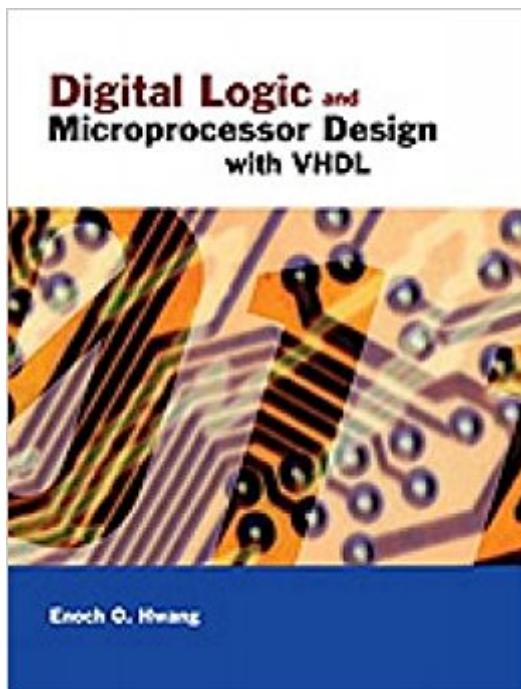


The book was found

Digital Logic And Microprocessor Design With VHDL



Synopsis

This book will teach students how to design digital logic circuits, specifically combinational and sequential circuits. Students will learn how to put these two types of circuits together to form dedicated and general-purpose microprocessors. This book is unique in that it combines the use of logic principles and the building of individual components to create data paths and control units, and finally the building of real dedicated custom microprocessors and general-purpose microprocessors. After understanding the material in the book, students will be able to design simple microprocessors and implement them in real hardware.

Book Information

Hardcover: 608 pages

Publisher: CL Engineering; 1 edition (February 18, 2005)

Language: English

ISBN-10: 0534465935

ISBN-13: 978-0534465933

Product Dimensions: 8.2 x 1 x 9.3 inches

Shipping Weight: 2.6 pounds (View shipping rates and policies)

Average Customer Review: 4.0 out of 5 stars 6 customer reviews

Best Sellers Rank: #234,874 in Books (See Top 100 in Books) #24 in Books > Computers & Technology > Hardware & DIY > Microprocessors & System Design > Microprocessor Design #97 in Books > Engineering & Transportation > Engineering > Electrical & Electronics > Digital Design #199 in Books > Engineering & Transportation > Engineering > Electrical & Electronics > Circuits

Customer Reviews

Chapter 1. Designing Microprocessors 1.1 Overview of a Microprocessor 1.2 Design Abstraction Levels 1.3 Examples of a 2-to-1 Multiplexer 1.4 Introduction to VHDL 1.5 Synthesis 1.6 Going Forward 1.7 Summary Checklist 1.8 Problems Chapter 2. Digital Circuits 2.1 Binary Numbers 2.2 Binary Switch 2.3 Basic Logic Operators and Logic Expressions 2.4 Truth Tables 2.5 Boolean Algebra and Boolean Function 2.6 Minterms and Maxterms 2.7 Canonical, Standard, and non-Standard Forms 2.8 Logic Gates and Circuit Diagrams 2.9 Example: Designing a Car Security System 2.10 VHDL for Digital Circuits 2.11 Summary Checklist 2.12 Problems Chapter 3. Combinational Circuits 3.1 Analysis of Combinational Circuits 3.2 Synthesis of Combinational Circuits 3.3 * Technology Mapping 3.4 Minimization of Combinational Circuits 3.5 * Timing Hazards

