

SEMICONDUCTOR LASERS II

Materials and Structures

Edited by Eli Kapon



OPTICS AND PHOTONICS



Semiconductor Lasers Ii Materials And Structures

Anil K. Maini



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and application related aspects of lasers and optoelectronics detailing both existing and emerging applications in industry medical diagnostics and therapeutics scientific studies and Defence simple explanation of the concepts and essential information on electronics and circuitry related to laser systems illustration of numerous solved and unsolved problems practical examples chapter summaries self evaluation exercises and a comprehensive list of references for further reading This volume is a valuable design guide for R D engineers and scientists engaged in design and development of lasers and optoelectronics systems and technicians in their operation and maintenance The tutorial approach serves as a useful reference for under graduate and graduate students of lasers and optoelectronics also PhD students in electronics optoelectronics and physics

Photonic Devices Jia-ming Liu, 2009-06-11 Photonic devices lie at the heart of the communications revolution and have become a large and important part of the electronic engineering field so much so that many colleges now treat this as a subject in its own right With this in mind the author has put together a unique textbook covering every major photonic device and striking a careful balance between theoretical and practical concepts The book assumes a basic knowledge of optics semiconductors and electromagnetic waves Many of the key background concepts are reviewed in the first chapter Devices covered include optical fibers couplers electro optic devices magneto optic devices lasers and photodetectors Problems are included at the end of each chapter and a solutions set is available The book is ideal for senior undergraduate and graduate courses but being device driven it is also an excellent engineers reference

Reliability Characterisation of Electrical and Electronic Systems, 2014-12-24 This book takes a holistic approach to reliability engineering for electrical and electronic systems by looking at the failure mechanisms testing methods failure analysis characterisation techniques and prediction models that can be used to increase reliability for a range of devices The text describes the reliability behavior of electrical and electronic systems It takes an empirical scientific approach to reliability engineering to facilitate a greater understanding of operating conditions failure mechanisms and the need for testing for a more realistic characterisation After introducing the fundamentals and background to reliability theory the text moves on to describe the methods of reliability analysis and characterisation across a wide range of applications Takes a holistic approach to reliability engineering Looks at the failure mechanisms testing methods failure analysis characterisation techniques and prediction models that can be used to increase reliability Facilitates a greater understanding of operating conditions failure mechanisms and the need for testing for a more realistic characterisation

II-VI Semiconductor Materials and their Applications Maria C. Tamargo, 2002-04-12 II VI Semiconductor Materials and Their Applications deals with II VI compound semiconductors and the status of the two areas of current optoelectronics applications blue green emitters and IR detectors Specifically the growth characterization materials and device issues for these two applications are described Emphasis is placed on the wide bandgap emitters where much progress has occurred recently The book also presents new directions that have potential future applications in optoelectronics for II VI materials In particular it discusses

the status of dilute magnetic semiconductors for magnetic optical and electromagnetic devices nonlinear optical properties photorefractive effects and new materials and physics phenomena such as self organized low dimensional structures II_VI Semiconductor Materials and Their Applications is a valuable reference book for researchers in the field as well as a textbook for materials science and applied physics courses **Introduction to Electronic Materials and Devices** Sergio M.

Rezende,2022-01-18 This textbook lays out the fundamentals of electronic materials and devices on a level that is accessible to undergraduate engineering students with no prior coursework in electromagnetism and modern physics The initial chapters present the basic concepts of waves and quantum mechanics emphasizing the underlying physical concepts behind the properties of materials and the basic principles of device operation Subsequent chapters focus on the fundamentals of electrons in materials covering basic physical properties and conduction mechanisms in semiconductors and their use in diodes transistors and integrated circuits The book also deals with a broader range of modern topics including magnetic spintronic and superconducting materials and devices optoelectronic and photonic devices as well as the light emitting diode solar cells and various types of lasers The last chapter presents a variety of materials with specific novel applications such as dielectric materials used in electronics and photonics liquid crystals and organic conductors used in video displays and superconducting devices for quantum computing Clearly written with compelling illustrations and chapter end problems Rezende s Introduction to Electronic Materials and Devices is the ideal accompaniment to any undergraduate program in electrical and computer engineering Adjacent students specializing in physics or materials science will also benefit from the timely and extensive discussion of the advanced devices materials and applications that round out this engaging and approachable textbook *Springer Handbook of Lasers and Optics* Frank Träger,2012-05-05 This new edition features numerous updates and additions Especially 4 new chapters on Fiber Optics Integrated Optics Frequency Combs and Interferometry reflect the changes since the first edition In addition major complete updates for the chapters Optical Materials and Their Properties Optical Detectors Nanooptics and Optics far Beyond the Diffraction Limit Features Contains over 1000 two color illustrations Includes over 120 comprehensive tables with properties of optical materials and light sources Emphasizes physical concepts over extensive mathematical derivations Chapters with summaries detailed index Delivers a wealth of up to date references Packaging of High Power Semiconductor Lasers Xingsheng Liu,Wei

