Digital Electronics with VHDL (Quartus II Version)
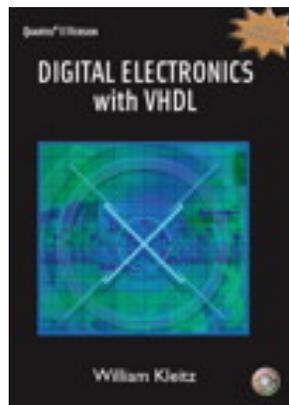
William Kleitz
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Book Description

For Digital Electronics courses requiring a comprehensive approach to Digital concepts with an emphasis on PLD programming and the integration of the latest Quartus II software. This text presents a step-by-step, practical approach to an enhanced and easy understanding of digital circuitry fundamentals with coverage of CPLD's, VHDL and Altera's Quartus II software. Coverage begins with the basic logic gates used to perform arithmetic operations, and proceeds up through sequential logic and memory circuits used to interface to modern PCs. The author combines extensive teaching experience with practical examples in order to bring entry level students up to speed in this emerging field.

Features

- *The Altera Quartus II software. (Software included on accompanying CD)*
- *Basic Problem Sets w/3 types of problems:*
   D (Design): require students to modify existing circuits or design one of their own.
   T (Troubleshooting): present students with a malfunctioning circuit.
   C (Challenging): the highest level of difficulty, which tests students' overall understanding of subject.

- *Over 1000 four-color illustrations-Used to exemplify the operation of complex circuit operations, most contain annotations describing the inputs and outputs and many have circuit operational notes.*
- *Specific sequence of steps-For each topical area in the text, makes the transition from problem definition, to practical example, to VHDL definitions for CPLD implementation.*
- *Over 100 MultiSIM exercises.*
- *Over 200 step-by-step, worked-out examples.*
- *More than 1000 problems and questions throughout*
- *Troubleshooting application and problems throughout.*
- *Several tables of commercially used Integrated Circuits (IC's).*
- *Student CD Included: Contains Quartus II web version software*
- *Reference to manufacturers' data sheets throughout Over 1,000 annotated figures — offer descriptive, color annotations that reinforce the fundamental concepts of book.*

Review

This first version of this book was released in 2003. Author introduces the concept of hardware descriptive language in chapter 4 "Programmable Logic Devices". You find many examples using real digital circuits with appropriate output files. In chapter 5, "Boolean Algebra and Reduction Techniques," the author introduces different methods of simplifying Boolean equations. In chapter 7, "Arithmetic Operations and Circuits," there are discussions of constructing half-adder, full adder and arithmetic logic unit. TTL 74181 chip has been extensively discussed in this chapter.

In chapter 11 the author talks about "Interfacing to the Analog World" the author covers analog to digital converting and digital to analog converting; these topics include digital and analog representations, operational amplifier basics, binary-weighted D/A converters, R/2R ladder D/A converters, integrated-circuit D/A converters, integrated-circuit data converter specifications, parallel-encoded A/D converters, counter-ramp A/D converters, successive-approximation A/D conversion, integrated-circuit A/D converters, data acquisition system application, transducers and signal conditioning.

Memory systems are covered in chapter 16; memory concepts, static RAMs, dynamic RAMs, Read-Only Memories, memory expansion and address decoding applications and magnetic/optical storage are included.

The advance chapters are about Microprocessor Fundamentals and 8051 Microcontroller; this book comes with a CD and it has MultiSIM examples. There are 18 chapters in this book. In addition to a companion site for students, the instructor recourses are great.

Saeid Moslehpour, Ph.D.
Department of Electrical & Computer Engineering
University of Hartford

The Quartus II software support for VHDL is described for the following categories of VHDL constructs. These sections match those in the IEEE Std 1076-1993 version of the IEEE Standard VHDL Language Reference Manual. The constructs of the IEEE Std 1076-2008 version of VHDL are listed in the About VHDL topic. Section One—Design Entities & Configurations: Section.

