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KEY=LINES - QUINN HASSAN

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

PHI Learning Pvt. Ltd. *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.*

TRANSMISSION LINES AND WAVE PROPAGATION, FOURTH EDITION

CRC Press *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*

ELECTROMAGNETIC FIELD THEORY AND TRANSMISSION LINES

Pearson Education India *Electromagnetic Field Theory and Transmission Lines is an ideal textbook for a single semester, first course on Electromagnetic Field Theory (EMFT) at the undergraduate level. This book uses plain and simple English, diagrammatic representations and real life examples to explain the fundamental concepts, notations, representation and principles that govern the field of EMFT. The chapters cover every aspect of EMFT from electrostatics to advanced topics dealing with Electromagnetic Interference (EMI)/Electromagnetic Compatibility (EMC), EMC standards and design methods for EMC. Careful and deta.*

ELECTROMAGNETIC FIELD THEORY FUNDAMENTALS

Cambridge University Press *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.*

THE PROPAGATION OF ELECTROMAGNETIC WAVES IN MULTICONDUCTOR TRANSMISSION LINES

INTERNATIONAL SERIES OF MONOGRAPHS ON ELECTROMAGNETIC WAVES

<u>Elsevier</u> *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.*

ELECTROMAGNETIC WAVES & TRANSMISSION LINES

WIDEBAND RF TECHNOLOGIES AND ANTENNAS IN MICROWAVE FREQUENCIES

<u>John Wiley & Sons</u> *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.*

ELECTROMAGNETICS AND TRANSMISSION LINES

<u>Technical Publications</u> *The book covers all the aspects of Electromagnetics and Transmission Lines for undergraduate course. The book provides comprehensive coverage of vector analysis, Coulomb's law, electric field intensity, flux and Gauss's law, conductors, dielectrics, capacitance, Poisson's and Laplace's equations, magnetostatics, electrodynamic fields, Maxwell's equations, Poynting theorem, transmission lines and uniform plane waves. The knowledge of vector analysis is the base of electromagnetic engineering. Hence book starts with the discussion of vector analysis. Then it introduces the basic concepts of electrostatics such as Coulomb's law, electric field intensity due to various charge distributions, electric flux, electric flux density, Gauss's law and divergence. The book continues to explain the concept of elementary work done, conservative property, electric potential and potential difference and the energy in the electrostatic fields. The detailed discussion of current density, continuity equation, boundary conditions and various types of capacitors is also included in the book. The book provides the discussion of Poisson's and Laplace's equations and their use in variety of practical applications. The chapter on magnetostatics incorporates the explanation of Biot-Savart's law, Ampere's circuital law and its applications, concept of curl scalar and vector magnetic potentials. The book also includes the concept of force on a moving charge, force on differential current element and magnetic boundary conditions. The book covers all the details of Faraday's laws, time varying fields, Maxwell's equations and Poynting theorem. 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 and Smith chart. Finally, the book provides the detailed study of uniform plane waves including their propagation in free space, perfect dielectrics, lossy dielectrics and good conductors. The book uses plain and lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self explanatory diagrams and large number of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.*

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

FIELDS, WAVES AND TRANSMISSION LINES

<u>Springer Science & Business Media</u> *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.

BASICS OF ELECTROMAGNETICS AND TRANSMISSION LINES

<u>CRC Press</u> *This book provides a complete awareness on the subject EMTL with regards to both theoretical and practical aspects of the subject. Various concepts from fundamentals to advanced topics are presented and discussed adequately. The book's bottom-up approach ensures that students understand all the basic building blocks before the development of a real-life system. Numerical problems and day-to-day examples, practical situations that occur in industries & daily life are also presented. Please note: Taylor & Francis does not sell or distribute the Hardback in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka.*

