

Fundamentals of solid state engineering

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Abstrak

The fourth edition of this class-tested, multi-disciplinary introduction to solid state engineering adds dozens of revised and updated sections and problems, as well as three new chapters on solar energy harvesting, thermal and photothermal energy harvesting, and photo-thermovoltaics. Combining concepts from physics, chemistry, electrical engineering, materials science, and mechanical engineering, Professor Razeghi describes electron-electron and electron-phonon interactions, the Kane effective mass method, the carbon atom, thermal properties of crystals, the harmonic oscillator, the hydrogen atom, the quantum mechanical description of angular momentum, and the origin of spin in a chapter devoted to quantum mechanics. This textbook features an improved transport theory description that goes beyond Drude theory, discussing the Boltzmann approach. Introducing students to the rigorous quantum mechanical way of thinking about and formulating transport processes, this fourth edition presents the basic physics concepts and thorough treatment of semiconductor characterization technology, designed for solid state engineers.