

2. Semiconductor Physics

2.1 Basic Band Theory

2.1.1 Essentials of the Free Electron Gas

2.1.2 Diffraction of Electron Waves

2.1.3 Energy Gaps and General Band Structure

2.1.4 Periodic Potentials and Bloch's Theorem

2.1.5 Band Structures and Standard Representations

2.2 Basic Semiconductor Physics

2.2.1 Intrinsic Properties in Equilibrium

2.2.2 Doping, Carrier Density, Mobility, and Conductivity

2.2.3 Lifetime and Diffusion Length

2.2.4 Simple Junctions and Devices

2.3 Elements of Advanced Theory

2.3.1 Effective Masses

2.3.2 Quasi Fermi Energies

2.3.3 Shockley-Read-Hall Recombination

2.3.4 Useful Relations

2.3.5 Junction Reconsidered