

Planar Microwave Engineering

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Microwave and RF Vacuum Electronic Power Sources Richard G. Carter 2018-04-12 Get up-to-speed on the theory, principles and design of vacuum electron devices.

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

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

Practical RF System Design William F. Egan 2004-03-15 The ultimate practical resource for today's RF system design professionals Radio frequency components and circuits form the backbone of today's mobile and satellite communications networks. Consequently, both practicing and aspiring industry professionals need to be able to solve ever more complex problems of RF design. Blending theoretical rigor with a wealth of practical expertise, *Practical RF System Design* addresses a variety of complex,

real-world problems that system engineers are likely to encounter in today's burgeoning communications industry with solutions that are not easily available in the existing literature. The author, an expert in the field of RF module and system design, provides powerful techniques for analyzing real RF systems, with emphasis on some that are currently not well understood. Combining theoretical results and models with examples, he challenges readers to address such practical issues as:

- * How standing wave ratio affects system gain
- * How noise on a local oscillator will affect receiver noise figure and desensitization
- * How to determine the dynamic range of a cascade from module specifications
- * How phase noise affects system performance and where it comes from
- * How intermodulation products (IMs) predictably change with signal amplitude, and why they sometimes change differently

An essential resource for today's RF system engineers, the text covers important topics in the areas of system noise and nonlinearity, frequency conversion, and phase noise. Along with a wealth of practical examples using MATLAB(r) and Excel, spreadsheets are available for download from an FTP Web site to help readers apply the methods outlined in this important resource.

Computational Electromagnetics for RF and Microwave Engineering David B. Davidson
2005-02-24 Publisher Description

Microwave Engineering David M. Pozar 2011-11-22 Pozar's new edition of Microwave Engineering includes more material on active circuits, noise, nonlinear effects, and wireless systems. Chapters on noise and nonlinear distortion, and active devices have been added along with the coverage of noise and more material on intermodulation distortion and related nonlinear effects. On active devices, there's more updated material on bipolar junction and field effect transistors. New and updated material on wireless communications systems, including link budget, link margin, digital modulation methods, and bit error rates is also part of the new edition. Other new material includes a section on transients on transmission lines, the theory of power waves, a discussion of higher order modes and frequency effects for microstrip line, and a discussion of how to determine unloaded.

The Stripline Circulator Joseph Helszajn 2008-05-16 Stripline circulator theory and applications from the world's foremost authority The stripline junction circulator is a unique three-port non-reciprocal microwave junction used to connect a single antenna to both a transmitter and a receiver. Its operation relies on the interaction between an electron spin in a suitably magnetized insulator with an alternating radio frequency magnetic field. In its simplest form, it consists of a microwave planar gyromagnetic resonator symmetrically coupled by three transmission lines. This book explores the magnetic interaction involved in the stripline circulator's operation, the nature of the microwave resonator shape, and the network problem that arises in coupling the microwave resonator to the microwave circuit. The stripline circulator is an important device met across a wide range of industries, including wireless, military, radar, and satellite communications. The book's design tables are a unique feature, offering valuable design support. Written by an international authority on non-reciprocal microwave circuits and devices, the book is organized into logical blocks of chapters that focus on specific effects and circuit aspects of the stripline circulator. Among the highlights of coverage are: Spatial shape demagnetizing factors of magnetic insulators Standing wave solutions of wye gyromagnetic planar resonators Lumped element circulators Negative permeability tracking and semi-tracking circulators Four-port single-junction circulators Fabrication of very weakly and weakly magnetized microstrip circulators The final chapter explores important and continuing discrepancies between theoretical models and actual practice. For designers building circulators, isolators, and phase shifters; researchers working on the limitation of ferrite devices; and graduate students intending to work in the field, Dr. Helszajn's insights and perspectives are invaluable.

Microwave Transistor Amplifiers Guillermo Gonzalez 1997 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.

