Fig. 3. Schematic diagram of our SPICE macromodel, which incorporates very high electric fields in the thin film. Varactors (X), (Y), and (XY) describe

Macromodeling With Spice

C. D. Motchenbacher,J. A. Connelly

Macromodeling With Spice:

Macromodeling with SPICE Joseph Alvin Connelly,Pyung Choi,1992 Describes macromodelling with SPICE a circuit simulation program The book covers the applicability of SPICE macromodelling in education and industry 31 drop in models simulated and verified for use either singly or in groups to perform any analog signal processing function are provided

Macromodeling with SPICE J. Alvin Connelly,1992 **Digital Timing Macromodeling for VLSI Design Verification** Jeong-Taek Kong,David V. Overhauser,2012-12-06 Digital Timing Macromodeling for VLSI Design Verification first of all provides an extensive history of the development of simulation techniques It presents detailed discussion of the various techniques implemented in circuit timing fast timing switch level timing switch level and gate level simulation It also discusses mixed mode simulation and interconnection analysis methods The review in Chapter 2 gives an understanding of the advantages and disadvantages of the many techniques applied in modern digital macromodels The book also presents a wide variety of techniques for performing nonlinear macromodeling of digital MOS subcircuits which address a large number of shortcomings in existing digital MOS macromodels Specifically the techniques address the device model detail transistor coupling capacitance effective channel length modulation series transistor reduction effective transconductance input terminal dependence gate parasitic capacitance the body effect the impact of parasitic RC interconnects and the effect of transmission gates The techniques address major sources of errors in existing macromodeling techniques which must be addressed if macromodeling is to be accepted in commercial CAD tools by chip designers The techniques presented in Chapters 4 6 can be implemented in other macromodels and are demonstrated using the macromodel presented in Chapter 3 The new techniques are validated over an extremely wide range of operating conditions much wider than has been presented for previous macromodels thus demonstrating the wide range of applicability of these techniques **The Electrical Engineering Handbook - Six Volume Set** Richard C. Dorf,2018-12-14 In two editions spanning more than a decade The Electrical Engineering Handbook stands as the definitive reference to the multidisciplinary field of electrical engineering Our knowledge continues to grow and so does the Handbook For the third edition it has grown into a set of six books carefully focused on specialized areas or fields of study Each one represents a concise yet definitive collection of key concepts models and equations in its respective domain thoughtfully gathered for convenient access Combined they constitute the most comprehensive authoritative resource available Circuits Signals and Speech and Image Processing presents all of the basic information related to electric circuits and components analysis of circuits the use of the Laplace transform as well as signal speech and image processing using filters and algorithms It also examines emerging areas such as text to speech synthesis real time processing and embedded signal processing Electronics Power Electronics Optoelectronics Microwaves Electromagnetics and Radar delves into the fields of electronics integrated circuits power electronics optoelectronics electromagnetics light waves and radar supplying all of the basic information required for a deep understanding of each area

It also devotes a section to electrical effects and devices and explores the emerging fields of microlithography and power electronics Sensors Nanoscience Biomedical Engineering and Instruments provides thorough coverage of sensors materials and nanoscience instruments and measurements and biomedical systems and devices including all of the basic information required to thoroughly understand each area It explores the emerging fields of sensors nanotechnologies and biological effects Broadcasting and Optical Communication Technology explores communications information theory and devices covering all of the basic information needed for a thorough understanding of these areas It also examines the emerging areas of adaptive estimation and optical communication Computers Software Engineering and Digital Devices examines digital and logical devices displays testing software and computers presenting the fundamental concepts needed to ensure a thorough understanding of each field It treats the emerging fields of programmable logic hardware description languages and parallel computing in detail Systems Controls Embedded Systems Energy and Machines explores in detail the fields of energy devices machines and systems as well as control systems It provides all of the fundamental concepts needed for thorough in depth understanding of each area and devotes special attention to the emerging area of embedded systems Encompassing the work of the world s foremost experts in their respective specialties The Electrical Engineering Handbook Third Edition remains the most convenient reliable source of information available This edition features the latest developments the broadest scope of coverage and new material on nanotechnologies fuel cells embedded systems and biometrics The engineering community has relied on the Handbook for more than twelve years and it will continue to be a platform to launch the next wave of advancements The Handbook s latest incarnation features a protective slipcase which helps you stay organized without overwhelming your bookshelf It is an attractive addition to any collection and will help keep each volume of the Handbook as fresh as your latest research   The Electrical Engineering Handbook,Second Edition Richard C. Dorf,1997-09-26 In 1993 the first edition of The Electrical Engineering Handbook set a new standard for breadth and depth of coverage in an engineering reference work Now this classic has been substantially revised and updated to include the latest information on all the important topics in electrical engineering today Every electrical engineer should have an opportunity to expand his expertise with this definitive guide In a single volume this handbook provides a complete reference to answer the questions encountered by practicing engineers in industry government or academia This well organized book is divided into 12 major sections that encompass the entire field of electrical engineering including circuits signal processing electronics electromagnetics electrical effects and devices and energy and the emerging trends in the fields of communications digital devices computer engineering systems and biomedical engineering A compendium of physical chemical material and mathematical data completes this comprehensive resource Every major topic is thoroughly covered and every important concept is defined described and illustrated Conceptually challenging but carefully explained articles are equally valuable to the practicing engineer researchers and students A distinguished advisory board and contributors including many of the

