<<现代VLSI设计>>

图书基本信息

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前言

This book was written in the belief that VLSI design is system design. Designing fastinverters is fun, but designing a highperformance, costeffective integrated circuitdemands knowledge of all aspects of digital design, from application algorithms tofabrication and packaging. Carver Mead and Lynn Conway dubbed this approach thetallthin designer approach. Todays hot designer is a little fatter than his or her 1979ancestor, since we now know a lot more about VLSI design than we did when Meadand Conway first spoke. But the same principle applies ：you must be wellversed inboth highlevel and lowlevel design skills to make the most of your designopportunities. Since VLSI has moved from an exotic, expensive curiosity to an everyday necessity , universities have refocused their VLSI design classes away from circuit design andtoward advanced logic and system design. Studying VLSI design as a system designdiscipline requires such a class to consider a somewhat different set of areas than doesthe study of circuit design. Topics such as ALU and multiplexer design or advancedclocking strategies used to be discussed using TFL and boardlevel components, withonly occasional nods toward VLSI implementations of very large components. However, the push toward higher levels of integration means that most advanced logicdesign projects will be designed for integrated circuit implementation.

I have tried to include in this book the range of topics required to grow and traintodays tall, moderatelychubby IC designer. Traditional logic design topics, such asadders and state machines, are balanced on the one hand by discussions of circuitsand layout techniques and on the other hand by the architectural choices implied byscheduling and allocation. Very large ICs are sufficiently complex that we canttackle them using circuit design techniques alone；the topnotch designer mustunderstand enough about architecture and logic design to know which parts of thecircuit and layout require close attention. The integration of systemlevel designtechniques , such as scheduling, with the more traditional logic design topics isessential for a full understanding of VLSIsize systems.

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内容概要

《现代VLSI设计：片上系统设计（第3版改编版）》是一本介绍现代VLSI芯片设计过程的书籍，改编自PEARSONEDUCATION出版的Modern VLSI Design：System-on-Chip Design（3／e）一书。
书中全面地论述了VLSI芯片设计的有关问题，反映了目前SoC的最新进展，并介绍了SoC的设计方法。
全书共分10章。
内容包括：数字系统与VLSl，晶体管的版图设计，逻辑门，组合逻辑网络，时序电路，子系统设计，自顶向下设计，系统设计，芯片设计，CAD系统及算法，另有3个附录。
每章末尾均附有难度不同的习题。
附录中还提供了丰富而实用的词汇表。
改编者保持原书的风格和原有体系结构，根据国内的教学要求和课程设置，调整了原书的一些内容，使之更适合我国高等学校作为教材使用。
《现代VLSI设计：片上系统设计（第3版改编版）》可作为高校电子工程、计算机科学与工程、微电子半导体等专业的高年级本科生和研究生的教材或教学参考书，也可供从事芯片设计的工程技术人员作为参考书使用。

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章节摘录

A register-transfer simulator exhibits the correct cycle-by-cycle behavior atits inputs and outputs, but the internal implementation of the simulator mayhave nothing to do with the logic implementation. Several specialized languages for hardware description and simulation have been developed. Hardware simulation languages, such as VHDL and Vefilog, provide primitiveswhich model the parallelism of logic gate evaluation, delays, etc., so that astructural description like a net list automatically provides accurate simulation. In a pinch, a C program makes a passable register-transfer simulator：the component is modeled as a procedure, which takes inputs for one cycleand generates the outputs for that cycle. However, hardware modeling in Cor other general-purpose programming languages requires more attention tothe mechanics of simulation. A logic simulator accepts a net list whose components are logic gates. Thesimulator evaluates the output of each logic gate based on the values pre-sented at the gates inputs. You can trace though the network to find logicbugs, comparing the actual value of a wire to what you think the valueshould be. Verilog and VHDL can be used for logic simulation： a libraryprovides simulation models for the logic gates； a net list tells the simulationsystem how the components are wired together.

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