Microstrip Filters for RF / Microwave Applications Jia-Sheng Hong 2011-01-06 The first edition of "Microstrip Filters for RF/Microwave Applications" was published in 2001. Over the years the book has been well received and is used extensively in both academia and industry by microwave researchers and engineers. From its inception as a manuscript the book is almost 8 years old. While the fundamentals of filter circuits have not changed, further innovations in filter realizations and other applications have occurred with changes in the technology and use of new fabrication processes, such as the recent advances in RF MEMS and ferroelectric films for tunable filters; the use of liquid crystal polymer (LCP) substrates for multilayer circuits, as well as the new filters for dual-band, multi-band and ultra wideband (UWB) applications. Although the microstrip filter remains as the main transmission line medium for these new developments, there has been a new trend of using combined planar transmission line structures such as co-planar waveguide (CPW) and slotted ground structures for novel physical implementations beyond the single layer in order to achieve filter miniaturization and better performance. Also, over the years, practitioners have suggested topics that should be added for completeness, or deleted in some cases, as they were not very useful in practice. In view of the above, the authors are proposing a revised version of the "Microstrip Filters for RF/Microwave Applications" text and a slightly changed book title of "Planar Filters for RF/Microwave Applications" to reflect the aforementioned trends in the revised book.

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

Microwave Systems Design Zaiki Awang 2013-09-24 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.

Microwave Engineering and Systems Applications Edward A. Wolff 1988-03-03 Systems. Microwave transmission, control, detection, and generation. Microwave measurements. Microwave subsystems.

Planar Microwave Engineering Thomas H. Lee 2004-08-30 Modern wireless communications hardware is underpinned by RF and microwave design techniques. This insightful book contains a wealth of circuit layouts, design tips, and practical measurement techniques for building and testing practical

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

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

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

Microwave Devices, Circuits and Subsystems for Communications Engineering Ian A. Glover 2006-05-01 *Microwave Devices, Circuits and Subsystems for Communications Engineering* provides a detailed treatment of the common microwave elements found in modern microwave communications systems. The treatment is thorough without being unnecessarily mathematical. The emphasis is on acquiring a conceptual understanding of the techniques and technologies discussed and the practical design criteria required to apply these in real engineering situations. Key topics addressed include: Microwave diode and transistor equivalent circuits Microwave transmission line technologies and microstrip design Network methods and s-parameter measurements Smith chart and related design techniques Broadband and low-noise amplifier design Mixer theory and design Microwave filter design Oscillators, 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

Microwave Engineering Ahmad Shahid Khan 2014-03-24 Detailing the active and passive aspects of microwaves, *Microwave Engineering: Concepts and Fundamentals* covers everything from wave propagation to reflection and refraction, guided waves, and transmission lines, providing a comprehensive understanding of the underlying principles at the core of microwave engineering. This encyclopedic text not only encompasses nearly all facets of microwave engineering, but also gives all topics—including microwave generation, measurement, and processing—equal emphasis. Packed with illustrations to aid in comprehension, the book: Describes the mathematical theory of waveguides and ferrite devices, devoting an entire chapter to the Smith chart and its applications Discusses different types of microwave components, antennas, tubes, transistors, diodes, and parametric devices Examines various attributes of cavity resonators, semiconductor and RF/microwave devices, and microwave integrated circuits Addresses scattering parameters and their properties, as well as planar structures including striplines and microstrips Considers the limitations of conventional tubes, behavior of charged particles in different fields, and the concept of velocity modulation Based on the author's own class notes, *Microwave Engineering: Concepts and Fundamentals* consists of 16 chapters featuring

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homework problems, references, and numerical examples. PowerPoint® slides and MATLAB®-based solutions are available with qualifying course adoption.

Planar Circuits for Microwaves and Lightwaves T. Okoshi 2012-12-06 Until recently, three principal classes had been known in the electrical circuitry. They were as follows: 1) The lumped-constant circuit, which should be called a zero-dimensional circuit, in the sense that the circuit elements are much smaller in size as compared with the wavelength in all three spatial directions. 2) The distributed-constant circuit, which should be called a one-dimensional circuit, in the sense that the circuit elements are much smaller than the wavelength in two directions but comparable to the wavelength in one direction. 3) The waveguide circuit, which should be called a three-dimensional circuit, in the sense that the circuit elements are comparable to the wavelength in all three directions. The principal subject of this book is the analysis and design (synthesis) theories for another circuit class which appeared in the late 1960s and became common in the 1970s. This new circuit class is 4) the planar circuit, which should be called a two-dimensional circuit, in the sense that the circuit elements are much smaller in size as compared with the wavelength in one direction, but comparable to the wavelength in the other two directions.

