Ultra-Wideband Antennas

Guest Editors: James Becker, Dejan Filipovic, Hans Schantz, and Seong-Youp Suh



Zhi Ning Chen

Band-Notch Characteristics in Ultra-Wideband Antennas Taimoor Khan, Yahia M.M. Antar, 2021-06-08 This book comprehensively reviews ultra wideband UWB and UWB multi input multi output MIMO antennas with band notched characteristics with a focus on interference cancellation functionality. The book is organized into seven chapters that cover single band dual band and multi band notched UWB antennas followed by band notched characteristics in UWB MIMO antennas Further it explains the mechanism of reconfigurability and tunability in band notched UWB antennas including advanced applications of UWB systems Overall it covers different techniques of canceling the electromagnetic interference in UWB in a concise volume Features Provides a comprehensive presentation of avoiding interference in UWB systems Reviews state of the art literature related to UWB antennas filtennas and various reconfigurable technologies Explains different techniques for producing band notch characteristics in UWB systems Includes discussion on historical perspectives of UWB technology Consolidates different research activities carried out on the electromagnetic interference cancellation techniques in the UWB communication systems Band Notch Characteristics in Ultra Wideband Antennas is aimed at researchers and graduate students in electrical and antenna engineering Taimoor Khan has been an Assistant Professor at the Department of Electronics and Communication Engineering National Institute of Technology Silchar since 2014 In addition to this Dr Khan has also worked as a Visiting Assistant Professor at Asian Institute of Technology Bangkok Thailand during September December 2016 His active research interests include Printed Microwave Circuits Electromagnetic Bandgap Structures Ultra wideband Antennas Dielectric Resonator Antennas Ambient Microwave Energy Harvesting and Artificial Intelligence Paradigms in Electromagnetics Dr Khan has successfully guided three Ph D theses and is supervising six Ph D students He has published over 75 research articles in well indexed journals and in world renowned conference proceedings Currently he is executing three funded research projects including two international collaborative SPARC and VAJRA research projects In September 2020 Dr Khan has been awarded a prestigious national IETE Prof SVC Aiya Memorial Award for the year 2020 Yahia M M Antar has been a Professor at the Department of Electrical and Computer Engineering Royal Military College of Canada since 1990 He served as the Chair of CNC URSI from 1999 to 2008 Commission B from 1993 to 1999 and has a cross appointment at Queen's University in Kingston He has authored and co authored over 250 journal papers several books and chapters in books over 500 refereed conference papers holds several patents has chaired several national and international conferences and has given plenary talks at many conferences Dr Antar is a fellow of the Engineering Institute of Canada the Electromagnetic Academy and an International Union of Radio Science URSI He was elected by the URSI to the Board as the Vice President in 2008 and in 2014 and to the IEEE AP AdCom in 2009 In 2011 he was appointed as a member of the Canadian Defence Advisory Board DAB of the Canadian Department of National Defence He serves as an Associate Editor for many IEEE and IET Journals and as an IEEE APS Distinguished Lecturer Presently he is working as President Elect for IEEE

Antenna and Propagation Society for the year 2020 **Ultra Wide Band Antennas** Xavier Begaud, 2013-03-04 Ultra Wide Band Technology UWB has reached a level of maturity that allows us to offer wireless links with either high or low data rates These wireless links are frequently associated with a location capability for which ultimate accuracy varies with the inverse of the frequency bandwidth Using time or frequency domain waveforms they are currently the subject of international standards facilitating their commercial implementation Drawing up a complete state of the art Ultra Wide Band Antennas is aimed at students engineers and researchers and presents a summary of internationally recognized studies Wideband Antennas Giselle M. Galvan-Tejada, Marco Antonio Peyrot-Solis, Hildeberto Jardón Aguilar, 2017-12-19 Ultra Wideband Antennas Design Methodologies and Performance presents the current state of the art of ultra wideband UWB antennas from theory specific for these radiators to guidelines for the design of omnidirectional and directional UWB antennas Offering a comprehensive overview of the latest UWB antenna research and development this book Discusses the developed theory for UWB antennas in frequency and time domains Delivers a brief exposition of numerical methods for electromagnetics oriented to antennas Describes solid planar equivalence which allows flat structures to be implemented instead of volumetric antennas Examines the impedance matching phase linearity and radiation patterns as design objectives for omnidirectional and directional antennas Addresses the time domain signal analysis for UWB antennas from which the distortion phenomenon can be modeled Includes illustrative examples design equations CST MICROWAVE STUDIO simulations and MATLAB plot generations Compares the performance of different UWB antennas supplying useful insight into particular tendencies and unresolved problems Ultra Wideband Antennas Design Methodologies and Performance provides a valuable reference for the scientific community as UWB antennas have a variety of applications in body area networks radar imaging spectrum monitoring electronic warfare wireless sensor networks and more **Planar Antennas** Praveen Kumar Malik, 2021-10-21 This comprehensive reference text discusses fundamental concepts applications design techniques and challenges in the field of planar antennas. The text focuses on recent advances in the field of planar antenna design and their applications in various fields of research including space communication mobile communication wireless communication and wearable applications. This resource presents planar antenna design concepts methods and techniques to enhance the performance parameters and applications for IoTs and device to device communication The latest techniques used in antenna design including their structures defected ground MIMO and fractal design are discussed comprehensively The text will be useful for senior undergraduate students graduate students and academic researchers in fields including electrical engineering electronics and communication engineering Innovations in Ultra-Wideband Technologies Albert Sabban, 2021-07-28 This book discusses innovation in ultra wideband UWB technologies and systems Divided into four sections the volume introduces UWB technologies and RF modules examines applications of these systems in areas such as medicine and sports and discusses the importance of an accurate design of microwave modules and antennas

