

Introduction To Rf Power Amplifier Design And Simulation

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Advanced Techniques in RF Power Amplifier Design - Steve C. Cripps
2002

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.

Modeling and Design Techniques for RF Power Amplifiers - Arvind Raghavan 2008-02-04

Achieve higher levels of performance, integration, compactness, and cost-effectiveness in the design and modeling of radio-frequency (RF) power amplifiers RF power amplifiers are important components of any wireless transmitter, but are often the limiting factors in achieving better performance and lower cost in a wireless communication system—presenting the RF IC design community with many challenges. The next-generation technological advances presented in this book are the result of cutting-edge research in the area of large-signal device modeling and RF power amplifier design at the Georgia Institute of

Technology, and have the potential to significantly address issues of performance and cost-effectiveness in this area. Richly complemented with hundreds of figures and equations, *Modeling and Design Techniques for RF Power Amplifiers* introduces and explores the most important topics related to RF power amplifier design under one concise cover. With a focus on efficiency enhancement techniques and the latest advances in the field, coverage includes: Device modeling for CAD Empirical modeling of bipolar devices Scalable modeling of RF MOSFETs Power amplifier IC design Power amplifier design in silicon Efficiency enhancement of RF power amplifiers The description of state-of-the-art techniques makes this book a valuable and handy reference for practicing engineers and researchers, while the breadth of coverage makes it an ideal text for graduate- and advanced undergraduate-level courses in the area of RF power amplifier design and modeling.

RF Circuit Design - Richard C. Li 2012-08-24

Summarizes the schemes and technologies in RF circuit design, describes the basic parameters of an RF system and the fundamentals of RF system design, and presents an introduction of the individual RF circuit block design. Forming the backbone of today's mobile and satellite communications networks, radio frequency (RF) components and circuits are incorporated into everything that transmits or receives a

radio wave, such as mobile phones, radio, WiFi, and walkie talkies. RF Circuit Design, Second Edition immerses practicing and aspiring industry professionals in the complex world of RF design. Completely restructured and reorganized with new content, end-of-chapter exercises, illustrations, and an appendix, the book presents integral information in three complete sections: Part One explains the different methodologies between RF and digital circuit design and covers voltage and power transportation, impedance matching in narrow-band case and wide-band case, gain of a raw device, measurement, and grounding. It also goes over equipotentiality and current coupling on ground surface, as well as layout and packaging, manufacturability of product design, and radio frequency integrated circuit (RFIC). Part Two includes content on the main parameters and system analysis in RF circuit design, the fundamentals of differential pair and common-mode rejection ratio (CMRR), Balun, and system-on-a-chip (SOC). Part Three covers low-noise amplifier (LNA), power amplifier (PA), voltage-controlled oscillator (VCO), mixers, and tunable filters. RF Circuit Design, Second Edition is an ideal book for engineers and managers who work in RF circuit design and for courses in electrical or electronic engineering.

Fundamentals of RF and Microwave Transistor Amplifiers - Inder Bahl 2009-06-17

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.

Introduction to Radio Frequency Design - Wes Hayward 1994

The fundamental methods of radio frequency design using mathematics to develop intuition for RF circuits and systems are explained here with an emphasis on applications of simple circuit models. The book prepares readers to actually design HF, VHF and UHF equipment.

Audio Power Amplifier Design - Douglas Self 2013-07-04

This book is essential for audio power amplifier designers and engineers for one simple reason...it enables you as a professional to develop reliable, high-performance circuits. The Author Douglas Self covers the major issues of distortion and linearity, power supplies, overload, DC-protection and reactive loading. He also tackles unusual forms of compensation and distortion produced by capacitors and fuses. This completely updated fifth edition includes four NEW chapters including one on The XD Principle, invented by the author, and used by Cambridge Audio. Crosstalk, power amplifier input systems, and microcontrollers in amplifiers are also now discussed in this fifth edition, making this book a must-have for audio power amplifier professionals and audiophiles.

[Linear CMOS RF Power Amplifiers for Wireless Applications](#) - Paulo Augusto Dal Fabbro 2010-06-22

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 - vances 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.

Microwave and RF Design, Volume 5 - Michael Steer 2019-09
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

Linear and Switch-Mode RF Power Amplifiers - Abdullah Eroglu
2017-09-06

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.

