Transmission Line And Wave By Bakshi And Godse

The book is written for an undergraduate course on the transmission lines and waveguides. It provides comprehensive coverage of four terminal networks, filters, transmission lines and various types of waveguides. The book starts with explaining the symmetrical and asymmetrical four terminal networks which form the basis of filters. Then book provides the detailed discussion of various types of filters. The discussion of composite filters and crystal filter is also included in the book. The book covers the transmission line parameters in detail along with reflection on a line, reflection loss and reflection factor. The chapter on transmission line at radio frequency includes parameters of line at high frequency, standing waves, standing wave ratio, single stub matching, double stub matching and Smith chart. The book covers the various aspects of guided waves between parallel planes. It also provides the discussion of rectangular and circular waveguides. At the end book incorporates the discussion of resonators. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The explanations are given using very simple and lucid language. All the chapters are arranged in a specific sequence which helps to build the understanding of the subject in a logical fashion. The book

explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.
Electromagnetic metamaterials-from fundamental physics to advanced engineering applications This book presents an original generalized transmission line approach associated with non-resonant structures that exhibit larger bandwidths, lower loss, and higher design flexibility. It is based on the novel concept of composite right/left-handed (CRLH) transmission line metamaterials (MMs), which has led to the development of novel guided-wave, radiated-wave, and refracted-wave devices and structures. The authors introduced this powerful new concept and are therefore able to offer readers deep insight into the fundamental physics needed to fully grasp the technology. Moreover, they provide a host of practical engineering applications. The book begins with an introductory chapter that places resonant type and transmission line metamaterials in historical perspective. The next six chapters give readers a solid foundation in the fundamentals and practical applications: Fundamentals of LH MMs describes the fundamental physics and exotic properties of left-handed metamaterials TL Theory of MMs establishes the foundations of CRLH structures in three progressive steps: ideal transmission line, LC network, and real distributed structure Two-Dimensional MMs develops both a transmission matrix

method and a transmission line method to address the problem of finite-size 2D metamaterials excited by arbitrary sources Guided-Wave Applications and Radiated-Wave Applications present a number of groundbreaking applications developed by the authors The Future of MMs sets forth an expert view on future challenges and prospects This engineering approach to metamaterials paves the way for a new generation of microwave and photonic devices and structures. It is recommended for electrical engineers, as well as physicists and optical engineers, with an interest in practical negative refractive index structures and materials.

Microwave photonics and information optics provide high bandwidth and precision along with ultrafast speed at a low cost. In order to reduce noise at the communication trans-receivers, scattering in the devices needs to be decreased, which can be achieved by replacing optoelectronic devices with photonic devices because in the latter only photons propagate electromagnetic waves. Contemporary Developments in High-Frequency Photonic Devices is a crucial research book that examines high-frequency photonics and their applications in communication engineering. Featuring coverage on a wide range of topics such as metamaterials, optoelectronic devices, and plasmonics, this book is excellent for students, researchers, engineers, and professionals.

A one-stop reference to the major techniques for analyzing microwave planar transmission line structures The last two decades have seen important progress in thedevelopment of methods for the analysis of microwave andmillimeter-wave passive structures, which contributed greatly tomicrowave integrated circuit design while also stimulating thedevelopment of new planar transmission lines. This timely andauthoritative work introduces microwave engineers to the mostcommonly used techniques for analyzing microwave planartransmission line structures. Designed to be easily accessible to readers with only a fundamentalbackground in electromagnetic theory, the book provides clearexplanations of the theory and applications of Green's function,the conformal-mapping method, spectral domain methods, variationalmethods, and the mode-matching methods. Coverage for each method isself-contained and supplemented with problems and solutions as wellas useful figures. In addition to providing detailed formulations of the methods underdiscussion, this highly practical book also demonstrates how toapply the principles of electromagnetic theory to the analysis ofmicrowave boundary value problems, customize methods for specificneeds, and develop new techniques. Analysis Methods for RF,Microwave, and Millimeter-Wave Planar Transmission Line Structuresis an excellent working resource for anyone involved in the designand engineering of

