Classic Works In Rf Engineering Combiners Couplers Transformers And Magnetic

Materials Artech House Microwave Library

Classic Works in RF EngineeringCombiners, Couplers, Transformers, and

Magnetic MaterialsArtech House on Demand Provides an introduction to fundamental mixer types, as well as variations on the classical mixer designs.

This book is the most

comprehensive publication on MWP technology and MWP-OES analytical spectrometry with an emphasis on practical issues. This practical resource offers a thorough examination of RF

transceiver design for MIMO communications. Offering a practical view on MIMO wireless systems, this book extends fundamental concepts on classic wireless transceiver design techniques to

MIMO transceivers. This helps reader gain a very comprehensive understanding of the subject. This in-depth volume describes many theoretical and implementation challenges on

MIMO transceivers and provides the practical solutions for these issues. This comprehensive book provides thorough descriptions of MIMO theoretical concepts, MIMO single carrier and

OFDM modulation, RF transceiver design concepts, power amplifier, MIMO transmitter design techniques and their RF impairments, MIMO receiver design methods, RF impairments study including

nonlinearity, DC-offset, I/Q imbalance and phase noise and their compensation in OFDM and MIMO techniques. In addition, it provides the most practical techniques to realize RF front-

ends in MIMO systems. This book is supported with many design equations and illustrations. The first book dedicated to RF Transceiver design for MIMO systems, this volume serves as a current, one-

stop guide offering you cost-effective solutions for your challenging projects in the field.

Antenna Systems and Electronic Warfare Applications Handbook of RF and Microwave

Power Amplifiers
Radio-Frequency Electronics
Broadband RF and Microwave Amplifiers
RF and Microwave Transmitter Design

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.

"This book describes these new technologies (circuit design and software-oriented approaches) in all aspects of radio

transmitter design including wireless telecommunicatio n, satellite, radar, military and other specific applicatio ns"--Provided by publisher.

This textbook provides a fundamental approach to RF

and microwave engineering. It is unusual for the thoroughness with which these areas are presented. The effect is that the reader comes away with a deep insight not only of the design formulation but

answers to how and why those formulations work. This is especially valuable for engineers whose careers involve research and product development, wherein the applicability of the

applied principles must be understood. The scope of this book extends from topics for a first course in electrical engineering, in which impedances are analyzed using complex

numbers, through the introduction of transmission lines that are analyzed using the Smith Chart, and on to graduate level subjects, such as equivalent circuits for obstacles in hollow waveguides,

analyzed using Green's Functions. This book is a virtual encyclopedia of circuit design methods. Despite the complexity, topics are presented in a conversational manner for ease

of comprehension. The book is not only an excellent text at the undergraduate and graduate levels, but is as well a detailed reference for the practicing engineer. Consider how well

informed an engineer will be who has become familiar with these topics as treated in High Frequency Techniques: (in order of presentation) Brief history of wireless (radio) and the Morse code U.S.

Radio Frequency Allocations Introduction to vectors AC analysis and why complex numbers and impedance are used Circuit and antenna reciprocity Decibel measure Maximum power

transfer Skin effect Computer simulation and optimization of networks LC matching of one impedance to another Coupled Resonators Uniform transmission lines for propagation

VSWR, return Loss and mismatch error The Telegrapher Equations (derived) Phase and Group Velocities The Impedance Transformation Equation for lines (derived) Fano's

and Bode's matching limits The Smith Chart (derived) Slotted Line impedance measurement Constant Q circles on the Smith Chart Approximating a transmission line with lumped L's

and C's ABCD, Z, Y and Scattering matrix analysis methods for circuits Statist Get up-to-speed on the theory, principles and design of vacuum electron devices. Classic Works in RF Engineering,

Volume 2
RF Engineering for Wireless Networks
Classic Works in RF Engineering: Microwave and RF filters
Communications Engineering Desk Reference
High-Frequency Integrated Circuits

This exciting new resource investigates the function of RF communication in electronic warfare systems. The book provides in-depth coverage of how RF signals must be constructed to perform jamming missions, which

prevent a receiver from properly extracting a target signal. Technical descriptions of oscillators and modulators, which generate the RF signals, are presented and explored. Power supplies that generate adequate

power for fueling high power amplifiers are also described and their operations investigated. Oscillator basics, including principles of oscillator operation, phase locked loop synthesizers and direct digital

synthesis are examined. Fundamentals of RF communications, including power supplies for RF power amplifiers, are included, making it useful for both novice and advanced practitioners. Written by a

prominent expert in the field, this authoritative book is the first available that combines the topics of electronic warfare and oscillator design and analysis.

