derive values of circuit components without the need for any circuit design tools, in order to explain the theory of the circuits. All the given analytical expressions are also cross verified using commercially available microwave circuit design tools, and each chapter includes relevant diagrams and solved problems. It is intended for scholars in the field of electronics and communication engineering.

LOAD-PULL TECHNIQUES WITH APPLICATIONS TO POWER AMPLIFIER DESIGN

Springer Science & Business Media This first book on load-pull systems is intended for readers with a broad knowledge of high frequency transistor device characterization, nonlinear and linear microwave measurements, RF power amplifiers and transmitters. *Load-Pull Techniques with Applications to Power Amplifier Design* fulfills the demands of users, designers, and researchers both from industry and academia who have felt the need of a book on this topic. It presents a comprehensive reference spanning different load-pull measurement systems, waveform measurement and engineering systems, and associated calibration procedures for accurate large signal characterization. Besides, this book also provides in-depth practical considerations required in the realization and usage of load-pull and waveform engineering systems. In addition, it also provides procedure to design application specific load-pull setup and includes several case studies where the user can customize architecture of load-pull setups to meet any specific measurement requirements. Furthermore, the materials covered in this book can be part of a full semester graduate course on microwave device characterization and power amplifier design.

DISTRIBUTED POWER AMPLIFIERS FOR RF AND MICROWAVE COMMUNICATIONS

Artech House This new resource presents readers with all relevant information and comprehensive design methodology of wideband amplifiers. This book specifically focuses on distributed amplifiers and their main components, and presents numerous RF and microwave applications including well-known historical and recent architectures, theoretical approaches, circuit simulation, and practical implementation techniques. A great resource for practicing designers and engineers, this book contains numerous well-known and novel practical circuits, architectures, and theoretical approaches with detailed description of their operational principles.

ANALYSIS AND DESIGN OF AUTONOMOUS MICROWAVE CIRCUITS

John Wiley & Sons Presents simulation techniques that substantially increase designers' control over the oscillation in autonomous circuits This book facilitates a sound understanding of the free-running oscillation mechanism, the start-up from the noise level, and the establishment of the steady-state oscillation. It deals with the operation principles and main characteristics of free-running and injection-locked oscillators, coupled oscillators, and parametric frequency dividers. *Analysis and Design of Autonomous Microwave Circuits* provides: An exploration of the main nonlinear-analysis methods, with emphasis on harmonic balance and envelope transient methods Techniques for the efficient simulation of the most common autonomous regimes A presentation and comparison of the main stability-analysis methods in the frequency domain A detailed examination of the instabilization mechanisms that delimit the operation bands of autonomous circuits Coverage of techniques used to eliminate common types of undesired behavior, such as spurious oscillations, hysteresis, and chaos A thorough presentation of the oscillator phase noise A comparison of the main methodologies of phase-noise analysis Techniques for autonomous circuit optimization, based on harmonic balance A consideration of different design objectives: presetting the oscillation frequency and output power, increasing efficiency, modifying the transient duration, and imposing operation bands *Analysis and Design of Autonomous Microwave Circuits* is a valuable resource for microwave designers, oscillator designers, and graduate students in RF microwave design.

ADVANCES IN MONOLITHIC MICROWAVE INTEGRATED CIRCUITS FOR WIRELESS SYSTEMS: MODELING AND DESIGN TECHNOLOGIES

MODELING AND DESIGN TECHNOLOGIES

IGI Global Monolithic Microwave Integrated Circuit (MMIC) is an electronic device that is widely used in all high frequency wireless systems. In developing MMIC as a product, understanding analysis and design techniques, modeling, measurement methodology, and current trends are essential. *Advances in Monolithic Microwave Integrated Circuits for Wireless Systems: Modeling and Design Technologies* is a central source of knowledge on MMIC development, containing research on theory, design, and practical approaches to integrated circuit devices. This book is of interest to researchers in industry and academia working in the areas of circuit design, integrated circuits, and RF and microwave, as well as anyone with an interest in monolithic wireless device development.

