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Silicon-Germanium Heterojunction Bipolar Transistors for mm-Wave Systems: Technology, Modeling and Circuit Applications

Editors:

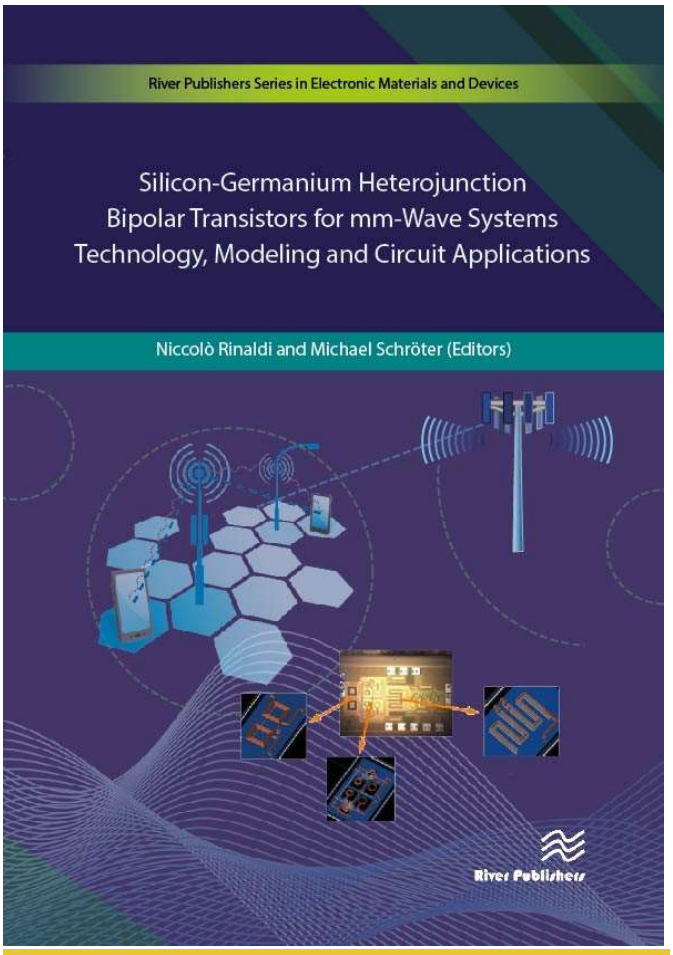
Niccolò Rinaldi, University of Naples, Italy

Michael Schröter, Technical University Dresden, Germany

The semiconductor industry is a fundamental building block of the new economy, there is no area of modern life untouched by the progress of nanoelectronics. The electronic chip is becoming an ever-increasing portion of system solutions, starting initially from less than 5% in the 1970 microcomputer era, to more than 60% of the final cost of a mobile telephone, 50% of the price of a personal computer (representing nearly 100% of the functionalities) and 30% of the price of a monitor in the early 2000's.

Interest in utilizing the (sub-)mm-wave frequency spectrum for commercial and research applications has also been steadily increasing. Such applications, which constitute a diverse but sizeable future market, span a large variety of areas such as health, material science, mass transit, industrial automation, communications, and space exploration.

Silicon-Germanium Heterojunction Bipolar Transistors for mm-Wave Systems Technology , Modeling and Circuit Applications provides an overview of results of the DOTSEVEN EU research project, and as such focusses on key material developments for mm-Wave Device Technology. It starts with the motivation at the beginning of the project and a summary of its major achievements. The subsequent chapters provide a detailed description of the obtained research results in the various areas of process development, device simulation, compact device modeling, experimental characterization, reliability, (sub-)mm-wave circuit design and systems.



River Publishers Series in Electronic Materials, Circuits and Devices

ISBN: 9788793519619
e-ISBN: 9788793519602
Available From: March 2018
Price: € 85.00

KEYWORDS:
Silicon-Germanium, Bipolar Transistors, mm-wave Systems Technology, HBT Technology; Device Simulation; Compact Modeling; mm-Wave Calibration; Reliability; Millimeter-wave circuits

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