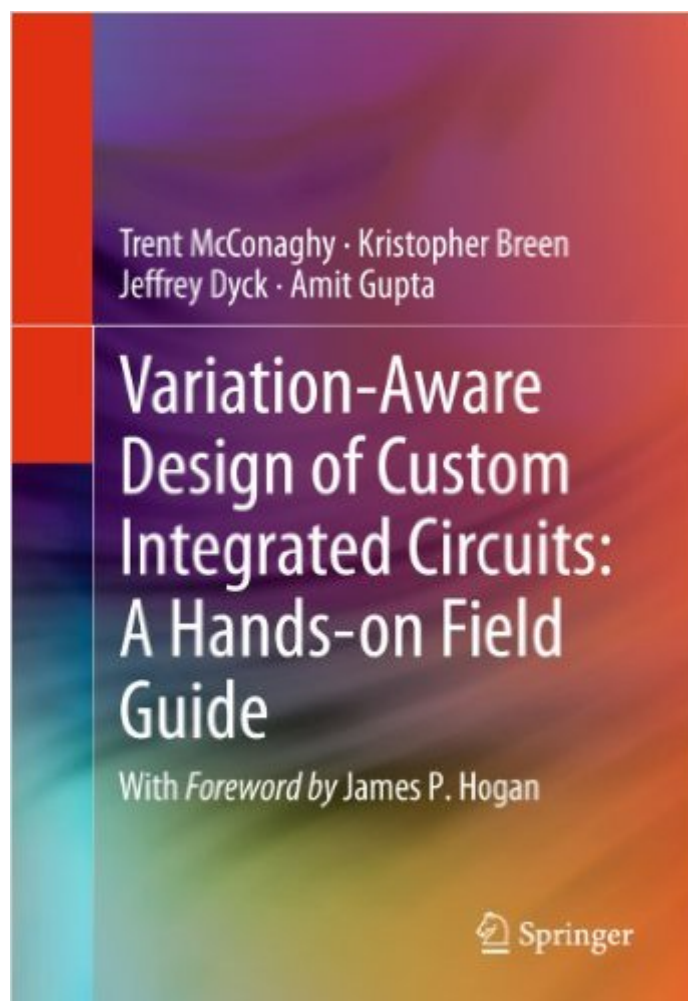# Variation-Aware Design Of Custom Integrated Circuits: A Hands-on Field Guide

Synopsis

This book targets custom IC designers who are encountering variation issues in their designs, especially for modern process nodes at 45nm and below, such as statistical process variations, environmental variations, and layout effects. It teaches them the state-of-the-art in Variation-Aware Design tools, which help the designer to analyze quickly the variation effects, identify the problems, and fix the problems. Furthermore, this book describes the algorithms and algorithm behavior/performance/limitations, which is of use to designers considering these tools, designers using these tools, CAD researchers, and CAD managers.

Book Information

File Size: 2499 KB

Print Length: 188 pages

Publisher: Springer; 2013 edition (October 2, 2012)

Publication Date: October 2, 2012

Sold by: Digital Services LLC

Language: English

ASIN: B00A9YH8P2

Text-to-Speech: Enabled

X-Ray: Not Enabled

Word Wise: Not Enabled

Lending: Not Enabled

Enhanced Typesetting: Not Enabled

Best Sellers Rank: #1,117,680 Paid in Kindle Store (See Top 100 Paid in Kindle Store)   #45 in Kindle Store > Kindle eBooks > Nonfiction > Science > Technology > Nanotechnology   #241 in Kindle Store > Kindle eBooks > Engineering & Transportation > Engineering > Electrical & Electronics > Circuits   #319 in Books > Computers & Technology > Programming > Software Design, Testing & Engineering > Logic

Customer Reviews

This book is a must read for IC designers who want to design for high yield. The book is written in a very accessible style and is therefore a very good guideline for students that are new to the topic. Furthermore, advanced circuit designers can also benefit from the simple and to-the-point variability-aware design flows described in the book. Depending on the type of design (digital, memory, analog/RF, etc.) different approaches are possible (Worst case design, corner design,

3sigma design, high-sigma design, etc.). Each method has advantages and disadvantages and is, depending on the application, more or less suited for a specific problem. In the book, these methods are very well explained and where applicable a basic understanding of different algorithms used by computer programs is provided. The material is well described and allows a good understanding without being too detailed. Excellent references are provided for further reading on a specific topic. A better understanding of this topic will help any IC designer to develop high yield, high performant circuits without doing days of Monte-Carlo simulations.In a nutshell: this book provides a very good introduction into nanometer CMOS IC design for variability, offering a comprehensive field guide to handle variability without loosing itself into mathematical details.