leading authors professors and researchers in the field today assist noted author and professor Richard Dorf in offering complete coverage of this rapidly expanding field No other single volume available today offers this combination of broad coverage and depth of exploration of the topics The Electrical Engineering Handbook will be an invaluable resource for electrical engineers for years to come **A Practical Guide to Analog Behavioral Modeling for IC System Design** Paul A. Duran,2012-11-14 A Practical Guide to Analog Behavioral Modeling for IC System Design presents a methodology for abstracting an IC system so that the designer can gain a macroscopic view of how sub systems interact as well as verify system functionality in various applications before committing to a design This will prevent problems that may be caused late in the design cycle by incompatibilities between the individual blocks that comprise the overall system This book will focus on the techniques of modelling IC systems through analog behavioral modeling and simulation It will investigate a practical approach by which designers can put together these systems to analyze topological and architectural issues to optimize IC system performance Highlights Discussions on modeling and simulation from SPICE to behavioral simulators Comparison of various hardware description languages and a discussion on the effects of language standardization Explanation on how to reduce time to market by decreasing design cycle time through modeling and simulation Contains more than 25 building block examples that can be used to construct mixed signal IC system models Analysis of 4 different IC systems using various levels of model detail This book is intended for the practicing engineer who would like to gain practical knowledge in applications of analog behavioral modelling for IC system design *Analog Circuit Design Volume Three* Bob Dobkin,John Hamburger,2014-11-29 Design Note Collection the third book in the Analog Circuit Design series is a comprehensive volume of applied circuit design solutions providing elegant and practical design techniques Design Notes in this volume are focused circuit explanations easily applied in your own designs This book includes an extensive power management section covering switching regulator design linear regulator design microprocessor power design battery management powering LED lighting automotive and industrial power design Other sections span a range of analog design topics including data conversion data acquisition communications interface design operational amplifier design techniques filter design and wireless RF communications and network design Whatever your application industrial medical security embedded systems instrumentation automotive communications infrastructure satellite and radar computers or networking this book will provide practical design techniques developed by experts for tackling the challenges of power management data conversion signal conditioning and wireless RF analog circuit design A rich collection of applied analog circuit design solutions for use in your own designs Each Design Note is presented in a concise two page format making it easy to read and assimilate Contributions from the leading lights in analog design including Bob Dobkin Jim Williams George Erdi and Carl Nelson among others Extensive sections covering power management data conversion signal conditioning and wireless RF High Performance Logic And Circuits For High-speed Electronic Systems Faquir C Jain,C Broadbridge,M Gherasimova,Hong

Tang,2019-06-27 In this volume we have put together papers spanning a broad range from the area of modeling of strain and misfit dislocation densities microwave absorption characteristics of nanocomposites to X ray diffraction studies Specific topics in this volume include In summary papers selected in this volume cover various aspects of high performance logic and circuits for high speed electronic systems **Circuit Design: Know It All** Darren Ashby,Bonnie Baker,Ian Hickman,Walt Kester,Robert Pease,Tim Williams,Bob Zeidman,2011-04-19 The Newnes Know It All Series takes the best of what our authors have written to create hard working desk references that will be an engineer s first port of call for key information design techniques and rules of thumb Guaranteed not to gather dust on a shelf Electronics Engineers need to master a wide area of topics to excel The Circuit Design Know It All covers every angle including semiconductors IC Design and Fabrication Computer Aided Design as well as Programmable Logic Design A 360 degree view from our best selling authors Topics include fundamentals Analog Linear and Digital circuits The ultimate hard working desk reference all the essential information techniques and tricks of the trade in one volume **Analog Circuit Design** Johan Huijsing,Rudy J. van de Plassche,Willy M.C. Sansen,2013-03-14 Johan H Huijsing This book contains 18 tutorial papers concentrated on 3 topics each topic being covered by 6 papers The topics are Low Noise Low Power Low Voltage Mixed Mode Design with CAD Tools Voltage Current and Time References The papers of this book were written by top experts in the field currently working at leading European and American universities and companies These papers are the reviewed versions of the papers presented at the Workshop on Advances in Analog Circuit Design which was held in Villach Austria 26 28 April 1995 The chairman of the Workshop was Dr Franz Dielacher from Siemens Austria The program committee existed of Johan H Huijsing from the Delft University of Technology Prof Willy Sansen from the Catholic University of Leuven and Dr Rudy 1 van der Plassche from Philips Eindhoven This book is the fourth of aseries dedicated to the design of analog circuits The topics which were covered earlier were Operational Amplifiers Analog to Digital Converters Analog Computer Aided Design Mixed AlD Circuit Design Sensor Interface Circuits Communication Circuits Low Power Low Voltage Integrated Filters Smart Power As the Workshop will be continued year by year a valuable series of topics will be built up from all the important areas of analog circuit design I hope that this book will help designers of analog circuits to improve their work and to speed it up *Semiconductor Modeling:* Roy Leventhal,Lynne Green,2007-01-10 Semiconductor Modeling For Simulating Signal Power and Electromagnetic Integrity assists engineers both recent graduates and working product designers in designing high speed circuits The authors apply circuit theory circuit simulation tools and practical experience to help the engineer understand semiconductor modeling as applied to high speed digital designs The emphasis is on semiconductor modeling with PCB transmission line effects equipment enclosure effects and other modeling issues discussed as needed The text addresses many practical considerations including process variation model accuracy validation and verification signal integrity and design flow Readers will benefit from its survey of modeling for semiconductors packages and interconnects along with