LINEAR AND SWITCH-MODE RF POWER AMPLIFIERS

DESIGN AND IMPLEMENTATION METHODS

CRC Press RF power amplifiers are implemented in communication, semiconductor wafer processing, magnetic resonance imaging (MRI), and radar systems to produce RF signal with the desired characteristics to perform several critical tasks in the entire system. They can be designed to operate in linear or switch-mode, depending on the specific application. This book explores the design and implementation methods for both linear and switch-mode amplifiers with real world engineering problems. The text discusses phased controlled switch-mode amplifiers and distortion and modulation effects in RF amplifiers. It illustrates the interface and integration of components and sub-systems for RF amplifiers. The

material is further reinforced with MATLAB design files.

HIGH EFFICIENCY RF AND MICROWAVE SOLID STATE POWER AMPLIFIERS

John Wiley & Sons Do you want to know how to design high efficiency RF and microwave solid state power amplifiers? Read this book to learn the main concepts that are fundamental for optimum amplifier design. Practical design techniques are set out, stating the pros and cons for each method presented in this text. In addition to novel theoretical discussion and workable guidelines, you will find helpful running examples and case studies that demonstrate the key issues involved in power amplifier (PA) design flow. Highlights include: Clarification of topics which are often misunderstood and misused, such as bias classes and PA nomenclatures. The consideration of both hybrid and monolithic microwave integrated circuits (MMICs). Discussions of switch-mode and current-mode PA design approaches and an explanation of the differences. Coverage of the linearity issue in PA design at circuit level, with advice on low distortion power stages. Analysis of the hot topic of Doherty amplifier design, plus a description of advanced techniques based on multi-way and multi-stage architecture solutions. High Efficiency RF and Microwave Solid State Power Amplifiers is: an ideal tutorial for MSc and postgraduate students taking courses in microwave electronics and solid state circuit/device design; a useful reference text for practising electronic engineers and researchers in the field of PA design and microwave and RF engineering. With its unique unified vision of solid state amplifiers, you won't find a more comprehensive publication on the topic.

MILLIMETER-WAVE INTEGRATED CIRCUITS

Springer Science & Business Media Millimeter-Wave Integrated Circuits delivers a detailed overview of MMIC design, specifically focusing on designs for the millimeter-wave (mm-wave) frequency range. The scope of the book is broad, spanning detailed discussions of high-frequency materials and technologies, high-frequency devices, and the design of high-frequency circuits. The design material is supplemented as appropriate by theoretical analyses. The broad scope of the book gives the reader a good theoretical and practical understanding of mm-wave circuit design. It is best-suited for both undergraduate students who are reading or studying high frequency circuit design and postgraduate students who are specializing in the mm-wave field.

MICROWAVE DEVICES AND CIRCUIT DESIGN

PHI Learning Pvt. Ltd. This textbook presents a unified treatment of theory, analysis and design of microwave devices and circuits. It is designed to address the needs of undergraduate students of electronics and communication engineering for a course in microwave engineering as well as those of the students pursuing M.Sc. courses in electronics science. The main objective is to provide students with a thorough understanding of microwave devices and circuits, and to acquaint them with some of the methods used in circuit analysis and design. Several types of planar transmission lines such as stripline, microstrip, slot line and a few other structures have been explained. The important concepts of scattering matrix and Smith chart related to design problems have been discussed in detail. The performance and geometry of microwave transistors-both bipolar and field effect- have been analysed. Microwave passive components such as couplers, power dividers, attenuators, phase shifters and circulators have been comprehensively dealt with. Finally, the analysis and design aspects of microwave transistor amplifiers and oscillators are presented using the scattering parameters technique. Numerous solved problems and chapter-end questions are included for practice and reinforcement of the concepts.

SWITCHMODE RF AND MICROWAVE POWER AMPLIFIERS

Academic Press Switchmode RF and Microwave Power Amplifiers, Third Edition is an essential reference book on developing RF and microwave switchmode power amplifiers. The book combines theoretical discussions with practical examples, allowing readers to design high-efficiency RF and microwave power amplifiers on different types of bipolar and field-effect transistors, design any type of high-efficiency switchmode power amplifiers operating in Class D or E at lower frequencies and in Class E or F and their subclasses at microwave frequencies with specified output power, also providing techniques on how to design multiband and broadband Doherty amplifiers using different bandwidth extension techniques and implementation technologies. This book provides the necessary information to understand the theory and practical implementation of load-network design techniques based on lumped and transmission-line elements. It brings a unique focus on switchmode RF and microwave power amplifiers that are widely used in cellular/wireless, satellite and radar communication systems which offer major power consumption savings. Provides a complete history of high-efficiency Class E and Class F techniques Presents a new chapter on Class E with shunt capacitance and shunt filter to simplify the design of high-efficiency power amplifier with broader frequency bandwidths Covers different Doherty architectures, including integrated and monolithic implementations, which are and will be, used in modern communication systems to save power consumption and to reduce size and costs Includes extended coverage of multiband and broadband Doherty amplifiers with different frequency ranges and output powers using different bandwidth extension techniques Balances theory with practical implementation, avoiding a cookbook approach and enabling engineers to develop better designs, including hybrid, integrated and monolithic implementations

