
Read Free Fundamentals Of Solid State Electronics

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CHRISTINE LOGAN

Fundamentals of Power Semiconductor Devices CRC Press
Fundamentals of Solid-state Electronics World Scientific
Semiconductor Physics and Devices S. Chand Publishing
This textbook describes the basic physics of semiconductors, including the hierarchy of transport models, and connects the theory with the functioning of actual semiconductor devices. Details are worked out carefully and derived from the basic physical concepts, while keeping the internal coherence of the analysis and explaining the different levels of approximation. Coverage includes the main steps used in the fabrication process of integrated circuits: diffusion, thermal oxidation, epitaxy, and ion implantation. Examples are based on silicon due to its industrial importance. Several chapters are included that provide the reader with the quantum-mechanical concepts necessary for understanding the transport properties of crystals. The behavior of crystals incorporating a position-dependent impurity

distribution is described, and the different hierarchical transport models for semiconductor devices are derived (from the Boltzmann transport equation to the hydrodynamic and drift-diffusion models). The transport models are then applied to a detailed description of the main semiconductor-device architectures (bipolar, MOS, CMOS), including a number of solid-state sensors. The final chapters are devoted to the measuring methods for semiconductor-device parameters, and to a brief illustration of the scaling rules and numerical methods applied to the design of semiconductor devices.

Smart Electronic Materials Prentice Hall

Excellent bridge between general solid-state physics textbook and research articles packed with providing detailed explanations of the electronic, vibrational, transport, and optical properties of semiconductors "The most striking feature of the book is its modern outlook ... provides a wonderful foundation. The most wonderful feature is its efficient style of exposition ... an excellent book." Physics Today "Presents the theoretical derivations

carefully and in detail and gives thorough discussions of the experimental results it presents. This makes it an excellent textbook both for learners and for more experienced researchers wishing to check facts. I have enjoyed reading it and strongly recommend it as a text for anyone working with semiconductors ... I know of no better text ... I am sure most semiconductor physicists will find this book useful and I recommend it to them." Contemporary Physics Offers much new material: an extensive appendix about the important and by now well-established, deep center known as the DX center, additional problems and the solutions to over fifty of the problems at the end of the various chapters.

Solid-State Physics for Electronics Cambridge University Press

This Solution Manual, a companion volume of the book, Fundamentals of Solid-State Electronics, provides the solutions to selected problems listed in the book. Most of the solutions are for the selected problems that had been assigned to the engineering undergraduate students who were taking an introductory device core course using this book. This Solution Manual also contains an extensive appendix which illustrates the application of the fundamentals to solutions of state-of-the-art transistor reliability problems which have been taught to advanced undergraduate and graduate students.

Solid-State Electronic Devices World Scientific

The field of organic and printed electronics is well established in terms of academic, scientific, and technological research but is still an emerging one in terms of mass industrial applications such as OLED displays and lighting and organic photovoltaics. This book provides a comprehensive introduction to organic and

printed electronics, their fundamental aspects, core technologies, and applications, and it is the first book of its kind specifically designed to address students in their final undergraduate or beginning graduate studies, as well as engineers interested in approaching this field.

Solid State Electronic Devices John Wiley & Sons

This comprehensive text discusses the fundamentals of analog electronics applications, design, and analysis. Unlike the physics approach in other analog electronics books, this text focuses on an engineering approach, from the main components of an analog circuit to general analog networks. Concentrating on development of standard formulae for conventional analog systems, the book is filled with practical examples and detailed explanations of procedures to analyze analog circuits. The book covers amplifiers, filters, and op-amps as well as general applications of analog design.

Fundamentals of Solid State Engineering Elsevier

Provides a multidisciplinary introduction to quantum mechanics, solid state physics, advanced devices, and fabrication Covers wide range of topics in the same style and in the same notation Most up to date developments in semiconductor physics and nano-engineering Mathematical derivations are carried through in detail with emphasis on clarity Timely application areas such as biophotonics , bioelectronics

Elsevier

This book, Electronic Devices and Circuit Application, is the first of four books of a larger work, Fundamentals of Electronics. It is comprised of four chapters describing the basic operation of each of the four fundamental building blocks of modern electronics:

operational amplifiers, semiconductor diodes, bipolar junction transistors, and field effect transistors. Attention is focused on the reader obtaining a clear understanding of each of the devices when it is operated in equilibrium. Ideas fundamental to the study of electronic circuits are also developed in the book at a basic level to lessen the possibility of misunderstandings at a higher level. The difference between linear and non-linear operation is explored through the use of a variety of circuit examples including amplifiers constructed with operational amplifiers as the fundamental component and elementary digital logic gates constructed with various transistor types. Fundamentals of Electronics has been designed primarily for use in an upper division course in electronics for electrical engineering students. Typically such a course spans a full academic year consisting of two semesters or three quarters. As such, Electronic Devices and Circuit Applications, and the following two books, Amplifiers: Analysis and Design and Active Filters and Amplifier Frequency Response, form an appropriate body of material for such a course. Secondary applications include the use in a one-semester electronics course for engineers or as a reference for practicing engineers.