ELECTROMAGNETIC ANALYSIS USING TRANSMISSION LINE VARIABLES

<u>World Scientific</u> *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.*

FIELDS, WAVES AND TRANSMISSION LINES

<u>Springer</u> *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.*

ELECTROMAGNETIC ANALYSIS USING TRANSMISSION LINE VARIABLES

<u>World Scientific</u> *Problems in electromagnetic propagation, especially those with complex geometries, have traditionally been solved using numerical methods, such as the method of finite differences. Unfortunately the mathematical methods suffer from a lack of physical appeal. The researcher or designer often loses sight of the physics underlying the problem, and changes in the mathematical formulation are often not identifiable with any physical change. This book employs a relatively new method for solving electromagnetic problems, one which makes use of a transmission line matrix (TLM). The propagation space is imagined to be filled with this matrix. The propagating fields and physical properties (for example, the presence of conductivity) are then mapped onto the matrix. Mathematically, the procedures are identical with the traditional numerical methods; however, the interpretation and physical appeal of the transmission line matrix are far superior. Any change in the matrix has an immediate physical significance. What is also very important is that the matrix becomes a launching pad for many improvements in the analysis (for example, the nature of coherent waves) using more modern notions of electromagnetic waves. Eventually, the purely mathematical techniques will probably give way to the transmission line matrix method. Contents: Introduction to Transmission Lines and Their Application to Electromagnetic PhenomenaNotation and Mapping of Physical PropertiesScattering EquationsCorrections for Plane Wave and Anisotropy EffectsBoundary Conditions and DispersionCell Discharge Properties and Integration of Transport Phenomena into the TLM MatrixDescription of TLM IterationSPICE Solutions Readership: Electrical engineers and physicists involved in electromagnetic propagation and analysis, as well as computer specialists involved in the development of advanced codes in electromagnetics. Keywords:Electromagnetics;Transmission Line;Node;Cell Matrix;PhotoconductivitySemiconductor;Avalanche Effect;Coherence;Wave Propagation;Finite DifferenceReviews:"The book treats the subject in a systematic manner giving the mathematical rigour necessary to describe the physical phenomena. The book is a useful work."Mathematics Abstracts*

TRANSMISSION LINES

EQUIVALENT CIRCUITS, ELECTROMAGNETIC THEORY, AND PHOTONS

<u>Cambridge University Press</u> *A rigorous and straightforward treatment of analog, digital and optical transmission lines, which avoids using complex mathematics.*

ELECTROMAGNETIC FIELD INTERACTION WITH TRANSMISSION LINES

FROM CLASSICAL THEORY TO HF RADIATION EFFECTS

<u>WIT Press</u> *The evaluation of electromagnetic field coupling to transmission lines is an important problem in electromagnetic compatibility. Traditionally, use is made of the TL approximation which applies to uniform transmission lines with electrically small cross-sectional dimensions, where the dominant mode of propagation is TEM. Antenna-mode currents and higher-order modes appearing at higher frequencies are neglected in TL theory. The use of the TL approximation has permitted to solve a large range of problems (e.g. lightning and EMP interaction with power lines). However, the continual increase in operating frequency of products and higher frequency sources of disturbances (such as UWB systems) makes that the TL basic assumptions are no longer acceptable*

for a certain number of applications. In the last decade or so, the generalization of classical TL theory to take into account high frequency effects has emerged as an important topic of study in electromagnetic compatibility. This effort resulted in the elaboration of the so-called 'generlized' or 'full-wave' TL theory, which incorporates high frequency radiation effects, while keeping the relative simplicity of TL equations. This book is organized in two main parts. Part I presents consolidated knowledge of classical transmission line theory and different field-to-transmission line coupling models. Part II presents different approaches developed to generalize TL Theory.