Preface; Propagation of radio waves; The decibel scale; Transmission

lines; Antennas; Resonant circuits; Oscillators; Piezo-electric devices; Bandwidth requirements and modulation; Frequency planning; Radio equipment; Microwave communication; Information privacy and encryption;

Multiplexing; Speech digitization and synthesis; VHF and UHF mobile communication; Signalling; Mobile radio systems; Base station site management; Instrumentation; Batteries; Satellite communications; Connectors and

interfaces; Broadcasting; Abbreviations and symbols; Miscellaneous data; Index.

This extensively revised and updated edition of the 1997 classic offers professionals a comprehensive, one-stop resource on the

latest developments, key technologies, and applications of RF engineering. Among the numerous updates, this edition includes brand-new chapters on GPS and an expanded treatment of wireless communications

systems.
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.
Microwave and RF Filters
Software-Defined Radio for Engineers
Circuits and Applications
The Generation, Propagation, and Reception of Signals and Noise
Microwave Mixers
MICROWAVE

INTEGRATED CIRCUIT COMPONENTS DESIGN THROUGH MATLAB® This book teaches the student community microwave integrated circuit component

design through MATLAB®, helping the reader to become conversant in using codes and, thereafter, commercial software for verification

purposes only. Microwave circuit theory and its comparisons, transmission line networks, S-parameters, ABCD parameters, basic design parameters of

planar transmission lines (striplines, microstrips, slot lines, coplanar waveguides, finlines), filter theory, Smith chart, inverted Smith

chart, stability circles, noise figure circles and microwave components, are thoroughly explained in the book. The chapters are planned in such a way

that readers get a thorough understanding to ensure expertise in design. Aimed at senior unde rgraduates, graduates and researchers in electrical engineering, e

lectromagnetics, 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 st ate-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.

This reference, written by leading

authorities in the field, gives basic theory, implementation details, advanced research, and applications of RF and microwave in healthcare and

biosensing. It first provides a solid understanding of the fundamentals with coverage of the basics of microwave engineering and the interaction

between electr omagnetic waves and biomaterials. It then presents the s tate-of-the-art development in microwave biosensing, implantable

devices -including applications of microwave technology for sensing biological tissues – and medical diagnosis, along with applications

involving remote patient monitoring. this book is an ideal reference for RF and microwave engineer working on, or thinking of working on,

the applications of RF and Microwave technology in medicine and biology.

Learn: The fundamentals of RF and microwave engineering in

healthcare and biosensing How to combine biological and medical aspects of the field with underlying engineering concepts How to implement microwave

biosensing for material chara cterization and cancer diagnosis Applications and functioning of wireless implantable biomedical devices and

microwave non-contact biomedical radars How to combine devices, systems, and methods for new practical applications The first book to review the

fundamentals, latest developments, and future trends in this important emerging field with emphasis on engineering aspects of sensing, monitoring,

and diagnosis using RF and Microwave Extensive coverage of biosensing applications are included Written by leaders in the field, including

members of the Technical Coordinating Committee of the Biological Effects and Medical Applications of the IEEE Microwave Theory and Techniques

Society This newly revised edition offers a comprehensive and current treatment of the subject and includes expanded derivations

and problem sets, helping to make the material even more accessible and easier to master.

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.

An Introduction to RF and Microwave

Design and Computer Simulation RF Electronics for Electronic Warfare Classic Works in RF Engineering Radio Frequency Principles and

Applications RF Transceiver Design for MIMO Wireless Communications

Annotation Consisting of 68 short chapters, this textbook for a two-semester course in electromagnetic field theory and radio frequency

(RF) circuits covers antennas, transmission lines, and RF networks. This second edition includes as an appendix the problem solutions that were previously published as a separate item; otherwise, it is unchanged from

the first, which was published in 1962. Annotation c. Book News, Inc., Portland, OR (booknews.com). Based on the popular Artech House classic, Digital Communication Systems Engineering with Software-Defined