Artificial Transmission Lines for RF and Microwave Applications Ferran Martín 2015-07-13 This book presents and discusses alternatives to ordinary transmission lines for the design and implementation of advanced RF/microwave components in planar technology. This book is devoted to the analysis, study and applications of artificial transmission lines mostly implemented by means of a host line conveniently modified (e.g., with modulation of transverse dimensions, with etched patterns in the metallic layers, etc.) or with reactive loading, in order to achieve novel device functionalities, superior performance, and/or reduced size. The author begins with an introductory chapter dedicated to the fundamentals of planar transmission lines. Chapter 2 is focused on artificial transmission lines based on periodic structures (including non-uniform transmission lines and reactively-loaded lines), and provides a comprehensive analysis of the coupled mode theory. Chapters 3 and 4 are dedicated to artificial transmission lines inspired by metamaterials, or based on metamaterial concepts. These chapters include the main practical implementations of such lines and their circuit models, and a wide overview of their RF/microwave applications (including passive and active circuits and antennas). Chapter 5 focuses on reconfigurable devices based on tunable artificial lines, and on non-linear transmission lines. The chapter also introduces several materials and components to achieve tuning, including diode varactors, RF-MEMS, ferroelectrics, and liquid crystals. Finally, Chapter 6 covers other advanced transmission lines and wave guiding structures, such as electroinductive-/magnetoinductive-wave lines, common-mode suppressed balanced lines, lattice-network artificial lines, and substrate integrated waveguides. *Artificial Transmission Lines for RF and Microwave Applications* provides an in-depth analysis and discussion of artificial transmission lines, including design guidelines that can be useful to researchers, engineers and students.

Microwave Transmission Line Circuits William T. Joines 2013-01-01 Here's an authoritative resource that offers you valuable assistance with your work involving microwave circuit analysis and design. This practical book provides a thorough understanding of the properties of planar transmission lines for integrated circuits. It presents matrix and computer-aided methods for analysis and design of circuit components. You find in-depth details on input, output, and interstage networks, as well as coverage of stability, noise, and signal distortion. Moreover, this unique book is the first to explore and develop the interface between lumped-element circuits and distributed element circuits. Supported with over 580 equations and 100 illustrations, this volume presents the necessary technological underpinnings and all the practical details you need to fully comprehend and work with the material.

Microstrip Lines and Slotlines, Third Edition Ramesh Garg 2013-05-01 Since the second edition of this book was published in 1996, planar transmission line technology has progressed considerably due to developments in ultrawideband (UWB) communications, imaging, and RFID applications. In addition, the simultaneous demands for compactness of wireless electronic devices while meeting improved performance requirements, necessitates increased use of computer-aided design, simulation, and analysis by microwave engineers. This book is written to help engineers successfully meet these challenges. Details include the development of governing equations, basis functions, Green's function and typical results. More than 1200 equations supplement the text. Special attention is given to the use of simulation software in the design of complex devices and understanding the connection between data collected from simulation software and the actual design process. The book is primarily intended for microwave design engineers and R&D specialists who need to employ planar transmission lines in designing distributed circuits and antenna systems for a wide range of wireless applications. Advanced undergraduate and graduate students in electronics and telecommunication engineering will also welcome this addition to your library.

RF Design Guide Peter Vizmuller 1995 Gain fast access to design information required for any RF communication project using high-frequency circuits and systems with this bestseller. It contains measurement methods, system calculations, statistical procedures, and actual circuit and measurement examples that help you shorten design cycles, improve quality, and reduce design risks. Augmented with 400 equations and 210 figures, the book is an ideal reference for product designers and consultants in the RF and wireless communications industry and an outstanding learning tool for classroom use.

Advances in Planar Filters Design Jiasheng Hong 2019-03-27 Microwave filters are the basic building blocks of communication systems. These filters, having reliable and scalable filter topologies with and without tunable properties, are capable of controlling different frequency bands as well as their fractional bandwidth to meet different system needs. There have been significant advances in the synthesis and physical realisation of microwave filter networks, and the design and applications for communication systems. This edited book presents recent advances in planar filter design. It covers a wide range of different design types, technologies and applications for wireless, microwave, communications and radar systems. A valuable reference for R&D engineers, professionals, specialists, research students and academic working on the topic of RF/microwave filters and related system applications.

Microwave and RF Engineering Roberto Sorrentino 2010-07-26 An essential text for both students and professionals, combining detailed theory with clear practical guidance This outstanding book explores a large spectrum of topics within microwave and radio frequency (RF) engineering, encompassing electromagnetic theory, microwave circuits and components. It provides thorough descriptions of the most common microwave test instruments and advises on semiconductor device modelling. With examples taken from the authors' own experience, this book also covers: network and signal theory; electronic technology with guided electromagnetic propagation; microwave circuits such as linear and non-linear circuits, resonant circuits and cavities, monolithic microwave circuits (MMICs), wireless architectures and integrated circuits; passive microwave components, control components; microwave filters and matching networks. Simulation files are included in a CD Rom, found inside the book. Microwave and RF Engineering presents up-to-date research and applications at different levels of difficulty, creating a useful tool for a first approach to the subject as well as for subsequent in-depth study. It is therefore indispensable reading for advanced professionals and designers who operate at high frequencies as well as senior students who are first approaching the subject.

