

Preface

Advanced semiconductor technologies are experiencing significant advancements through the application of new materials and processes. The quest to surpass the limitations of traditional silicon has led to the exploration of wide-bandgap semiconductors such as Silicon Carbide (SiC) and Gallium Nitride (GaN). These materials offer unprecedented opportunities for advancements in high-power and high-frequency microelectronic devices.

At the core of this technological leap is the intricate process of substrate creation and layer growth. The substrate, often a wafer of SiC or GaN, serves as the foundational canvas upon which layers are meticulously grown through processes like Chemical Vapor Deposition (CVD) and Heteroepitaxial Growth. These layers are crucial for the fabrication of devices for power electronics, where the control of electrical properties is paramount. The transformation of these materials into wafers and subsequent layers requires precision and control of base chemical processes to yield the desired electrical characteristics of the finished devices.

On the cusp of a new era in semiconductor technologies, the role of materials like GaN and SiC becomes increasingly significant. Their ability to operate at higher temperatures, voltages, and frequencies than their silicon counterparts heralds a new age of efficiency and performance in electronics.

This special edition will be useful to engineers and researchers whose activities are related to the growth of semiconductor structures for power electronics and microelectronics device production.