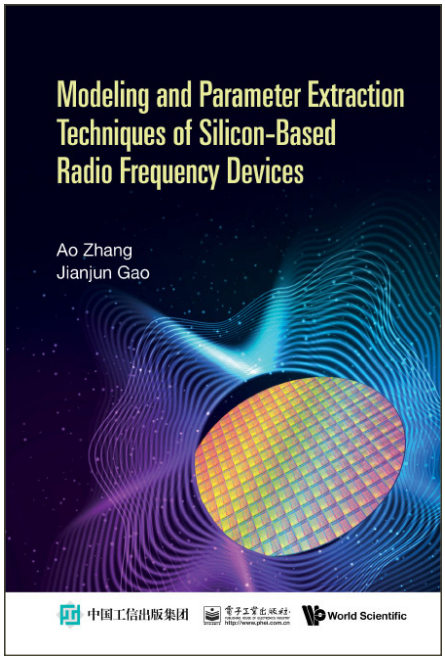
Modeling and Parameter Extraction Techniques of Silicon-Based Radio Frequency Devices



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ABOUT THE BOOK

This comprehensive compendium describes the basic modeling techniques for silicon-based semiconductor devices, introduces the basic concepts of silicon-based passive and active devices, and provides its state-of-the-art modeling and equivalent circuit parameter extraction methods.

The unique reference text benefits practicing engineers, technicians, senior undergraduate and first-year graduate students working in the areas of RF, microwave and solid-state device, and integrated circuit design.

READERSHIP

Researchers, professionals, academics, graduate & undergraduate students in electrical & electronic engineering.

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ABOUT THE AUTHORS

Ao Zhang was born in Nanjing, Jiangsu province, China, in 1995. She received the BS degree in Electrical engineering from Nanjing University of Posts and Telecommunications, Nanjing, China, in 2017 and the PhD degree in Microwave engineering at East China Normal University, Shanghai, China, in 2021. In 2019, she visited Carleton University, Ottawa, ON, Canada, as a research associate working on HBT modeling using artificial neural network techniques. From 2022, she joined Nantong University, Nantong, Jiangsu province, China. Her research focuses on modeling and on-wafer millimeter-wave measurements of active and passive devices.

Jianjun Gao was born in Hebei province, China, in 1968. He received the BEng and PhD degrees from the Tsinghua University, Beijing, China, in 1991 and 1999, respectively, and the MEng degree from the Hebei Semiconductor Research Institute, Hebei, China,in 1994. From 1999 to 2001, he was a Post-Doctoral Researcher in developing PHEMT optical modulator driver at the Microelectronics R&D Center, Chinese Academy of Sciences. In 2001, he joined the school of Electrical and Electronic Engineering, Nanyang Technological University (NTU), Singapore, as a Researcher in semiconductor device modeling and on wafer measurement. In 2003, he joined the Institute for High-Frequency and Semiconductor System Technologies, Berlin University of Technology, Berlin, Germany, as a Research Associate working on the InP HBT modeling and circuit design for high speed optical communication. In 2004, he joined the Electronics Engineering Department, Carleton University, Ottawa, ON, Canada, as Post-doctor Fellow working on the semiconductor neural network modeling technique. From 2004 to 2007, He was a Full Professor with the Radio Engineering Department at the Southeast University, Nanjing, China. Since 2007, he has been a Full Professor with the School of Information Science and Technology, East China Normal University, Shanghai, China. He has authored *RF and Microwave Modeling and Measurement Techniques for Field Effect Transistors* (USA SciTech Publishing 2009), *Optoelectronic Integrated Circuit Design and Device Modeling* (Wiley, 2010), and *Heterojunction Bipolar Transistor for Circuit Design — Microwave Modeling and Parameter Extraction* (Wiley, 2015). His main areas of research are characterization, modeling and on wafer measurement of microwave semiconductor devices, optoelectronics device and high-speed integrated circuit for radio frequency and optical communication.