Practical RF Amplifier Design and Performance Optimization with SPICE and Load- and Source-pull Techniques - Amal Banerjee
2021-03-01

This book explains and demonstrates with an exhaustive set of design examples, how common types of radio frequency (RF) amplifiers (classes A, B, AB, C, D, E, F, G and H) can be designed, and then have their performance characteristics evaluated and optimized with SPICE. The author demonstrates the transient analysis features of SPICE, along with industry-standard load- and source-pull techniques to simulate the steady-state, long-term time-domain behavior of any test RF amplifier. Describes methods for designing and evaluating/optimizing the performance characteristics of an RF amplifier that circumvent the issues involved with existing, traditional methods and don't require expensive, high-end software tools; Includes C language executables for each RF amplifier type, eliminating errors that might creep in while computing passive component (capacitor, inductor, resistor) values for a given RF amplifier type; Demonstrates industry-standard load- and source-pull schemes that can be included easily in text SPICE netlists, allowing accurate calculation of impedance matching and impedance values at the input and output ports of the test RF amplifier, eliminating messy, error-prone S parameter based calculations.

RF and Microwave Power Amplifier Design - Andrei Grebennikov
2004-09-15

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.

Introduction to Wireless Communication Circuits - Forouhar Farzaneh 2018-05-21

Over the past decade, tremendous development of wireless communications has changed human life and engineering. Considerable advancement has been made in design and architecture of related RF and microwave circuits. Introduction to Wireless Communication Circuits focuses on special circuits dedicated to the RF level of wireless communications. From oscillators to modulation and demodulation, and from mixers to RF and power amplifier circuits, all are presented in a sequential manner. A wealth of analytical relations is provided in the text alongside various worked out examples. Related problem sets are given at the end of each chapter. Basic concepts of RF Analog Circuit Design are developed in the book. Technical topics discussed include: - Wireless Communication System - RF Oscillators and Phase Locked Loops - Modulator and Demodulator Circuits - RF Mixers - Automatic Gain Control and Limiters - Microwave Circuits, Transmission Lines and S-Parameters - Matching Networks - Linear Amplifier Design and Power Amplifiers - Linearization Techniques This textbook is intended for advanced undergraduate and graduate students, as well as RF Engineers and professionals.

RF Power Amplifiers - Marian K. Kazimierczuk 2014-12-15

This second edition of the highly acclaimed RF Power Amplifiers has been thoroughly revised and expanded to reflect the latest challenges associated with power transmitters used in communications systems. With more rigorous treatment of many concepts, the new edition includes a unique combination of class-tested analysis and industry-proven design techniques. Radio frequency (RF) power amplifiers are the fundamental building blocks used in a vast variety of wireless communication circuits, radio and TV broadcasting transmitters, radars, wireless energy transfer, and industrial processes. Through a

combination of theory and practice, RF Power Amplifiers, Second Edition provides a solid understanding of the key concepts, the principle of operation, synthesis, analysis, and design of RF power amplifiers. This extensive update boasts: up to date end of chapter summaries; review questions and problems; an expansion on key concepts; new examples related to real-world applications illustrating key concepts and brand new chapters covering 'hot topics' such as RF LC oscillators and dynamic power supplies. Carefully edited for superior readability, this work remains an essential reference for research & development staff and design engineers. Senior level undergraduate and graduate electrical engineering students will also find it an invaluable resource with its practical examples & summaries, review questions and end of chapter problems. Key features: • A fully revised solutions manual is now hosted on a companion website alongside new simulations. • Extended treatment of a broad range of topologies of RF power amplifiers. • In-depth treatment of state-of-the-art of modern transmitters and a new chapter on oscillators. • Includes problem-solving methodology, step-by-step derivations and closed-form design equations with illustrations. [Envelope Tracking Power Amplifiers for Wireless Communications](#) - Zhancang Wang 2014-06-01

Envelope tracking technology is seen as the most promising efficiency enhancement technology for RF power amplifiers for 4G and beyond wireless communications. More and more organizations are investing and researching on this topic with huge potential in academic and commercial areas. This is the first book on the market to offer complete introduction, theory, and design considerations on envelope tracking for wireless communications. This resource presents you with a full introduction to the subject and covers underlying theory and practical design considerations.

