

Editorial

Active and Passive Microwave Devices and Circuits

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New systems working at RF, microwave, and millimeter wave will give rise to new services for medical, security, home, entertain, and communication industries. Active and Passive Microwave Devices and Circuits are playing an important role in the design of these systems. This special issue of Active and Passive components is devoted towards the design, analysis, and fabrication of Active and Passive components.

In the first paper entitled "Dependence on frequency of the electromagnetic field distribution inside a cylindrical cavity," the authors explain the relevant changes in the electron cyclotron resonance ion source behavior for small variations of the exciting radiation frequency.

The second paper in this issue "Printed antenna arrays with side lobe suppression" investigates approaches and their limitations to minimize side lobes in printed antenna arrays. It also proposes antenna structures with printed pentagonal dipole arrays.

The third paper "Isotropic broad-band E-field probe" discusses the development and characterization of isotropic broad-band E-field probe which has an isotropic reception from 100 MHz to 18 GHz.

In satellite communication networks, the noise performance and the required spectral purity of the low noise band receiver are of the important issues.

The fourth paper "Ka band phase locked loop oscillator for satellite EHF band receiver" deals with the design and fabrication of Ka band phase locked loop oscillator (PLL DRO) with a fundamental frequency 19.250 GHz for satellite EHF band receiver.

The fifth paper "The novel microwave stop-band filter" proposes new band rejection element for implementing stop band filter. This paper also describes the synthesis,

manufacture and testing of fifth-order Chebyshev filters implemented with this band rejection element.

The sixth paper "Passive frequency selective surface array as a diffuser for destroying millimeter wave coherence" proposes the design, construction, and testing of grounded frequency selective surfaces (FSS) as a diffuser for destroying millimeter wave coherence which is used to eliminate speckle in active millimeter wave imaging. The FSS arrays were designed with finite integral technique and fabricated by etching technique. The S-parameter was characterized with a free space MVNA and measurement of radiation patterns was done with a BWO in motorized setup.

In the seventh paper entitled "A new fractal-based design of stacked integrated transformers," novel fractal stacked transformers were analyzed using full-wave EM simulations and compared in terms of the inductance and quality factor. The novel fractal stacked transformers show improved performance over conventional spiral inductor-based transformers.

A novel layout of leaky-wave antennas based on tapered design has been proposed and investigated in the eighth paper "High efficiency and broadband microstrip leaky-wave antenna." This paper also shows that this structure is attractive for the design of high performance microstrip leaky-wave antennas for microwave and millimeter wave applications.

The ninth paper entitled "Material parameter measurements for microwave antireflection coating development" is on the material parameter measurements for microwave antireflection coating development.

Prospects of 4H-SiC double drift region IMPATT device as a photo-sensitive high-power source at 0.7 terahertz frequency regime is presented in the tenth paper entitled

Passive And Active Microwave Circuits

Joseph Helszajn



Passive And Active Microwave Circuits:

Passive and Active Microwave Circuits Joseph Helszajn, 1978-01-01 *Passive and Active RF-microwave Circuits* Pierre Jarry, Jacques N. Beneat, 2015 Theoretical Electromagnetic Simulation of Passive and Active Microwave Circuits Brent Thomas Toland, 1994 *Passive Active Microwave Circuits* Helszajn J., *RF and Microwave Passive and Active Technologies* Mike Golio, Janet Golio, 2018-10-03 In the high frequency world the passive technologies required to realize RF and microwave functionality present distinctive challenges SAW filters dielectric resonators MEMS and waveguide do not have counterparts in the low frequency or digital environment Even when conventional lumped components can be used in high frequency applications their behavior does not resemble that observed at lower frequencies RF and Microwave Passive and Active Technologies provides detailed information about a wide range of component technologies used in modern RF and microwave systems Updated chapters include new material on such technologies as MEMS device packaging surface acoustic wave SAW filters bipolar junction and heterojunction transistors and high mobility electron transistors HMETs The book also features a completely rewritten section on wide bandgap transistors *Microwave Circuit Design* Kyung-Whan Yeom, 2015 Nonlinear Active Microwave Circuits T. Berceci, 1987 This book presents analysis and design methods of microwave nonlinear active circuits Nonlinear models are established for each individual device thus introducing a set of nonlinear building blocks This allows not only qualitative but also quantitative investigations The relationships thereby obtained can be used for design purposes and they are also a help in understanding the circuit operation and for the detailed investigation of oscillators amplifiers mixers frequency multipliers and dividers The book concentrates on problems arising from the active nonlinear elements and it is mostly nonlinear transmission properties that are investigated Normalized quantities are applied in order to obtain results that can be used generally for a wide range of applications Equations are derived for many important circuit characteristics such as bandwidth gain amplitude and phase response group delay time AM compression AM to PM conversion noise figure AM noise FM noise output power added power efficiency matching optimum adjustment stability dynamic properties The results are directly applicable in the design procedure of circuits

