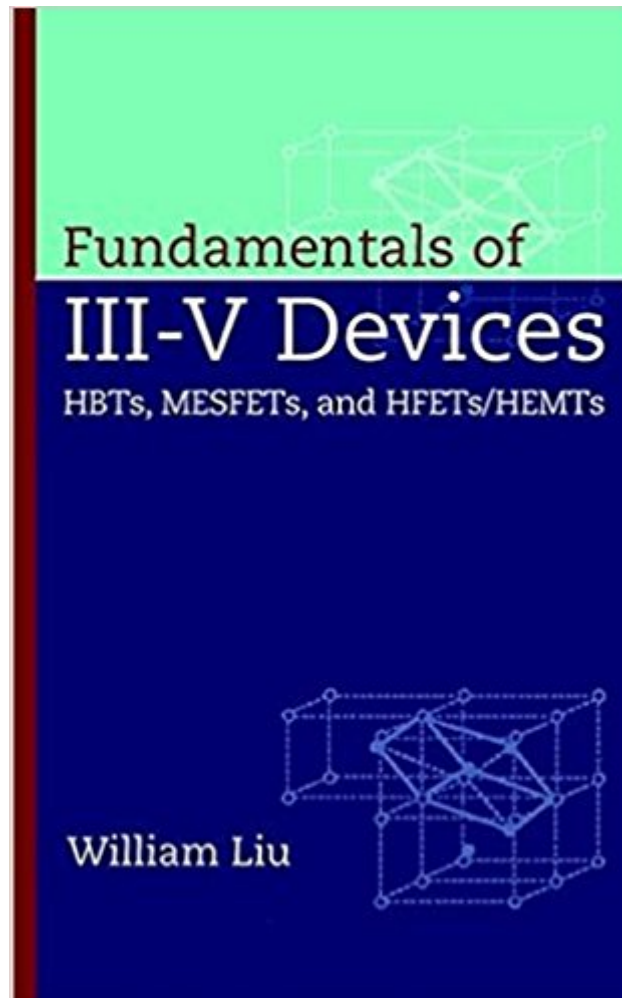




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# Fundamentals Of III-V Devices: HBTs, MESFETs, And HFETs/HEMTs



## Synopsis

A systematic, accessible introduction to III-V semiconductor devices With this handy book, readers seeking to understand semiconductor devices based on III-V materials no longer have to wade through difficult review chapters focusing on a single, novel aspect of the technology. Well-known industry expert William Liu presents here a systematic, comprehensive treatment at an introductory level. Without assuming even a basic course in device physics, he covers the dc and high-frequency operations of all major III-V devices-heterojunction bipolar transistors (HBTs), metal-semiconductor field-effect transistors (MESFETs), and the heterojunction field-effect transistors (HFETs), which include the high electron mobility transistors (HEMTs). An excellent introduction for researchers and circuit designers working on wireless communications equipment, *Fundamentals of III-V Devices* offers a variety of features, including:

- \* An introductory chapter on the basic properties, growth process, and device physics of III-V materials
- \* Coverage of both dc and high-frequency models, integrating aspects of device physics and circuit design
- \* A discussion of transistor fabrication and device comparison
- \* 55 worked-out examples illustrating design considerations for a given application
- \* 215 figures and end-of-chapter practice problems
- \* Appendices listing parameters for various materials and transistor types

## Book Information

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WILLIAM LIU is a senior member of the technical staff at Texas Instruments, where he has worked since obtaining his PhD in electrical engineering from Stanford University in 1991. Dr. Liu has published numerous papers, reviews, and chapter contributions on HBTs. He holds thirteen U.S. patents on device and circuit design in various HBT technologies. He is a senior member of the IEEE.

Really thorough and in-depth explanation for both HBT and MESFET/HEMT devices. Specially interesting for me is the "from low freq to high freq" approach of the book with regards to the equivalent linear models of the devices. Too mathematical sometimes...

Good basic reference on current microwave transistor design and performance. It is well organized and presents the required material to develop and basic understanding of the subject.

People study the III-V Semiconductor have two good choices of reference book. One is written by Jiann S. Yuan with the title: "SiGe, GaAs, InP HBT". One is this book by William Liu. I found both are very up-to-date and detailed. But, Liu's is simply the more comprehensive one. Both talk a great deal about SiGe, GaAs and InP, but Yuan is focus on HBT. In the recent development, InP-based HEMT emerges to supercede HBT in the range from 6 to 10 GHz. You will find that Liu's book is more helpful in that regards.

This is a popular book for introducing III-V semiconductor devices, and I think this will be the best one for beginners. However, the author can't put too much information in this book due to the restriction of volume. Thus, sometimes this book is also not very clear in some details, but this is still a very good book!

This book has a lot of typos and it is quite confusing if some equations are correct or wrong. I would not recommend this book for a graduate course if I were the professor.

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