This is a truly useful book for both academic researchers and industrial practitioners. There are many books devoted to manufacturing-related variation physics or statistical algorithms for variability, but few that give an integral view on physical design solutions from both perspectives. It is in the integration area of advanced process, layout, extraction methodology, design approach, and verification that this book adds an unique value to reliable design.It starts with the necessary background knowledge of design uncertainties, and continues through chapters of verification and methodologies in robust custom IC design, with a comprehensive treatment on related algorithms. This book is indeed for IC designers and tool developers who want a timely and convenient reference written by expert practitioners of the industry.

This is a book that every circuit designer must read -- especially the students who are just entering the field must read this before they get tainted by the old, corner-based designs flows that are broken. I find this book as a great companion to the Solido's Variation Designer tool, just as the papers of Ken Kundert's and Joel Phillip's were to the Cadence SpectreRF. It covers all the theoretical basis required to fully utilize the tool; those who fully grasp these concepts would be million years ahead of those who just run plain Monte-Carlo simuations for weeks and months and even those who run the Solido's tools as black-boxes. The authors kindly offer their precious insights in the field they acquired from the long, interdisciplinary research between IC design, computer-aided tools, statistics, and machine learning.

The book gives a good overview of which solutions currently can be found that handle the effects of the unpredictable nature of circuit manufacturing on circuit designs.Next to an introduction on the existing variation effects deteriorating our designs and even killing them, the book gives a

comprehensive overview of possible solutions to handle these effects.As all these methods have their pros and cons, mostly trading each other off, the book describes and compares these solutions and focuses on how Solido Design Automation puts them into practice to treat designers' headaches.For project developers in electronics industry, this book is a great introduction to the tools and methods Solido offers to bring circuit development to the next level and increase productivity while lowering design time.

I am graduate student at INAOE in Mexico. I acquired the book and I found it is a good guidance for computer aided simulation of integrated circuits. The organization helps to understand step by step what to do in order to accomplish target specifications including not only variations but also statistical analysis. In my graduate program, most of the circuits under design need a worst case analysis, so that the part on PVT is helpful. Finally, I found that the book reflects the invaluable expertise of the authors, so that I am doing better focusing my designs to accomplish targets imposed by the modern nanoelectronic industry.

Variation-Aware Design of Custom Integrated Circuits: A Hands-on Field Guide Design of 3D Integrated Circuits and Systems (Devices, Circuits, and Systems) Low-Voltage/Low-Power Integrated Circuits and Systems: Low-Voltage Mixed-Signal Circuits (IEEE Press Series on Microelectronic Systems) Advances in 3D Integrated Circuits and Systems (Series on Emerging Technologies in Circuits and Systems) CMOS SRAM Circuit Design and Parametric Test in Nano-Scaled Technologies: Process-Aware SRAM Design and Test (Frontiers in Electronic Testing) How to Use Custom Dashboards in Google Analytics: Using Custom Dashboards to Grow Your Blog Principles of Transistor Circuits, Eighth Edition: Introduction and guide to the design of amplifiers, function generators, receivers and digital circuits Analysis and Design of Analog Integrated Circuits, 5th Edition Design of Analog CMOS Integrated Circuits Design With Operational Amplifiers And Analog Integrated Circuits (McGraw-Hill Series in Electrical and Computer Engineering) Analysis and Design of Digital Integrated Circuits CMOS Digital Integrated Circuits Analysis & Design Design with Operational Amplifiers and Analog Integrated Circuits Analysis and Design of Analog Integrated Circuits (4th Edition) Design of Integrated Circuits for Optical Communications Digital Integrated Circuits: A Design Perspective The Design of CMOS Radio-Frequency Integrated Circuits, Second Edition Electronic Circuits: The Definitive Guide to Circuit Boards, Testing Circuits and Electricity Principles The South Beach Diet Gluten Solution:Â The Delicious, Doctor-Designed, Gluten-Aware Plan for Losing Weight and Feeling

Great--FAST! The South Beach Diet Gluten Solution: The Delicious, Doctor-Designed, Gluten-Aware Plan for Losing Weight and Feeling Great--FAST! by Arthur Agatston (April 2 2013)