The Electrical Engineering Handbook, Second Edition Richard C. Dorf, 1997-09-26 In 1993 the first edition of The Electrical Engineering Handbook set a new standard for breadth and depth of coverage in an engineering reference work Now this classic has been substantially revised and updated to include the latest information on all the important topics in electrical engineering today Every electrical engineer should have an opportunity to expand his expertise with this definitive guide In a single volume this handbook provides a complete reference to answer the questions encountered by practicing engineers in industry government or academia This well organized book is divided into 12 major sections that encompass the entire field of electrical engineering including circuits signal processing electronics electromagnetics electrical effects and devices and energy and the emerging trends in the fields of communications digital devices computer engineering systems

and biomedical engineering A compendium of physical chemical material and mathematical data completes this comprehensive resource Every major topic is thoroughly covered and every important concept is defined described and illustrated Conceptually challenging but carefully explained articles are equally valuable to the practicing engineer researchers and students A distinguished advisory board and contributors including many of the leading authors professors and researchers in the field today assist noted author and professor Richard Dorf in offering complete coverage of this rapidly expanding field No other single volume available today offers this combination of broad coverage and depth of exploration of the topics The Electrical Engineering Handbook will be an invaluable resource for electrical engineers for years to come

The Electronics Handbook Jerry C. Whitaker, 1996-12-23 The superb organization of The Electronics Handbook means that it is not only a comprehensive and fascinating reference but also a pleasure to use Some of these organizational features include

RF and Microwave Circuit Design Charles E. Free, Colin S. Aitchison, 2021-09-14 RF and Microwave Circuit Design Provides up to date coverage of the fundamentals of high frequency microwave technology written by two leading voices in the field RF and Microwave Circuit Design Theory and Applications is an authoritative highly practical introduction to basic RF and microwave circuits With an emphasis on real world examples the text explains how distributed circuits using microstrip and other planar transmission lines can be designed and fabricated for use in modern high frequency passive and active circuits and sub systems The authors provide clear and accurate guidance on each essential aspect of circuit design from the theory of transmission lines to the passive and active circuits that form the basis of modern high frequency circuits and sub systems Assuming a basic grasp of electronic concepts the book is organized around first principles and includes an extensive set of worked examples to guide student readers with no prior grounding in the subject of high frequency microwave technology Throughout the text detailed coverage of practical design using distributed circuits demonstrates the influence of modern fabrication processes Filling a significant gap in literature by addressing RF and microwave circuit design with a central theme of planar distributed circuits this textbook Provides comprehensive discussion of the foundational concepts of RF and microwave transmission lines introduced through an exploration of wave propagation along a typical transmission line Describes fabrication processes for RF and microwave circuits including etched thick film and thin film RF circuits Covers the Smith Chart and its application in circuit design S parameters Mason's non touching loop rule transducer power gain and stability Discusses the influence of noise in high frequency circuits and low noise amplifier design Features an introduction to the design of high frequency planar antennas Contains supporting chapters on fabrication circuit parameters and measurements Includes access to a companion website with PowerPoint slides for instructors as well as supplementary resources Perfect for senior undergraduate students and first year graduate students in electrical engineering courses RF and Microwave Circuit Design Theory and Applications will also earn a place in the libraries of RF and microwave professionals looking for a useful reference to refresh their understanding of fundamental

concepts in the field **RF and Microwave Circuits, Measurements, and Modeling** Mike Golio, Janet 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 **Microwave Engineering** Joseph Helszajn, 1992 **Fundamentals of RF and Microwave Techniques and Technologies** Hans L. Hartnagel, Rüdiger Quay, Ulrich L. Rohde, Matthias Rudolph, 2023-07-28 The increase of consumer medical and sensors electronics using radio frequency RF and microwave MW circuits has implications on overall performances if design is not robust and optimized for a given applications The current and later generation communication systems and Internet of Thing IoT demand for robust electronic circuits with optimized performance and functionality but low cost size and power consumption As a result there is a need for a textbook that provides a comprehensive treatment of the subject This book provides state of the art coverage of RF and Microwave Techniques and Technologies covers important topics transmission line theory passive and semiconductor devices active and passive microwave circuits and receiver systems as well as antennas noise and digital signal modulation schemes With an emphasis on theory design and applications this book is targeted to students teachers scientists and practicing design engineers who are interested in broadening their knowledge of RF and microwave electronic circuit design Readers will also benefit from a unique integration of theory and practice provides the readers a solid understanding of the RF and microwave concepts active and passive components antenna and modulation schemes Readers will learn to solve common design problems ranging from selection of components matching networks to biasing and stability and digital modulation techniques More importantly it provides basic understanding in the analysis and design of RF and microwave circuits in a manner that is practiced in industry This make sure that the know how learned in this book can be effortlessly and straightway put into practice without any obstacles Electronic Noise and