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

MODULE 10-INTRODUCTION TO WAVE PROPAGATION, TRANSMISSION LINES, AND ANTENNAS

Рипол Классик

ELECTROMAGNETIC WAVEGUIDES AND TRANSMISSION LINES

OUP Oxford *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.*

ELECTROMAGNETIC ANALYSIS USING TRANSMISSION LINE VARIABLES (THIRD EDITION)

World Scientific *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*

TRANSMISSION LINES AND WAVE PROPAGATION

CRC Press *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

LOCALIZATION OF ELECTROMAGNETIC WAVES IN NETWORKS OF TRANSMISSION LINES

SWR EXPLAINED

A RADIO AMATEUR'S GUIDE TO ELECTROMAGNETIC WAVES, TRANSMISSION LINES AND VSWR.

LOW-VISIBILITY ANTENNAS FOR COMMUNICATION SYSTEMS

CRC Press Low-visibility antennas have many attractive features, such as being low-profile, flexible, lightweight, small-volume, and low-cost. Low-Visibility Antennas for Communication Systems provides explicit guidelines for the development of these antennas. Offering valuable insight into emerging antenna technologies, the book:Introduces the fundamental t

THE PROPAGATION OF ELECTROMAGNETIC WAVES IN MULTICONDUCTOR TRANSMISSION LINES

COUPLING BETWEEN ELECTROMAGNETIC WAVES AND WIRES USING TRANSMISSION-LINE MODELLING

ANALYSIS OF ELECTROMAGNETIC FIELDS AND WAVES

THE METHOD OF LINES

John Wiley & Sons The Method of Lines (MOL) is a versatile approach to obtaining numerical solutions to partial differential equations (PDEs) as they appear in dynamic and static problems. This method, popular in science and engineering, essentially reduces PDEs to a set of ordinary differential equations that can be integrated using standard numerical integration methods. Its significant advantage is that the analysis algorithms follow the physical wave propagation and are therefore efficient. This is because the fields on the discretisation lines are described by generalised transmission line (GTL) equations. With this formulation we have a connection to the well known transmission line theory and resulting in an easy understanding. The method of lines is a very accurate and powerful way to analyze electromagnetic waves, enabling a full-wave solution without the computational burden of pure finite element or finite difference methods. With Analysis of Electromagnetic Fields and Waves, Reinhold Pregla describes an important and powerful method for analyzing electromagnetic waves. This book: Describes the general analysis principles for electromagnetic fields. Includes applications in microwave, millimetre wave and optical frequency regions. Unifies the analysis by introducing generalised transmission line (GTL) equations for all orthogonal coordinate systems and with materials of arbitrary anisotropy as a common start point. Demonstrates a unique analysis principle with the numerical stable impedance/admittance transformation and a physical adapted field transformation concept that is also useful for other modelling algorithms. Includes chapters on Eigenmode calculations for various waveguides, concatenations and junctions of arbitrary number of different waveguide sections in complex devices, periodic structures (e.g. Bragg gratings, meander lines, clystron resonators, photonic crystals), antennas (e.g. circular and conformal). Enables the reader to solve partial differential equations in other physical areas by using the described principles. Features an accompanying website with program codes in Matlab© for special problems. Analysis of Electromagnetic Fields and Waves will appeal to electromagnetic field practitioners in primary and applied research as well as postgraduate students in the areas of photonics, micro- and millimetre waves, general electromagnetics, e.g. microwave integrated circuits, antennas, integrated and fibre optics, optoelectronics, nanophotonics, microstructures, artificial materials.

THEORY OF WAVEGUIDES AND TRANSMISSION LINES

CRC Press 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.

ELECTRONIC WAVES & TRANSMISSION LINE CIRCUIT DESIGN

YOUR ILLUSTRATED GUIDE TO WAVE ENGINEERING

Author House 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.