LOW-POWER MILLIMETER WAVE TRANSMITTERS FOR HIGH DATA RATE APPLICATIONS

Springer This book discusses low power techniques for millimeter wave transmitter IC. Considerations for the front-end design are followed by several implementation examples in the 60GHz band in CMOS down to 28nm technology. Additionally, the design and implementation details of digitally-modulated millimeter wave polar transmitters are presented.

MICROWAVE CIRCUITS FOR 24 GHZ AUTOMOTIVE RADAR IN SILICON-BASED TECHNOLOGIES

Springer Science & Business Media 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.

ADVANCED TECHNIQUES IN RF POWER AMPLIFIER DESIGN

Artech House This much-anticipated volume builds on the author's best selling and classic work, RF Power Amplifiers for Wireless Communications (Artech House, 1999), offering experienced engineers a more in-depth understanding of the theory and design of RF power amplifiers. An invaluable reference tool for RF, digital and system level designers, the book includes discussions on the most critical topics for professionals in the field, including envelope power management schemes and linearization.

NONLINEAR MICROWAVE AND RF CIRCUITS

Artech House This newly and thoroughly revised edition of the 1988 Artech House classic offers you a comprehensive, up-to-date treatment of nonlinear microwave and RF circuits. It gives you a current, in-depth understanding of the theory of nonlinear circuit analysis with a focus on Volterra-series and harmonic-balance methods. You get practical guidance in designing nonlinear circuits and modeling solid-state devices for nonlinear circuit analysis by computer. Moreover, you learn how characteristics of such models affect the analysis of these circuits.

AUTOMOTIVE ANTENNA DESIGN AND APPLICATIONS

CRC Press The steady evolution of wireless communication technologies continues to pave the way for the implementation of innovative services and devices in modern vehicles. These include analog and digital audio broadcasting radio, satellite radio, GPS, cell phones, and short range communication devices. Such applications require the use multiple antennas operating in different frequency ranges. Automotive Antenna Design and Applications thoroughly examines traditional and new advanced automotive antennas, including the principles, designs, and techniques used to reduce antenna dimensions without significant degradation of communication quality. The contents of this book are based on cutting-edge data collected from numerous technical papers, patents, and patent applications. It presents an overview of many commercially available automotive antennas and covers features that have become standard in automotive applications, such as printed-on car glass antennas, reduced-size helical antennas, multiband compact, printed-on dielectric and patch designs in a single package. Includes simulation examples of antenna parameters that significantly speed up the design process using software packages such as FEKO, NEC, IE3D, and Genesys Highlighting the practical aspects of antenna design, the authors present passive and active designs and describe the entire design process, including antenna simulation, prototype sample fabrication, and laboratory test measurements. The book also covers the production adjustments that can result from the demands of the real car environment. The presentation of numerous examples of passive and active automotive antennas greatly enhances this reference's value to professionals, students, and anyone else working in the ever-evolving field of antenna design and application.

CONQUER RADIO FREQUENCY

A MULTIMEDIA CONCEPTUAL GUIDE TO RF & MICROWAVE ENGINEERING, BASED ON AWR MICROWAVE OFFICE VIDEO TUTORIALS

Explore RF Ltd This material, which includes a full-colour textbook and over 12 hours of video tutorials (in mp4 format), provides a comprehensive guide for the RF and Microwave engineering student or junior professional. It allows the reader to achieve a good understanding of the foundation theory and concepts behind high frequency circuits as well illustrating the most common design and simulation techniques for passive and active RF circuits.