RF, microwave, and millimeter-wave integratedcircuits.
Transmission Line Theory Different types of transmission lines, Definition of characteristic impedance, The transmission line as a cascade of T-Sections, Definition of propagation constant.General solution of the transmission line, The two standard forms for voltage and current of a line terminated by an impedance, Physical significance of the equation and the infinite line, The two standard forms for the input impedance of a transmission line terminated by an impedance, Meaning of reflection coefficient, Wavelength and velocity of propagation.Waveform distortion, Distortionless transmission line, The telephone cable, Inductance loading of telephone cables.Input impedance of lossless lines, Reflection on a line not terminated by Z0, Transfer impedance, Reflection factor and reflection loss, T and section equivalent to lines. The Line at Radio Frequencies Standing waves and standing wave ratio on a line, One eighth wave line, The quarter wave line and impedance matching, The half wave line.The circle diagram for the dissipationless line, The Smith chart, Application of the Smith chart, Conversion from impedance to reflection coefficient and vice-versa. Impedance to admittance conversion and viceversa, Input impedance of a lossless line terminated by an impedance, Single stub matching and double stub matching.Guided Waves Waves between parallel planes of perfect conductors,

Transverse electric and transverse magnetic waves, Characteristics of TE and TM Waves, Transverse electromagnetic waves, Velocities of propagation, Component uniform plane waves between parallel planes, Attenuation of TE and TM waves in parallel plane guides, Wave impedances.Rectangular Waveguides Transverse magnetic waves in rectangular wave guides, Transverse electric waves in rectangular waveguides, Characteristic of TE and TM waves, Cut-off wavelength and phase velocity, Impossibility of TEM waves in waveguides, Dominant mode in rectangular waveguide, Attenuation of TE and TM modes in rectangular waveguides, Wave impedances, Characteristic impedance, Excitation of modes.Circular Wave Guides and Resonators Bessel functions, Solution of field equations in cylindrical co-ordinates, TM and TE waves in circular guides, Wave impedances and characteristic impedance, Dominant mode in circular waveguide, Excitation of modes, Microwave cavities, Rectangular cavity resonators, Circular cavity resonator, Semicircular cavity resonator, Q factor of a cavity resonator for TE101 mode.

Cylindrical arrays lie at the heart of the antenna systems of most major radio communication systems, including broadcasting networks, cellular 'phone systems and radar. In this book, the authors present practical theoretical methods for determining current distributions, input admittances and field

patterns of a wide variety of cylindrical antennas, including the isolated antenna, the two-element array, the circular array, curtain arrays, Yagi and log-periodic arrays, planar arrays and three-dimensional arrays. Coverage includes analysis of horizontal antennas over, on and in the earth and sea, large resonant arrays of electrically short dipoles and a chapter on the theory and techniques of experimental measurement. Written by three of the leading engineers in the field, and based on world-class research carried out at Harvard over the last forty years, Cylindrical Antennas and Arrays is destined to become established as the basic reference for practising engineers and advanced students for many years to come.

The book widely discusses the principle and analyses involved in transmission lines in general and wave guides in particular. The book begins with introduction to Transmission line theory discussing various types of distortions, reflection, filters, and continues with the transmission line at radio frequencies and related parameters. Guided waves are discussed in different modes like TE, TM and TEM before ending up with detailed explanations on different types of wave guides like rectangular, circular, cylindrical, co-axial lines and components like cavity resonators. Features Lucid and simple to understand. Elaborate explanation on the analysis supported with lot of diagrams. Large number of

problems to illustrate the theory. Special attention given to problems using Smith Chart. Appendices on filters and Maxwell's equations. Contents Transmission line theory Transmission line at radio frequencies Guided waves Wave guides Theory of Filters m-derived filters Maxwell's Equations.