THE DETERMINATION OF ELECTROMAGNETIC WAVES IN TRANSMISSION-LINES OF CONSTANT CROSS-SECTION BUT NON-UNIFORM MEDIA

ELECTROMAGNETIC METAMATERIALS

TRANSMISSION LINE THEORY AND MICROWAVE APPLICATIONS

John Wiley & Sons *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.*

FUNDAMENTALS OF TRANSMISSION LINES AND ELECTROMAGNETIC FIELDS

Addison Wesley Publishing Company

THE PROPAGATION OF ELECTROMAGNETIC WAVES IN MULTICONDUCTOR TRANSMISSION LINES

THE PROPAGATION OF ELECTROMAGNETIC WAVES IN MULTICONDUCTOR TRANSMISSION LINES, ETC

THE PROPAGATION OF ELECTROMAGNETIC WAVES IN MULTICONDUCTOR TRANSMISSION LINES

TRANSMISSION LINES AND LUMPED CIRCUITS

FUNDAMENTALS AND APPLICATIONS

Elsevier *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*

ELECTROMAGNETIC FIELD WAVES AND TRANSMISSION LINES

ELECTROMAGNETIC FIELD THEORY

Technical Publications *The comprehensive study of electric, magnetic and combined fields is nothing but electromagnetic engineering. Along with electronics, electromagnetics plays an important role in other branches. The book is structured to cover the key aspects of the course Electromagnetic Field Theory for undergraduate students. The knowledge of vector analysis is the base of electromagnetic engineering. Hence book starts with the discussion of vector analysis. Then it introduces the basic concepts of electrostatics such as Coulomb's law, electric field intensity due to various charge distributions, electric flux, electric flux density, Gauss's law, divergence and divergence theorem. The book continues to explain the concept of elementary work done, conservative property, electric potential and potential difference and the energy in the electrostatic fields. The detailed discussion of current density, continuity*

equation, boundary conditions and various types of capacitors is also included in the book. The book provides the discussion of Poisson's and Laplace's equations and their use in variety of practical applications. The chapter on magnetostatics incorporates the explanation of Biot-Savart's law, Ampere's circuital law and its applications, concept of curl, Stoke's theorem, scalar and vector magnetic potentials. The book also includes the concept of force on a moving charge, force on differential current element and magnetic boundary conditions. The book covers all the details of Faraday's laws, time varying fields, Maxwell's equations and Poynting theorem. Finally, the book provides the detailed study of uniform plane waves including their propagation in free space, perfect dielectrics, lossy dielectrics and good conductors. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. The variety of solved examples is the feature of this book which helps to inculcate the knowledge of the electromagnetics in the students. Each chapter is well supported with necessary illustrations and self-explanatory diagrams. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

APPLIED ELECTROMAGNETICS

EARLY TRANSMISSION LINES APPROACH

John Wiley & Sons *STUDENT COMPANION SITE Every new copy of Stuart Wentworth's Applied Electromagnetics comes with a registration code which allows access to the Student's Book Companion Site. On the BCS the student will find: * Detailed Solutions to Odd-Numbered Problems in the text * Detailed Solutions to all Drill Problems from the text * MATLAB code for all the MATLAB examples in the text * Additional MATLAB demonstrations with code. This includes a Transmission Lines simulator created by the author. * Weblinks to a vast array of resources for the engineering student. Go to www.wiley.com/college/wentworth to link to Applied Electromagnetics and the Student Companion Site. ABOUT THE PHOTO Passive RFID systems, consisting of readers and tags, are expected to replace bar codes as the primary means of identification, inventory and billing of everyday items. The tags typically consist of an RFID chip placed on a flexible film containing a planar antenna. The antenna captures radiation from the reader's signal to power the tag electronics, which then responds to the reader's query. The PENI Tag (Product Emitting Numbering Identification Tag) shown, developed by the University of Pittsburgh in a team led by Professor Marlin H. Mickle, integrates the antenna with the rest of the tag electronics. RFID systems involve many electomagnetics concepts, including antennas, radiation, transmission lines, and microwave circuit components. (Photo courtesy of Marlin H. Mickle.)*

TRANSMISSION LINES

THEORY, TYPES, AND APPLICATIONS

Nova Science Pub Incorporated *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.*