MICROWAVE CIRCUIT DESIGN

A PRACTICAL APPROACH USING ADS

Prentice Hall This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Today's Up-to-Date, Step-by-Step Guide to Designing Active Microwave Circuits Microwave Circuit Design is a complete guide to modern circuit design, including simulation tutorials that demonstrate Keysight Technologies' Advanced Design System (ADS), one of today's most widely used electronic design automation packages. And the software-based circuit design techniques that Yeom presents can be easily adapted for any modern tool or environment. Throughout, author Kyung-Whan Yeom uses the physical interpretation of basic concepts and concrete examples—not exhaustive calculations—to clearly and concisely explain the essential theory required to design microwave circuits, including passive and active device concepts, transmission line theory, and the basics of high-frequency measurement. To bridge the gap between theory and practice, Yeom presents real-world, hands-on examples focused on key elements of modern communication systems, radars, and other microwave transmitters and receivers. Practical coverage includes Up-to-date microwave simulation design examples based on ADS and easily adaptable to any simulator Detailed, step-by-step derivations of key design parameters related to procedures, devices, and performance Relevant, hands-on problem sets in every chapter Clear discussions of microwave IC categorization and roles; passive device impedances and equivalent circuits; coaxial and microstrip transmission lines; active devices (FET, BJT, DC Bias); and impedance matching A complete, step-by-step introduction to circuit simulation using the ADS toolset and window framework Low noise amplifier (LNA) design: gains, stability, conjugate matching, and noise circles Power amplifier (PA) design: optimum load impedances, classification, linearity, and composite PAs Microwave oscillator design: oscillation conditions, phase noise, basic circuits, and dielectric resonators Phase lock loops (PLL) design: configuration, operation, components, and loop filters Mixer design: specifications, Schottky diodes, qualitative analysis of mixers (SEM, SBM, DBM), and quantitative analysis of single-ended mixer (SEM) Microwave Circuit Design brings together all the practical skills graduate students and professionals need to successfully design today's active microwave circuits.

HANDBOOK OF RF AND MICROWAVE POWER AMPLIFIERS

Cambridge University Press This is a one-stop guide for circuit designers and system/device engineers, covering everything from CAD to reliability.

RADAR RF CIRCUIT DESIGN

Artech House 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.

LINEAR CMOS RF POWER AMPLIFIERS FOR WIRELESS APPLICATIONS

EFFICIENCY ENHANCEMENT AND FREQUENCY-TUNABLE CAPABILITY

Springer Science & Business Media Advances in electronics have pushed mankind to create devices, ranging from - credible gadgets to medical equipment to spacecraft instruments. More than that, modern society is getting used to—if not dependent on—the comfort, solutions, and astonishing amount of information brought by these devices. One field that has continuously benefited from those advances is the radio frequency integrated circuit (RFIC) design, which in its turn has promoted countless benefits to the mankind as a payback. Wireless communications is one prominent example of what the advances in electronics have enabled and their consequences to our daily life. How could anyone back in the eighties think of the possibilities opened by the wireless local area networks (WLANs) that can be found today in a host of places, such as public libraries, coffee shops, trains, to name just a few? How can a youngster, who lives this true WLAN experience nowadays, imagine a world without it? This book deals with the design of linear CMOS RF Power Amplifiers (PAs). The RF PA is a very important part of the RF transceiver, the device that enables wireless communications. Two important aspects that are key to keep the advances in RF PA design at an accelerated pace are treated: efficiency enhancement and frequency-tunable capability. For this purpose, the design of two different integrated circuits realized in a 0.11 μm technology is presented, each one addressing a different aspect. With respect to efficiency enhancement, the design of a dynamic supply RF power amplifier is treated, making up the material of Chaps. 2 to 4.