This rigorous treatment of transmission lines presents all the essential concepts in a clear and straightforward manner. Key principles are demonstrated by numerous practical worked examples and illustrations, and complex mathematics is avoided throughout. Early chapters cover pulse propagation, sinusoidal waves and coupled lines, all set within the context of a simple lossless equivalent circuit. Later chapters then develop this basic model by demonstrating the derivation of circuit parameters, and the use of Maxwell's equations to extend this theory to major transmission lines. Finally, a discussion of photonic concepts and properties provides valuable insights into the fundamental physics underpinning transmission lines. Covering DC to optical frequencies, this accessible text is an invaluable resource for students, researchers and professionals in electrical, RF and microwave engineering.

Electromagnetics (CC BY-SA 4.0) is an open textbook intended to serve as a primary textbook for a one-semester first course in undergraduate engineering electromagnetics, and includes:electric and magnetic fields; electromagnetic

properties of materials; electromagnetic waves; and devices that operate according to associated electromagnetic principles including resistors,capacitors, inductors, transformers, generators, and transmission lines. This book employs the "transmission lines first" approach, in which transmission lines are introduced using a lumped-element equivalent circuit model fora differential length of transmission line, leading to one-dimensional wave equations for voltage and current. This book is intended for electrical engineering students in the third year of a bachelor of science degree program. A free electronic version of this book is available at: https://doi.org/10.7294/W4WQ01ZM

This book covers the principles of operation of electromagnetic waveguides and transmission lines. The approach is divided between mathematical descriptions of basic behaviors and treatment of specific types of waveguide structures. Classical (distributed-network) transmission lines, their basic properties, their connection to lumped-element networks, and the distortion of pulses are discussed followed by a full field analysis of waveguide modes. Modes of specific kinds of waveguides - traditional hollow metallic waveguides, dielectric (including optical) waveguides, etc. are discussed. Problems of excitation and scattering of waveguide modes are addressed, followed by discussion of real systems and performance.

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.

Provides a comprehensive discussion of planar transmission lines and their applications, focusing on physical understanding, analytical approach, and circuit models Planar transmission lines form the core of the modern high-frequency communication, computer, and other related technology. This advanced text gives a complete overview of the technology and acts as a comprehensive tool for radio frequency (RF) engineers that reflects a linear discussion of the subject from fundamentals to more complex arguments. Introduction to Modern Planar Transmission Lines: Physical, Analytical, and Circuit Models Approach begins

with a discussion of waves on transmission lines and waves in material medium, including a large number of illustrative examples from published results. After explaining the electrical properties of dielectric media, the book moves on to the details of various transmission lines including waveguide, microstrip line, co-planar waveguide, strip line, slot line, and coupled transmission lines. A number of special and advanced topics are discussed in later chapters, such as fabrication of planar transmission lines, static variational methods for planar transmission lines, multilayer planar transmission lines, spectral domain analysis, resonators, periodic lines and surfaces, and metamaterial realization and circuit models. Emphasizes modeling using physical concepts, circuit-models, closed-form expressions, and full derivation of a large number of expressions Explains advanced mathematical treatment, such as the variation method, conformal mapping method, and SDA Connects each section of the text with forward and backward cross-referencing to aid in personalized self-study Introduction to Modern Planar Transmission Lines is an ideal book for senior undergraduate and graduate students of the subject. It will also appeal to new researchers with the inter-disciplinary background, as well as to engineers and professionals in industries utilizing RF/microwave technologies.

An original advanced level reference appealing to both the microwave and antenna

communities An overview of the research activity devoted to the synthesis of transmission lines by means of electrically small planar elements, highlighting the main microwave applications and the potential for circuit miniaturization Showcases the research of top experts in the field Presents innovative topics on synthesized transmission lines, which represent fundamental elements in microwave and mm-wave integrated circuits, including on-chip integration Covers topics that are related to the microwave community (transmission lines), and topics that are related to the antenna community (phased arrays), broadening the readership appeal

In the last 30 years there have been dramatic changes in electrical technology--yet the length of the undergraduate curriculum has remained four years. Until some ten years ago, the analysis of transmission lines was a standard topic in the EE and CpE undergraduate curricula. Today most of the undergraduate curricula contain a rather brief study of the analysis of transmission lines in a one-semester junior-level course on electromagnetics. In some schools, this study of transmission lines is relegated to a senior technical elective or has disappeared from the curriculum altogether. This raises a serious problem in the preparation of EE and CpE undergraduates to be competent in the modern industrial world. For the reasons mentioned above, today's undergraduates lack the basic skills to design high-speed digital and high-frequency analog systems. It does little good to write sophisticated software if the hardware is unable to process the instructions. This problem will increase as the speeds and frequencies of these systems

continue to increase seemingly without bound. This book is meant to repair that basic deficiency.