Feedback Linearization of RF Power Amplifiers - J.L. Dawson 2007-05-08

Improving the performance of the power amplifier is the most pressing problem facing designers of modern radio-frequency (RF) transceivers. Linearity and power efficiency of the transmit path are of utmost importance, and the power amplifier has proven to be the bottleneck for

both. High linearity enables transmission at the highest data rates for a given channel bandwidth, and power efficiency prolongs battery lifetime in portable units and reduces heat dissipation in high-power transmitters. Cartesian feedback is a power amplifier linearization technique that acts to soften the tradeoff between power efficiency and linearity in power amplifiers. Despite its compelling, fundamental advantages, the technique has not enjoyed widespread acceptance because of certain implementation difficulties. Feedback Linearization of RF Power Amplifiers introduces new techniques for overcoming the challenges faced by the designer of a Cartesian feedback system. The theory of the new techniques are described and analyzed in detail. The book culminates with the results of the first known fully integrated Cartesian feedback power amplifier system, whose design was enabled by the techniques described. Feedback Linearization of RF Power Amplifiers is a valuable reference work for engineers in the telecommunications industry, industry researchers, academic researchers.

Switchmode RF and Microwave Power Amplifiers - Andrei Grebennikov 2012-06-19

Annotation Written by leading experts, this is a broad and in-depth reference on RF and microwave switch mode power amplifiers. It combines theoretical analysis with practical implementation, including the use of computer-aided design examples.

Linear CMOS RF Power Amplifiers - Hector Solar Ruiz 2013-09-14

The work establishes the design flow for the optimization of linear CMOS power amplifiers from the first steps of the design to the final IC implementation and tests. The authors also focuses on design guidelines of the inductor's geometrical characteristics for power applications and covers their measurement and characterization. Additionally, a model is proposed which would facilitate designs in terms of transistor sizing, required inductor quality factors or minimum supply voltage. The model considers limitations that CMOS processes can impose on implementation. The book also provides different techniques and architectures that allow for optimization.

RF Circuit Design - Christopher Bowick 2014-06-28

Essential reading for experts in the field of RF circuit design and engineers needing a good reference. This book provides complete design procedures for multiple-pole Butterworth, Chebyshev, and Bessel filters. It also covers capacitors, inductors, and other components with their behavior at RF frequencies discussed in detail. Provides complete design procedures for multiple-pole Butterworth, Chebyshev, and Bessel filters Covers capacitors, inductors, and other components with their behavior at RF frequencies discussed in detail

Introduction to RF Power Amplifier Design and Simulation - Abdullah Eroglu 2018-09-03

Introduction to RF Power Amplifier Design and Simulation fills a gap in the existing literature by providing step-by-step guidance for the design of radio frequency (RF) power amplifiers, from analytical formulation to simulation, implementation, and measurement. Featuring numerous illustrations and examples of real-world engineering applications, this book: Gives an overview of intermodulation and elaborates on the difference between linear and nonlinear amplifiers Describes the high-frequency model and transient characteristics of metal-oxide-semiconductor field-effect transistors Details active device modeling techniques for transistors and parasitic extraction methods for active devices Explores network and scattering parameters, resonators, matching networks, and tools such as the Smith chart Covers power-sensing devices including four-port directional couplers and new types of reflectometers Presents RF filter designs for power amplifiers as well as application examples of special filter types Demonstrates the use of computer-aided design (CAD) tools, implementing systematic design techniques Blending theory with practice, Introduction to RF Power Amplifier Design and Simulation supplies engineers, researchers, and RF/microwave engineering students with a valuable resource for the creation of efficient, better-performing, low-profile, high-power RF amplifiers.

[Introduction to RF Power Amplifier Design and Simulation](#) - Abdullah Eroglu 2020-12-18

Introduction to RF Power Amplifier Design and Simulation fills a gap in the existing literature by providing step-by-step guidance for the design of radio frequency (RF) power amplifiers, from analytical formulation to simulation, implementation, and measurement. Featuring numerous illustrations and examples of real-world engineering applications, this book: Gives an overview of intermodulation and elaborates on the difference between linear and nonlinear amplifiers Describes the high-frequency model and transient characteristics of metal-oxide-semiconductor field-effect transistors Details active device modeling techniques for transistors and parasitic extraction methods for active devices Explores network and scattering parameters, resonators, matching networks, and tools such as the Smith chart Covers power-sensing devices including four-port directional couplers and new types of reflectometers Presents RF filter designs for power amplifiers as well as application examples of special filter types Demonstrates the use of computer-aided design (CAD) tools, implementing systematic design techniques Blending theory with practice, Introduction to RF Power Amplifier Design and Simulation supplies engineers, researchers, and RF/microwave engineering students with a valuable resource for the creation of efficient, better-performing, low-profile, high-power RF amplifiers.

