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DIGITAL INTEGRATED CIRCUITS

A DESIGN PERSPECTIVE
SECOND EDITION



JAN M. RABAEY
ANANTHA CHANDRAKASAN
BORIVOJE NIKOLIĆ



Digital Integrated Circuits A Design Perspective Second Edition

Xiaowei Li, Guihai Yan, Cheng Liu



Digital Integrated Circuits A Design Perspective Second Edition:

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Digital Integrated Circuits Jan M. Rabaey, 1996 Beginning with discussions on the operation of electronic devices and analysis of the nucleus of digital design the text addresses the impact of interconnect design for low power issues in timing and clocking design methodologies and the effect of design automation on the digital design perspective

Digital Integrated Circuits John E. Ayers, 2018-09-03 Exponential improvement in functionality and performance of digital integrated circuits has revolutionized the way we live and work The continued scaling down of MOS transistors has broadened the scope of use for circuit technology to the point that texts on the topic are generally lacking after a few years The second edition of *Digital Integrated Circuits Analysis and Design* focuses on timeless principles with a modern interdisciplinary view that will serve integrated circuits engineers from all disciplines for years to come Providing a revised instructional reference for engineers involved with Very Large Scale Integrated Circuit design and fabrication this book delves into the dramatic advances in the field including new applications and changes in the physics of operation made possible by relentless miniaturization This book was conceived in the versatile spirit of the field to bridge a void that had existed between books on transistor electronics and those covering VLSI design and fabrication as a separate topic Like the first edition this volume is a crucial link for integrated circuit engineers and those studying the field supplying the cross disciplinary connections they require for guidance in more advanced work For pedagogical reasons the author uses SPICE level 1 computer simulation models but introduces BSIM models that are indispensable for VLSI design This enables users to develop a strong and intuitive sense of device and circuit design by drawing direct connections between the hand analysis and the SPICE models With four new chapters more than 200 new illustrations numerous worked examples case studies and support provided on a dynamic website this text significantly expands concepts presented in the first edition

VLSI Design Esteban Tlelo-Cuautle, Sheldon X.-D. Tan, 2012-01-20 This book provides some recent advances in design nanometer VLSI chips The selected topics try to present some open problems and challenges with important topics ranging from design tools new post silicon devices GPU based parallel computing emerging 3D integration and antenna design The book consists of two parts with chapters such as VLSI design for multi sensor smart systems on a chip Three dimensional integrated circuits design for thousand core processors Parallel symbolic analysis of large analog circuits on GPU platforms Algorithms for CAD tools VLSI design A multilevel memetic algorithm for large SAT encoded problems etc

Electronic Design Automation Laung-Terng Wang, Yao-Wen Chang, Kwang-Ting (Tim) Cheng, 2009-03-11 This book provides broad and comprehensive coverage of the entire EDA flow EDA VLSI practitioners and researchers in need of fluency in an adjacent field will find this an invaluable

reference to the basic EDA concepts principles data structures algorithms and architectures for the design verification and test of VLSI circuits Anyone who needs to learn the concepts principles data structures algorithms and architectures of the EDA flow will benefit from this book Covers complete spectrum of the EDA flow from ESL design modeling to logic test synthesis verification physical design and test helps EDA newcomers to get up and running quickly Includes comprehensive coverage of EDA concepts principles data structures algorithms and architectures helps all readers improve their VLSI design competence Contains latest advancements not yet available in other books including Test compression ESL design modeling large scale floorplanning placement routing synthesis of clock and power ground networks helps readers to design develop testable chips or products Includes industry best practices wherever appropriate in most chapters helps readers avoid costly mistakes

Digital Integrated Circuits Evgeni Perelroyzen,2018-10-03 A current trend in digital design the integration of the MATLAB components Simulink and Stateflow for model building simulations system testing and fault detection allows for better control over the design flow process and ultimately for better system results Digital Integrated Circuits Design for Test Using Simulink and Stateflow illustrates the construction of Simulink models for digital project test benches in certain design for test fields The first two chapters of the book describe the major tools used for design for test The author explains the process of Simulink model building presents the main library blocks of Simulink and examines the development of finite state machine modeling using Stateflow diagrams Subsequent chapters provide examples of Simulink modeling and simulation for the latest design for test fields including combinational and sequential circuits controllability and observability deterministic algorithms digital circuit dynamics timing verification built in self test BIST architecture scan cell operations and functional and diagnostic testing The book also discusses the automatic test pattern generation ATPG process the logical determinant theory and joint test action group JTAG interface models Digital Integrated Circuits explores the possibilities of MATLAB s tools in the development of application specific integrated circuit ASIC design systems The book shows how to incorporate Simulink and Stateflow into the process of modern digital design