The Propagation of Electromagnetic Waves in Multiconductor Transmission Lines presents the study of the problems relating to the propagation of electromagnetic waves along multi-conductor transmission line. This book examines the theoretical investigations into the propagation of electromagnetic waves in transmission line systems involving two or more conductors. Organized into 12 chapters, this book begins with an overview of the rigorous method based on Maxwell's equations for solving the basic problem in the theory of the steady-state propagation of electromagnetic waves in a multi-conductor system. This text then examines the significant practical problem of determining the electromagnetic fields of symmetrical and non-symmetrical two-wire lines in free space. Other chapters consider the methods of calculating the parameters of non-uniform lines. This book discusses as well the problem of transient electromagnetic processes in a multi-conductor system. The final chapter deals with the asymptotic representation of cylindrical functions of two-imaginary variables. Electrical engineers will find this book useful.

Guru and Hiziroglu have produced an accessible and user-friendly text on electromagnetics that will appeal to both students and professors teaching this course. This lively book includes many worked examples and problems in every chapter, as well as chapter summaries and background revision material where appropriate. The

book introduces undergraduate students to the basic concepts of electrostatic and magnetostatic fields, before moving on to cover Maxwell's equations, propagation, transmission and radiation. Chapters on the Finite Element and Finite Difference method, and a detailed appendix on the Smith chart are additional enhancements. MathCad code for many examples in the book and a comprehensive solutions set are available at www.cambridge.org/9780521830164.

Suitable for advanced undergraduate students of electronic and electrical engineering, this text provides a comprehensive review of the fundamental theory for the transverse electromagnetic mode (TEM) on transmission lines, with emphasis on communications applications. The coverage includes transient performance of relevance for digital systems as well as the more traditional steady-state sinusoidal performance. Both time-domain and frequency-domain measurements are considered. Interconnections in digital systems are considered from a transmission-line viewpoint and an analysis is given for the crosstalk problem for coupled lines. For the case of sinusoidal excitation the theory for a wide range of matching systems is given, ranging from simple stub tuners to multi-section transformers and tapers. There is particular emphasis on the effect of errors on system performance. Computer program listings are provided for the design of matching systems and the study of the effects of errors. These Turbo Pascal programs are available separately on diskette.

Transmission Lines and Wave Propagation, Fourth Edition helps readers develop a

thorough understanding of transmission line behavior, as well as their advantages and limitations. Developments in research, programs, and concepts since the first edition presented a demand for a version that reflected these advances. Extensively revised, the fourth edition of this bestselling text does just that, offering additional formulas and expanded discussions and references, in addition to a chapter on coupled transmission lines. What Makes This Text So Popular? The first part of the book explores distributed-circuit theory and presents practical applications. Using observable behavior, such as travel time, attenuation, distortion, and reflection from terminations, it analyzes signals and energy traveling on transmission lines at finite velocities. The remainder of the book reviews the principles of electromagnetic field theory, then applies Maxwell's equations for time-varying electromagnetic fields to coaxial and parallel conductor lines, as well as rectangular, circular, and elliptical cylindrical hollow metallic waveguides, and fiber-optic cables. This progressive organization and expanded coverage make this an invaluable reference. With its analysis of coupled lines, it is perfect as a text for undergraduate courses, while graduate students will appreciate it as an excellent source of extensive reference material. This Edition Includes: An overview of fiber optic cables emphasizing the principle types, their propagating modes, and dispersion Discussion of the role of total internal reflection at the core/cladding interface, and the specific application of boundary conditions to a circularly symmetrical propagating mode A chapter on coupled transmission lines, including coupled-line network analysis

and basic crosstalk study More information on pulse propagation on lines with skin-effect losses A freeware program available online Solutions manual available with qualifying course adoption