I'm new to VHDL, Quartus II and ModelSim. Now I'm doing a lab where we are constructing a blinking LED. How should simulation be handled when the construction deals with relatively long time periods. The frequency of the blinking LED is 1 Hz and the clock on the dev board I'm using (Terasic DE2-115) is 50 MHz. In the code I'm counting the clock pulses and turn on the LED accordingly. However, when I want to verify my code with ModelSim, I get in to troubles dealing with times as long as seconds. So I solved it just by changing the period in the code to a couple of clock cyc The Quartus software and all CPLD examples are included on a CD-ROM. Despite a previous review, I found VHDL coding was thoroughly explained for all covered digital topics. This book gives you a firm enough footing in VHDL that you will be able to pursue more advanced coding on your own. I have seen books that jump immediately into more advanced VHDL at the expense of a comfortable knowledge of the basics. It is also common in books that cover VHDL to only lightly cover the theory of operation and circuitry of the VHDL logic. This book empowers you to continue your learning by giving you an un Out of print. Digital Electronics with VHDL (Quartus II Version). William Kleitz, State University of New York, Tompkins Cortland. ©2006 |Pearson | Out of print. For Digital Electronics courses requiring a comprehensive approach to Digital concepts with an emphasis on PLD programming and the integration of the latest Quartus II software. This text presents a step-by-step, practical approach to an enhanced and easy understanding of digital circuitry fundamentals with coverage of CPLD's, VHDL and Altera's Quartus II software. Coverage begins with the basic logic gates used to perform arithmetic operations, and proceeds up through sequential logic and memory circuits used to interface to modern PCs. Q UARTUS II I NTRODUCTION U SING VHDL D ESIGNS For Quartus II 13.0 Quartus II Introduction Using VHDL Designs Appendix Tutorial â€" Using Quartus II CAD Software 1 Getting Started Each logic circuit, or subcircuit, being designed with Quartus II software is called a project. The software works on one project at a time and keeps all information for that project in a single directory (folder) in the file system.

The Quartus II software also provides other predefined compilation flows that you can use with commands on the Processing menu. Table 1 lists the commands for some of the most common compilation flows. 4 â– introduction to the quartus II software. Â Imports and exports version-compatible databases and merges partitions. Generates internal netlist files, including Verilog Quartus Mapping Files, for the Quartus II Compiler database so they can be used for back-annotation and for the LogicLock feature, and back-annotates device and resource assignments to preserve the fit for future compilations. For Digital Electronics courses requiring a comprehensive approach to Digital concepts with an emphasis on PLD programming and the integration of the latest Quartus II software. This text presents a step-by-step, practical approach to an enhanced and easy understanding of digital circuitry fundamentals with coverage of CPLD's, VHDL and Altera's Quartus II software. Â Pearson New International Edition Digital Electronics with VHDL Quartus II Version William Kleitz First Edition. Pearson Education Limited Edinburgh Gate Harlow Essex CM20 2JE England and Associated Companies throughout the world Visit us on the World Wide Web at: www.pearsoned.co.uk Â© Pearson Education Limited 2014 All rights reserved. Download now. SaveSave Tutorial Quartus II Simulation Vhdl For Later. 0 ratings0% found this document useful (0 votes). 19 views27 pages. Tutorial Quartus II Simulation Vhdl. Uploaded by. Heitor B. S. Bezerra. Â The Simulation Waveform Editor is available for use with Alteraâ€™s Quartus II software version 13.0 or later. It al- lows the user to apply inputs to the designed circuit, usually referred to as test vectors, and to observe the outputs generated in response. In this tutorial, the reader will learn about The Quartus II system includes full support for all of the popular methods of entering a description of the desired circuit into a CAD system. This tutorial makes use of the VHDL design entry method, in which the user species the desired circuit in the VHDL hardware description language. Â The screen captures in the tutorial were obtained using the Quartus II version 7.1; if other versions of the software are used, some of the images may be slightly different. Â â€¢ Creating a project â€¢ Design entry using VHDL code â€¢ Synthesizing a circuit specied in VHDL code â€¢ Fitting a synthesized circuit into an Altera FPGA â€¢ Assigning the circuit inputs and outputs to specic pins on the FPGA â€¢ Simulating the designed circuit â€¢ Programming and conguring the FPGA chip on Alteraâ€™s DE2 board.