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4.1 Introduction4.2 Reduction of planar defects in 3C-SiC; 4.3 Performance of vertical MOSFETs; 4.4 Conclusions; References; Part B Characterization of Defects and Material Properties; 5 Identification of intrinsic defects in SiC: Towards an understanding of defect aggregates by combining theoretical and experimental approaches; 5.1 Introduction; 5.2 Assessing the identity of defects in SiC; 5.3 Vacancy-related defects; 5.4 Vacancy aggregation and its consequences; 5.5 Carbon interstitial-related defects and high-frequency vibrations; 5.6 The carbon aggregation and its implications
5.7 Summary and outlookReferences; 6 EPR identification of intrinsic defects in SiC; 6.1 Introduction; 6.2 Isolated vacancy; 6.3 Pulsed ELDOR of TV2a: Observation of missing central line; 6.4 Divacancy; 6.5 Antisites and antisite-vacancy pairs; 6.6 Conclusion; References; 7 Electrical and topographical characterization of aluminum implanted layers in 4H silicon carbide; 7.1 Introduction; 7.2 Experimental; 7.3 Electrical characterization; 7.4 Topographical characterization; 7.5 Summary; References; 8 Optical properties of as-grown and process-induced stacking faults in 4H-SiC; 8.1 Introduction
8.2 Structural aspects8.3 Imaging techniques; 8.4 Optical SFs signature; 8.5 More realistic type-II QW model; 8.6 Transfer matrix method; 8.7 Focussing on a single QW; 8.8 Conclusions; References; 9 Characterization of defects in silicon carbide by Raman spectroscopy; 9.1 Introduction; 9.2 Experimental setup; 9.3 Polytype conversion in 3C-SiC grown by chemical vapor deposition; 9.4 Electronic Raman studies of shallow donors in silicon carbide; 9.5 Graphene layers on SiC-surfaces; 9.6 Summary; References
10 Lifetime-killing defects in 4H-SiC epilayers and lifetime control by low-energy electron irradiation

Sommario/riassunto

This book prestigiously covers our current understanding of SiC as a semiconductor material in electronics. Its physical properties make it more promising for high-powered devices than silicon.The volume is devoted to the material and covers methods of epitaxial and bulk growth. Identification and characterization of defects is discussed in detail. The contributions help the reader to develop a deeper understanding of defects by combining theoretical and experimental approaches. Apart from applications in power electronics, sensors, and NEMS, SiC has recently gained new interest as a s