Radio, this book provides a practical approach to quickly learning the software-defined radio (SDR) concepts needed for work in the field. This up-to-date volume guides readers on how to quickly prototype wireless designs using SDR

for real-world testing and experimentation. This book explores advanced wireless communication techniques such as OFDM, LTE, WLA, and hardware targeting. Readers will gain an understanding of the core concepts behind wireless

hardware, such as the radio frequency front-end, analog-to-digital and digital-to-analog converters, as well as various processing technologies. Moreover, this volume includes chapters on timing estimation,

matched filtering, frame synchronization message decoding, and source coding. The orthogonal frequency division multiplexing is explained and details about HDL code generation and deployment are provided. The book concludes

with coverage of the WLAN toolbox with OFDM beacon reception and the LTE toolbox with downlink reception. Multiple case studies are provided throughout the book. Both MATLAB and Simulink source code are included

to assist readers with their projects in the field. Equips students with essential industry-relevant knowledge through in-depth explanations, practical applications, examples, and exercises.

A transistor-level,

design-intensive overview of high speed and high frequency monolithic integrated circuits for wireless and broadband systems from 2 GHz to 200 GHz, this comprehensive text covers high-speed, RF, mm-wave, and optical

fibre circuits using nanoscale CMOS, SiGe BiCMOS, and III-V technologies. Step-by-step design methodologies, end-of chapter problems, and practical simulation and design projects are provided, making this an ideal

resource for senior undergraduate and graduate courses in circuit design. With an emphasis on device-circuit topology interaction and optimization, it gives circuit designers and students alike an in-depth understanding of

device structures and process limitations affecting circuit performance. Radio Frequency Integrated Circuit Design Designing Bipolar Transistor Radio Frequency Integrated Circuits Design of RF and Microwave

Amplifiers and Oscillators
Practical RF System Design
The Restoration of Antique and Classic Cars

Antennas systems play a critical role in modern electronic warfare communications and radar.

Today's EW engineers need to have a solid understanding of the design principles of this technology and how antenna systems are used in the field. This comprehensive book serves as a one-stop

resource for practical EW antenna system know-how. Supported with over 700 illustrations and nearly 1,700 equations, this authoritative reference offers professionals detailed explanations of

all the important foundations and aspects of this technology. Moreover, engineers get an in-depth treatment of a wide range of antenna system applications. The book presents the key

characteristics of each type of antenna, including dipoles, monopoles, loops, arrays, horns, and patches. Practitioners also find valuable discussions on the limitations

of antennas system performance in EW applications. 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. Finally, here is

a single volume containing all of the engineering information needed to successfully design and implement any type of wireless network! Author Dan Dobkin covers every aspect of RF

engineering necessary for wireless networks. He begins with a review of essential math and electromagnetic theory followed by thorough discussions of multiplexing, modulation

types, bandwidth, link budgets, network concepts, radio system architectures, RF amplifiers, mixers and frequency conversion, filters, single-chip radio systems, antenna theory and

designs, signal propagation, as well as planning and implementing wireless networks for both indoor and outdoor environments. The appendices contain such vital data as U.S., European, and Japanese

technical and regulatory standards for wireless networks, measurements in wireless networks, reflection and matching of transmission lines, determining power density,

and much more. No matter what type of wireless network you design—Bluetooth, UWB, or even metropolitan area network (MAN)—this book is the one reference you can't do without! The A-to-Z guide to

wireless network engineering—covers everything from basic electromagnetic theory to modulation techniques to network planning and implementation! Engineering and design principles

covered are applicable to any type of wireless network, including 802.11, 802.16, 802.20, and Bluetooth. Discusses state-of-the-art modulation techniques such as ultra

wideband (UWB) and orthogonal f requency-division multiplexing (OFDM).

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.

Microwave Induced Plasma Analytical Spectrometry

High Frequency Techniques Introduction to Radio Frequency Design Hardware, Antennas, and Propagation RF Circuit Design

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 authorsOCO 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."

