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1.8.1.5 Selective Etching of GaN/AlGaN; 1.8.1.6 Dry Etching of p-GaN; 1.8.1.7 Dry Etching on Ga- and N-Face of Freestanding GaN Substrate; 1.8.1.8 Magnetron Reactive Ion Etching; 1.8.1.9 Chemically Assisted Ion Beam Etching (CAIBE); 1.8.1.10 RF Plasma Etching of GaN; 1.8.2 Laser Ablation Etching of GaN; 1.8.3 Wet Etching; 1.8.4 Photochemical Etching; 1.9 Implant Isolation; 1.10 Process Damage; References; 2 Determination of Impurity and Carrier Concentrations; Introduction; 2.1 Impurity Binding Energy; 2.2 Conductivity Type: Hot Probe and Hall Measurements; 2.2.1 Measurement of Mobility; 2.3 Semiconductor Statistics, Density of States, and Carrier Concentration; 2.3.1 Degeneracy Factor; 2.3.2 Charge Balance Equation and Carrier Concentration; 2.3.2.1 n-Type Semiconductor; 2.3.2.2 p-Type Semiconductor; 2.3.2.3 Multiple Occupancy of the Valence Bands; 2.4 Capacitance-Voltage Measurements; Appendix 2.A. Fermi Integral; Appendix 2.B. Density of States in 3D, 2D, and 1D Systems; 2.B.1. Three-Dimensional Structure; 2.B.2. Two-Dimensional Structure; 2.B.3. One-Dimensional Structure; References; 3 Carrier Transport; 3.1 Prelude; 3.2 Carrier Scattering; 3.2.1 Boltzmann Transport Equation; 3.2.2 Impurity Scattering; 3.2.2.1 Ionized Impurity Scattering; 3.2.2.2 Neutral Impurity Scattering; 3.2.3 Acoustic Phonon Scattering; 3.2.3.1 Deformation Potential Scattering; 3.2.3.2 Piezoelectric Scattering; 3.2.4 Optical Phonon Scattering; 3.2.4.1 Nonpolar Optical Phonon Scattering; 3.2.4.2 Polar Optical Phonon Scattering; 3.2.5 Short-Range Potential-Induced Scattering; 3.2.5.1 Alloy Potential-Induced Scattering; 3.2.5.2 Potential Barrier Scattering; 3.2.5.3 Potential Well Scattering; 3.2.5.4 Space Charge Scattering; 3.2.5.5 Dipole Scattering; 3.2.6 Carrier-Carrier Scattering

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## Sommario/riassunto

The three volumes of this handbook treat the fundamentals, technology and nanotechnology of nitride semiconductors with an extraordinary clarity and depth. They present all the necessary basics of semiconductor and device physics and engineering together with an extensive reference section. Volume 2 addresses the electrical and optical properties of nitride materials. It includes semiconductor metal contacts, impurity and carrier concentrations, and carrier transport in semiconductors.

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