Fundamentals of Solid-state Electronics Springer

Fundamentals of Power Semiconductor Devices provides an in-depth treatment of the physics of operation of power semiconductor devices that are commonly used by the power electronics industry. Analytical models for explaining the operation of all power semiconductor devices are shown. The treatment here focuses on silicon devices but includes the unique attributes and design requirements for emerging silicon carbide

devices. The book will appeal to practicing engineers in the power semiconductor device community.

Fundamentals of Solid State Engineering Morgan & Claypool Publishers

Basic Principles of Electronics, Volume 2: Semiconductors focuses on the properties, applications, and characteristics of semiconductors. The publication first elaborates on conduction in the solid state, conduction and heat, and semiconductors. Discussions focus on extrinsic or impurity semiconductors, electrons and holes, effect of temperature on the conductivity, mean free path, Joule heating effect, "vacancies" in crystals, and Drude's theory of metallic conduction. The text then ponders on semiconductor technology and simple devices, transistor, and transistor production and characteristics. Topics include strain gauges, thermistors, thermoelectric semiconductors, crystal preparation, photoconductors, and the Hall effect. The book elaborates on special devices, processes, and uses, common transistor circuitry, and a low-frequency equivalent circuit for common base, including radiation detection, optoelectronics, field effect transistors, sonar amplifier, oscillators, and multi-stage amplifiers. The publication is highly recommended for technical college students and researchers wanting to study semiconductors.

Fundamentals of Solid-State Electronics Study Guide Wiley-IEEE Press

This book is a lucid presentation for chemists, electrical engineers, surface scientists, and solid-state physicists, of the fundamentals underlying the construction of simple and small chemical sensors. The first part of the book is a review of the

theoretical background in solid state physics, chemistry and electronics. Semiconductor and solid electrolyte bulk models are reviewed as well as solid/gas and solid/liquid interface models. Membranes and catalysis theory are also covered expansively. The second part is a discussion of more complete sensor devices, their essential components, and of the important developments in this area over the last fifteen to twenty years. The book provides guidance through the multidisciplinary world of chemical sensors. It should be understandable to students with some training in physics and chemistry and a general knowledge of electronics. Finally, comments on economic considerations in the development of new sensor products and suggestions for future research and development should be of value to company R&D planners. Key Features * Introduction * Solid State Background * Solid/Gas Interfaces * Solid/Liquid Interfaces * Catalysis Background * Membrane Background * Biosensor Principles * Principles of Chemfet Operation * Silicon Based Chemical Sensors * Thin Film Gas Sensors * Solid Electrolytes-Devices * Gas Sensors Based on Semiconductor Powders * Application of Solid State Chemical Sensors

Fundamentals of Solid State Electronics World Scientific Publishing Company

Quantum mechanics has evolved from a subject of study in pure physics to one with a wide range of applications in many diverse fields. The basic concepts of quantum mechanics are explained in this book in a concise and easy-to-read manner, leading toward applications in solid-state electronics and optics. Following a logical sequence, the book focuses on key ideas and is conceptually and mathematically self-contained. The

fundamental principles of quantum mechanics are illustrated by showing their application to systems such as the hydrogen atom, multi-electron ions and atoms, the formation of simple organic molecules and crystalline solids of practical importance. It leads on from these basic concepts to discuss some of the most significant applications in semiconductor electronics and optics. Containing many homework problems, the book is suitable for senior-level undergraduate and graduate-level students in electrical engineering, material sciences, applied physics and chemistry.

Fundamentals of Solid State Cambridge University Press
Electrical Engineering Advanced Theory of Semiconductor Devices Semiconductor devices are ubiquitous in today's world and are found increasingly in cars, kitchens and electronic door locks, attesting to their presence in our daily lives. This comprehensive book provides the fundamentals of semiconductor device theory from basic quantum physics to computer-aided design. *Advanced Theory of Semiconductor Devices* will improve your understanding of computer simulation of devices through a thorough discussion of basic equations, their validity, and numerical solutions as they are contained in current simulation tools. You will gain state-of-the-art knowledge of devices used in both III-V compounds and silicon technology. Specially featured are novel approaches and explanations of electronic transport, particularly in p-n junction diodes. Close attention is also given to innovative treatments of quantum-well laser diodes and hot electron effects in silicon technology. This in-depth book is written for engineers, graduate students, and research scientists in solid-state electronics who want to gain a

better understanding of the principles underlying semiconductor devices.