Julian Schwinger was already the world's leading nuclear theorist when he joined the Radiation Laboratory at MIT in 1943, at the ripe age of 25. Just 2 years earlier he had joined the faculty at Purdue, after a postdoc with OppenheimerinBerkeley,andgraduatestudyatColumbia. Anearlysemester at Wisconsin had con?rmed his penchant to work at night, so as not to have to interact with Breit and Wigner there. He was to perfect his iconoclastic 1 habits in his more than 2 years at the Rad Lab. Despite its deliberately misleading name, the Rad Lab was not involved in nuclear physics, which was imagined then by the educated public as a esoteric science without possible military application. Rather, the subject at hand was the perfection of radar, the beaming and re?ection of microwaves which had already saved Britain from the German onslaught. Here was a technology which won the war, rather than one that prematurely ended it, at a still incalculable cost. It was partly for that reason that Schwinger joined this e?ort, rather than what might have appeared to be the more natural project for his awesome talents, the development of nuclear weapons at Los Alamos. He had got a bit of a taste of that at the "Metallurgical

Laboratory" in Chicago, and did not much like it. Perhaps more important for his decision to go to and stay at MIT during the war was its less regimented and isolated environment.

This latest edition continues the evolution toward the ultimate realization of a new technique for solving electromagnetic propagation problems. The technique combines the classical and intuitive use of a transmission line matrix (TLM) while striving for consistency with the guideposts demanded by quantum mechanics and the essential structure of electromagnetic theory. The matrix then becomes a useful vehicle for examining both coherent and noncoherent electromagnetic waves. The goal is a mathematical tool capable of solving problems related to the propagation of transient, high-speed, complex waveforms containing both symmetric and plane wave components. For such waveforms, standard classical electromagnetic theory is unable to provide a truly accurate solution since it does not properly account for the correlations among the various TLM cells. The correlations among neighboring TLM cells allow the cell waves to sense one another and to collectively participate as a coherent wave. For arbitrary signals, e.g., complex, high speed, highly non-uniform signals, the correlation model must be placed on a firmer footing to insure the proper correlation strength based on the close adherence to quantum mechanical principles. The purpose of the Third

Edition is to thereby improve the correlation model, and incorporate the model into the simulations. The simulation results thus obtained show great promise in describing the full range of electromagnetic phenomena. Wave divergence and diffraction simulations, employing both composite and shorter range correlation models, have been incorporated. The models employ correlation coefficients which may be linked with quantum mechanical parameters, thus providing a deeper understanding of coherent wave fronts. Contents: Introduction to Transmission Lines and Their Application to Electromagnetic PhenomenaNotation and Mapping of Physical PropertiesScattering EquationsCorrections for Plane Wave and Grid Anisotropy EffectsBoundary Conditions and DispersionCell Discharge Properties and Integration of Transport Phenomena into the Transmission Line MatrixDescription of TLM Iteration (includes Correlation/Decorrelation Effects)SPICE Solutions Readership: Graduate students and researchers in applied physics and electrical engineering. Keywords: Transmission Line Matrix;Electromagnetics;Plane Waves;Wave Correlations;Light Activated Semiconductor;Picosecond Electromagnetic SignalsReview: Key Features: Unique approach offering the potential for more accurate solutions compared to the standard approaches, especially in the treatment of fast risetime (picosecond) devices and transmitters, that may

eventually supplant present standard electromagnetic methods, which have limited validity for very fast phenomenaEmploys the TLM method, that is very intuitive and physically appealing; thus providing a convenient means for incorporating correlation/decorrelation effects, which are relatable to quantum mechanical parametersLists the Program Statements giving the reader a "hands-on" approach to the simulations, which will encourage readers to observe the effects of their own changes in the program

One of us (FAB) published a book Problems in Electronics with Solutions in 1957 which became well established and ran to five editions, the last revised and enlarged edition appearing in 1976. When the first edition was written it covered almost the complete undergraduate electronics courses in engin eering at universities. One book, at a price students can afford, can no longer cover an undergraduate course in electronics. It has therefore been decided to produce a book covering one important section of such a course using the experience gained and a few problems from previous editions of Problems in Electronics with Solutions. The book is based largely on problems collected by us over many years and given to undergraduate electronic and electrical engineers. Its purpose is to present the problems, together with a large number of their solutions, in the hope that it will prove valuable to undergraduates and other teachers. It should

also be useful for Master's degree students in electronic and electrical engineering and physics, research workers, engineers and scientists in industry and as a reference source.