Fundamentals of Microwave and RF Design Michael Steer 2019-09 Fundamentals of Microwave and RF Design enables mastery of the essential concepts required to cross the barriers to a successful career in microwave and RF design. Extensive treatment of scattering parameters, that naturally describe power flow, and of Smith-chart-based design procedures prepare the student for success. The emphasis is on design at the module level and on covering the whole range of microwave functions available. The orientation is towards using microstrip transmission line technologies and on gaining essential mathematical, graphical and design skills for module design proficiency. This book is derived from a multi volume comprehensive book series, Microwave and RF Design, Volumes 1-5, with the emphasis in this book being on presenting the fundamental materials required to gain entry to RF and microwave design. This book closely parallels the companion series that can be consulted for in-depth analysis with referencing of the book series being familiar and welcoming. Key Features * A companion volume to 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> * 59 worked examples * An average of 24 exercises per chapter * Answers to selected exercises * Emphasis on module-level design using microstrip technologies * Extensive treatment of design using Smith charts * A parallel companion book series provides a detailed reference resource

Foundations for Microstrip Circuit Design Terry C. Edwards 2016-02-01 Building on the success of the previous three editions, Foundations for Microstrip Circuit Design offers extensive new, updated and revised material based upon the latest research. Strongly design-oriented, this fourth edition provides the reader with a fundamental understanding of this fast expanding field making it a definitive source for professional engineers and researchers and an indispensable reference for senior students in electronic engineering. Topics new to this edition: microwave substrates, multilayer transmission line structures, modern EM tools and techniques, microstrip and planar transmission line design, transmission line theory, substrates for planar transmission lines, Vias, wirebonds, 3D integrated interposer structures, computer-aided design, microstrip and power-dependent effects, circuit models, microwave network analysis, microstrip passive elements, and slotline design fundamentals.

Handbook of Research on Advanced Trends in Microwave and Communication Engineering El Oualkadi, Ahmed 2016-08-25 Wireless communications have become invaluable in the modern world. The market is going through a revolutionary transformation as new technologies and standards endeavor to keep up with demand for integrated and low-cost mobile and wireless devices. Due to their ubiquity, there is also a need for a simplification of the design of wireless systems and networks. The Handbook of Research on Advanced Trends in Microwave and Communication Engineering showcases the current trends and approaches in the design and analysis of reconfigurable microwave devices, antennas for wireless applications, and wireless communication technologies. Outlining both theoretical and experimental approaches, this publication brings to light the unique design issues of this emerging research, making it an ideal reference source for engineers, researchers, graduate students, and IT professionals.

Millimeter-Wave Circuits for 5G and Radar Gernot Hueber 2019-06-20 Discover the concepts and techniques needed to design millimeter-wave circuits for current and emerging wireless system applications.

Microwave Integrated Circuit Components Design through MATLAB® S Raghavan 2019-11-11 MICROWAVE INTEGRATED CIRCUIT COMPONENTS DESIGN THROUGH MATLAB® This book teaches the student community microwave integrated circuit component design through MATLAB®, helping the reader to become conversant in using codes and, thereafter, commercial software for

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verification purposes only. Microwave circuit theory and its comparisons, transmission line networks, S-parameters, ABCD parameters, basic design parameters of planar transmission lines (striplines, microstrips, slot lines, coplanar waveguides, finlines), filter theory, Smith chart, inverted Smith chart, stability circles, noise figure circles and microwave components, are thoroughly explained in the book. The chapters are planned in such a way that readers get a thorough understanding to ensure expertise in design. Aimed at senior undergraduates, graduates and researchers in electrical engineering, electromagnetics, microwave circuit design and communications engineering, this book:

- Explains basic tools for design and analysis of microwave circuits such as the Smith chart and network parameters
- Gives the advantage of realizing the output without wiring the circuit by simulating through MATLAB code
- Compares distributed theory with network theory
- Includes microwave components, filters and amplifiers