Handbook of RF and Microwave Power Amplifiers - John L. B. Walker 2012

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

Bandwidth and Efficiency Enhancement in Radio Frequency Power Amplifiers for Wireless Transmitters - Karun Rawat 2020-03-05

This book focuses on broadband power amplifier design for wireless communication. Nonlinear model embedding is described as a powerful tool for designing broadband continuous Class-J and continuous class F power amplifiers. The authors also discuss various techniques for extending bandwidth of load modulation based power amplifiers, such as Doherty power amplifier and Chireix outphasing amplifiers. The book also covers recent trends on digital as well as analog techniques to

enhance bandwidth and linearity in wireless transmitters. Presents latest trends in designing broadband power amplifiers; Covers latest techniques for using nonlinear model embedding in designing power amplifiers based on waveform engineering; Describes the latest techniques for extending bandwidth of load modulation based power amplifiers such as Doherty power amplifier and Chireix outphasing amplifiers; Includes coverage of hybrid analog/digital predistortion as wideband solution for wireless transmitters; Discusses recent trends on on-chip power amplifier design with GaN /GaAs MMICs for high frequency applications.

Radio Frequency Transistors - Helge Granberg 2013-10-22

Cellular telephones, satellite communications and radar systems are adding to the increasing demand for radio frequency circuit design principles. At the same time, several generations of digitally-oriented graduates are missing the essential RF skills. This book contains a wealth of valuable design information difficult to find elsewhere. It's a complete 'tool kit' for successful RF circuit design. Written by experienced RF design engineers from Motorola's semiconductors product section. Book covers design examples of circuits (e.g. amplifiers; oscillators; switches; pulsed power; modular systems; wiring state-of-the-art devices; design techniques).

Doherty Power Amplifiers - Bumman Kim 2018-03-28

Doherty Power Amplifiers: From Fundamentals to Advanced Design Methods is a great resource for both RF and microwave engineers and graduate students who want to understand and implement the technology into future base station and mobile handset systems. The book introduces the very basic operational principles of the Doherty Amplifier and its non-ideal behaviors. The different transconductance requirements for carrier and peaking amplifiers, reactive element effect, and knee voltage effect are described. In addition, several methods to correct imperfections are introduced, such as uneven input drive, gate bias adaptation, dual input drive and the offset line technique. Advanced design methods of Doherty Amplifiers are also explained, including multistage/multiway Doherty power amplifiers which can enhance the

efficiency of the amplification of a highly-modulated signal. Other covered topics include signal tracking operation which increases the dynamic range, highly efficient saturated amplifiers, and broadband amplifiers, amongst other comprehensive, related topics. Specifically written on the Doherty Power Amplifier by the world's leading expert, providing an in-depth presentation of principles and design techniques Includes detailed analysis on correcting non-ideal behaviors of Doherty Power Amplifiers Presents advanced Doherty Power Amplifier architectures

Design and Control of RF Power Amplifiers - Alireza Shirvani
2013-04-18

Design and Control of RF Power Amplifiers investigates various architectures and concepts for the design and control of radio-frequency (RF) power amplifiers. This book covers merits and challenges of integrating RF power amplifiers in various technologies, and introduces a number of RF power amplifier performance metrics. It provides a thorough review of various power amplifier topologies, followed by a description of approaches and architectures for the control and linearization of these amplifiers. A novel parallel amplifier architecture introduced in this book offers a breakthrough solution to enhancing efficiency in systems using power control. Design and Control of RF Power Amplifiers is a valuable resource for designers, researchers and students in the field of RF integrated circuit design. Detailed and thorough coverage of various concepts in RF power amplifier design makes this book an invaluable guide for both beginners and professionals.

Introduction to Microwave Circuits - Robert J. Weber 2001-01-23

"Do you want to design a wireless transmitter or receiver for hand-held telephones? Have you wondered why the printed circuit wires on high-frequency circuits don't always run in a straight line? This valuable text will answer all of your questions regarding component parasitics and circuit characterization for rf/microwave amplifier, oscillator, and filter circuit design and analysis. You will understand why capacitors act as inductors and vice versa and why amplifiers work like oscillators, while