Broadband RF and Microwave Amplifiers provides extensive coverage of broadband radio frequency (RF) and microwave power amplifier design, including

well-known historical and recent novel schematic configurations, theoretical approaches, circuit simulation results, and practical implementation strategies. The text begins by

introducing two-port networks to illustrate the behavior of linear and nonlinear circuits, explaining the basic principles of power amplifier design, and discussing impedance matching and

broadband power amplifier design using lumped and distributed parameters. The book then: Shows how dissipative or lossy gain-compen sation-matching circuits can offer an important trade-off between power

gain, reflection coefficient, and operating frequency bandwidth Describes the design of broadband RF and microwave amplifiers using real frequency techniques (RFTs),

supplying numerous examples based on the MATLAB® programming process Examines Class-E power amplifiers, Doherty amplifiers, low-noise amplifiers, microwave gallium arsenide field-

effect transistor (GaAs FET)-distributed amplifiers, and complementary metal-oxide semiconductor (CMOS) amplifiers for ultra-wideband (UWB) applications Broadband RF and

Microwave Amplifiers combines theoretical analysis with practical design to create a solid foundation for innovative ideas and circuit design techniques. Covering the fundamentals

applying to all radio devices, this is a perfect introduction to the subject for students and professionals. The Restoration of Antique and Classic Cars by Richard C. Wheatley and

Brian Morgan is an essential handbook for the automotive enthusiast who owns or is acquiring a car in need of restoration. The descriptions and precepts found inside generally

apply to vintage cars; in particular they are applicable to cars of the pre-WWII period. The purpose of this comprehensive book is to enable the amateur to restore his car to its original or "Show Model"

condition. The reader is advised on the choice of a car to restore, its dismantling, the treatment of the frame, suspension, steering, axles, brakes and wheels, and on the rebuilding of the engine and gear

box. There are also chapters devoted to the fuel system, controls and instruments, electrical equipment and wiring, the body frame and covering, body painting, coach trimming, special

finishes and the garage and workshop. All of the illustrations, working drawings, diagrams and photographs have been specially prepared.

Dielectrics and Waves

Principles of RF

and Microwave Design
Microwave Integrated Circuit Components
Design through MATLAB®
RF Systems, Components, and Circuits Handbook
Microwave and RF Vacuum Electronic

Power Sources

This highly practical and convenient book is the most comprehensive resource on microwave and RF filter theory, design, analysis, and applications ever compiled. A

perfect companion to the Artech House 2006 bestseller, Classic Works in RF Engineering, this new volume collects 50 classic, hard-to-find papers from the 1950s to 2007 on critical topics in the field-from

aperture-coupled filters to zolotarev lowpass filters and everything in between. Moreover, this invaluable collection includes design procedures, formulas, examples, and performance data to help you tackle

your challenging projects with speed and efficiency. Including insightful introductions from leading authority and editor, Ralph Levy, each paper brings you definitive project-ready guidance

including theoretical background, applications, selection criteria, design steps, calculations, examples, and input on filter components like capacitors, resistors, and

inductors. The book includes over 100 diagrams and schematics that help clarify the material at every stage, along with a wealth of problem-solving tips from the top innovators in the field. Whether you need

details on combline, resonator, waveguide, or bandstop filters, this one-of-a-kind volume saves you countless hours searching the literature. 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 This is a one-stop guide for circuit designers and system/device engineers, covering everything from

CAD to reliability. If you're looking for an in-depth and up-to-date understanding bipolar transistor RFIC design, this practical resource is a smart choice. Unlike most books on the market that focus on GaAs

MESFET or silicon CMOS process technology, this unique volume is dedicated exclusively to RFIC designs based on bipolar technology. Until now, critical GaAs HBT and SiGe HBT process technologies have

been largely neglected in reference books. This book fills this gap, offering you a detailed treatment of this increasingly important topic. You discover a wide range of circuit topologies that are optimized

for maximum performance with bipolar devices. From discussions of key applications (Bluetooth, UWB, GPS, WiMax) and architectures… to in-depth coverage of fabrication technologies and amplifier design…

to a look at performance tradeoffs and production costs, this book arms you with complete design know-how for your challenging work in the field.

