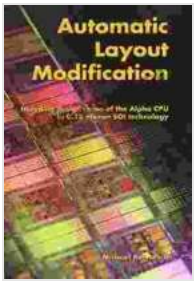
Design Reuse of the Alpha CPU in 13 Micron SOI Technology

This book presents the results of a project to design a high-performance microprocessor using a new 13 micron silicon-on-insulator (SOI) technology. The project was a collaboration between DEC's Semiconductor Research and Development Center and the University of California at Berkeley. The goal of the project was to demonstrate the feasibility of using SOI technology to build a high-performance microprocessor. The project was successful in meeting its goals. The resulting microprocessor, called the Alpha 21264, is a high-performance 64-bit microprocessor that operates at a clock speed of 200 MHz. The Alpha 21264 is the first microprocessor to be built using SOI technology.



Automatic Layout Modification: Including design reuse of the Alpha CPU in 0.13 micron SOI technology

by Michael Reinhardt

★★★★★ 5 out of 5

Language	: English
File size	: 4197 KB
Text-to-Speech	: Enabled
Print length	: 242 pages

Benefits of Design Reuse

Design reuse offers a number of benefits, including:

- Reduced design time

- Lower design costs
- Improved design quality
- Reduced risk
- Faster time-to-market

Design reuse can be used at all levels of the design process, from the architectural level to the circuit level. In the case of the Alpha 21264, design reuse was used at both the architectural and circuit levels. The architectural design of the Alpha 21264 was based on the existing Alpha 21064 microprocessor. This allowed the design team to leverage the work that had already been done on the Alpha 21064, and to focus on the new features that were needed for the Alpha 21264. At the circuit level, the design team reused a number of circuits from the Alpha 21064, including the data path, the control logic, and the memory interface. This allowed the design team to save a significant amount of time and effort.

Challenges of Design Reuse

While design reuse offers a number of benefits, there are also some challenges associated with it. These challenges include:

- Managing the complexity of reused designs
- Ensuring that reused designs are compatible with the new design
- Verifying the correctness of reused designs

The design team for the Alpha 21264 successfully overcame these challenges by using a number of techniques, including:

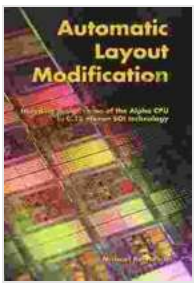
- Using a hierarchical design methodology
- Developing a comprehensive set of design rules
- Using a formal verification methodology

By using these techniques, the design team was able to manage the complexity of the reused designs, ensure that they were compatible with the new design, and verify their correctness.

The Alpha 21264 is a high-performance 64-bit microprocessor that operates at a clock speed of 200 MHz. The Alpha 21264 is the first microprocessor to be built using SOI technology. The design of the Alpha 21264 leveraged the work that had already been done on the Alpha 21064 microprocessor, and used a number of techniques to overcome the challenges of design reuse. The Alpha 21264 is a successful demonstration of the feasibility of using SOI technology to build high-performance microprocessors.

This book is a valuable resource for anyone who is interested in learning more about design reuse or SOI technology. The book provides a detailed overview of the design of the Alpha 21264, and discusses the benefits and challenges of design reuse. The book also provides a number of case studies of other successful design reuse projects.

If you are interested in learning more about design reuse or SOI technology, I highly recommend this book.



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