and Glitches 3.6 7-Segment Decoder Example 3.7 VHDL for Combinational Circuits 3.8 Summary Checklist 3.9 Problems Chapter 4. Standard Combinational Components 4.1 Signal Naming Conventions 4.2 Adder 4.3 Two's Complement Binary Numbers 4.4 Subtractor 4.5 Adder-Subtractor Combination 4.6 Arithmetic Logic Unit 4.7 Decoder 4.8 Encoder 4.9 Multiplexer 4.10 Tri-state Buffer 4.11 Comparator 4.12 Shifter-Rotator 4.13 Multiplier 4.14 Summary Checklist 4.15 Problems Chapter 5. * Implementation Technologies 5.1 Physical Abstraction 5.2 Metal-Oxide-Semiconductor Field-Effect Transistor (MOSFET) 5.3 CMOS Logic 5.4 CMOS Circuits 5.5 Analysis of CMOS Circuits 5.6 Using ROMs to Implement a Function 5.7 Using PLAs to Implement a Function 5.8 Using PALs to Implement a Function 5.9 Complex Programmable Logic Device (CPLD) 5.10 Field-Programmable Gate Array (FPGA) 5.11 Summary Checklist 5.12 Problems Chapter 6. Latches and Flip-Flops 6.1 Bistable Element 6.2 SR Latch 6.3 SR Latch with Enable 6.4 D Latch 6.5 D Latch with Enable 6.6 Clock 6.7 D Flip-Flop 6.8 D Flip-Flop with Enable 6.9 Asynchronous Inputs 6.10 Description of a Flip-Flop 6.11 Timing Issues 6.12 Example: Car Security System ? Version 2 6.13 VHDL for Latches and Flip-Flops 6.14 * Flip-Flop Types 6.15 Summary Checklist 6.16 Problems Chapter 7. Sequential Circuits 7.1 Finite-State-Machine (FSM) Model 7.2 State Diagrams 7.3 Analysis of Sequential Circuits 7.4 Synthesis of Sequential Circuits 7.5 Unused State Encodings and the Encoding of States 7.6 Example: Car Security System ? Version 3 7.7 VHDL for Sequential Circuits 7.8 * Optimization for Sequential Circuits 7.9 Summary Checklist 7.10 Problems Chapter 8. Standard Sequential Components 8.1 Registers 8.2 Shift Registers 8.3 Counters 8.4 Register Files 8.5 Static Random Access Memory 8.6 * Larger Memories 8.6.1 More Memory Locations 8.7 Summary Checklist 8.8 Problems Chapter 9. Datapaths 9.1 General Datapath 9.2 Using a General Datapath 9.3 Timing Issues 9.4 A More Complex General Datapath 9.5 Dedicated Datapath 9.6 Designing Dedicated Datapaths 9.7 Using a Dedicated Datapath 9.8 VHDL for Datapaths 9.9 Summary Checklist 9.10 Problems Chapter 10. Control Units 10.1 Constructing the Control Unit 10.2 Examples 10.3 Generating Status Signals 10.4 Timing Issues 10.5 Standalone Controllers 10.6 * ASM Charts and State Action Tables 10.7 VHDL for Control Units 10.8 Summary Checklist 10.9 Problems Chapter 11. Dedicated Microprocessors 11.1 Manual Construction of a Dedicated Microprocessor 11.2 Examples 11.3 VHDL for Dedicated Microprocessors 11.4 Summary Checklist 11.5 Problems Chapter 12. General-Purpose Microprocessors 12.1 Overview of the CPU Design 12.2 The EC-1 General-Purpose Microprocessor 12.3 The EC-2 General-Purpose Microprocessor 12.4 VHDL for General-Purpose Microprocessors 12.5 Summary Checklist 12.6 Problems Appendix A. Schematic Entry Tutorial 1 A.1 Getting Started A.2 Using the Graphic Editor A.3 Specifying the Top-Level File

and Project A.4 Synthesis for Functional Simulation A.5 Circuit Simulation A.6 Creating and Using the Logic Symbol Appendix B. VHDL Entry Tutorial 2 B.1 Getting Started B.2 Synthesis for Functional Simulation B.3 Circuit Simulation Appendix C. UP2 Programming Tutorial 3 C.1 Getting Started C.2 Synthesis for Programming the PLD C.3 Circuit Simulation C.4 Using the Floorplan Editor C.5 Fitting the Netlist and Pins to the PLD C.6 Hardware Setup C.7 Programming the PLD C.8 Testing the Hardware C.9 MAX7000S EPM7128SLC84-7 Summary C.10 FLEX10K EPF10K70RC240-4 Summary Appendix D. VHDL Summary D.1 Basic Language Elements D.2 Dataflow Model Concurrent Statements D.3 Behavioral Model Sequential Statements D.4 Structural Model Statements D.5 Conversion Routines Index

Dr. Enoch Hwang has a Ph.D. in Computer Science from the University of California, Riverside. He currently serves as a Professor of Computer Science at La Sierra University in Southern California, teaching digital logic and microprocessor design. In 2015, Dr. Hwang was invited to serve as a visiting professor to Zhejiang University in Hangzhou, China, where he taught their Digital Systems Design course. Many new ideas from that class have been incorporated into this edition of the book. From as early as childhood, Dr. Hwang was fascinated with electronic circuits. In one of his first experiments, he attempted to connect a microphone to the speaker inside a portable radio through the earphone plug. Instead of hearing sound from the microphone through the speaker, smoke was seen coming out of the radio. Thus ended that experiment and his family's only radio. He now continues on his interest in digital circuits with research in embedded microprocessor systems, controller automation, power optimization, and robotics.