usable advice on how to get complex high speed prototypes to work on the first try Highlights include Presents a very complete and well balanced treatment of modeling of semiconductors packages and interconnects Facilitates reader comprehension of the whole field of high speed modeling including digital and RF circuits Combines practical modeling techniques with the latest EDA tools for simulation and successful high speed digital design Facilitates resolution of practical every day problems Presents modeling from its historical roots to current state of the art Facilitates keeping abreast of the latest modeling developments as they continue to unfold   **Analog VHDL** Andrzej T. Rosinski,Alain Vachoux,2012-12-06 Analog VHDL brings together in one place important contributions and up to date research results in this fast moving area Analog VHDL serves as an excellent reference providing insight into some of the most challenging research issues in the field   **Memristor-Based Nanoelectronic Computing Circuits and Architectures** Ioannis Vourkas,Georgios Ch. Sirakoulis,2015-08-26 This book considers the design and development of nanoelectronic computing circuits systems and architectures focusing particularly on memristors which represent one of today s latest technology breakthroughs in nanoelectronics The book studies explores and addresses the related challenges and proposes solutions for the smooth transition from conventional circuit technologies to emerging computing memristive nanotechnologies Its content spans from fundamental device modeling to emerging storage system architectures and novel circuit design methodologies targeting advanced non conventional analog digital massively parallel computational structures Several new results on memristor modeling memristive interconnections logic circuit design memory circuit architectures computer arithmetic systems simulation software tools and applications of memristors in computing are presented High density memristive data storage combined with memristive circuit design paradigms and computational tools applied to solve NP hard artificial intelligence problems as well as memristive arithmetic logic units certainly pave the way for a very promising memristive era in future electronic systems Furthermore these graph based NP hard problems are solved on memristive networks and coupled with Cellular Automata CA inspired computational schemes that enable computation within memory All chapters are written in an accessible manner and are lavishly illustrated The book constitutes an informative cornerstone for young scientists and a comprehensive reference to the experienced reader hoping to stimulate further research on memristive devices circuits and systems   **Passive Macromodeling** Stefano Grivet-Talocia,Bjorn Gustavsen,2015-10-30 Offers an overview of state of the art passive macromodeling techniques with an emphasis on black box approaches This book offers coverage of developments in linear macromodeling with a focus on effective proven methods After starting with a definition of the fundamental properties that must characterize models of physical systems the authors discuss several prominent passive macromodeling algorithms for lumped and distributed systems and compare them under accuracy efficiency and robustness standpoints The book includes chapters with standard background material such as linear time invariant circuits and systems basic discretization of field equations state space systems as well as appendices collecting basic facts from linear algebra

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Memristor Science and Applications Robert Kozma,Robinson E. Pino,Giovanni E. Pazienza,2012-06-28 Physical implementation of the memristor at industrial scale sparked the interest from various disciplines ranging from physics nanotechnology electrical engineering neuroscience to intelligent robotics As any promising new technology it has raised hopes and questions it is an extremely challenging task to live up to the high expectations and to devise revolutionary and feasible future applications for memristive devices The possibility of gathering prominent scientists in the heart of the Silicon Valley given by the 2011 International Joint Conference on Neural Networks held in San Jose CA has offered us the unique opportunity of organizing a series of special events on the present status and future perspectives in neuromorphic memristor science This book presents a selection of the remarkable contributions given by the leaders of the field and it may serve as inspiration and future reference to all researchers that want to explore the extraordinary possibilities given by this revolutionary concept

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