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Second Edition Erickson

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Fundamentals of Power Electronics, Second Edition, is intended for use in introductory power electronics courses and related fields for both senior undergraduates and first-year graduate students interested in

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Fundamentals of Power Electronics, Erickson, Robert W ... Shigekane H, Fujihira T, Sasagawa K et al (2009) Macro-trend and a future expectation of innovations in power Page 11/29

electronics and power devices. Proceedings of the IPEMC, pp 35–39 Google Scholar 44.

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As a graduate student in Electric Power Engineering, this is one of the best books I have purchased in all of my university studies. As long as you have taken an introductory circuits course in your undergraduate curriculum, Dr. Erickson does a great job at explaining power electronics in a way that anyone can understand.

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Fundamentals of Powerson He is the author of the textbook Fundamentals of Power Electronics. now in its second edition. Professor Erickson is the author of over one hundred journal and conference papers in the area of power electronics, is a recipient of the IEEE Power Electronics Society Transactions Prize Paper Award, and the IFFF William F Newell Power Electronics Award, the highest honor in the power area.

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Professor Erickson is a Fellow of the IEEE, a Fellow of the CU/NREL Renewable and Sustainable Energy Institute, and is the author of the textbook Fundamentals of Power Electronics, now in its second edition.

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He is the author of approximately one hundred journal and conference papers in the area of power electronics.

In many university curricula, the power electronics field has evolved beyond the status of comprising one or two special-topics courses. Often there are several courses dealing with the power electronics field, covering the topics of converters, motor drives, and power devices, with possibly additional advanced courses in these areas as well. There may also be more traditional power-area courses in energy conversion, machines, and power systems. In the breadth vs. depth tradeoff, it no longer makes sense for one textbook to attempt to Page 15/29

cover all of these courses; indeed. each course should ideally employ a dedicated textbook. This text is intended for use in introductory power electronics courses on converters, taught at the senior or first-year graduate level. There is sufficient material for a one year course or, at a faster pace with some material omitted, for two quarters or one semester. The first class on converters has been called a way of enticing control and electronics students into the power area via the "back door". The power electronics field is guite broad, and includes fundamentals in the areas of • Converter circuits and electronics • Control systems • Magnetics • Power applications • Design-oriented analysis This wide variety of areas is one of the things which makes the Page 16/29

field so interesting and appealing to newcomers. This breadth also makes teaching the field a challenging undertaking, because one cannot assume that all students enrolled in the class have solid prerequisite knowledge in so many areas.

Fundamentals of Power Electronics. Third Edition, is an up-to-date and authoritative text and reference book on power electronics. This new edition retains the original objective and philosophy of focusing on the fundamental principles, models, and technical requirements needed for designing practical power electronic systems while adding a wealth of new material. Improved features of this new edition include: new material on switching loss mechanisms and their modeling; wide bandgap

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semiconductor devices: a more rigorous treatment of averaging; explanation of the Nyquist stability criterion; incorporation of the Tan and Middlebrook model for current programmed control; a new chapter on digital control of switching converters; major new chapters on advanced techniques of designoriented analysis including feedback and extra-element theorems; average current control; new material on input filter design; new treatment of averaged switch modeling, simulation, and indirect power; and sampling effects in DCM, CPM, and digital control. Fundamentals of Power Electronics, Third Edition, is intended for use in introductory power electronics courses and related fields for both senior undergraduates and first-year graduate students interested Page 18/29

in converter circuits and electronics, control systems, and magnetic and power systems. It will also be an invaluable reference for professionals working in power electronics, power conversion, and analog and digital electronics.

Designed for polytechnic and undergraduate students of electrical/electronics, this book offers short questions and answers at the end of chapters. It is also suitable for those preparing for professional courses like AMIE and AMITE.

Harmonic distortion problems include equipment overheating, motor failures, capacitor failure and inaccurate power metering. The topic Page 19/29

of power system harmonics was covered for the first time 20 years ago and the first edition has become a standard reference work in this area. Unprecedented developments in power electronic devices and their integration at all levels in the power system require a new look at the causes and effects of these problems, and the state of hardware and software available for harmonic assessment. Following the successful first edition, this second edition of Power System Harmonics maintains the practical approach to the subject and discusses the impact of advanced power electronic technology on instrumentation, simulation, standards and active harmonic elimination techniques. Features include: A new chapter on modern digital instrumentation techniques. Added Page 20/29

sections on active filters and modern distorting devices such as FACTS devices, multilevel conversion, current source, voltage source inverters and turn-OFF-related power electronic devices. References to international standards for harmonics and interharmonics. Numerical examples of technique application. Offering a comprehensive understanding of power systems, this book is an asset to power engineers involved in the planning, design and operation of power system generation. transmission and distribution. Researchers and postgraduate students in the field will also benefit from this useful reference.