oscillators for local area networks work more like local area heaters. Application of the information in Introduction to Microwave Circuits will reduce design-cycle time and costs, markedly increasing the probability of first-time success in printed circuit or monolithic microwave integrated circuit (MMIC) design. Several approaches are taken into consideration, such as the effects of currents on the ground plane, bypass and coupling capacitors, and nonlinear effects in linear circuits. Featured topics include: * Incorporation of component parasitics in the design cycle * Closed form solution to oscillator design * Odd mode stability analysis * PIN diode analysis for high-power switching applications An integrated design example of a 1.25 GHz amplifier, oscillator, and filter printed circuit is also included, which could be useful in printed circuit board designs from tens of megahertz to tens of gigahertz. Introduction to Microwave Circuits provides the tools necessary to analyze or synthesize microwave circuits. This text is an essential reference for undergraduate students, microwave engineers, and administrators. Also, it will assist experienced designers in other fields to meet the current rapid expansion of communication system applications and work effectively in microwave circuit design. About the Author Robert J. Weber began his prolific career in the Solid State Research Laboratory at the Collins Radio Company, later a part of Rockwell International. For 25 years, he worked on advanced development and applied research in the one- to ten-gigahertz frequency range and received several distinguished awards for his valuable contributions to the field. Dr. Weber is involved in ongoing experimental research in integrating microwave circuits with other devices such as MEMS, chemical sensors, and electro-optics. Also, he teaches microwave circuit design and fiber-optics communications at the Department of Electrical and Computer Engineering, Iowa State University. Dr. Weber is an IEEE Fellow." Sponsored by: IEEE Microwave Theory and Techniques Society.

Distributed Power Amplifiers for RF and Microwave Communications - Narendra Kumar 2015-06-01

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.

RF and Microwave Circuits, Measurements, and Modeling - Mike Golio 2018-10-08

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.

RF CMOS Power Amplifiers: Theory, Design and Implementation - Mona M. Hella 2001-12-31

RF CMOS Power Amplifiers: Theory Design and Implementation focuses on the design procedure and the testing issues of CMOS RF power amplifiers. This is the first monograph addressing RF CMOS power amplifier design for emerging wireless standards. The focus on power amplifiers for short is distance wireless personal and local area networks (PAN and LAN), however the design techniques are also applicable to emerging wide area networks (WAN) infrastructure using micro or pico cell networks. The book discusses CMOS power amplifier design principles and theory and describes the architectures and tradeoffs in designing linear and nonlinear power amplifiers. It then details design examples of RF CMOS power amplifiers for short distance wireless applications (e, g., Bluetooth, WLAN) including designs for multi-standard platforms. Design aspects of RF circuits in deep submicron CMOS are also discussed. *RF CMOS Power Amplifiers: Theory Design and Implementation* serves as a reference for RF IC design engineers and RD and R&D managers in industry, and for graduate students conducting research in wireless semiconductor IC design in general and with CMOS technology in particular.

RF Power Amplifiers - Mihai Albulet 2001-06-30

The book reviews developments in the following fields: RF power amplifiers, modulators and power transistors

High Efficiency RF and Microwave Solid State Power Amplifiers - Paolo Colantonio 2009-07-08

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.

RF Power Amplifiers for Wireless Communications - Steve C. Cripps
2006-01-01

This extensively revised edition offers a comprehensive, practical, up-to-date understanding of how to tackle a power amplifier design with confidence and quickly determine the cause of malfunctioning hardware.

Linear and Switch-Mode RF Power Amplifiers - Abdullah Eroglu
2017-09-06

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.

Reliable RF Power Amplifier Design Based on a Partitioning Design Approach - Rui Ma 2010