The Encyclopedia of the Industrial Revolution in World History Kenneth E. Hendrickson III,2014-11-25 As editor Kenneth E Hendrickson III notes in his introduction Since the end of the nineteenth century industrialization has become a global phenomenon After the relative completion of the advanced industrial economies of the West after 1945 patterns of rapid economic change invaded societies beyond western Europe North America the Commonwealth and Japan In *The Encyclopedia of the Industrial Revolution in World History* contributors survey the Industrial Revolution as a world historical phenomenon rather than through the traditional lens of a development largely restricted to Western society *The Encyclopedia of the Industrial Revolution in World History* is a three volume work of over 1 000 entries on the rise and spread of the Industrial Revolution across the world Entries comprise accessible but scholarly explorations of topics from the aerospace industry to zaibatsu Contributor articles not only address topics of technology and technical innovation but emphasize the individual human and social experience of

industrialization Entries include generous selections of biographical figures and human communities with articles on entrepreneurs working men and women families and organizations They also cover legal developments disasters and the environmental impact of the Industrial Revolution Each entry also includes cross references and a brief list of suggested readings to alert readers to more detailed information The Encyclopedia of the Industrial Revolution in World History includes over 300 illustrations as well as artfully selected extended quotations from key primary sources from Thomas Malthus Essay on the Principal of Population to Arthur Young s look at Birmingham England in 1791 This work is the perfect reference work for anyone conducting research in the areas of technology business economics and history on a world historical scale

Built-in Fault-Tolerant Computing Paradigm for Resilient Large-Scale Chip Design Xiaowei Li, Guihai Yan, Cheng Liu, 2023-03-01 With the end of Dennard scaling and Moore s law IC chips especially large scale ones now face more reliability challenges and reliability has become one of the mainstay merits of VLSI designs In this context this book presents a built in on chip fault tolerant computing paradigm that seeks to combine fault detection fault diagnosis and error recovery in large scale VLSI design in a unified manner so as to minimize resource overhead and performance penalties Following this computing paradigm we propose a holistic solution based on three key components self test self diagnosis and self repair or 3S for short We then explore the use of 3S for general IC designs general purpose processors network on chip NoC and deep learning accelerators and present prototypes to demonstrate how 3S responds to in field silicon degradation and recovery under various runtime faults caused by aging process variations or radical particles Moreover we demonstrate that 3S not only offers a powerful backbone for various on chip fault tolerant designs and implementations but also has farther reaching implications such as maintaining graceful performance degradation mitigating the impact of verification blind spots and improving chip yield This book is the outcome of extensive fault tolerant computing research pursued at the State Key Lab of Processors Institute of Computing Technology Chinese Academy of Sciences over the past decade The proposed built in on chip fault tolerant computing paradigm has been verified in a broad range of scenarios from small processors in satellite computers to large processors in HPCs Hopefully it will provide an alternative yet effective solution to the growing reliability challenges for large scale VLSI designs

CMOS Digital Integrated Circuits Sung-Mo Kang, Yusuf Leblebici, 1996 This text is the most comprehensive book on the market for CMOS circuits Aimed at junior senior courses offered in electrical engineering and computer science this book starts with CMOS processing and then covers MOS transition models basic CMOS gates dynamic circuits memory circuits BiCMOS circuits I O circuits VLSI design methodologies design for manufacturability and design for testability This text provides rigorous treatment of basic design concepts with detailed examples It addresses both design concepts and computer aided analysis for most of the circuit examples SPICE simulation results are provided for illustration

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The Cornellian ,2001

Millimeter-wave CMOS Power Amplifiers Design Mounir Youssef

Bohsali,2008 **15th Symposium on Integrated Circuits and Systems Design** Ricardo Augusto da Luz Reis,Ney Calazans,2002 **ISLPED'04** ,2004 IEEE Catalog Number 04TH8758 T p verso Proceedings ,2004 Low Power Synchronization for Wireless Communication Marcy Josephine Ammer,2004 **Modern VLSI Design** Wayne Wolf,1998 Techniques for the latest deep submicron mega chip projects The start to finish state of the art guide to VLSI design VLSI design is system design To build high performance cost effective ICs you must understand all aspects of digital design from planning and layout to fabrication and packaging Modern VLSI Design Second Edition Systems on Silicon is a comprehensive bottom up guide to the entire VLSI design process Emphasizing CMOS it focuses on the crucial challenges of deep submicron VLSI design Coverage includes Devices and layouts transistor structures and characteristics wires vias parasitics design rules layout design and tools Logic gates and combinational logic networks including interconnect delay and crosstalk Sequential machines and sequential system design Subsystem design including high speed adders multipliers ROM SRAM SRAM PGAs and PLAs Floorplanning clock distribution and power distribution Architecture design including VHDL scheduling function unit selection power and testability Chip design methodologies CAD systems and algorithms Modern VLSI Design Second Edition Systems on Silicon offers a complete yet accessible introduction to crosstalk models and optimization It covers minimizing power consumption at every level of abstraction from circuits to architecture and new insights into design for testability techniques that maximize quality despite quicker turnarounds It also presents detailed coverage of the algorithms underlying contemporary VLSI computer aided design software so designers can understand their tools nomatter which ones they choose Whether you re a practicing professional or advanced student this is the sophisticated VLSI design knowledge you need to succeed with tomorrow s most challenging projects CMOS Digital Integrated Circuits Sung-Mo Kang,Yusuf Leblebici,1999 The second edition of this comprehensive text contains extensive revisions to reflect recent advances in technology and in circuit design practices Recognizing that the area of digital integrated circuit design is evolving at an increasingly fast pace every effort has been made to present state of the art material on all subjects covered in the book This book is primarily designed as a comprehensive text for senior level and first year graduate level digital circuit design classes as well as a reference for practicing engineers in the areas of IC design and VLSI **On-chip Signaling Techniques for Nanometer VLSI Designs** Himanshu Kaul,2005

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