SEMICONDUCTORS AND SEMIMETALS

VOLUME 12

Infrared Detectors II

Semiconductors And Semimetals Volume 12 Infrared Detectors Ii

Antonio Rogalski

Semiconductors And Semimetals Volume 12 Infrared Detectors Ii:

Semiconductors and semimetals. Volume 12 : infrared detectors II R. K. Willardson,1953 Semiconductors and Semimetals ,1982-03-18 Semiconductors and Semimetals *Proceedings of the Second International Conference on Long Wavelength Infrared Dectectors and Arrays, Physics and Applications* V. Swaminathan,1995 Physics of Photonic Devices Shun Lien Chuang,2012-11-07 The most up to date book available on the physics of photonic devices This new edition of Physics of Photonic Devices incorporates significant advancements in the field of photonics that have occurred since publication of the first edition Physics of Optoelectronic Devices New topics covered include a brief history of the invention of semiconductor lasers the Lorentz dipole method and metal plasmas matrix optics surface plasma waveguides optical ring resonators integrated electroabsorption modulator lasers and solar cells It also introduces exciting new fields of research such as surface plasmonics and micro ring resonators the theory of optical gain and absorption in quantum dots and quantum wires and their applications in semiconductor lasers and novel microcavity and photonic crystal lasers quantum cascade lasers and GaN blue green lasers within the context of advanced semiconductor lasers Physics of Photonic Devices Second Edition presents novel information that is not yet available in book form elsewhere Many problem sets have been updated the answers to which are available in an all new Solutions Manual for instructors Comprehensive timely and practical Physics of Photonic Devices is an invaluable textbook for advanced undergraduate and graduate courses in photonics and an indispensable tool for researchers working in this rapidly growing field **Compound Semiconductor Bulk Materials And Characterizations** Osamu Oda,2007-04-18 This book is concerned with compound semiconductor bulk materials and has been written for students researchers and engineers in material science and device fabrication It offers them the elementary and intermediate knowledge of compound semiconductor bulk materials necessary for entering this field In the first part the book describes the physical properties crystal growth technologies principles of crystal growth various defects in crystals characterization techniques and applications In the second and the third parts the book reviews various compound semiconductor materials including important industrial materials and the results of recent research **Technology of Quantum Devices** Manijeh Razeghi,2009-12-11 Technology of Quantum Devices offers a multi disciplinary overview of solid state physics photonics and semiconductor growth and fabrication Readers will find up to date coverage of compound semiconductors crystal growth techniques silicon and compound semiconductor device technology in addition to intersubband and semiconductor lasers Recent findings in quantum tunneling transport quantum well intersubband photodetectors QWIP and quantum dot photodetectors QWDIP are described along with a thorough set of sample problems

Handbook of Nonlinear Optics Richard L. Sutherland,2003-04-22 Examining classic theories experimental methods and practical formulas for exploration of the core topics in nonlinear optics the second edition of this acclaimed text was extensively revised to reflect recent advances in the analysis and modification of material properties for application in

frequency conversion optical switching and limiting multiphoton absorption and electro optic effects Handbook of Nonlinear Optics Second Edition contains additional chapters on ultrafast characterization techniques laser flash photolysis and the electro optic effect as well as expanded coverage of nonlinear optics in fibers and pulsed two beam coupling

Semiconductor Physical Electronics Sheng S. Li,2012-12-06 The purpose of this book is to provide the reader with a self contained treatment of fundamen tal solid state and semiconductor device physics The material presented in the text is based upon the lecture notes of a one year graduate course sequence taught by this author for many years in the Department of Electrical Engineering of the University of Florida It is intended as an introductory textbook for graduate students in electrical engineering However many students from other disciplines and backgrounds such as chemical engineering materials science and physics have also taken this course sequence and will be interested in the material presented herein This book may also serve as a general reference for device engineers in the semiconductor industry The present volume covers a wide variety of topics on basic solid state physics and physical principles of various semiconductor devices The main subjects covered include crystal structures lattice dynamics semiconductor statistics energy band theory excess carrier phenomena and recombination mechanisms carrier transport and scattering mechanisms optical properties photoelectric effects metal semiconductor devices the p n junction diode bipolar junction transistor MOS devices photonic devices quantum effect devices and high speed III V semiconductor devices The text presents a unified and balanced treatment of the physics of semiconductor materials and devices It is intended to provide physicists and mat erials scientists with more device backgrounds and device engineers with a broader knowledge of fundamental solid state physics *Intersubband Infrared Photodetectors* V. Ryzhii,2003 Infrared technologies are very important for a wide range of military scientific and commercial applications Devices and systems based on semiconductor heterostructure and quantum well and quantum dot structures open up a new era in infrared technologies This book deals with various topics related to the latest achievements in the development of intersubband infrared photodetectors reviewed by top experts in the field It covers physical aspects of the operation of the devices as well as details of their design in different applications The papers included in the book will be useful for researchers and engineers interested in the physics of optoelectronic devices as well as their practical design and applications **Detection of Light** George Rieke,2003 Detection of Light provides a comprehensive overview of the important approaches to photon detection from ultraviolet to submillimeter spectral regions This expanded and fully updated second edition discusses recently introduced types of detector such as superconducting tunnel junctions hot electron bolometer mixers and fully depleted CCDs Material from many disciplines is combined into a comprehensive and unified treatment of the detection of light with emphasis on the underlying physical principles This self contained text assumes only an undergraduate level of physics and is suitable for advanced undergraduate and graduate students *Handbook of Nitride Semiconductors and Devices, GaN-based Optical and Electronic Devices* Hadis Morkoç,2009-07-30 The three volumes

