# DESCRIPTION

New advanced modeling methods for simulating the electromagnetic properties of complex three-dimensional electronic systems

Based on the author's extensive research, this book sets forth tested and proven electromagnetic modeling and simulation methods for analyzing signal and power integrity as well as electromagnetic interference in large complex electronic interconnects, multilayered package structures, integrated circuits, and printed circuit boards. Readers will discover the state of the technology in electronic package integration and printed circuit board simulation and modeling. In addition to popular full-wave electromagnetic computational methods, the book presents new, more sophisticated modeling methods, offering readers the most advanced tools for analyzing and designing large complex electronic structures.

*Electrical Modeling and Design for 3D System Integration* begins with a comprehensive review of current modeling and simulation methods for signal integrity, power integrity, and electromagnetic compatibility. Next, the book guides readers through:

- The macromodeling technique used in the electrical and electromagnetic modeling and simulation of complex interconnects in three-dimensional integrated systems
The semi-analytical scattering matrix method based on the N-body scattering theory for modeling of three-dimensional electronic package and multilayered printed circuit boards with multiple vias

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Two- and three-dimensional integral equation methods for the analysis of power distribution networks in three-dimensional package integrations

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The physics-based algorithm for extracting the equivalent circuit of a complex power distribution network in three-dimensional integrated systems and printed circuit boards

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An equivalent circuit model of through-silicon vias

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Metal-oxide-semiconductor capacitance effects of through-silicon vias

Engineers, researchers, and students can turn to this book for the latest techniques and methods for the electrical modeling and design of electronic packaging, three-dimensional electronic integration, integrated circuits, and printed circuit boards.

ABOUT THE AUTHOR

ER-PING LI, PhD, holds an appointment as Chair Professor at Zhejiang University, China, and has also been a principal scientist and director at the Institute of High Performance Computing, Singapore. He is a Fellow of the IEEE and a Fellow of the Electromagnetics Academy. He has received numerous awards and honors in recognition of his professional work from the IEEE and other professional bodies. Dr. Li is a pioneer in the modeling and simulation for signal/power and EMC in integrated circuits and electronic systems packaging. He has chaired or spoken at numerous international conferences and universities, and has also served as editor to several IEEE Transactions.