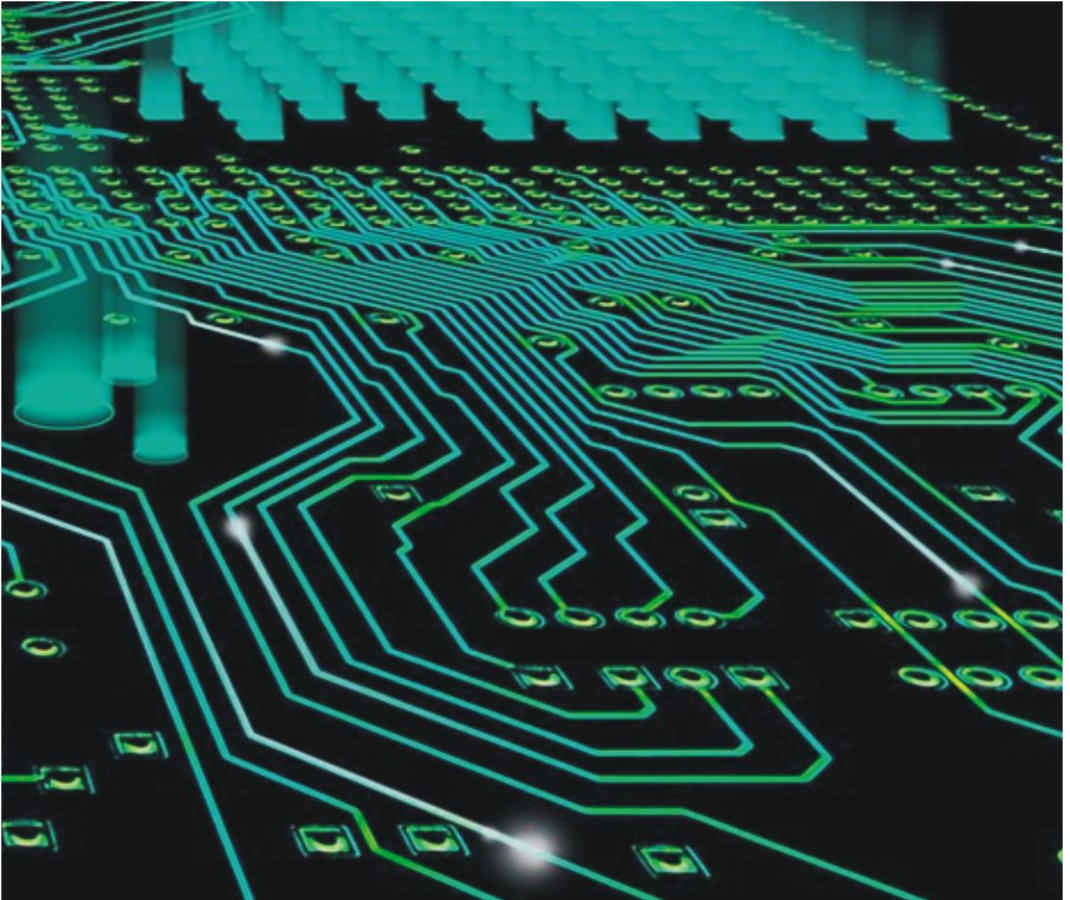


Integrated Circuit Design

Using Open Cores and Design Tools

Achieving integrated circuit designs, by using open source hardware blocks and royalty free design tools, is now available for electronic engineers with a general purpose computer and internet access. Keep up with the trend!



Integrated Circuit Design Using Open Cores and Design Tools

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Preface

This book presents and explains the design of Integrated Circuits using open cores and open source design tools. It covers design aspects for all of the circuit elements: a processor (the Open RISC 1200 or OR1200), program memory, data memory, external address and data buses, communication port, interrupt controller, internal bus, clock, reset, and GPIO ports. For this purpose, all the hardware cores are open source and the fabrication technology is low cost. Detailed aspects of the design process are explained, such as application software optimization, small memory usage, memory intensive algorithms versus computation intensive algorithms. Also, an analysis of several application and research fields is presented, so the designed and implemented circuit used in this book as an example, can be used in other applications, with little or no modifications. Besides, a detailed design flow is explained, showing calculations for every design stage; the design flow covers synthesis process, area optimization, power and speed calculations, IO ring definition, and Place&route of the components and connections. Finally, two different implementations are presented: low-cost high volume, and medium-cost low volume: a) Technical data of the Integrated circuit implementation is presented and explained. b) An alternate implementation is also presented, using a development board with an ARM processor, especially useful for one-shot implementations. We hope that this book can help those electronic engineers with innovative ideas that can be implemented in an integrated circuit, without needing a big brand behind them.

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