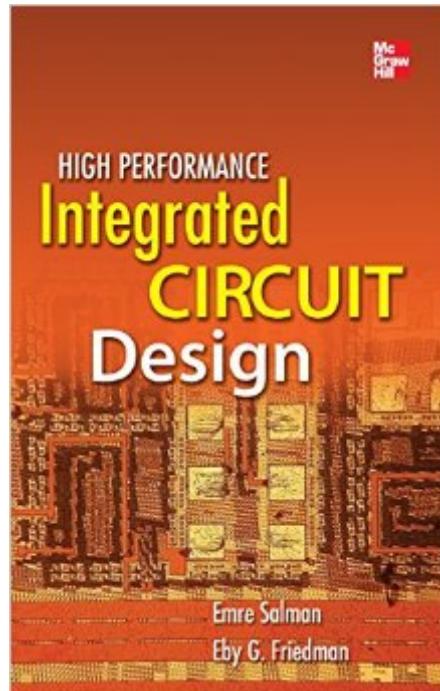


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# High Performance Integrated Circuit Design



## Synopsis

The latest techniques for designing robust, high performance integrated circuits in nanoscale technologies Focusing on a new technological paradigm, this practical guide describes the interconnect-centric design methodologies that are now the major focus of nanoscale integrated circuits (ICs). High Performance Integrated Circuit Design begins by discussing the dominant role of on-chip interconnects and provides an overview of technology scaling. The book goes on to cover data signaling, power management, synchronization, and substrate-aware design. Specific design constraints and methodologies unique to each type of interconnect are addressed. This comprehensive volume also explains the design of specialized circuits such as tapered buffers and repeaters for data signaling, voltage regulators for power management, and phase-locked loops for synchronization. This is an invaluable resource for students, researchers, and engineers working in the area of high performance ICs.

High Performance Integrated Circuit Design Coverage includes:

- Technology scaling
- Interconnect modeling and extraction
- Signal propagation and delay analysis
- Interconnect coupling noise
- Power generation
- Power distribution networks
- CAD of power networks
- Techniques to reduce power supply noise
- Power dissipation
- Synchronization theory and tradeoffs
- Synchronous system characteristics
- On-chip clock generation
- Clock distribution networks
- Substrate noise in mixed-signal ICs
- Techniques to reduce substrate noise

## Book Information

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## Customer Reviews

This is a good book from PhD thesis. So if you have another book Power Distribution Networks with

On-Chip..., this book is 80% similar. Very informative for a power engineer like me to understand what the real needs from CMOS ASIC point of view. Quite a big coverage, however, not very detailed explanation. On the other hand, the reference list is quite good to dig into the details.

This book clearly and coherently explains the basic concepts that have driven the past several generations of the integrated circuit industry while providing a solid intuitive foundation for understanding what the current problems are. Each of the concepts are broken down into small easy to understand bite-sized chunks without losing any detail or generality. Instead of being drowned in a sea of equations, the author tries to explain the concept. Then you are presented with an equation that helps you solve the problem (The power distribution section is a particularly good example of this). The thing I like about the book, that is different from other books is it doesn't just give you a set of equations to solve a specific problem. For each section, it tries to give you a sense about the important questions to ask when you are looking to solve a problem and why those are the important things to look at. It then gives you an idea of how to attack each issue specifically. For the most part it's pretty successful, which is why I like the book as a technical review of the state of the IC industry. From a pure writing point of view, it is a typical textbook. It's a little less dry than most textbooks, but it is a technical book after all. Cheers

I got this book about three weeks ago and I have already finished reading 5 chapters. As an engineer who has been in the semiconductors business for more than 8 years, I learned quite a bit from this book. It contains so much useful and detailed information about interconnect design. Some of the chapters could have been more up-to-date, but overall, I'm very happy to purchase this book. It is a great reference book. It is not so hard to understand the content, if you have some CMOS VLSI background. First and second parts of the book set the stage for the rest of the book, so should be read carefully. Especially, I like the fact that there are more than 800 references. This makes it easy for the interested readers to go deeper in the field. This book is a great start to learn interconnect design on VLSI circuits.

The book covers wide variety of topics and deals with many of them in detail. Its a great read for novice reader and even for an experienced reader for consolidated information in one place.

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