S. Raghavan was a Senior Professor (HAG) in the Department of Electronics and Communication Engineering, National Institute of Technology (NIT), Trichy, India and has 39 years of teaching and research experience at the Institute. His interests include: microwave integrated circuits, RF MEMS, Bio MEMS, metamaterial, frequency selective surfaces (FSS), substrate integrated waveguides (SIW), biomedical engineering and microwave engineering. He has established state-of-the-art MICs and microwave research laboratories at NIT, Trichy with funding from the Indian government. He is a Fellow/Senior Member in more than 24 professional societies including: IEEE (MTT, EMBS, APS), IETE, IEI, CSI, TSI, ISSS, ILA and ISOI. He is twice a recipient of the Best Teacher Award, and has received the Life Time Achievement Award, Distinguished Professor of Microwave Integrated Circuit Award and Best Researcher Award.

Microwave Circuit Design Using Linear and Nonlinear Techniques George D. Vendelin 2005-10-03 The ultimate handbook on microwave circuit design with CAD. Full of tips and insights from seasoned industry veterans, *Microwave Circuit Design* offers practical, proven advice on improving the design quality of microwave passive and active circuits-while cutting costs and time. Covering all levels of microwave circuit design from the elementary to the very advanced, the book systematically presents computer-aided methods for linear and nonlinear designs used in the design and manufacture of microwave amplifiers, oscillators, and mixers. Using the newest CAD tools, the book shows how to design transistor and diode circuits, and also details CAD's usefulness in microwave integrated circuit (MIC) and monolithic microwave integrated circuit (MMIC) technology. Applications of nonlinear SPICE programs, now available for microwave CAD, are described. State-of-the-art coverage includes microwave transistors (HEMTs, MODFETs, MESFETs, HBTs, and more), high-power amplifier design, oscillator design including feedback topologies, phase noise and examples, and more. The techniques presented are illustrated with several MMIC designs, including a wideband amplifier, a low-noise amplifier, and an MMIC mixer. This unique, one-stop handbook also features a major case study of an actual anticollision radar transceiver, which is compared in detail against CAD predictions; examples of actual circuit designs with photographs of completed circuits; and tables of design formulae.

Microwave and RF Design, Volume 2 Michael Steer 2019-09 *Microwave and RF Design: Transmission Lines* builds on the concepts of forward- and backward-traveling waves. Many examples are included of advanced techniques for analyzing and designing transmission line networks with microstrip lines primarily used in design examples. Coupled-lines are an important functional element in microwave circuits, and circuit equivalents of coupled lines are introduced as fundamental building blocks in design. The text and examples introduce the often hidden design requirements of mitigating parasitic effects and eliminating unwanted modes of operation. This book is suitable as both an undergraduate and graduate textbook, as well as a career-long reference book. Key Features * The second 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> * 56 worked

examples * An average of 31 exercises per chapter * Answers to selected exercises * Focus on planar lines including microstrip * A companion book, Fundamentals of Microwave and RF Design, is suitable as a comprehensive undergraduate textbook on microwave engineering

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

Advances in Microstrip and Printed Antennas Kai Fong Lee 1997-06-23 Lee-Antennas-044210 The latest research results and important topics driving the development of microstrip and printed antennas Keeping abreast of current research topics and results in a field as dynamic as microstrip and printed antennas is a challenge for graduate students, researchers, and practicing engineers alike-theoretical and experimental advances since 1989 have quickly outdated existing literature on the subject. This invaluable reference provides the latest information on conventional antenna topics, comprehensive accounts of new research topics, updated research results, and summaries of future trends. Advances in Microstrip and Printed Antennas is a comprehensive, up-to-date presentation of the research that is propelling these antennas into an ever-widening array of applications, including potential uses in radar and communication systems. Featuring contributions by leading researchers and supplemented with extensive illustrations, this book: * Covers recent advances in probe-fed and aperture-coupled microstrip antennas, microstrip arrays, and dual and circularly polarized planar antennas * Examines the development of CAD formulas for the rectangular patch * Explores the potential for multifunction printed antennas, new high-temperature superconducting materials, active microstrip antennas, and tapered slot printed antennas * Discusses the finite-difference time-domain method of analysis * Examines competing dielectric resonator antenna technology * Includes design data and an extensive bibliography

