

Jens Lienig · Susann Rothe · Matthias Thiele

## Fundamentals of Electromigration-Aware Integrated Circuit Design

Second Edition

The book provides a comprehensive overview of electromigration and its effects on the reliability of electronic circuits. This second edition has been updated to introduce recent advancements in the understanding of the physical process of electromigration, which gives the reader the knowledge for adopting appropriate counter measures. A comprehensive set of options is presented for modifying the present IC design methodology to prevent electromigration. Finally, the authors show how specific effects can be exploited in present and future technologies to reduce electromigration's negative impact on circuit reliability.

### Contents

- Introduction
- Fundamentals of Electromigration
- Integrated Circuit Design and Electromigration
- Mitigating Electromigration in Physical Design
- Summary and Outlook

*"This improved, second edition of the book provides the fundamental science necessary for a sound grounding from which to make practical use of the complete and indispensable application-oriented information regarding the electromigration-aware design of electronic systems. It is a foundational reference for today's design professionals, as well as for the next generation of engineering students."*

Prof. Worthy Martin, Emeritus Associate Professor of Computer Science,  
University of Virginia

*"This is a long-awaited book bridging the design and reliability methodologies imperative for generating robust and high-performing semiconductor devices. A deep insight into physics of the electromigration induced degradation of on-chip interconnect components as well as explaining a design specific failure development are beneficial for both the chip-design and materials engineering communities."*

Dr. Valeriy Sukharev, Chief Scientist, Siemens EDA

*"This book summarizes our current understanding of electromigration and how its effects can be moderated in practice. Particularly important and valuable are techniques that can address electromigration in modern automated design flows."*

Dr. Igor Markov, Distinguished Architect, Synopsys, Inc.

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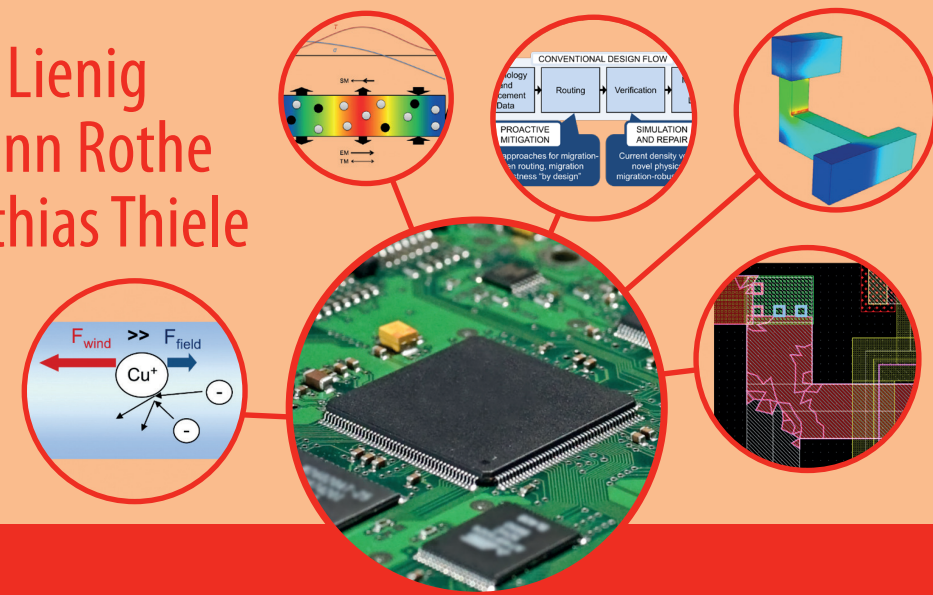
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