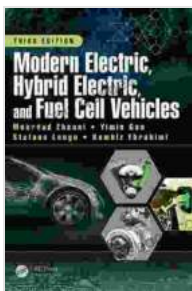


Fundamentals Theory and Design of Power Electronics and Applications

Power electronics is a field of electrical engineering that deals with the conversion, control, and conditioning of electrical power. Power electronics devices are used in a wide range of applications, including power supplies, motor drives, renewable energy systems, and electric vehicles.



Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design (Power Electronics and Applications Series Book 6) by William Wordsworth

★★★★☆ 4.3 out of 5

Language : English

File size : 13220 KB

Screen Reader : Supported

Print length : 424 pages



The fundamentals of power electronics include the study of power semiconductor devices, power converters, and control techniques. Power semiconductor devices are used to switch and control the flow of electrical power. Power converters are used to convert electrical power from one form to another, such as from AC to DC or DC to AC. Control techniques are used to regulate the output of power converters and to protect them from damage.

Power Semiconductor Devices

Power semiconductor devices are used to switch and control the flow of electrical power. The most common types of power semiconductor devices are diodes, transistors, and thyristors.

* Diodes are used to allow current to flow in only one direction. *

Transistors are used to amplify or switch electrical signals. * Thyristors are used to control the flow of electrical power in high-power applications.

Power Converters

Power converters are used to convert electrical power from one form to another. The most common types of power converters are AC-DC converters, DC-DC converters, and DC-AC converters.

* AC-DC converters convert AC power to DC power. * DC-DC converters convert DC power from one voltage level to another. * DC-AC converters convert DC power to AC power.

Control Techniques

Control techniques are used to regulate the output of power converters and to protect them from damage. The most common types of control techniques are pulse-width modulation (PWM), feedback control, and open-loop control.

* PWM is a technique that is used to control the output voltage of a power converter by varying the width of the pulses that are applied to the power semiconductor devices. * Feedback control is a technique that is used to regulate the output of a power converter by comparing the actual output to the desired output and then adjusting the input to the power converter

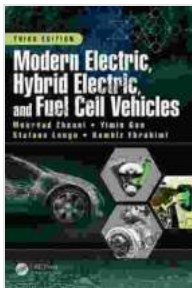
accordingly. * Open-loop control is a technique that is used to control the output of a power converter without using feedback.

Applications of Power Electronics

Power electronics is used in a wide range of applications, including:

* Power supplies * Motor drives * Renewable energy systems * Electric vehicles * Industrial automation * Aerospace

Power electronics is a rapidly growing field that is essential for the development of new and innovative electrical systems. The fundamentals of power electronics include the study of power semiconductor devices, power converters, and control techniques. Power electronics is used in a wide range of applications, including power supplies, motor drives, renewable energy systems, and electric vehicles.



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