
POWER ELECTRONICS

Devices, Drivers, Applications, and Passive Components

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PREFACE

The book is in four parts.

Part 1 covers semiconductor switching devices, their electrical and thermal characteristics and properties. Part 2 describes device driving and protection, while Part 3 presents a number of generic applications. The final part, Part 4, introduces capacitors, magnetic components, and resistors, and their characteristics relevant to power electronic applications.

- 1 Basic Semiconductor Physics and Technology
- 2 The pn Junction
- 3 Power Switching Devices and their Static Electrical Characteristics
- 4 Electrical Ratings and Characteristics of Power Semiconductor Switching Devices
- 5 Cooling of Power Switching Semiconductor Devices
- 6 Load, Switch, and Commutation Considerations
- 7 Driving Transistors and Thyristors
- 8 Protecting Diodes, Transistors, and Thyristors
- 9 Switching-aid Circuits with Energy Recovery
- 10 Series and Parallel Device Operation and Protection
- 11 Naturally Commutating Converters
- 12 AC Voltage Regulators
- 13 DC Choppers
- 14 Power Inverters
- 15 Switched-mode and Resonant dc Power Supplies
- 16 Capacitors
- 17 Soft Magnetic Materials
- 18 Resistors

The 80 non-trivial worked examples cover the key issues in power electronics.

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