Interfering Signals Gabriel Vasilescu, 2006-01-17 Electronic Noise and Interfering Signals is a comprehensive reference book on noise and interference in electronic circuits with particular focus on low noise design. The first part of the book deals with mechanisms modelling and computation of intrinsic noise which is generated in every electronic device. The second part analyzes the coupling mechanisms which can lead to a contamination of circuits by parasitic signals and provides appropriate solutions to this problem. The last part contains more than 100 practical elaborate case studies. The book requires no advanced mathematical training as it introduces the fundamental methods. Moreover it provides insight into computational noise analysis with SPICE and NOF a software developed by the author. The book addresses designers of electronic circuits as well as researchers from electrical engineering physics and material science. It should also be of interest for undergraduate and graduate students.

The Electrical Engineering Handbook Wai Kai Chen, 2004-11-16 The Electrical Engineer's Handbook is an invaluable reference source for all practicing electrical engineers and students. Encompassing 79 chapters, this book is intended to enlighten and refresh knowledge of the practicing engineer or to help educate engineering students. This text will most likely be the engineer's first choice in looking for a solution; extensive complete references to other sources are provided throughout. No other book has the breadth and depth of coverage available here. This is a must have for all practitioners and students. The Electrical Engineer's Handbook provides the most up to date information in Circuits and Networks, Electric Power Systems, Electronics, Computer Aided Design and Optimization, VLSI Systems, Signal Processing, Digital Systems and Computer Engineering, Digital Communication and Communication Networks, Electromagnetics and Control and Systems. About the Editor in Chief: Wai Kai Chen is Professor and Head Emeritus of the Department of Electrical Engineering and Computer Science at the University of Illinois at Chicago. He has extensive experience in education and industry and is very active professionally in the fields of circuits and systems. He was Editor in Chief of the IEEE Transactions on Circuits and Systems Series I and II, President of the IEEE Circuits and Systems Society and is the Founding Editor and Editor in Chief of the Journal of Circuits Systems and Computers. He is the recipient of the Golden Jubilee Medal, the Education Award and the Meritorious Service Award from the IEEE Circuits and Systems Society and the Third Millennium Medal from the IEEE. Professor Chen is a fellow of the IEEE and the American Association for the Advancement of Science. 77 chapters encompass the entire field of electrical engineering. THOUSANDS of valuable figures, tables, formulas and definitions. Extensive bibliographic references.

Advanced Microwave Circuits and Systems Vitaliy Zhurbenko, 2010-04-01 This book is based on recent research work conducted by the authors dealing with the design and development of active and passive microwave components, integrated circuits and systems. It is divided into seven parts. In the first part, comprising the first two chapters, alternative concepts and equations for multiport network analysis and characterization are provided. A thru only de-embedding technique for accurate on-wafer characterization is introduced. The second part of the book corresponds to the analysis and design of ultra wideband low noise amplifiers (LNA).

Designing

Microwave Circuits by Exact Synthesis Brian J. Minnis, 1996 This practical book presents a Universal Design Procedure that can be applied to virtually all types of passive active linear or nonlinear microwave components It allows you to leave the complexities of network synthesis to computer software so that you can focus your attention on the versatility of synthesis procedures and their applications Includes more than 170 illustrations and 230 equations Electronics, Power Electronics, Optoelectronics, Microwaves, Electromagnetics, and Radar Richard C. Dorf, 2018-10-03 In two editions spanning more than a decade The Electrical Engineering Handbook stands as the definitive reference to the multidisciplinary field of electrical engineering Our knowledge continues to grow and so does the Handbook For the third edition it has expanded into a set of six books carefully focused on a specialized area or field of study Electronics Power Electronics Optoelectronics Microwaves Electromagnetics and Radar represents a concise yet definitive collection of key concepts models and equations in these areas thoughtfully gathered for convenient access Electronics Power Electronics Optoelectronics Microwaves Electromagnetics and Radar delves into the fields of electronics integrated circuits power electronics optoelectronics electromagnetics light waves and radar supplying all of the basic information required for a deep understanding of each area It also devotes a section to electrical effects and devices and explores the emerging fields of microlithography and power electronics Articles include defining terms references and sources of further information Encompassing the work of the world's foremost experts in their respective specialties Electronics Power Electronics Optoelectronics Microwaves Electromagnetics and Radar features the latest developments the broadest scope of coverage and new material in emerging areas *Advanced Microwave Engineering* Rajeswari Chatterjee, 1988 Microwave Circuits and Passive Devices M. L. Sisodia, G. S. Raghuvanshi, 1987

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