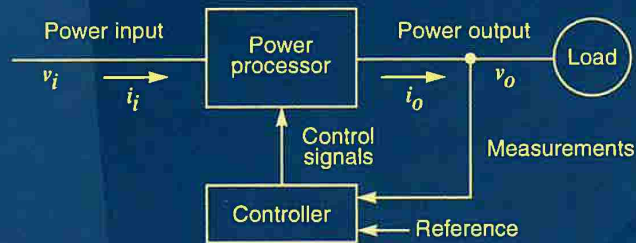


Second Edition

POWER ELECTRONICS

Converters,
Applications,
and Design



MOHAN / UNDELAND / ROBBINS

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ABOUT THE AUTHORS

Ned Mohan is a professor in the Department of Electrical Engineering at the University of Minnesota, where he holds the Oscar A. Schott Chair in Power Electronics. He has worked on several power electronics projects sponsored by the industry and the electric power utilities, including the Electric Power Research Institute. He has numerous publications and patents in this field.

Tore M. Undeland is a Professor in Power Electronics in the Faculty of Electrical Engineering and Computer Science at the Norwegian Institute of Technology. He is also Scientific Advisor to the Norwegian Electric Power Research Institute of Electricity Supply. He has been a visiting scientific worker in the Power Electronics Converter Department of ASEA in Vaasteras, Sweden, and at Siemens in Trondheim, Norway, and a visiting professor in the Department of Electrical Engineering at the University of Minnesota. He has worked on many industrial research and development projects in the power electronics field and has numerous publications.

William P. Robbins is a professor in the Department of Electrical Engineering at the University of Minnesota. Prior to joining the University of Minnesota, he was a research engineer at the Boeing Company. He has taught numerous courses in electronics and semiconductor device fabrication. His research interests are in ultrasonics, pest insect detection via ultrasonics, and micromechanical devices, and he has numerous publications in this field.

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NED MOHAN

*Department of Electrical Engineering
University of Minnesota
Minneapolis, Minnesota*

TORE M. UNDELAND

*Faculty of Electrical Engineering and Computer Science
Norwegian Institute of Technology
Trondheim, Norway*

WILLIAM P. ROBBINS

*Department of Electrical Engineering
University of Minnesota
Minneapolis, Minnesota*



JOHN WILEY & SONS, INC.

New York Chichester Brisbane Toronto Singapore

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This book was typeset in Times Roman by The Clarinda Company, and printed and bound by Hamilton Printing Company. The cover was printed by NEBC.

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Library of Congress Cataloging in Publication Data:

Mohan, Ned.

Power electronics : converters, applications, and design / Ned Mohan, Tore M. Undeland, William P. Robbins.—2nd ed.

p. cm.

Includes bibliographical references and indexes.

ISBN 0-471-58408-8 (cloth)

1. Power electronics. 2. Electric current converters. 3. Power semiconductors. I. Undeland, Tore M. II. Robbins, William P.

III. Title.

TK7881.15.M64 1995

621.317—dc20

94-21158

CIP

Printed in the United States of America.

10 9 8 7 6 5 4 3 2

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PREFACE

SECOND EDITION

The first edition of this book was published in 1989. The basic intent of this edition remains the same; that is, as a cohesive presentation of power electronics fundamentals for applications and design in the power range of 500 kW or less, where a huge market exists and where the demand for power electronics engineers is likely to be. Based on the comments collected over a five-year period, we have made a number of substantial changes to the text. The key features are as follows:

- An introductory chapter has been added to provide a review of basic electrical and magnetic circuit concepts, making it easier to use this book in introductory power electronics courses.
- A chapter on computer simulation has been added that describes the role of computer simulations in power electronics. Examples and problems based on PSpice® and MATLAB® are included. However, we have organized the material in such a way that any other simulation package can be used instead or the simulations can be skipped altogether.
- Unlike the first edition, the diode rectifiers and the phase-controlled thyristor converters are covered in a complete and easy-to-follow manner. These two chapters now contain 56 problems.
- A new chapter on the design of inductors and transformers has been added that describes easy-to-understand concepts for step-by-step design procedures. This material will be extremely useful in introducing the design of magnetics into the curriculum.
- A new chapter on heat sinks has been added.

ORGANIZATION OF THE BOOK

This book is divided into seven parts. Part 1 presents an introduction to the field of power electronics, an overview of power semiconductor switches, a review of pertinent electric and magnetic circuit concepts, and a generic discussion of the role of computer simulations in power electronics.

Part 2 discusses the generic converter topologies that are used in most applications. The actual semiconductor devices (transistors, diodes, and so on) are assumed to be ideal, thus allowing us to focus on the converter topologies and their applications.

Part 3 discusses switch-mode dc and uninterruptible power supplies. Power supplies represent one of the major applications of power electronics.

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