RF/MICROWAVE ENGINEERING AND APPLICATIONS IN ENERGY SYSTEMS

John Wiley & Sons RF/MICROWAVE ENGINEERING AND APPLICATIONS IN ENERGY SYSTEMS An essential text with a unique focus on RF and microwave engineering theory and its applications In RF/Microwave Engineering and Applications in Energy Systems, accomplished researcher Abdullah Eroglu delivers a detailed treatment of key theoretical aspects of radio-frequency and microwave engineering concepts along with parallel presentations of their practical applications. The text includes coverage of recent advances in the subject, including energy harvesting methods, RFID antenna designs, HVAC system controls, and smart grids. The distinguished author provides step-by-step solutions to common engineering problems by way of numerous examples and offers end-of-chapter problems and solutions on each topic. These practical applications of theoretical subjects aid the reader with retention and recall and demonstrate a solid connection between theory and practice. The author also applies common simulation tools in several chapters, illustrating the use and implementation of time domain circuit simulators in conjunction with electromagnetic simulators, as well as Matlab for design, simulation, and implementation at the component and system levels. Readers will also benefit from: A thorough introduction to the foundations of electromagnetics, including line, surface, and volume integrals, vector operation and theorems, and Maxwell's equations Comprehensive explorations of passive and active components in RF and microwave engineering, including resistors, capacitors, inductors, and semiconductor materials and active devices Practical discussions of transmission lines, including transmission line analysis, Smith charts, microstrip lines, and striplines In-depth examinations of network parameters, including impedance parameters, ABCD parameters, h-Hybrid parameters, and network connections Perfect for senior-level undergraduates and graduate students studying RF or Microwave engineering, RF/Microwave Engineering and Applications in Energy Systems is also an indispensable resource for professionals whose work touches on radio-frequency and microwave technologies.

MICROWAVE CIRCUIT DESIGN USING LINEAR AND NONLINEAR TECHNIQUES

John Wiley & Sons Four leaders in the field of microwave circuit design share their newest insights into the latest aspects of the technology The third edition of Microwave Circuit Design Using Linear and Nonlinear Techniques delivers an insightful and complete analysis of microwave circuit design, from their intrinsic and circuit properties to circuit design techniques for maximizing performance in communication and radar systems. This new edition retains what remains relevant from previous editions of this celebrated book and adds brand-new content on CMOS technology, GaN, SiC, frequency range, and feedback power amplifiers in the millimeter range region. The third edition contains over 200 pages of new material. The distinguished engineers, academics, and authors emphasize the commercial applications in telecommunications and cover all aspects of transistor technology. Software tools for design and microwave circuits are included as an accompaniment to the book. In addition to information about small and large-signal amplifier design and power amplifier design, readers will benefit from the book's treatment of a wide variety of topics, like: An in-depth discussion of the foundations of RF and microwave systems, including Maxwell's equations, applications of the technology, analog and digital requirements, and elementary definitions A treatment of lumped and distributed elements, including a discussion of the parasitic effects on lumped elements Descriptions of active devices, including diodes, microwave transistors, heterojunction bipolar transistors, and microwave FET Two-port networks, including S-Parameters from SPICE analysis and the derivation of transducer power gain Perfect for microwave integrated circuit designers, the third edition of Microwave Circuit Design Using Linear and Nonlinear Techniques also has a place on the bookshelves of electrical engineering researchers and graduate students. It's a comprehensive take on all aspects of transistors by world-renowned experts in the field places this book at the vanguard of microwave circuit design research.

RF CIRCUIT DESIGN

Elsevier It's Back! New chapters, examples, and insights; all infused with the timeless concepts and theories that have helped RF engineers for the past 25 years! RF circuit design is now more important than ever as we find ourselves in an increasingly wireless world. Radio is the backbone of today's wireless industry with protocols such as Bluetooth, Wi-Fi, WiMax, and ZigBee. Most, if not all, mobile devices have an RF component and this book tells the reader how to design and integrate that component in a very practical fashion. This book has been updated to include today's integrated circuit (IC) and system-level design issues as well as keeping its classic "wire lead" material. Design Concepts and Tools Include •The Basics: Wires, Resistors, Capacitors, Inductors •Resonant Circuits: Resonance, Insertion Loss •Filter Design: High-pass, Bandpass, Band-rejection •Impedance Matching: The L Network, Smith Charts, Software Design Tools •Transistors: Materials, Y Parameters, S Parameters •Small Signal RF Amplifier: Transistor Biasing, Y Parameters, S Parameters •RF Power Amplifiers: Automatic Shutdown Circuitry, Broadband Transformers, Practical Winding Hints •RF Front-End: Architectures, Software-Defined Radios, ADC's Effects •RF Design Tools: Languages, Flow, Modeling Check out this book's companion Web site at: <http://www.elsevierdirect.com/companion.jsp?ISBN=9780750685184> for full-color Smith Charts and extra content! *Completely updated but still contains its classic timeless information *Two NEW chapters on RF Front-End Design and RF Design Tools *Not overly math intensive, perfect for the working RF and digital professional that need to build analog-RF-Wireless circuits

