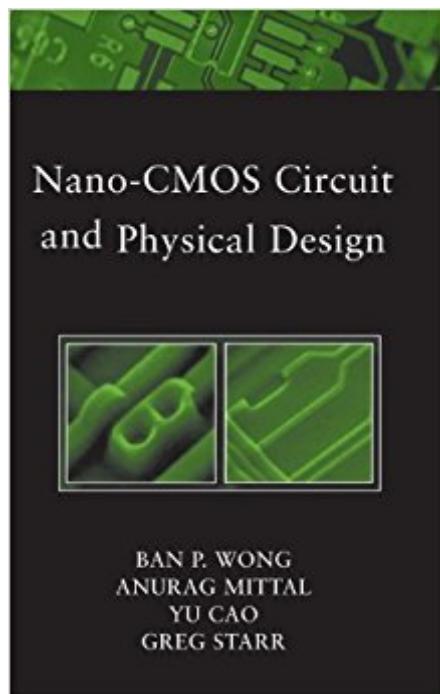


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# Nano-CMOS Circuit And Physical Design



## Synopsis

Based on the authors' expansive collection of notes taken over the years, Nano-CMOS Circuit and Physical Design bridges the gap between physical and circuit design and fabrication processing, manufacturability, and yield. This innovative book covers: process technology, including sub-wavelength optical lithography; impact of process scaling on circuit and physical implementation and low power with leaky transistors; and DFM, yield, and the impact of physical implementation.

## Book Information

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## Customer Reviews

A practical approach to nano-CMOS circuit design and implementation The fast pace of new technology and the challenges of nano-scaling are bringing together the once-separate disciplines of circuit design, technology device physics, and physical implementation. A good understanding of the underlying physical constraints of device, interconnect, and manufacturing is crucial for designing circuit systems and devices and making sound technology decisions. Nano-CMOS Circuit and Physical Design integrates the nanometer process, device manufacturability, advanced circuit design, and related physical implementation into a single, seamless approach to advanced semiconductor technology. This comprehensive volume explores new developments in devices and processing; presents design issues, paying special attention to technology/design interactions such as signal integrity and interconnects; and addresses the impact of design for manufacturability and

variability. Important topics include: Nano-CMOS process scaling issues and implications on design Subwavelength optical lithography Physics and theory of operation issues and solutions Design for manufacturability and variability Written by expert practitioners, Nano-CMOS Circuit and Physical Design is a useful resource for IC designers and professionals in the field, providing them with practical design solutions and approaches.

BAN P. WONG, IENG MIEE, served for five years as a member of the technical program committee of IEEE International Solid-State Circuits Conference and as session chair, cochair, and organizer of a panel session. He has three issued patents. He has led circuit design teams in developing methodology and implementation of high-performance and low-power microprocessors. He is currently Senior Engineering Manager for NVIDIA Corporation. ANURAG MITTAL received his PhD in applied physics from Yale University. He has codeveloped novel embedded NVM microcontroller and microprocessor solutions including the world's first truly CMOS-compatible Flash technology. He is Senior Staff Engineer for Virage Logic, Inc. YU CAO received his PhD in electrical engineering from University of California, Berkeley. He is a postdoctoral researcher in the Berkeley Wireless Research Center. He received the 2000 Beatrice Winner Award at the IEEE International Solid-State Circuits Conference. GREG STARR received his PhD in electrical engineering from Arizona State University. Currently, he is a Senior Design Manager at Xilinx Corporation.

Although written at the time when BSIM4 was still hot off the press, this book stayed relevant over the years precisely because of its main stated goal of publication: to fight compartmentalization of knowledge in IC design. Isolation between process and circuit design engineers is probably even greater today than it was in 2005. The greatest strength of this book is that it provides measured insight into other worlds in which designers normally don't live in. Not too much, not too little, just enough to perk reader's interest to look further, and at the same time providing insight into complexity of the most advanced manufacturing process mankind has produced to date. I came across this book five years ago preparing for a node switch, and have been coming back to it ever since to read on the effects that have trickled into design space since then. Most of the predictions of the book have materialized, some haven't, and all are in need of an update. While still a valuable resource, revision of this unique volume is needed, hopefully the IEEE, the authors and the publisher will agree with me and follow through.

A must read for every custom circuit designer working on 90nm and beyond. Warning! this is not for

the novice! A wealth of information. Can't wait for the next book by the authors.

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