Fundamentals of Electronics: Book 2 Morgan & Claypool Publishers

This companion to Fundamentals of Solid-State Electronics provides a helpful summary of the main text for students and lecturers alike. The clear typeface, large font, and point form layout, are designed to produce viewgraphs for lectures and to provide ample margins for study notes. This Study Guide comes complete with a detailed description of two one-semester solid-state electronics core courses, taught to about 80-100 sophomore-junior students each time, four years apart. It links the contents of the one-semester lecture course to the textbook. This book is also available as a set with Fundamentals of Solid-State Electronics and Fundamentals of Solid-State Electronics — Solution Manual. Sample Chapter(s) Introduction to this Course (116k) Chapter 1: Electrons, Bonds, Bands, Holes (565k) Request Inspection Copy

Chemical Sensing with Solid State Devices E. Fred Schubert

The Physical Basis of Electronics: An Introductory Course, Second Edition is an 11-chapter text that discusses the physical concepts of electronic devices. This edition deals with the considerable advances in electronic techniques, from the introduction of field effect transistors to the development of integrated circuits. The opening chapters discuss the fundamentals of vacuum electronics and solid-state electronics. The subsequent chapters deal with the other components of electronic devices and their functions, including semiconductor diode and transistor as an amplifier and a switch. The discussion then shifts to several types

of field-effect transistor and the production of p-n junctions, transistors, and integrated circuits. A chapter highlights the four classifications of thermionic valves commonly used in electronic devices, namely, diodes, triodes, tetrodes, and pentodes. This chapter also considers the effect of small gas introduced to the characteristics of these valves. The concluding chapters discuss some of the basic modes of operation of electronic circuits and cathode-ray tube. This edition is of great value to undergraduate electronics students.

Analog Electronics Applications Fundamentals of Solid-state Electronics

Aims of the Book: The foremost and primary aim of the book is to meet the requirements of students pursuing following courses of study: 1. Diploma in Electronics and Communication Engineering (ECE)-3-year course offered by various Indian and foreign polytechnics and technical institutes like city and guilds of London Institute (CGLI). 2. B.E. (Elect. & Comm.)-4-year course offered by various Engineering Colleges. Efforts have been made to cover the papers: Electronics-I & II and Pulse and Digital Circuits. 3. B.Sc. (Elect.)-3-Year vocationalised course recently introduced by Approach.

Fundamentals of Solid-state Electronics John Wiley & Sons

This companion to Fundamentals of Solid-State Electronics provides a helpful summary of the main text for students and lecturers alike. The clear typeface, large font, and point form layout, are designed to produce viewgraphs for lectures and to provide ample margins for study notes. This Study Guide comes complete with a detailed description of two one-semester solid-state electronics core courses, taught to about 80-100

sophomore-junior students each time, four years apart. It links the contents of the one-semester lecture course to the textbook.

Organic and Printed Electronics Springer

Describing the fundamental physical properties of materials used in electronics, the thorough coverage of this book will facilitate an understanding of the technological processes used in the fabrication of electronic and photonic devices. The book opens with an introduction to the basic applied physics of simple electronic states and energy levels. Silicon and copper, the building blocks for many electronic devices, are used as examples. Next, more advanced theories are developed to better account for the electronic and optical behavior of ordered materials, such as diamond, and disordered materials, such as amorphous silicon. Finally, the principal quasi-particles (phonons, polarons, excitons, plasmons, and polaritons) that are fundamental to explaining phenomena such as component aging

(phonons) and optical performance in terms of yield (excitons) or communication speed (polarons) are discussed.

Fundamentals of Solid State Morgan & Claypool Publishers

Explains how semiconductors work, discusses digital and linear integrated circuits, and outlines design specifications and operating principles for such components as transistors, diodes, and ICs

Fundamentals of Solid-state Electronics Routledge

"This is the fifth edition of the most widely used introductory book on semiconductor materials, physics, devices and technology. The book was written with two basic goals in mind: 1) develop the basic semiconductor physics concepts to understand current and future devices; 2) provide a sound understanding of current semiconductor devices and technology so that their applications to electronic and optoelectronic circuits and systems can be appreciated."--BOOK JACKET. Title Summary field provided by Blackwell North America, Inc. All Rights Reserved