The theory of transmission lines is a classical topic of electrical engineering. Recently this topic has received renewed attention and has been a focus of considerable research. This is because the transmisson line theory has found new and important applications in the area of high-speed VLSI interconnects, while it has retained its significance in the area of power transmission. In many applications, transmission lines are connected to nonlinear circuits. For instance, interconnects of high-speed VLSI chips can be modelled as transmission lines loaded with nonlinear elements. These nonlinearities may lead to many new effects such as instability, chaos, generation of higher order harmonics, etc. The mathematical models of transmission lines with nonlinear loads consist of the linear partial differential equations describing the current and voltage dynamics along the lines together with the nonlinear boundary conditions imposed by the nonlinear loads connected to the lines. These nonlinear boundary conditions make the mathematical treatment very difficult. For this reason, the analysis of transmission lines with nonlinear loads has not been addressed adequately in the existing literature. The unique and distinct feature of the proposed book is that it

will present systematic, comprehensive, and in-depth analysis of transmission lines with nonlinear loads. A unified approach for the analysis of networks composed of distributed and lumped circuits A simple, concise and completely general way to present the wave propagation on transmission lines, including a thorough study of the line equations in characteristic form Frequency and time domain multiport representations of any linear transmission line A detailed analysis of the influence on the line characterization of the frequency and space dependence of the line parameters A rigorous study of the properties of the analytical and numerical solutions of the network equations The associated discrete circuits and the associated resisitive circuits of transmission lines Periodic solutions, bifurcations and chaos in transmission lines connected to noninear lumped circuits

Presents wideband RF technologies and antennas in the microwave band and millimeter-wave band This book provides an up-to-date introduction to the technologies, design, and test procedures of RF components and systems at microwave frequencies. The book begins with a review of the elementary electromagnetics and antenna topics needed for students and engineers with no basic background in electromagnetic and antenna theory. These introductory chapters will allow readers to study and understand the basic design principles

and features of RF and communication systems for communications and medical applications. After this introduction, the author examines MIC, MMIC, MEMS, and LTCC technologies. The text will also present information on meta-materials, design of microwave and mm wave systems, along with a look at microwave and mm wave receivers, transmitters and antennas. Discusses printed antennas for wireless communication systems and wearable antennas for communications and medical applications Presents design considerations with both computed and measured results of RF communication modules and CAD tools Includes end-of-chapter problems and exercises Wideband RF Technologies and Antennas in Microwave Frequencies is designed to help electrical engineers and undergraduate students to understand basic communication and RF systems definition, electromagnetic and antennas theory and fundamentals with minimum integral and differential equations. Albert Sabban, PhD, is a Senior Researcher and Lecturer at Ort Braude College Karmiel Israel. Dr. Sabban was RF and antenna specialist at communication and Biomedical Hi-tech Companies. He designed wearable compact antennas to medical systems. From 1976 to 2007, Dr. Albert Sabban worked as a senior R&D scientist and project leader in RAFAEL.

This monograph deals with the theoretical aspects of the circuit modelling of high-

frequency electromagnetic structures using the Lorentz reciprocity theorem. This is the first book to cover the generalization from closed structures to open-boundary waveguides and circuit structures. The author has developed a new way to represent a general waveguide by transmission lines: and was awarded the Microwave Prize of the IEEE for this work. The first part of the book discusses the construction of transmission line models for waveguide structures. Then the incidence of external electromagnetic waves on high-frequency structures is studied, and finally the concepts derived in the earlier parts of the book are generalized to reciprocal and non-reciprocal anisotropic, bi-isotropic, and bianisotropic materials.