Front cover -- Titelseite -- Impressum -- Acknowledgments -- Contents --

List of Abbreviations and Acronyms -- Abstract -- Zusammenfassung -- Chapter 1 Introduction -- 1.1 Principle of the Partitioning Design Approach -- 1.2 Dissertation Organization -- Chapter 2 Investigation of Planar-Interconnection -- 2.1 Active Chip Device Interconnection -- 2.1.1 Die Attach -- 2.1.2 Wire Bonding Pad-To-Microstrip -- 2.2 Microstrip-to-Microstrip Interconnection -- 2.2.1 Soldering -- 2.2.2 Multi-Wire Bonding -- 2.2.3 Copper Ribbon -- 2.2.4 Silver- Painting -- Chapter 3 Analysis and Modeling of Passive SMD Components -- 3.1 SMD Resistor -- 3.2 SMD Capacitor -- 3.3 SMD Inductor -- Chapter 4 Modeling of AlGaAs/GaAs HEMT Chip Device -- 4.1 AlGaAs/GaGa HEMT Chip -- 4.2 Modeling Approach Overview -- 4.3 Small-Signal Modeling -- 4.3.1 Extrinsic Parameter Extraction -- 4.3.2 Intrinsic Parameter Extraction -- 4.4 Large-Signal Modeling -- 4.4.1 Gate Current and Charge Models -- 4.4.2 Drain Current Model -- 4.4.3 Model Verification -- Chapter 5 Demonstrator Design of a Class-AB Power Amplifier Following -- 5.1 Micro-Packaged Device Characterization -- 5.1.1 Small-Signal Performance -- 5.1.2 Large-Signal Performance -- 5.2 Bias Network Design -- 5.2.1 Drain Bias Network -- 5.2.2 Gate Bias Network -- 5.3 Matching Network Design -- 5.3.1 Matching Impedance Determination -- 5.4 Power Amplifier Performance Evaluation -- 5.4.1 Small-Signal Performance -- 5.4.2 Large-Signal Performance -- Chapter 6 Conclusions and Outlook -- Appendix -- Appendix A THLR In-Fixture Calibration -- Appendix B Precise Determination of Substrate Permittivity -- Appendix C Schematic Circuit of the Designed Power Amplifier Demonstrator -- Appendix D Power Amplifier Design Following the Conventional Design Approach -- References -- Back cover

RF Power Amplifier Behavioral Modeling - Dominique Schreurs
2008-10-30

A comprehensive and up-to-date one-stop reference for engineers working in power amplifier modeling or RF designers using power amplifier models.

RF and Microwave Transmitter Design - Andrei Grebennikov 2011-09-19
RF and Microwave Transmitter Design is unique in its coverage of both historical transmitter design and cutting edge technologies. This text

explores the results of well-known and new theoretical analyses, while informing readers of modern radio transmitters' practical designs and their components. Jam-packed with information, this book broadcasts and streamlines the author's considerable experience in RF and microwave design and development.

RF Power Amplifiers - Marian K. Kazimierczuk 2008-11-20

An advanced textbook covering the fundamental theory of RF power amplifiers and their uses, this book provides essential guidance for design procedures. The introduction explains the basic theory of RF power amplifiers besides providing the basic classification of the different types of RF power amplifier. It then systematically dedicates a chapter to each different of RF power amplifier covering A, B and C, D (full-bridge and half-bridge types), E (zero-voltage-switching and zero-current-switching), F and DE amplifiers. Throughout this comprehensive guide, the optimal operating conditions are explored and the possible causes for suboptimum operation explained. The book then considers integrated inductors and linearization techniques and LC Oscillators in the concluding chapters. A comprehensive text covering the fundamentals of RF power amplifiers and their range of applications in radio and TV broadcasting, wireless communications and radars.

Presents accessible coverage of the complex principles of operation of RF power amplifiers and radio power systems. Introduces the fundamental design techniques and procedures for practitioners for RF power amplifiers. All chapters contain examples and design procedures throughout, with review questions and problems at the end of each chapter. A solutions manual is available for instructors upon enquiry

Switchmode RF Power Amplifiers - Andrei Grebennikov 2011-04-01

A majority of people now have a digital mobile device whether it be a cell phone, laptop, or blackberry. Now that we have the mobility we want it to be more versatile and dependable; RF power amplifiers accomplish just that. These amplifiers take a small input and make it stronger and larger creating a wider area of use with a more robust signal. Switching mode RF amplifiers have been theoretically possible for decades, but were largely impractical because they distort analog signals until they

are unrecognizable. However, distortion is not an issue with digital signals—like those used by WLANs and digital cell phones—and switching mode RF amplifiers have become a hot area of RF/wireless design. This book explores both the theory behind switching mode RF amplifiers and design techniques for them. *Provides essential design and implementation techniques for use in cma2000, WiMAX, and other digital mobile standards *Both authors have written several articles on the topic and are well known in the industry *Includes specific design equations to greatly simplify the design of switchmode amplifiers

Radio Frequency Integrated Circuit Design - John W. M. Rogers
2014-05-14

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

RF Power Amplifiers for Mobile Communications - Patrick Reynaert
2006-11-18

This book tackles both high efficiency and high linearity power amplifier (PA) design in low-voltage CMOS. With its emphasis on theory, design and implementation, the book offers a guide for those actively involved in

the design of fully integrated CMOS wireless transceivers. Offering mathematical background, as well as intuitive insight, the book is

essential reading for RF design engineers and researchers and is also suitable as a text book.