Ultrawideband Antennas Daniel Valderas, 2011 Ultrawideband UWB technology positioned as the cutting edge of research and development paves the way to meet the emerging demands set by broadband wireless applications such as high speed data transmission medical imaging short range radars electromagnetic testing etc This breathtaking resource builds upon the basics of UWB technology to provide a complete compilation of figures of merit along with a vital state of the art of the different antenna alternatives that are to be employed according to the specific application Without excessive recourse to mathematics this volume emphasizes on the UWB antenna design and equips readers with practical prediction techniques based on simple formulas and models The big picture of UWB antenna technology would not be complete without addressing its applications and this will serve to provide consultants with key clues for slot market searching Containing over 150 supporting illustrations and figures this comprehensive overview of UWB technology antenna design and applications is a vital source of information and reference for R D organizations researchers practitioners consultants RF professionals and communication engineers Microstrip Antenna Design for Wireless Applications Praveen Kumar Malik, Sanjeevikumar Padmanaban, Jens Bo Holm-Nielsen, 2021-11-29 This book focuses on recent advances in the field of microstrip antenna design and its applications in various fields including space communication mobile communication wireless communication medical implants and wearable applications Scholars as well as researchers and those in the electronics electrical instrumentation engineering fields will benefit from this book The book shall provides the necessary literature and techniques using which to assist students and researchers would design antennas for the above mentioned applications and will ultimately enable users to take measurements in different environments It is intended to help scholars and researchers in their studies by enhancing their the knowledge and skills in on the latest applications of microstrip antennas in the world of communications such as world like IoT D2D satellites and wearable devices to name a few FEATURES Addresses the complete functional framework workflow in printed antenna design systems Explores the basic and high level concepts including advanced aspects in planer design issues thus serving as a manual for those in the the industry while also assisting beginners Provides the latest techniques used for antennas in terms of structure defected ground MIMO and fractal designs Discusses case studies related to data intensive technologies in microchip antennas in terms of the most recent applications Microstrip Antennas Sudipta and similar uses for the Internet of Things and device to device communication Chattopadhyay, 2017-11-15 The progress in modern tiny multifunctional wireless devices has dramatically increased the demand for microstrip antennas in recent years Furthermore in the last few years such microstrip antennas found numerous applications in both the military and the commercial sectors Therefore microstrip patch antenna has become a major focus to the researchers in the field of antenna engineering In this book some recent advances in microstrip antennas are presented This book contains mainly three sections In the first section some new approaches to modern analytical techniques rather than the conventional cavity model transmission line model or spectral domain analysis have been discussed In the second