A transmission line is the material medium or structure that forms all or part of a path from one place to another for directing the transmission of energy, such as electromagnetic waves or acoustic waves, as well as electric power transmission. This book presents current research data from across the globe in the study of transmission lines, including fault location fundamentals in transmission and distribution systems; optical fibers used for terrestrial and submarine transmission systems; transmission pole dynamics and design; the impacts of priority service on transmission investment using a mathematical programming model; impedance matching by segmented transmission lines; and wave propagating in the magnetically insulated transmission

line.

The book introduces concepts on a wide range of materials and has several advantages over existing texts, including: 1. The presentation of a series of scientific postulates and laws of RF and microwaves, which lay the foundation for the behavior of waves and their propagation on transmission lines, is unique to this book compared with similar RF and Microwave texts. 2. The presentation of classical laws and principles of electricity and magnetism, all inter-related, conceptually and graphically. 3. There is a shift of emphasis from rigorous mathematical solutions of Maxwell's equations, and instead has been aptly placed on simple yet fundamental concepts that underlie these equations. This shift of emphasis will promote a deeper understanding of the electronics, particularly at RF/Microwave frequencies. 4. Wave propagation in free space and tramsmission lines has been amply treated from a totally new standpoint. Designing RF/Microwave passive circuits using the Smith Chart as covered in this book becomes a systematic and yet pleasant task, which can easily be duplicated by any practitioner in the field. 5. New technical terms are precisely defined as they are first introduced, thereby keeping the subject matter in focus and preventing misunderstanding, and 6. Finally the abundant use of graphical illustrations and diagrams brings a great deal of clarity and conceptual understanding, enabling difficult concepts to be understood with ease. The fundamentals of RF and microwave electronics can be mastered visually, through many tested practical examples in the

book and in the accompanying CD using Microsoft Excel ® environment. This book is perfect for RF/microwave newcomers or industry veterans! The material is presented lucidly and effectively through worked practical examples using both clear-cut math and vivid illustrations, which help the reader gain practical knowledge in passive circuit design using the Smith Chart.

This book offers a thoroughly up-to-date understanding of artificial transmission lines, from their fundamentals to their main RF and microwave applications. The following topics are presented: fundamentals of transmission lines; artificial transmission lines based on periodic and slow wave structures; artificial lines based on metamaterial concepts; reconfigurable, tunable, and nonlinear transmission lines; magneto- and electro-inductive wave delay lines; common mode suppressed balanced lines; wideband artificial transmission lines; and substrate integrated waveguides.

This systematic and well-written book provides an in-depth analysis of all the major areas of the subject such as fields, waves and lines. It is written in a simple and an easy-to-understand language. Beginning with a discussion on vector calculus, the book elaborately explains electrostatics, including the concepts of electric force and field intensity, electric displacement, Gauss law, conductors, dielectrics and capacitors. This is followed by a detailed study of magnetostatics, covering Biot–Savart law, Lorentz's force law and Ampere's circuital law. Then, it discusses Maxwell's equations that describe the time-varying fields and the wave theory which is the basis of radiation and

wireless communications. Finally, the book gives a fair treatment to transmission line theory, which is a foundation course in mechanical engineering. The text is well-supported by a large number of solved and unsolved problems to enhance the analytical skill of the students. The problems are framed to test the conceptual understanding of the students. It also includes plenty of objective type questions with answers. It is intended as a textbook for the undergraduate students of Electrical and Electronics Engineering and Electronics and Communication Engineering for their course on Electromagnetic Waves and Transmission Lines.

Electronic Waves & Transmission Line Circuit DesignYour Illustrated Guide to Wave EngineeringAuthor House

Summary: Describes transmission line matrix techniques for solving electromagnetic problems. The approach visualizes the propagation medium as divided into identical cells with the electromagnetic energy confined to transmission lines which separate the cells. The author, who works for United Silicon Carbide, develops the electromagnetic scattering equations for one, two and three dimensions, corrects the transmission line matrix for any wave properties, and incorporates boundary conditions and dispersion into the method. Finally, he outlines a computer program for finding the transient solution of a 2D semiconductor switch whose conductivity is induced by a light source.