Planar Microwave Engineering Thomas H. Lee 2004 Modern wireless communications hardware is underpinned by RF and microwave design techniques. This insightful book contains a wealth of circuit layouts, design tips, and practical measurement techniques for building and testing practical gigahertz systems. The book covers everything you need to know to design, build, and test a high-frequency circuit. Microstrip components are discussed, including tricks for extracting good performance from cheap materials. Connectors and cables are also described, as are discrete passive components, antennas, low-noise amplifiers, oscillators, and frequency synthesizers. Practical measurement techniques are presented in detail, including the use of network analyzers, sampling oscilloscopes, spectrum analyzers, and noise figure meters. Throughout the focus is practical, and many worked examples and design projects are included. There is also a CD-ROM that contains a variety of design and analysis programs. The book is packed with indispensable information for students taking courses on RF or microwave circuits and for practising engineers.--

Principles of Planar Near-Field Antenna Measurements Stuart Gregson 2007-12-31 This single volume provides a comprehensive introduction and explanation of both the theory and practice of 'Planar Near-Field Antenna Measurement' from its basic postulates and assumptions, to the intricacies of its deployment in complex and demanding measurement scenarios. To do this the book initially examines the properties of antennas that allow them to enhance the free space interaction of electronic systems and this leads into a full description of the theory of 'Planar Near-Field Scanning'.

Emerging Innovations in Microwave and Antenna Engineering Jamal Zbitou 2018-12-21 "Premier reference source"-- book cover.

Microwave Propagation in Ferrimagnetics M. S. Sodha 2013-11-21 During the last three decades, interest in the field of interaction of microwaves with ferrimagnetics has steadily increased. Investigations in this field have led to the development of a number of devices used for a variety of applications. The initial emphasis of the investigators was on the microwave behavior of ferrimagnetics placed in cavities and metallic waveguides and associated devices. This work has been presented in various books, monographs, and reviews written during the sixties. In recent years, interest in microwave propagation in ferrimagnetics has shifted from loaded waveguides to relatively new areas, e. g. , magnetostatic and magnetoelastic waves in layered structures, microwave propagation in ferrimagnetic strip lines and microstrips, etc. Such investigations are important from the viewpoint of devices such as delay lines, filters, convolvers, guided wave amplifiers, striplines, and microstrip phase shifters, circulators, edge guided mode isolators, etc. As such, we felt the need for a text (meant for graduate students starting work in these areas as well as practicing electrical engineers and applied physicists) which presents a coherent account of the various aspects of propagation of microwaves (electromagnetic as well as magnetoelastic) in biased ferrimagnetics and discusses the relatively recent developments in the theory and operation of the aforementioned devices, and this book is the result. A biased ferrimagnetic is, in the mathematical sense, a complicated medium, electromagnetically as well as elastically.

RF and Microwave Circuit Design Charles E. Free 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.

FOUNDATIONS FOR MICROWAVE ENGINEERING, 2ND ED Robert E. Collin 2007 About The Book:

The book covers the major topics of microwave engineering. Its presentation defines the accepted standard for both advanced undergraduate and graduate level courses on microwave engineering. It is

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an essential reference book for the practicing microwave engineer

RF and Microwave Engineering Frank Gustrau 2012-06-22 This book provides a fundamental and practical introduction to radio frequency and microwave engineering and physical aspects of wireless communication. In this book, the author addresses a wide range of radio-frequency and microwave topics with emphasis on physical aspects including EM and voltage waves, transmission lines, passive circuits, antennas, radio wave propagation. Up-to-date RF design tools like RF circuit simulation, EM simulation and computerized Smith charts, are used in various examples to demonstrate how these methods can be applied effectively in RF engineering practice. Design rules and working examples illustrate the theoretical parts. The examples are close to real world problems, so the reader can directly transfer the methods within the context of their own work. At the end of each chapter a list of problems is given in order to deepen the reader's understanding of the chapter material and practice the new competences. Solutions are available on the author's website. Key Features: Presents a wide range of RF topics with emphasis on physical aspects e.g. EM and voltage waves, transmission lines, passive circuits, antennas. Uses various examples of modern RF tools that show how the methods can be applied productively in RF engineering practice. Incorporates various design examples using circuit and electromagnetic (EM) simulation software. Discusses the propagation of waves: their representation, their effects, and their utilization in passive circuits and antenna structures. Provides a list of problems at the end of each chapter. Includes an accompanying website containing solutions to the problems (http://www.fh-dortmund.de/gustrau_rf_textbook) This will be an invaluable textbook for bachelor and masters students on electrical engineering courses (microwave engineering, basic circuit theory and electromagnetic fields, wireless communications). Early-stage RF practitioners, engineers (e.g. application engineer) working in this area will also find this book of interest.