There is plenty of information to learn in this book but I think it could use a little more detail and show more examples of VHDL code. Otherwise, plenty of variety. Not so much on the clarity.

Any solution for this book

"Digital Logic and Microprocessor Design with VHDL" by Hwang is a very well-written text book. One would think that authors of Digital Logic textbooks would be able to present the information in a logical manner. Ironically, the Fundamentals of Digital Logic with VHDL Design with CD-ROM by Brown, et al, (which is the required text for my class) fails to present the information in the most logical manner possible. The flow of Hwang's book is very smooth. Hwang provides plenty of detailed examples along the way, so you know if you understand the material or

not. Furthermore, the examples are presented in such a manner that it becomes a simple matter to extrapolate and problem solve. If your professor tells you to purchase Brown's textbook, I would ignore him/her and get Hwang's book instead. Even if there is assigned homework from Brown, it would be so much easier to copy the problems or photocopy than to try and understand the highly choppy and convoluted presentation from Brown.

The author states, in Chapter 1:"In this book, I will show you from the ground up how to design the digital circuits inside the PC, or more precisely, the circuitry inside those black IC chips. Specifically, I will show you how to design the logic circuit for a microprocessor, which is at the heart of every electronic device."This is exactly what he does, step by step. There is sample code and a recommended development board that you can purchase for nominal cost to learn from. I am so glad this book is available and I am writing this review to encourage authors like this to continue. Interested people, hobbyists and professional engineers alike, will enjoy this walk through the mysterious world of IC chips.This is the best guide on the subject I have seen so far.

One of few STEM textbooks to successfully balance rigor and simplicity. You'll learn a lot, but much more easily than you would expect with such heavy subject matter.

I read the book with the idea that I could learn the theory and implementation behind FPGA programming. Instead I got useless information about circuits and how they work in digital systems. Unless I am building my own synthesis tool, I found little to no information in implementing FPGA chips for mechatronic systems.To be fair, the book did provide a lot of logical designs in how microprocessors work. But I find that information useless because we have synthesizers that can do that for us.

[Download to continue reading...](#)

Digital Logic and Microprocessor Design with VHDL Introduction to Logic Circuits & Logic Design with VHDL Advanced Digital Logic Design Using VHDL, State Machines, and Synthesis for FPGA's Fundamentals of Digital Logic with VHDL Design Motorola MC68000 Microprocessor Family: Assembly Language Interface Design and System Design, The (2nd Edition) Digital Design with RTL Design, VHDL, and Verilog Digital and Microprocessor Fundamentals: Theory and Applications (3rd Edition) Digital Design with CPLD Applications and VHDL Digital Design Using VHDL: A Systems Approach Digital Systems Design Using VHDL Digital Electronics: A Practical Approach with VHDL (9th Edition) Digital Fundamentals with VHDL Circuit Design and Simulation with VHDL

(MIT Press) RTL Hardware Design Using VHDL: Coding for Efficiency, Portability, and Scalability
Design Recipes for FPGAs, Second Edition: Using Verilog and VHDL Circuit Design with VHDL
Introduction to Logic Circuits & Logic Design with Verilog Graphic Design Success: Over 100 Tips
for Beginners in Graphic Design: Graphic Design Basics for Beginners, Save Time and Jump Start
Your Success (graphic ... graphic design beginner, design skills) Digital Systems Design and
Prototyping: Using Field Programmable Logic and Hardware Description Languages Bitcoin Basics:
Cryptocurrency, Blockchain And The New Digital Economy (Digital currency, Cryptocurrency,
Blockchain, Digital Economy)

[Contact Us](#)

[DMCA](#)

[Privacy](#)

[FAQ & Help](#)