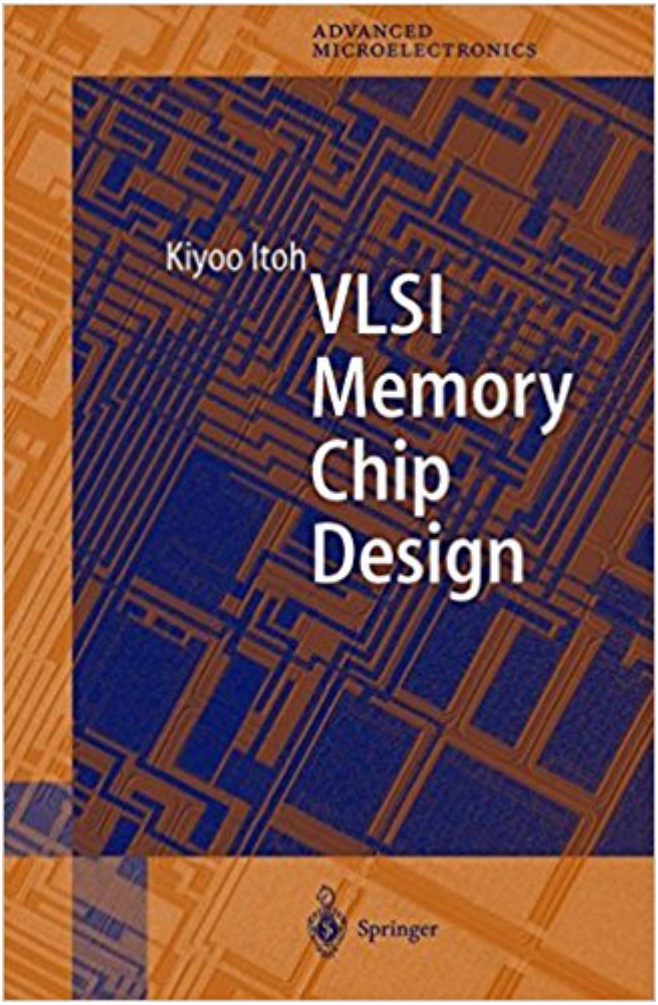
VLSI Memory Chip Design (Springer Series In Advanced Microelectronics) (v. 5)



Synopsis

A systematic description of microelectronic device design. Topics range from the basics to low-power and ultralow-voltage designs, subthreshold current reduction, memory subsystem designs for modern DRAMs, and various on-chip supply-voltage conversion techniques. It also covers process and device issues as well as design issues relating to systems, circuits, devices and processes, such as signal-to-noise and redundancy.

Book Information

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Customer Reviews

This book features a systematic description of microelectronic device design ranging from the basics to current topics, such as low-power/ultralow-voltage designs including subthreshold current reduction, memory subsystem designs for modern DRAMs and various on-chip supply-voltage conversion techniques. It also covers process and device issues as well as design issues relating to systems, circuits, devices and processes, such as signal-to-noise and redundancy.

This is a wonderful book about DRAM and SRAM design, useful for learning about integrated circuit design in general, and useful for learning about some of the odd characteristics of DRAMs and SRAMs when used in electronic design.Integrated circuit memory devices typically have a simple structure: the memory storage array is surrounded by access logic, which is in turn connected to the external interface and to timing logic. This simple structure makes learning about memory chips a

good introduction to learning about integrated circuit design in general. In order to understand memory chip design, you must learn about integrated circuits at many levels of abstraction: passive components (the capacitor storage elements used in DRAMs and the parasitic capacitance of the long access lines), individual transistors (the gating elements along the access lines), analog behavior (DRAM sense amplifiers), and digital behavior (timing and control).This book presents primarily DRAM design, but also SRAM design, in a very organized and clear manner. The presentation, a combination of text, diagrams, and equations, is very good. The text is extremely well-written, the diagrams are clear and drawn well, and the equations elegantly presented. Apparently the book was typeset by the author using LaTeX, which accounts for much of the high-quality equation typesetting.The core chapters are:chapter 1: An introduction to memory chip design (48 pages)chapter 2: The basics of RAM design and technology (48 pages)chapter 3: DRAM circuits (98 pages)Subsequent chapters discuss specific topics:chapter 4: High signal-to-noise ratio DRAM design and technology (54 pages)chapter 5: On-chip voltage generators (90 pages)chapter 6: High-performance subsystem memories (50 pages) [This chapter covers several features implemented in specialized memories]The final chapters discuss power-related issues:chapter 7: Low-power memory circuits (36 pages)chapter 8: Ultra-low-voltage memory circuits (48 pages)Throughout the book the writing is excellent, this is a very technical book that is a pleasure to read.

This is one of the well-written books in the field of custom circuit design. Overall organization and all chapters are well written. Circuit design details are excellent. Some of the noise analysis and pitfalls of memory design are very good. Treatment on high-performance and low power memory design is superb. Great JOB.

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