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Sinopsis

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This descriptive textbook provides an in-depth look at the theories and process technologies necessary for understanding modern power semiconductor devices, i.e. from the fundamentals of junction electrostatics, p-n junction devices, unipolar MOSFET, bipolar IGBT, and superjunction devices to their associated silicon wafer process technology. State-of-the-art devices based on current research and development are included in the book to widen the scope for future device generation. The detailed structure and performance merit of the devices are also presented, together with laboratory measurements and SEM photographs. Examples used in the book are based mainly on actual fabricated devices, with the process steps described in clear detail. This book is useful for senior-year undergraduate courses on power semiconductor or power electronic devices, as well as for graduate-level courses, especially those focusing on advanced device development and design aspects. Device designers and researchers will also find this book a good reference in their work.

Contents:
Introduction
Carrier Physics and Junction Electrostatics
Bipolar Junction Diode
Power Metal-Oxide-Semiconductor Field-Effect Transistor
Insulated-Gate Bipolar Transistor
Superjunction Structures
Fabrication and Modeling of Power Devices
Practical Case Studies in Power Devices