section of the book a light has been showered on some new techniques for bandwidth enhancement of microstrip radiators In the last section of the book the recent trends in microstrip antenna research have been showcased Some newfangled application oriented approach to this field is vividly discussed The books main objective is to facilitate the microstrip antenna researchers for exploring the subject in more vibrant manner and also to revolutionize wireless communications A sufficient number of topics have been covered some for the first time in a research handbook I hope that the book will surely be beneficial for scientists practicing engineers and researchers working in the field of microstrip antennas Industrial and Medical Applications with Optimization Techniques for Wireless Communication S. Kannadhasan, R. Nagarajan, 2024-12-30 The text begins by covering the fundamental concepts and new advances in the field of antenna theory antenna hardware and propagation It further explains the designing of metamaterials microstrip patch antennas for medical applications photonic crystals of millimeter wave signals for 5G communications dual band miniaturized circular antennas for wireless networks and ultra thin compact flexible antennas for wearable applications. This book Presents the design and development of S shaped and T shaped microstrip path antennas for industrial applications Highlights the use of W shaped and metamaterials microstrip patch antennas for medical applications Covers photonic crystals of millimeter wave signals for 5G communications Showcases the importance of compact and wideband slot antenna for wireless communications Illustrates the design of an ultra thin compact flexible antenna for wearable applications It is primarily written for senior undergraduates graduate students and academic researchers in the fields of electrical engineering electronics and communications engineering antenna design and microwave engineering Printed Antennas Binod Kumar Kanaujia, Surendra Kumar Gupta, Jugul Kishor, Deepak Gangwar, 2020-11-22 Printed antennas have become an integral part of next generation wireless communications and have been found to be commonly used to improve system capacity data rate reliability etc This book covers theory design techniques and the chronological regression of the printed antennas for various applications This book will provide readers with the basic conceptual knowledge about antennas along with advanced techniques for antenna design It covers a variety of analytical techniques and their CAD applications and discusses new applications of printed antenna technology such as sensing The authors also present special reconfigurable antennas such as ME dipole polarization feeding and DGS The book will be useful to students as an introduction to design and applications of antennas Additionally experienced researchers in this field will find this book a ready reference and benefit from the techniques of research in printed antennas included in this book Following are some of the salient features of this book Covers a variety of analytical techniques and their CAD applications Discusses new applications of printed antenna technology such as sensing Examines the state of design techniques of printed antenna Presents special reconfigurable antennas such as ME dipole polarization feeding and DGS <u>Ultra-wideband RF System Engineering</u> Thomas Zwick, Werner Wiesbeck, Jens Timmermann, Grzegorz Adamiuk, 2013-10-03 This comprehensive summary of the state of the art in Ultra

Wideband UWB system engineering takes you through all aspects of UWB design from components through the propagation channel to system engineering aspects Mathematical tools and basics are covered allowing for a complete characterisation and description of the UWB scenario in both the time and the frequency domains UWB MMICs antennas antenna arrays and filters are described as well as quality measurement parameters and design methods for specific applications The UWB propagation channel is discussed including a complete mathematical description together with modeling tools A system analysis is offered addressing both radio and radar systems and techniques for optimization and calibration Finally an overview of future applications of UWB technology is presented Ideal for scientists as well as RF system and component engineers working in short range wireless technologies Multifunctional Ultrawideband Antennas Chinmoy Saha, Jawad Y Siddigui, Y M M Antar, 2019-03-19 Multifunctional Antennas MFA are comparatively a new area for antenna research and finds applications in various modern wireless radios like Cognitive Radio CR in Software Defined Radio SDR technology and MIMO technology This book is first attempt and an invaluable resource which deals with the design and realization of various kinds of multifunctional antennas After clearly explaining the exclusive features of MFAs the book presents various designs of such antennas considering versatile modern and upcoming applications Written by three internationally known researchers Multi Functional Ultra Wideband Antennas Trends Techniques and Applications Provides a lucid introduction on UWB systems historical perspective and discusses various applications of such systems Discusses fundamentals of antennas and its characterization in time and frequency domains primarily aimed for the beginners in the area Revisits the design and realization of various classical UWB antennas Discusses various techniques of designing frequency notched UWB antennas and provide detailed comparison of the techniques Deals with the techniques of deriving multiple antenna functionalities from a single antenna Incorporates exclusive discussions on modern reconfigurable antennas and printed and dielectric resonator based MIMO antennas with clear focus on recent and upcoming technological requirements With Multi Functional Ultra Wideband Antennas Trends Techniques and Applications antenna engineers communication system engineers graduate students academic industry researchers will gain a thorough knowledge on design of such antennas with clear physical insight and understanding Chinmoy Saha PHD is an associate Professor in the Department of Avionics at Indian Institute of Space Science and Technology Thiruvananthapuram Kerala India His current research interest includes Microwave Circuits Engineered Materials Metamaterial Inspired Antennas and Circuits reconfigurable and multi functional antennas for modern wireless applications Dielectric Resonator antennas THz antennas and wireless power transfer He is the author or coauthor of several books scientific journals and recipient of several prestigious awards Jawad Yaseen Siddiqui PHD is an associate Professor in the Department of Radio Physics and Electronics at University of Calcutta Kolkata India His current research interest includes ultra wideband antennas frequency reconfigurable antennas tapered slot antennas and multi functional antennas for cognitive radio application He is the author

