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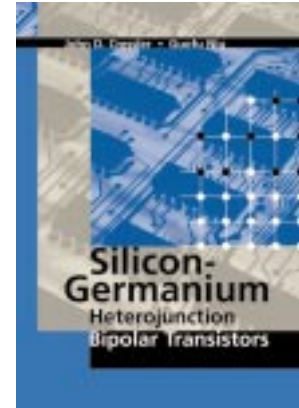
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Silicon-Germanium Heterojunction Bipolar Transistors

John D. Cressler and Guofu Niu

This informative resource presents the first comprehensive treatment of silicon-germanium heterojunction bipolar transistors (SiGe HBTs). It offers you a complete, from-the-ground-up understanding of SiGe HBT devices and technology, from a very broad perspective. The book covers motivation, history, materials, fabrication, device physics, operational principles, and circuit-level properties associated with this new cutting-edge semiconductor device technology. Including over 600 equations and more than 350 illustrations, this hands-on reference shows you in clear and concise language how to design, simulate, fabricate, and measure a SiGe HBT.

Moreover, the book helps you gain a thorough understanding of the subtle optimization issues and design tradeoffs of SiGe HBTs and RF/microwave circuits built with this technology. The book explains how SiGe HBTs offer the high-performance associated with III-V devices such as GaAs and InP, while preserving the low-cost, high-integration level, high yield, and economy-of-scale benefits of conventional silicon IC manufacturing. You discover why SiGe technology offers a unique solution for 21st century communications IC needs.



Contents: Preface. Introduction. SiGe Strained-Layer Epitaxy. SiGe HBT BiCMOS Technology. Static Characteristics. Dynamic Characteristics. Second Order Phenomena. Noise. Linearity. Temperature Effects. Other Device Design Issues. Radiation Tolerance. Device Simulation. Future Directions. Properties of Silicon and Germanium. About the Authors.

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