

P_rinciples and E_lements

of

POWER ELECTRONICS

Devices, Drivers, Applications, and Passive Components

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PREFACE

The book is in four parts.

Part 1 covers power semiconductor switching devices, their static and dynamic electrical and thermal characteristics and properties. Part 2 describes device driving and protection, while Part 3 presents a number of generic applications. Part 4 covers systems and energy sources. The final part, Part 5, introduces capacitors, magnetic components, resistors, and dc relays 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	High-Performance Cooling for Power Electronics
7	Load, Switch, and Commutation Considerations
8	Driving Transistors and Thyristors
9	Protecting Diodes, Transistors, and Thyristors
10	Switching-aid Circuits with Energy Recovery
11	Series and Parallel Device Operation, Interference, and Grounding
12	Device Protection
13	Naturally Commutating AC to DC Converters – Uncontrolled Rectifiers
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15	AC Voltage Regulators
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22	50/60Hz Transformers: Single and Three Phase
23	HV Direct-Current Transmission
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26	Inverter Grid Connection for Embedded Generation
27	Energy Sources and Storage: Primary Sources
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29	Capacitors
30	Resistors
31	Soft Magnetic Materials: Inductors and Transformers
32	Hard Magnetic Materials: Permanent Magnets
33	Contactors and Relays
34	Transducers and Sensors

The 168 non-trivial worked examples cover the key issues in power electronics.

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