

《芯片和系统的电源完整性建模与设计》

图书基本信息

书名：《芯片和系统的电源完整性建模与设计》

13位ISBN编号：9787030345004

10位ISBN编号：7030345002

出版时间：2012-6

出版社：科学出版社

作者：Madhavan Swaminathan

页数：471

版权说明：本站所提供下载的PDF图书仅提供预览和简介以及在线试读，请支持正版图书。

更多资源请访问：www.tushu000.com

《芯片和系统的电源完整性建模与设计》

内容概要

斯瓦米纳坦等编著的《芯片和系统的电源完整性建模与设计(影印版)》包括电源完整性设计和建模两部分内容，重点在建模方面。全书分五章，涵盖了从基础知识到高级应用所需了解的各个细节。书中通过真实的案例分析和可下载的软件实例，描述了当今高效电源分配和噪声最小化的设计与建模的前沿技术，其中很多例子可以进行再仿真实现，这些可以用来评估常用的商用软件的准确性和速度。

《芯片和系统的电源完整性建模与设计(影印版)》适合研究电源完整性的学生、学者及工程师使用。

。

书籍目录

- Preface
- Acknowledgments
- About the Author
- Chapter 1
 - Basic Concepts
 - 1.1 Introduction
 - 1.1.1 Functioning of Traisto
 - 1.1.2 What Are the Problems with Power Delivery?
 - 1.1.3 Importance of Power Delivery in Microprocesso and ICs
 - 1.1.4 Power Delivery Network
 - 1.1.5 Traients on the Power Supply
 - 1.2 Simple Relatiohips for Power Delivery
 - 1.2.1 Core Circuits
 - 1.2.2 I/O Circuits
 - 1.2.3 Delay Due to SSN
 - 1.2.4 Timing and Voltage Margin Due to SSN
 - 1.2.5 Relatiohip between Capacitor and Current
 - 1.3 Design of PDNs
 - 1.3.1 Target Impedance
 - 1.3.2 Impedance and Noise Voltage
 - 1.4 Components of a PDN
 - 1.4.1 Voltage Regulator
 - 1.4.2 Bypass or Decoupling Capacito
 - 1.4.3 Package and Board Planes
 - 1.4.4 On-Chip Power Distribution
 - 1.4.5 PDN with Components
 - 1.5 Analysis of PDNs
 - 1.5.1 Single-Node Analysis
 - 1.5.2 Distributed Analysis
 - 1.6 Chip-Package Antiresonance: An Example
 - 1.7 High-Frequency Measurements
 - 1.7.1 Measurement of Impedance
 - 1.7.2 Measurement of Self-Impedance
 - 1.7.3 Measurement of Trafer Impedance
 - 1.7.4 Measurement of Impedance by Completely Eliminating Probe Inductance
 - 1.8 Signal Lines Referenced to Planes
 - 1.8.1 Signal Lines as Tramission Lines
 - 1.8.2 Relatiohip between Tramission-Line Paramete and SSN
 - 1.8.3 Relatiohip between SSN and Return Path
 - Discontinuities
 - 1.9 PDN Modeling Methodology
 - 1.10 Summary

