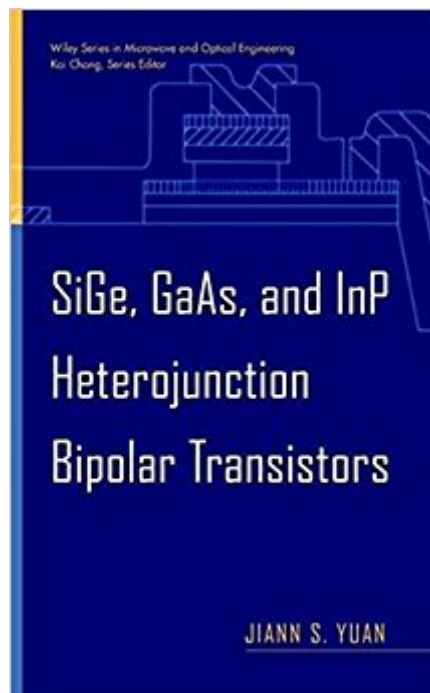




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# SiGe, GaAs, And InP Heterojunction Bipolar Transistors (Wiley Series In Microwave And Optical Engineering)



## Synopsis

An up-to-date, comprehensive guide to heterojunction bipolar transistor technology. Owing to their superior performance in microwave and millimeter-wave applications, heterojunction bipolar transistors (HBTs) have become a major force in mobile and wireless communications. This book offers an integrated treatment of SiGe, GaAs, and InP HBTs, presenting a much-needed overview of HBTs based on different materials systems-their fabrication, analysis, and testing procedures. Highly respected expert Jiann S. Yuan discusses in depth the dc and RF performance and modeling of HBT devices, including simulation, thermal instability, reliability, low-temperature and high-temperature performance, and HBT analog and digital circuits. He provides step-by-step presentations of HBT materials-including Si HBTs and III-V and IV-IV compound HBTs, which are rarely described in the literature. Also covered are device and circuit interaction as well as specific high-speed devices in mobile and wireless communications. This immensely useful guide to a rapidly expanding field includes more than 200 figures, tables of different material systems in terms of their physical parameters, and up-to-date experimental results culled from the latest research. An essential resource for circuit and device designers in the semiconductor industry, SiGe, GaAs, and InP Heterojunction Bipolar Transistors is also useful for graduate students in electrical engineering, applied physics, and materials science.

## Book Information

Series: Wiley Series in Microwave and Optical Engineering (Book 61)

Hardcover: 488 pages

Publisher: Wiley-Interscience; 1 edition (April 12, 1999)

Language: English

ISBN-10: 0471197467

ISBN-13: 978-0471197461

Product Dimensions: 6.3 x 1.1 x 9.5 inches

Shipping Weight: 1.7 pounds (View shipping rates and policies)

Average Customer Review: 3.2 out of 5 stars 4 customer reviews

Best Sellers Rank: #3,976,156 in Books (See Top 100 in Books) #99 in [Books > Engineering & Transportation > Engineering > Electrical & Electronics > Electronics > Solid State](#) #123 in [Books > Engineering & Transportation > Engineering > Electrical & Electronics > Electronics > Transistors](#) #1139 in [Books > Health, Fitness & Dieting > Mental Health > Bipolar](#)

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An up-to-date, comprehensive guide to heterojunction bipolar transistor technology. Owing to their superior performance in microwave and millimeter-wave applications, heterojunction bipolar transistors (HBTs) have become a major force in mobile and wireless communications. This book offers an integrated treatment of SiGe, GaAs, and InP HBTs, presenting a much-needed overview of HBTs based on different materials systems-their fabrication, analysis, and testing procedures. Highly respected expert Jiann S. Yuan discusses in depth the dc and RF performance and modeling of HBT devices, including simulation, thermal instability, reliability, low-temperature and high-temperature performance, and HBT analog and digital circuits. He provides step-by-step presentations of HBT materials-including Si HBTs and III-V and IV-IV compound HBTs, which are rarely described in the literature. Also covered are device and circuit interaction as well as specific high-speed devices in mobile and wireless communications. This immensely useful guide to a rapidly expanding field includes more than 200 figures, tables of different material systems in terms of their physical parameters, and up-to-date experimental results culled from the latest research. An essential resource for circuit and device designers in the semiconductor industry, SiGe, GaAs, and InP Heterojunction Bipolar Transistors is also useful for graduate students in electrical engineering, applied physics, and materials science.

JIANN S. YUAN, PhD, is Associate Professor of Electrical Engineering at the University of Central Florida. Widely published in the area of HBT technology, Dr. Yuan is also the author of Semiconductor Device Physics, Simulation, and Analysis.

I have not bothered to write a review, until now. I want to warn other people not to waste their money on this book (an expensive one) as I did. The book is nothing but a compilation of large number of (important or unimportant) experimental data from research papers. There is no central flow of thought, no insight of the author to the topics, no theoretical development. The author just quotes experimental data over and over again from papers that measure a variety of variations of the same type of devices. Of course there are some equations in the book, but the author just quote those equations from papers (again) with no derivation, just like the way he quotes all the experimental data. As a contrast, I want to mention S. M. Sze's famous "Physics of Semiconductor Devices". This book also quotes results from a large number of research papers. But Sze organizes the content in a very systematic manner. He provides good insight and brief theoretical derivation to the topics treated, and use the quoted papers as a means to support the theories. The selection of topics and papers in the book also reflects Sze's outstanding expertise and personal taste in the

field. So the quality difference between Sze's and Yuan's is miles long. Note that Sze's is notorious as a textbook for students but is invaluable as a reference for professionals in the field. If you really want to learn the subject, go for William Liu's "Fundamentals of III-V Devices: HBTs, MESFETs, and HFETs/HEMTs", a five star book.

my best friend need it , Absolutely beautiful, elegant product that works wonderfully. My favorite kitchen utensil by far! very patient and helpful. Nice and valuable. delivery so quickly.

I used this book as a text for a Heterojunction device class. Although , the book does contain a great deal of useful information , most of it is in the form of statements and data from research publications - devoid of any explanation. Also, we found many serious errors in the text. Wouldnt recommend as an introductory text to HBTs

This is an excellent book about the up-to-date HBT technology. The best thing is that you can find anything, from material properties, fabrication, analysis, to device modeling in this book. Highly recommended as a textbook.

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