Zhao,Lingling Xiong,Hui Liu,2014-07-14 This book introduces high power semiconductor laser packaging design The challenges of the design and various packaging and testing techniques are detailed by the authors New technologies and current applications are described in detail **Laser Diode Microsystems** Hans Zappe,2013-03-14 Laser Diode Microsystems provides the reader with the basic knowledge and understanding required for using semiconductor laser diodes in optical microsystems and micro optical electromechanic systems This tutorial addresses the fundamentals of semiconductor laser operation and design coupled with an overview of the types of laser diodes suitable for use in

Microsystems along with their distinguishing characteristics Emphasis is placed on laser diode characterization and measurement as well as the assembly techniques and optical accessories required for incorporation of semiconductor lasers into complex microsystems Equipped with typical results and calculation examples this hand on text helps readers to develop a feel for how to choose a laser diode characterize it and incorporate it into a microsystem Semiconductor-Laser Fundamentals Weng W. Chow,Stephan W. Koch,1999-07-21 This in depth title discusses the underlying physics and operational principles of semiconductor lasers It analyzes the optical and electronic properties of the semiconductor medium in detail including quantum confinement and gain engineering effects The text also includes recent developments in blue emitting semiconductor lasers *Surface Science And Its Applications - Proceedings Of The 9th Latin American Congress* Pereira Osvaldo De Melo,Isaac Hernandez-calderon,2000-09-04 This book presents the proceedings of the Ninth Latin American Congress on Surface Science and Its Applications The topics include recent advances in catalysis electronic structural properties imaging and analysis of surfaces and interfaces growth and characterization of thin films and vacuum and instrumentation *Fundamentals of Microwave Photonics* V. J. Urick,Keith J. Williams,Jason D. McKinney,2015-01-30 A comprehensive resource to designing and constructing analog photonic links capable of high RF performance Fundamentals of Microwave Photonics provides a comprehensive description of analog optical links from basic principles to applications The book is organized into four parts The first begins with a historical perspective of microwave photonics listing the advantages of fiber optic links and delineating analog vs digital links The second section covers basic principles associated with microwave photonics in both the RF and optical domains The third focuses on analog modulation formats starting with a concept deriving the RF performance metrics from basic physical models and then analyzing issues specific to each format The final part examines applications of microwave photonics including analog receive mode systems high power photodiodes applications radio astronomy and arbitrary waveform generation Covers fundamental concepts including basic treatments of noise sources of distortion and propagation effects Provides design equations in easy to use forms as quick reference Examines analog photonic link architectures along with their application to RF systems A thorough treatment of microwave photonics Fundamentals of Microwave Photonics will be an essential resource in the laboratory field or during design meetings The authors have more than 55 years of combined professional experience in microwave photonics and have published more than 250 associated works Laser Physics and Technology Pradeep Kumar Gupta,Rajeev Khare,2014-11-06 The book Laser Physics and Technology addresses fundamentals of laser physics representative laser systems and techniques and some important applications of lasers The present volume is a collection of articles based on some of the lectures delivered at the School on Laser Physics and Technology organized at Raja Ramanna Centre for Advanced Technology during March 12 30 2012 The objective of the School was to provide an in depth knowledge of the important aspects of laser physics and technology to doctoral students and young researchers and motivate them for further work in this area In keeping with

this objective the fourteen chapters written by leading Indian experts based on the lectures delivered by them at the School provide along with class room type coverage of the fundamentals of the field a brief review of the current status of the field The book will be useful for doctoral students and young scientists who are embarking on a research in this area as well as to professionals who would be interested in knowing the current state of the field particularly in Indian context

Semiconductor Laser Diode Dnyaneshwar Patil, 2012-04-25 This book represents a unique collection of the latest developments in the rapidly developing world of semiconductor laser diode technology and applications An international group of distinguished contributors have covered particular aspects and the book includes optimization of semiconductor laser diode parameters for fascinating applications This collection of chapters will be of considerable interest to engineers scientists technologists and physicists working in research and development in the field of semiconductor laser diode as well as to young researchers who are at the beginning of their career Energy Research Abstracts , 1988

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