or coauthor of several books scientific journals and recipient of prestigious awards He is a Co Principal Investigator on Stratosphere Troposphere ST Radar Project at the University of Calcutta Kolkata India Yahia M M Antar PHD is a Professor in the Department of Department of Electrical and Computer Engineering at the Royal Military College of Canada Kingston ON Canada He is the author or coauthor of several books scientific journals and recipient of prestigious awards which includes IEEE Antennas and Propagation Society prestigious Chen To Tai Distinguished Educator Award for 2017 2015 IEEE Canada J M Ham outstanding Engineering Education Award 2014 IEEE Canada RA Fessenden Silver Medal 2012 Queen s Diamond Jubilee Medal from the Governor General of Canada and many more Wideband, Multiband, and Smart Reconfigurable Antennas for Modern Wireless Communications Matin, Mohammad A., 2015-08-26 Modern society thrives on communication that is instant and available at all times a constant exchange of information that encompasses everything from video streaming to GPS navigation Experts even suggest that in the near future everything from our cars to our kitchen appliances will be connected to the internet a feat that would not be possible without advanced wireless technology Wideband Multiband and Smart Reconfigurable Antennas for Modern Wireless Communications showcases current trends and novel approaches in the design and analysis of the antennas that make wireless applications possible while also identifying unique integration opportunities for antennas and wireless applications to work together By featuring both theoretical and experimental approaches to integration this book highlights specific design issues to assist a wide range of readers including students researchers academics and industry practitioners. This publication features chapters on a broad scope of topics including algorithms and antenna optimization wireless infrastructure development wireless applications of intelligent algorithms antenna architecture and antenna reconfiguration techniques Antenna Fundamentals for Legacy Mobile Applications and Beyond Issa Elfergani, Abubakar Sadiq Hussaini, Jonathan Rodriguez, Raed Abd-Alhameed, 2017-10-03 This book highlights technology trends and challenges that trace the evolution of antenna design starting from 3rd generation phones and moving towards the latest release of LTE A The authors explore how the simple monopole and whip antenna from the GSM years have evolved towards what we have today an antenna design that is compact multi band in nature and caters to multiple elements on the same patch to provide high throughput connectivity. The scope of the book targets a broad range of subjects including the microstrip antenna PIFA antenna and the monopole antenna to be used for different applications over three different mobile generations Beyond that the authors take a step into the future and look at antenna requirements for 5G communications which already has the 5G drive in place with prominent scenarios and use cases emerging They examine these and put in place the challenges that lie ahead for antenna design particularly in mm Wave design The book provides a reference for practicing engineers and under post graduate students working in this field Antennas for Portable Devices Zhi Ning Chen, 2007-04-04 Offers a comprehensive and practical reference guide to antenna design and engineering for portable devices Antennas are often the most bulky components in many portable

wireless devices such as mobile phones Whilst the demand for ever smaller and more powerful wireless devices increases as does the importance of designing and engineering smaller antennas to fit these devices Antennas for Portable Devices provides a complete and cutting edge guide to the design and engineering of small antennas for portable electronic devices such as mobile phone handsets laptop computers RFID radio frequency identification microwave thermal therapies devices wearable devices and UWB ultra wideband based consumer devices The book addresses practical engineering issues that antenna professionals have to deal with It explains the immediate demands for existing systems discusses the antenna technology for the latest and emerging applications and gives comprehensive coverage of hot topics in the wireless industry Issues including design considerations engineering design measurement setup and methodology and practical applications are all covered in depth Antennas for Portable Devices Covers antennas for all modern portable wireless devices from handsets RFID tags laptops wearable sensors UWB based wireless USB dongles and handheld microwave treatment devices Explains how to design and engineer applications for miniaturization of antenna technology utilising practical case studies to provide the reader with an understanding of systems and design skills Links the basic antenna theory with design methodology and engineering design Is amply illustrated with numerous figures and data tables of antenna designs to aid understanding Features contributions from industry and research experts in antenna technology and applications This invaluable resource will provide a comprehensive overview of miniaturizing antenna technology for antenna engineers in industry and R D organizations graduate students consultants researchers RF professionals technical managers as well as practitioners working in the area of consumer electronics RF systems wireless communications or bio medical devices

