Semiconductor Device Modeling with SPICE

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Semiconductor Device Modeling With Spice

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Semiconductor Device Modeling With Spice:

Semiconductor Device Modeling with SPICE Paolo Antognetti,Giuseppe Massobrio,1988 Semiconductor Device Modeling with SPICE Giuseppe Massobrio,Paolo Antognetti,1993 How to stimulate circuits faster and better with SPICE Table of Contents PN Junction Diode And Schottky Diode Bipolar Junction Transistor BJT Junction Field Effect Transistor JFET The MOS Transistor BJT Parameter Measurements MOS Parameter Measurements Noise and Distortion The SPICE Program MESFET ISFET And Thyrstor Devices Appendix A The Two Terminal PN Structure Appendix B The Two Terminal MOS Structure Appendix C MS Junctions Index 100 illustrations **Semiconductor Device Modeling with SPICE** Paolo Antognetti,1988 **Introduction to Device Modeling and Circuit Simulation** Tor A. Fjeldly,Trond Ytterdal,Michael S. Shur,1998 This book is a useful reference for practicing electrical engineers as well as a textbook for a junior senior or graduate level course in electrical engineering The authors combine two subjects device modeling and circuit simulation by providing a large number of well prepared examples of circuit simulations immediately following the description of many device models *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 **Springer Handbook of Semiconductor Devices** Massimo Rudan,Rossella Brunetti,Susanna Reggiani,2022-11-10 This Springer Handbook comprehensively covers the topic of semiconductor devices embracing all aspects from theoretical background to fabrication modeling and applications Nearly 100 leading scientists from industry and academia were selected to write the handbook s chapters which were conceived for professionals and practitioners material

scientists physicists and electrical engineers working at universities industrial R D and manufacturers Starting from the description of the relevant technological aspects and fabrication steps the handbook proceeds with a section fully devoted to the main conventional semiconductor devices like e g bipolar transistors and MOS capacitors and transistors used in the production of the standard integrated circuits and the corresponding physical models In the subsequent chapters the scaling issues of the semiconductor device technology are addressed followed by the description of novel concept based semiconductor devices The last section illustrates the numerical simulation methods ranging from the fabrication processes to the device performances Each chapter is self contained and refers to related topics treated in other chapters when necessary so that the reader interested in a specific subject can easily identify a personal reading path through the vast contents of the handbook   Microwave and RF Semiconductor Control Device Modeling Robert H. Caverly,2016-02-01 This comprehensive new resource presents a detailed look at the modeling and simulation of microwave semiconductor control devices and circuits Fundamental PIN MOSFET and MESFET nonlinear device modeling are discussed including the analysis of transient and harmonic behavior Considering various control circuit topologies the book analyzes a wide range of models from simple approximations to sophisticated analytical approaches Readers find clear examples that provide guidance in how to use specific modeling techniques for their challenging projects in the field Numerous illustrations help practitioners better understand important device and circuit behavior revealing the relationship between key parameters and results This authoritative volume covers basic and complex mathematical models for the most common semiconductor control elements used in today s microwave and RF circuits and systems   *Silicon And Beyond: Advanced Device Models And Circuit Simulators* Tor A Fjeldly,Michael S Shur,2000-04-20 The steady downscaling of device feature size combined with a rapid increase in circuit complexity as well as the introduction of new device concepts based on non silicon material systems poses great challenges for device and circuit designers One of the major tasks is the development of new and improved device models needed for accurate device and circuit design Another task is the development of new circuit simulation tools to handle very large and complex circuits This book addresses both these issues with up to date reviews written by leading experts in the field The first three chapters of the book discuss advanced device models both for existing technologies and for new emerging technologies Among the topics covered are models for MOSFETs thin film transitors TFTs and compound semiconductor devices including GaAs HEMTs and HFETs heterodimensional devices quantum tunneling devices as well as wide bandgap devices Chapters 4 and 5 discuss advanced circuit simulators that hold promise for handling circuits of much higher complexity than what is possible for typical state of the art circuit simulators today   Reliability of High Temperature Electronics A. Christou,1996   **Device Modeling for Analog and RF CMOS Circuit Design** Trond Ytterdal,Yuhua Cheng,Tor A. Fjeldly,2003-08-01 Bridges the gap between device modelling and analog circuit design Includes dedicated software enabling actual circuit design Covers the three significant models BSIM3 Model 9 and EKV

Presents practical guidance on device development and circuit implementation The authors offer a combination of extensive academic and industrial experience **POWER/HVMOS Devices Compact Modeling** Wladyslaw Grabinski,Thomas Gneiting,2010-07-20 Semiconductor power electronics plays a dominant role due its increased efficiency and high reliability in various domains including the medium and high electrical drives automotive and aircraft applications electrical power conversion etc Power HVMOS Devices Compact Modeling will cover very extensive range of topics related to the development and characterization power high voltage HV semiconductor technologies as well as modeling and simulations of the power HV devices and smart power integrated circuits ICs Emphasis is placed on the practical applications of the advanced semiconductor technologies and the device level compact spice modeling This book is intended to provide reference information by selected leading authorities in their domain of expertise They are representing both academia and industry All of them have been chosen because of their intimate knowledge of their subjects as well as their ability to present them in an easily understandable manner **Introduction to PSpice Using OrCAD for Circuits and Electronics** M. H. Rashid,2004 This book uses a top down approach to introduce readers to the SPICE simulator It begins by describing techniques for simulating circuits then presents the various SPICE and OrCAD commands and their applications to electrical and electronic circuits Lavishly illustrated this new edition includes even more hands on exercises suggestions sample problems and circuit models of actual devices It is an ideal supplement for courses in electric or electronic circuitry and is also a solid professional reference BOOK JACKET Title Summary field provided by Blackwell North America Inc All Rights Reserved **IEEE Circuits & Devices** ,2003 *Practical ESD Protection Design* Albert Wang,2021-12-07 An authoritative single volume reference on the design and analysis of ESD protection for ICs Electrostatic discharge ESD is a major reliability challenge to semiconductors integrated circuits ICs and microelectronic systems On chip ESD protection is a vital to any electronic products such as smartphones laptops tablets and other electronic devices Practical ESD Protection Design provides comprehensive and systematic guidance on all major aspects of designs of on chip ESD protection for integrated circuits ICs Written for students and practicing engineers alike this one stop resource covers essential theories hands on design skills computer aided design CAD methods characterization and analysis techniques and more on ESD protection designs Detailed chapters examine an array of topics ranging from fundamental to advanced including ESD phenomena ESD failure analysis ESD testing models ESD protection devices and circuits ESD design layout and technology effects ESD design flows and co design methods ESD modelling and CAD techniques and future ESD protection concepts Based on the author s decades of design research and teaching experiences Practical ESD Protection Design Features numerous real world ESD protection design examples Emphasizes on ESD protection design techniques and procedures Describes ESD IC co design methodology for high performance mixed signal ICs and broadband radio frequency RF ICs Discusses CAD based ESD protection design optimization and prediction using both Technology and Electrical Computer Aided Design TCAD ECAD

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