Market_Desc: • Electrical Engineering Students • Electrical Engineering Instructors• Power Electronics Page 21/29

Engineers Special Features: Easy to follow step-by-step in depth treatment of all the theory. Computer simulation chapter describes the role of computer simulations in power electronics. Examples and problems based on Pspice and MATLAB are included. Introductory chapter offers a review of basic electrical and magnetic circuit concepts. A new CD-ROM contains the following: Over 100 of new problems of varying degrees of difficulty for homework assignments and self-learning. PSpice-based simulation examples, which illustrate basic concepts and help in design of converters. A newlydeveloped magnetic component design program that demonstrates design trade-offs. PowerPoint-based slides, which will improve the learning experience and the ease of using the Page 22/29

book About The Book: The text includes cohesive presentation of power electronics fundamentals for applications and design in the power range of 500 kW or less. It describes a variety of practical and emerging power electronic converters made feasible by the new generation of power semiconductor devices. Topics included in this book are an expanded discussion of diode rectifiers and thyristor converters as well as chapters on heat sinks, magnetic components which present a step-bystep design approach and a computer simulation of power electronics which introduces numerical techniques and commonly used simulation packages such as PSpice, MATLAB and EMTP.

Based on the fundamentals of electromagnetics, this clear and Page 23/29

concise text explains basic and applied principles of transformer and inductor design for power electronic applications. It details both the theory and practice of inductors and transformers employed to filter currents, store electromagnetic energy, provide physical isolation between circuits, and perform stepping up and down of DC and AC voltages. The authors present a broad range of applications from modern power conversion systems. They provide rigorous design guidelines based on a robust methodology for inductor and transformer design. They offer real design examples, informed by proven and working field examples. Key features include: emphasis on high frequency design, including optimisation of the winding layout and treatment of non-

sinusoidal waveforms a chapter on planar magnetic with analytical models and descriptions of the processing technologies analysis of the role of variable inductors, and their applications for power factor correction and solar power unique coverage on the measurements of inductance and transformer capacitance, as well as tests for core losses at high frequency worked examples in MATLAB, end-of-chapter problems, and an accompanying website containing solutions, a full set of instructors ' presentations, and copies of all the figures. Covering the basics of the magnetic components of power electronic converters, this book is a comprehensive reference for students and professional engineers dealing with specialised inductor and transformer design. It is especially Page 25/29

useful for senior undergraduate and graduate students in electrical engineering and electrical energy systems, and engineers working with power supplies and energy conversion systems who want to update their knowledge on a field that has progressed considerably in recent years.

Simulation of Power Electronics
Converters Using PLECS® is a guide
to simulating a power electronics
circuit using the latest powerful
software for power electronics circuit
simulation purposes. This book assists
engineers gain an increased
understanding of circuit operation so
they can, for a given set of
specifications, choose a topology,
select appropriate circuit component
types and values, estimate circuit

performance, and complete the design by ensuring that the circuit performance will meet specifications even with the anticipated variations in operating conditions and circuit component values. This book covers the fundamentals of power electronics converter simulation, along with an analysis of power electronics converters using PLECS. It concludes with real-world simulation examples for applied content, making this book useful for all those in the electrical and electronic engineering field. Contains unique examples on the simulation of power electronics converters using PLECS® Includes explanations and guidance on all included simulations for re-doing the simulations Incorporates analysis and design for rapidly creating power electronics circuits with high accuracy Page 27/29

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Power Electronics and Motor Drives: Advances and Trends. Second Edition is the perfect resource to keep the electrical engineer up-to-speed on the latest advancements in technologies, equipment and applications. Carefully structured to include both traditional topics for entry-level and more advanced applications for the experienced engineer, this reference sheds light on the rapidly growing field of power electronic operations. New content covers converters. machine models and new control methods such as fuzzy logic and neural network control. This reference will help engineers further understand recent technologies and gain practical understanding with its inclusion of Page 28/29

many industrial applications. Further supported by a glossary per chapter, this book gives engineers and researchers a critical reference to learn from real-world examples and make future decisions on power electronic technology and applications. Provides many practical examples of industrial applications Updates on the newest electronic topics with content added on fuzzy logic and neural networks Presents information from an expert with decades of research and industrial experience

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