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Autore	Kazimierczuk Marian K.
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5 Open-Loop Boost AC-DC Power Factor Corrector-Steady-State Simulation Objectives; Specifications; Pre-lab; Quick Design; Procedure; A. Simulation of the Boost Converter as a Power Factor Corrector; B. Simulation of the Boost Converter as a Peak Rectifier Circuit; Post-lab Questions; 6 Buck DC-DC Converter in CCM-Steady-State Simulation; Objectives; Specifications; Pre-lab; Quick Design; Procedure; A. Simulation of the Buck Converter and its Analysis in Steady State; B. Simulation of the Buck Converter to Determine the Power Losses and Overall Efficiency; Post-lab Questions
7 Efficiency and DC Voltage Transfer Function of PWM Buck DC-DC Converter in CCM Objectives; Theory; Specifications; Pre-lab; Quick Design; Procedure; A. Efficiency of the Buck Converter as a Function of the Input Voltage at Full and Light Load Conditions; B. Efficiency of the Buck Converter as a Function of the Output Current at Minimum, Nominal, and Maximum Input Voltages; C. DC Voltage Transfer Function of the Buck Converter as a Function of the Duty Cycle; Post-lab Questions; 8 Buck DC-DC Converter in DCM-Steady-State Simulation; Objectives; Specifications; Pre-lab; Quick Design; Procedure A. Simulation of the Buck Converter in DCM and its Analysis in Steady State

Sommario/riassunto

Designed to complement a range of power electronics study resources, this unique lab manual helps students to gain a deep understanding of the operation, modeling, analysis, design, and performance of pulse-width modulated (PWM) DC-DC power converters. Exercises focus on three essential areas of power electronics: open-loop power stages; small-signal modeling, design of feedback loops and PWM DC-DC converter control schemes; and semiconductor devices such as silicon, silicon carbide and gallium nitride. Meeting the standards required by industrial employers, the lab manual combines program