Newnes Radio and RF Engineering

Pocket Book Combiners, Couplers, Transformers, and Magnetic Materials Microwave Engineering Microwave and RF Engineering Radio-electronic Transmission Fundamentals

The main purpose of this book is to make available the research on radio-frequency that was originally published in the 1940s but is still relevant today and difficult

to find. It focuses on passive signal processing components, namely impedance conversion and power splitting /combining, magnetic materials and RF

transformers. A one-stop Desk Reference, for R&D engineers involved in communications engineering; this is a book that will not gather dust on the shelf. It brings together the essential

professional reference content from leading international contributors in the field. Material covers a wide scope of topics including voice, computer,

facsimile, video, and multimedia data technologies * A fully searchable Mega Reference Ebook, providing all the essential material needed by Communications

Engineers on a day-to-day basis. * Fundamentals, key techniques, engineering best practice and rules-of-thumb together in one quick-reference. * Over 2,500 pages of

reference material, including over 1,500 pages not included in the print edition "Now, in a single convenient volume, you can have all the information you need on real-

world applications of electromagnetic theory, including the prediction, analysis, and measurement of electromagnetic fields and their effects. RADIO FREQUENCY PRINCIPLES and

APPLICATIONS will guide you from the basics of electromagnetic theory to the full range of new and vital applications. Author Albert A. Smith, Jr. provides a wealth of

practical information in an accessible style, without using obtuse theory or requiring complex mathematical derivations. This exceptionally ""readable""

text ties together the various related topics in a logical development, and the material flows from the fundamentals of electromagnetic fields to areas of practical

application. The numerous figures provide helpful illustrations, and the appendicies offer additional mathematical details. This book will be of particular use

to engineers working in the many diverse fields relating to the application of electromagnetic concepts, including engineers involved in RF technology, EMC, radio wave

propagation, antennas, radio frequency environments, wireless communications, microwaves, and space systems. Professors: To request an examination copy simply e-mail collegeado

ption@ieee.org. " Sponsored by: IEEE Electromagnetic Compatibility Society, IEEE Microwave Theory and Techniques Society. Radio Frequency (RF) is the fundamental

technology behind a huge range of modern consumer electronics and wireless communication devices, and this book provides a comprehensive and methodical guide to RF for

engineers, technicians, enthusiasts and hobbyists with an interest in the electronics behind radio frequency communications. In Practical RF Handbook, Ian Hickman draws upon his own

radio engineering background to develop a hands-on guide to the difficulties and pitfalls of RF design with a minimum of maths. A broad coverage includes devices,

circuits, equipment, systems, radio propagation and external noise to fully acquaint the reader with the necessary circuit technologies and techniques. The fourth

edition brings the book fully up-to-date with new advances in RF, including coverage of OFDM, UWB, WiFi and WiMax. Practical coverage of the cutting-edge technology behind the fast-

moving world of communications electronics Real-world design guide for engineers, technicians and students, covering key principles with a minimum of maths Updated throughout,

including coverage of recent hot topics such as UWB, WiFi and WiMax Practical RF Handbook Distributed Power Amplifiers for RF and

Microwave Communications Microwave and RF filters Principles and Applications of RF/Microwave in Healthcare and Biosensing

This comprehensive resource provides a thorough

introduction to the principles of electronic circuits operating in the radio, microwave, and millimeter-wave frequency ranges. The book highlights the fundamental physical laws of classical electromagnetics using a foundation

of Maxwell's equations to give insight into the operating principles of circuit elements of all kinds, from lumped elements to transmission lines, waveguides, optical fibers, and quasi-optical structures. Standard passive

system components like filters, splitters, couplers, hybrids, baluns, and antennas are explained to acclimate the reader to considering multiple technological solutions for common design

problems. A basic overview of active circuit designs, such as amplifiers, mixers, and multipliers is also provided, along with discussion of the performance characteristics of electronic systems, including noise and linearity. Emphasis is placed on

visualization and understanding of how and why electronic circuits of all frequencies are built and operate the way they do. Readers learn how to match an amplifier for optimum noise performance over the broadest bandwidth with the

fewest number of elements and how to visualize the coupling of various modes in a mixed waveguide-type structure and avoid resonances due to trapped, higher-order modes. The book provides the tools needed to design and optimize a

launcher from microstrip into waveguide, and whether the best characteristics can be achieved by incorporating matching elements in the microstrip section, the waveguide section, or both. Packed with references and examples,

readers learn not only how to do the math but what the math means. The growing interest in commercial RF applications and high-frequency engineering has triggered a scramble for fundamental design and analysis

information. This expertly compiled resource gives microwave engineers instant, one-stop access to a vast range of essential source material in a single convenient volume. Radio Frequency Integrated Circuits and Systems