

Fundamentals Of Solid State Electronics



Synopsis

This is perhaps the most comprehensive undergraduate textbook on the fundamental aspects of solid state electronics. It presents basic and state-of-the-art topics on materials physics, device physics, and basic circuit building blocks not covered by existing textbooks on the subject. Each topic is introduced with a historical background and motivations of device invention and circuit evolution. Fundamental physics is rigorously discussed with minimum need of tedious algebra and advanced mathematics. Another special feature is a systematic classification of fundamental mechanisms not found even in advanced texts. It bridges the gap between solid state device physics covered here with what students have learnt in their first two years of study. Used very successfully in a one-semester introductory core course for electrical and other engineering, materials science and physics junior students, the second part of each chapter is also used in an advanced undergraduate course on solid state devices. The inclusion of previously unavailable analyses of the basic transistor digital circuit building blocks and cells makes this an excellent reference for engineers to look up fundamental concepts and data, design formulae, and latest devices such as the GeSi heterostructure bipolar transistors.

Book Information

Paperback: 1040 pages

Publisher: World Scientific Publishing Company (October 1, 1991)

Language: English

ISBN-10: 9810206380

ISBN-13: 978-9810206383

Product Dimensions: 6 x 3.3 x 8.8 inches

Shipping Weight: 12.6 ounces (View shipping rates and policies)

Average Customer Review: 5.0 out of 5 stars 1 customer review

Best Sellers Rank: #1,032,238 in Books (See Top 100 in Books) #36 in [Books > Engineering & Transportation > Engineering > Electrical & Electronics > Electronics > Solid State](#) #350 in [Books > Science & Math > Physics > Solid-State Physics](#) #217220 in [Books > Textbooks](#)

Customer Reviews

"A pedagogical masterpiece recommended to anyone who has completed first-year chemistry and second-year physics and the mathematics that accompanies these courses, in preparation for the study of solid state electronic devices ... the quality of the work and the unbelievably economical

price from the publisher make this book a must for anyone interested in this subject."

"This book is probably the most comprehensive text ever published that clarified the VLSI device properties with respect to fundamental physics. The breadth of the discipline covered by this text would challenge even experienced professors that have taught the fundamentals of VLSI."

If you are new to device physics this is a very good place to start. It starts from basic crystallography and band theory of solids and moves on to the phenomenological models for the pn junction to MOSFET's and BJTs. It also contains a wealth of physical data that the working device physicist will always find useful for reference. I feel it is more comprehensive than Sze's "Device Physics", and easier to read.

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