# Compound Semiconductor Materials and Devices

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## ABSTRACT

Ever since its invention in the 1980s, the compound semiconductor heterojunction-based high electron mobility transistor (HEMT) has been widely used in radio frequency (RF) applications. This book provides readers with broad coverage on techniques and new trends of HEMT, employing leading compound semiconductors, III-N and III-V materials.

The content includes an overview of GaN HEMT device-scaling technologies and experimental research breakthroughs in fabricating various GaN MOSHEMT transistors. Readers are offered an inspiring example of monolithic integration of HEMT with LEDs, too. The authors compile the most relevant aspects of III-V HEMT, including the current status of state-of-art HEMTs, their possibility of replacing the Si CMOS transistor channel, and growth opportunities of III-V materials on an Si substrate.

With detailed exploration and explanations, the book is a helpful source suitable for anyone learning about and working on compound semiconductor devices.

## KEYWORDS

compound semiconductors, III-N materials, light-emitting diodes (LEDs), high electron mobility transistor (HEMT), MOSHEMT, HEMT-LED, device modeling, heterostructures, MOSFET, monolithic integration, epitaxy, current collapse

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