Chapter 2

Modeling of Planes

2.1 Introduction

2.2 Behavior of Planes

2.2.1 Frequency Domain

2.2.2 Time Domain

2.2.3 Two-Dimensional Planes

2.3 Lumped Modeling Using Partial Inductances

2.3.1 Extracting the Inductance and Resistance

Matrices

2.4 Distributed Circuit-Based Approaches

2.4.1 Modeling Using Transmission Lines

2.4.2 Transmission Matrix Method (TMM)

2.4.3 Frequency-Dependent Behavior of Unit-Cell

Elements

2.4.4 Modeling of Gaps in Planes

2.5 Discretization-Based Plane Models

2.5.1 Finite-Difference Method

2.5.2 Finite-Difference Time-Domain Method

2.5.3 Finite-Element Method

2.6 Analytical Methods

2.6.1 Cavity Resonator Method

2.6.2 Network Representation of the Cavity

Resonator Model

2.7 Multiple Plane Pair

2.7.1 Coupling through the Vias

2.7.2 Coupling through the Conductors

2.7.3 Coupling through the Apertures

2.8 Summary

Chapter 3

Simultaneous Switching Noise

3.1 Introduction

3.1.1 Methods for Modeling S₁₁ and S₂₂

3.2 Simple Models

3.2.1 Modeling of Output Buffers

3.3 Modeling of Transmission Lines and Planes

3.3.1 Microstrip Configuration

3.3.2 Stripline Configuration

3.3.3 Conductor-Backed Coplanar Waveguide

Configuration

3.3.4 Summary of Modal Decomposition

Methods

3.4 Application of Models in Time-Domain Analysis

3.4.1 Plane Bounce from Return Currents

3.4.2 Microstrip-to-Microstrip Via

Transition

3.4.3 Split Planes

3.5 Application of Models in Frequency-Domain Analysis

3.5.1 Stripline between a Power and a Ground

Plane

3.5.2 Microstrip-to-Stripline Via Transition

3.5.3 Reduction of Noise Coupling Using Thin

Dielectrics

3.6 Extension of M-FDM to Incorporate Transmission Lines

3.6.1 Analysis of a Complex Board Design

3.7 Summary

Chapter 4

Time-Domain Simulation Methods

4.1 Introduction

4.2 Rational Function Method

4.2.1 Basic Theory

4.2.2 Interpolation Schemes

4.2.3 Properties of Rational Functions

4.2.4 Passivity Enforcement

4.2.5 Integration in a Circuit Solver

4.2.6 Disadvantages

4.3 Signal Flow Graphs

4.3.1 Causality

4.3.2 Transfer-Function Causality

4.3.3 Minimum Phase

4.3.4 Delay Extraction from Frequency

Response

4.3.5 Causal Signal Flow Graphs

4.3.6 Computational Aspects in SFG

4.3.7 Fast Convolution Methods

4.3.8 Cosimulation of Signal and Power Using

SFGs

4.4 Modified Nodal Analysis (MNA)

4.4.1 What Is MNA?

4.4.2 Frequency Domain

4.4.3 Time Domain

4.4.4 MNA Formulation with S-Parameters

4.5 Summary

Chapter 5

Applications

5.1 Introduction

5.2 High-Speed Servers

5.2.1 Core PDN Noise

5.2.2 I/O PDN Noise

5.2.3 Summary

5.3 High-Speed Differential Signaling

5.3.1 Test Vehicle Description

5.3.2 Plane Modeling

5.3.3 Modeling of Master and Slave Islands

5.3.4 Rational Function Modeling

5.3.5 Modal Decomposition and Noise

Simulation

5.3.6 Summary

- 5.4 Analysis of IC Packages
 - 5.4.1 Simulation of a Multilayered Package Using M-FDM
 - 5.4.2 Causal Simulation of HyperBGA Package
 - 5.4.3 Summary
- 5.5 Extraction of Dielectric Constant and Loss Tangent
 - 5.5.1 Problem Definition
 - 5.5.2 Corner-to-Corner Plane-Probing Method
 - 5.5.3 Causal Model Development
 - 5.5.4 Summary
- 5.6 Embedded Decoupling Capacitors
 - 5.6.1 Embedded Individual Thin- or Thick-Film Capacitors
 - 5.6.2 Why Embed Individual Capacitors
 - 5.6.3 Design of an Embedded Thick-Film Capacitor Array
 - 5.6.4 Integration of Embedded Capacitors into IBM Package
 - 5.6.5 Embedded Planar Capacitors
 - 5.6.6 Summary
- 5.7 Electromagnetic Bandgap (EBG) Structures
 - 5.7.1 Basic Theory
 - 5.7.2 Response of EBG Structures
 - 5.7.3 Dispersion-Diagram Analysis
 - 5.7.4 Modification of M-FDM Using Fringe and Gap Fields
 - 5.7.5 Scalable Design of EBG Structures for Power Plane Isolation
 - 5.7.6 Digital-RF Integration
 - 5.7.7 ADC Load-Board Design
 - 5.7.8 Issues with EBG Structures for Digital Systems
 - 5.7.9 Summary
- 5.8 Future Challenges
- Appendix A
 - A.1 Multiport Networks
 - A.2 Matrix Representation of Transmission Lines
 - A.3 Spectrum of Digital Signals
- Appendix B Software list
- Index

《芯片和系统的电源完整性建模与设计》

精彩短评

- 1、本书算是PI的入门书籍吧，英文不好的可以去看李玉山教授翻译的中文版

《芯片和系统的电源完整性建模与设计》

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:www.tushu000.com