FOUNDATIONS FOR MICROWAVE ENGINEERING

Wiley-IEEE Press FOUNDATIONS FOR MICROWAVE ENGINEERING, Second Edition, covers the major topics of microwave engineering. Its presentation defines the accepted standard for both advanced undergraduate and graduate level courses on microwave engineering. An essential reference book for the practicing microwave engineer, it features: Planar transmission lines, as well as an appendix that describes in detail conformal mapping methods for their analysis and attenuation characteristics Small aperture coupling and its

application in practical components such as directional couplers and cavity coupling Printed circuit components with an emphasis on techniques such as even and odd mode analysis and the use of symmetry properties Microwave linear amplifier and oscillator design using solid-state circuits such as varactor devices and transistors FOUNDATIONS FOR MICROWAVE ENGINEERING, Second Edition, has extensive coverage of transmission lines, waveguides, microwave circuit theory, impedance matching and cavity resonators. It devotes an entire chapter to fundamental microwave tubes, in addition to chapters on periodic structures, microwave filters, small signal solid-state microwave amplifier and oscillator design, and negative resistance devices and circuits. Completely updated in 1992, it is being reissued by the IEEE Press in response to requests from our many members, who found it an invaluable textbook and an enduring reference for practicing microwave engineers. Sponsored by: IEEE Antennas and Propagation Society, IEEE Microwave Theory and Techniques Society An Instructor's Manual presenting detailed solutions to all the problems in the book is available upon request from the Wiley Marketing Department.

BROADBAND MICROWAVE AMPLIFIERS

Artech House "This authoritative resource offers a complete understanding of state-of-the-art and cutting-edge techniques for designing and fabricating broadband microwave amplifiers. The book covers the complete design cycle, detailing each stage in a practical, hands-on manner." "This comprehensive reference illustrates the formulation of small- and large-signal device models to help professionals accurately simulate amplifier performance, and covers all the practical aspects and circuit components used in fabrication. Engineers find design examples of various types of amplifiers that are applicable in broadband systems such as optical communications, satellite communications, spread-spectrum communications, wireless local area networks, electronic warfare, instrumentation, and phased array radar. The book also provides an in-depth treatment of ultra-broadband microwave amplifiers." --Book Jacket.

MICROWAVE AND RF DESIGN, VOLUME 5

AMPLIFIERS AND OSCILLATORS

NC State University Microwave and RF Design: Amplifiers and Oscillators presents the design of amplifiers and oscillators in a way that enables state-of-the-art designs to be realized. Detailed strategies and case studies are presented. Design of competitive microwave amplifiers and oscillators is particularly challenging as many trade-offs are required in design, and the design decisions cannot be reduced to a formulaic flow. The emphasis is on developing design skills. This book is suitable as both an undergraduate and graduate textbook, as well as a career-long reference book. Key Features * The fifth volume of a comprehensive series on microwave and RF design * Open access ebook editions are hosted by NC State University Libraries at <https://repository.lib.ncsu.edu/handle/1840.20/36776> * 9 worked examples * An average of 23 exercises per chapter * Answers to selected exercises * 6 extensive case studies following the design of competitive amplifiers and oscillators with world leading performance * Volume 5 of a five volume series on microwave and RF design, all available as open access ebooks * A companion book, Fundamentals of Microwave and RF Design, is suitable as a comprehensive undergraduate textbook on microwave engineering

MICROWAVE SYSTEMS DESIGN

Springer Science & Business Media The aim of this book is to serve as a design reference for students and as an up-to-date reference for researchers. It also acts as an excellent introduction for newcomers to the field and offers established rf/microwave engineers a comprehensive refresher. The content is roughly classified into two - the first two chapters provide the necessary fundamentals, while the last three chapters focus on design and applications. Chapter 2 covers detailed treatment of transmission lines. The Smith chart is utilized in this chapter as an important tool in the synthesis of matching networks for microwave amplifiers. Chapter 3 contains an exhaustive review of microstrip circuits, culled from various references. Chapter 4 offers practical design information on solid state amplifiers, while Chapter 5 contains topics on the design of modern planar filters, some of which were seldom published previously. A set of problems at the end of each chapter provides the readers with exercises which are compiled from actual university exam questions. An extensive list of references is available at the end of each chapter to enable readers to obtain further information on the topics covered.