of this handbook treat the fundamentals technology and nanotechnology of nitride semiconductors with an extraordinary clarity and depth They present all the necessary basics of semiconductor and device physics and engineering together with an extensive reference section Volume 3 deals with nitride semiconductor devices and device technology Among the application areas that feature prominently here are LEDs lasers FETs and HBTs detectors and unique issues surrounding solar blind detection **Infrared Detectors** Antonio Rogalski,2010-11-15 Completely revised and reorganized while retaining the approachable style of the first edition Infrared Detectors Second Edition addresses the latest developments in the science and technology of infrared IR detection Antoni Rogalski an internationally recognized pioneer in the field covers the comprehensive range of subjects necessary to un *Encyclopedia of Optical Engineering: Pho-Z, pages 2049-3050* Ronald G. Driggers,2003 Compiled by 330 of the most widely respected names in the electro optical sciences the Encyclopedia is destined to serve as the premiere guide in the field with nearly 2000 figures 560 photographs 260 tables and 3800 equations From astronomy to x ray optics this reference contains more than 230 vivid entries examining the most intriguing technological advances and perspectives from distinguished professionals around the globe The contributors have selected topics of utmost importance in areas including digital image enhancement biological modeling biomedical spectroscopy and ocean optics providing thorough coverage of recent applications in this continually expanding field

Narrow-gap Semiconductor Photodiodes Antoni Rogalski,Krzysztof Adamiec,Jaroslaw Rutkowski,2000 In this monograph investigations of the performance of narrow gap semiconductor photodiodes are presented and recent progress in different IR photodiode technologies is discussed HgCdTe photodiodes InSb photodiodes alternatives to HgCdTe III V and II VI ternary alloy photodiodes lead chalcogenide photodiodes and a new class of photodiodes based on two dimensional solids Investigations of the performance of photodiodes operated in different spectral regions are presented *Fundamentals of Infrared and Visible Detector Operation and Testing* John David Vincent,Steve Hodges,John Vampola,Mark Stegall,Greg Pierce,2015-10-26 Presents a comprehensive introduction to the selection operation and testing of infrared devices including adescription of modern detector assemblies and theiroperation This book discusses how to use and test infrared and visibledetectors The book provides a convenient reference for thoseentering the field of IR detector design test or use those whowork in the peripheral areas and those who teach and train othersin the field Chapter 1 contains introductory material Radiometry is coveredin Chapter 2 The author examines Thermal detectors in Chapter 3 the Classical photon detectors simplephotoconductors and photovoltaics in Chapter 4 and ModernPhoton Detectors in Chapter 5 Chapters 6 through 8consider respectively individual elements and small arrays ofelements the readouts ROICs used with large imagingarrays and Electronics for FPA Operation and Testing The Test Setand The Testing Process are analyzed in Chapters 9 and 10 withemphasis on uncertainty and trouble shooting Chapters 11 through15 discuss related skills such as Uncertainty Cryogenics Vacuum Optics and the use of Fourier Transforms in the detector business Some highlights of this new edition