Printed Antennas for Future Generation Wireless Communication and Healthcare Balaka Biswas, Ayan
Karmakar, 2023-05-16 This proposed book focuses on the design and development of printed antennas along with modeling aspects for multifaceted applications. It further investigates imperfections in the manufacturing processes and assembly operation during the testing characterization of printed antennas. This text Discusses in a comprehensive manner the design and development aspects of printed antennas. Provides fractal engineering aspects for miniaturization and wideband characteristics of the low profile antenna with high performances Covers high gain printed antenna for Terahertz application. Showcases electrical modeling of smart antennas. Pedagogical features such as review questions based on practical experiences are included at the end of each chapter. The book comprehensively discusses fractal engineering in printed antennas for miniaturization and enhancement of performance factors. It further covers the modeling of electrically small antennas circuit modeling modeling of factual based. Ultra Wide Band antennas and modeling of reconfigurable micro electromechanical system based patch antennas. The book highlights performance metrics of multiple input multiple output antennas. It will serve as an ideal reference text for senior undergraduate graduate students and academic researchers in fields including electrical engineering electronics communications engineering and computer engineering.

Wideband

Wave-Propagating Components for Wireless RF Communications Mohammad Alibakhshikenari, 2025-03-19 This book provides detailed design studies on various microwave and millimeter wave components such as modern antennas well developed sensors low loss waveguides and high precision radar structures for wireless RF communications Innovative methodologies and design approaches to overcoming challenges and enhancing the efficiency of current wireless communication devices have been thoroughly demonstrated along with experimental validations The strength of this book lies in its extensive collection of review studies on numerous works available in the literature Their disadvantages and advantages have been explicitly summarized to provide a comprehensive insight for readers Then the feasible techniques proposed in this book offer proper solutions to resolve the disadvantages of prior arts causing the improvement of the quality of telecommunication networks These contributions in antennas and wave propagation sensors waveguides and radar systems can be useful for researchers in these fields from both academic and industrial sectors interested in establishing further developments of wireless RF communication systems This book includes ten chapters discussing several wireless communication applications which were prepared by various worldwide research groups with extensive track records in RF microwave and millimeter wave technologies HCTL Open International Journal of Technology Innovations and Research (IJTIR) Raj Gaurav Mishra, 2013-03-31 HCTL Open International Journal of Technology Innovations and Research IJTIR ISSN Online 2321 1814 is an International Open Access Peer Reviewed Online journal devoted to various disciplines of Science and Technology HCTL Open IJTIR is a bi monthly journal published by HCTL Open Publications Solutions India and Hybrid Cognitive Radio Tonu Trump, 2017-07-05 Computing Technology Labs India Get more information at http ijtir hctl org One of the most critical resources required for wireless communication is the radio spectrum Traditionally the administration of the spectrum rights tends to grant exclusive rights to some services in the major geographic regions On the other hand several studies have shown that the spectrum is actually underutilized and that new devices should use the underutilized spectrum in an opportunistic manner Cognitive radio is a way to do that The cognitive radio needs to collect cognition about the radio environment to operate efficiently Such a radio needs to understand if the spectrum it intends to use is free or utilized by some primary user By primary user we mean the licensed user of the band and correspondingly the cognitive radios are often termed as secondary users The goal of this book is to collect recent research about cognitive radio and provide an up to date review of the challenging topic Advanced Radio Frequency Antennas for Modern **Communication and Medical Systems** Albert Sabban, 2020-09-23 The main objective of this book is to present novel radio frequency RF antennas for 5G IOT and medical applications The book is divided into four sections that present the main topics of radio frequency antennas The rapid growth in development of cellular wireless communication systems over the last twenty years has resulted in most of world population owning smartphones smart watches I pads and other RF communication devices Efficient compact wideband antennas are crucial in RF communication devices This book presents

nformation on planar antennas cavity antennas Vivaldi antennas phased arrays MIMO antennas beamforming phased array econfigurable Pabry Perot cavity antennas and time modulated linear array

Ultra Wideband Antennas International Journal Of Antennas And Propagation Book Review: Unveiling the Power of Words

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