are that it Discusses radiometric nomenclature and calculations detectormechanisms the associated electronics how these devices aretested and real life effects and problems Examines new tools in Infrared detector operations specifically selection and use of ROICs electronics for FPAoperation operation of single element and very small FPAs microbolometers and multi color FPAs Contains five chapters with frequently sought after informationon related subjects such as uncertainty optics cryogenics vacuum and the use of Fourier mathematics for detectoranalyses Fundamentals of Infrared and Visible Detector Operation andTesting Second Edition provides the background and vocabularynecessary to help readers understand the selection operation andtesting of modern infrared devices *Photodetectors* P.N.J. Dennis,2012-12-06 This book has been written as part of a new series of scientific text books being published by Plenum Publishing Company Limited The scope of the series is to review a chosen topic in each volume and in addition to present abstracts of the most important references cited in the text Thus allowing the reader to supplement the information contained within this book without have to refer to many additional publications This volume is devoted to the subject of Radiation Detectors known as Photodetectors and particular emphasis has been placed on devices operating in the infrared region of the electromagnetic spectrum Although some detectors which are sensitive at ultraviolet and visible wavelengths are also described The existence of the infrared region of the spectrum has been known for almost two hundred years but the development of detectors specifically for these wavelengths was limited for a long time due to technology limitations and difficulties in understanding and explaining the phenomena involved Significant advances were made during World War II when the potential military applications of being able to see in the dar were demonstrated and this progress has been maintained during the last forty years when many major advances have been achieved such that the use of photodetectors for both civil and military applications is now relatively common and can be inexpensive Infrared and Terahertz Detectors, Third Edition Antoni Rogalski,2019-01-10 This new edition of Infrared and Terahertz Detectors provides a comprehensive overview of infrared and terahertz detector technology from fundamental science to materials and fabrication techniques It contains a complete overhaul of the contents including several new chapters and a new section on terahertz detectors and systems It includes a new tutorial introduction to technical aspects that are fundamental for basic understanding The other dedicated sections focus on thermal detectors photon detectors and focal plane arrays **Fundamentals of Photonics** Bahaa E. A. Saleh,Malvin Carl Teich,1991-08-29 In recent years photonics has found increasing applications in such areas as communications signal processing computing sensing display printing and energy transport Now Fundamentals of Photonics is the first self contained introductory level textbook to offer a thorough survey of this rapidly expanding area of engineering and applied physics Featuring a logical blend of theory and applications coverage includes detailed accounts of the primary theories of light including ray optics wave optics electromagnetic optics and photon optics as well as the interaction of light with matter and the theory of semiconductor materials and their optical properties Presented at increasing levels of complexity these sections serve as

building blocks for the treatment of more advanced topics such as Fourier optics and holography guidedwave and fiber optics photon sources and detectors electro optic and acousto optic devices nonlinear optical devices fiber optic communications and photonic switching and computing Included are such vital topics as Generation of coherent light by lasers and incoherent light by luminescence sources such as light emitting diodes Transmission of light through optical components lenses apertures and imaging systems waveguides and fibers Modulation switching and scanning of light through the use of electrically acoustically and optically controlled devices Amplification and frequency conversion of light by the use of wave interactions in nonlinear materials Detection of light by means of semiconductor photodetectors Each chapter contains summaries highlighted equations problem sets and exercises and selected reading lists Examples of real systems are included to emphasize the concepts governing applications of current interest and appendices summarize the properties of one and two dimensional Fourier transforms linear systems theory and modes of linear systems An Instructor s Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department **Optical Payloads for Space Missions** Shen-En Qian,2016-01-26 Optical Payloads for Space Missions is a comprehensive collection of optical spacecraft payloads with contributions by leading international rocket scientists and instrument builders Covers various applications including earth observation communications navigation weather and science satellites and deep space exploration Each chapter covers one or more specific optical payload Contains a review chapter which provides readers with an overview on the background current status trends and future prospects of the optical payloads Provides information on the principles of the optical spacecraft payloads missions background motivation and challenges as well as the scientific returns benefits and applications Perspectives in Optoelectronics Sudhanshu Shekhar Jha,1995 Optoelectronics is a rapidly expanding field of research and development In years to come it is destined to play a primary role in the growing information industry The basic philosophy behind the science and technology of optoelectronics is to create and develop photonic devices in which optical photons light waves instead of electronic carriers are manipulated for the conventional task performed by microelectronics Thanks to the availability of large bandwidth at optical frequencies the development of cost effective low loss low dispersion silica fibers for optical transmission and the possibility of ultra fast two dimensional processing the field of present day microelectronics is moving steadily towards this new technology of optoelectronics and photonics This volume presents reviews of different areas of optoelectronics written by international experts in the field covering most of the topics of recent importance It includes detailed discussions on semiconductor lasers and optical amplifiers optical fiber transmission photodetectors optoelectronic and photonic integrated circuits light wave telecommunications optical signal and image processing optical computing nonlinear and integrated optics space time Fourier optics optical metrology and sensing and optical interconnects All chapters are written in the style of a textbook containing tutorial sections which should be of great use to graduate students The volume should serve as an excellent book

for graduate level course on optoelectronics modern optical engineering and optical communications

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Table of Contents Semiconductors And Semimetals Volume 12 Infrared Detectors Ii

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