Reliability and Degradation: Semiconductor Devices and Circuits (Wiley Series in Solid State Devices and Circuits)

Howes, M. J.

# Reliability And Degradation Semiconductor Devices And Circuits

United States. National Bureau of Standards

# **Reliability And Degradation Semiconductor Devices And Circuits:**

Reliability and Degradation M. J. Howes, D. V. Morgan, 1986 Microelectronics Failure Analysis, 2004-01-01 For newcomers cast into the waters to sink or swim as well as seasoned professionals who want authoritative guidance desk side this hefty volume updates the previous 1999 edition It contains the work of expert contributors who rallied to the job in response to a committee s call for help the committee was assigned to the update by the Electron Heterostructure Devices Patrick Roblin, Hans Rohdin, 2002-03-07 Fuelled by rapid growth in communications technology silicon heterostructures and related high speed semiconductors are spearheading the drive toward smaller faster and lower power devices High Speed Heterostructure Devices is a textbook on modern high speed semiconductor devices intended for both graduate students and practising engineers This book is concerned with the underlying physics of heterostructures as well as some of the most recent techniques for modeling and simulating these devices Emphasis is placed on heterostructure devices of the immediate future such as the MODFET HBT and RTD The principles of operation of other devices such as the Bloch Oscillator RITD Gunn diode quantum cascade laser and SOI and LD MOSFETs are also introduced Initially developed for a graduate course taught at Ohio State University the book comes with a complete set of homework problems and a web link to MATLAB programs supporting the lecture material Handbook of Electronic Package Design Michael Pecht, 2018-10-24 Both a handbook for practitioners and a text for use in teaching electronic packaging concepts guidelines and techniques The treatment begins with an overview of the electronics design process and proceeds to examine the levels of electronic packaging and the fundamental issues in the development Semiconductor Device Reliability A. Christou, B.A. Unger, 2012-12-06 This publication is a compilation of papers presented at the Semiconductor Device Reliabi lity Workshop sponsored by the NATO International Scientific Exchange Program The Workshop was held in Crete Greece from June 4 to June 9 1989 The objective of the Workshop was to review and to further explore advances in the field of semiconductor reliability through invited paper presentations and discussions The technical emphasis was on quality assurance and reliability of optoelectronic and high speed semiconductor devices. The primary support for the meeting was provided by the Scientific Affairs Division of NATO We are indebted to NATO for their support and to Dr Craig Sinclair who admin isters this program The chapters of this book follow the format and order of the sessions of the meeting Thirty six papers were presented and discussed during the five day Workshop In addition two panel sessions were held with audience participation where the particularly controversial topics of bum in and reliability modeling and prediction methods were dis cussed A brief review of these sessions is presented in this book NASA Reference Publication ,1977 Catalog of National Bureau of Standards Publications, 1966-1976 United States. National Bureau of Standards, 1978 Design and Test for Systems Dependability Shojiro Asai, 2018-07-20 This book discusses the new roles that the VLSI very large scale integration of semiconductor circuits is taking for the safe secure and dependable design and operation of

electronic systems The book consists of three parts Part I as a general introduction to this vital topic describes how electronic systems are designed and tested with particular emphasis on dependability engineering where the simultaneous assessment of the detrimental outcome of failures and cost of their containment is made This section also describes the related research project Dependable VLSI Systems in which the editor and authors of the book were involved for 8 years Part II addresses various threats to the dependability of VLSIs as key systems components including time dependent degradations variations in device characteristics ionizing radiation electromagnetic interference design errors and tampering with discussion of technologies to counter those threats Part III elaborates on the design and test technologies for dependability in such applications as control of robots and vehicles data processing and storage in a cloud environment and heterogeneous wireless telecommunications. This book is intended to be used as a reference for engineers who work on the design and testing of VLSI systems with particular attention to dependability It can be used as a textbook in graduate courses as well Readers interested in dependable systems from social and industrial economic perspectives will also benefit from the 1998 Fourth International High Temperature Electronics Conference IEEE Electron discussions in this book Devices Society, 1998 These papers discuss the need for and status of high temperature electronics development with particular reference to semiconductor materials devices and applications passive components ohmic contacts and metallizations testing at high temperatures and thermal management Catalog of National Bureau of Standards Publications, 1966-1976 United States. National Bureau of Standards. Technical Information and Publications Division, Betty L. Burris, Rebecca J. Morehouse, 1978 Recent Topics on Modeling of Semiconductor Processes, Devices, and Circuits Rasit Onur Topaloglu, Peng Li, 2011 The last couple of years have been very busy for the semiconductor industry and researchers The rapid speed of production channel length reduction has brought lithographic challenges to semiconductor modeling These include stress optimization transisto High Temperature Electronics K. Fricke, V. Krozer, 1995 These proceedings review the state of the art in the field of semiconductor materials for high temperature application Areas examined include the material quality of SiC crystalline and polycrystalline diamond and the problems of material growth **NBS Special** Publication ,1978 Scientific and Technical Aerospace Reports, 1967 Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database Catalog of National Bureau of Standards Publications, 1966-1976: Key word index United States. National Bureau of Standards. Technical Information and Publications Division, 1978 High Temperature Electronics F. Patrick McCluskey, Thomas Podlesak, Richard Grzybowski, 2018-05-04 The development of electronics that can operate at high temperatures has been identified as a critical technology for the next century Increasingly engineers will be called upon to design avionics automotive and geophysical electronic systems requiring components and packaging reliable to 200 C and beyond Until now however they have had no single resource on high

temperature electronics to assist them Such a resource is critically needed since the design and manufacture of electronic components have now made it possible to design electronic systems that will operate reliably above the traditional temperature limit of 125 C However successful system development efforts hinge on a firm understanding of the fundamentals of semiconductor physics and device processing materials selection package design and thermal management together with a knowledge of the intended application environments High Temperature Electronics brings together this essential information and presents it for the first time in a unified way Packaging and device engineers and technologists will find this book required reading for its coverage of the techniques and tradeoffs involved in materials selection design and thermal management and for its presentation of best design practices using actual fielded systems as examples In addition professors and students will find this book suitable for graduate level courses because of its detailed level of explanation and its coverage of fundamental scientific concepts Experts from the field of high temperature electronics have contributed to nine chapters covering topics ranging from semiconductor device selection to testing and final assembly Microelectronic Failure Analysis Richard J. Ross, Christian Boit, Donald Staab, 1999 Forty seven papers on electronics failure analysis provide an overview for newcomers to the field and a reference tool for the experienced analyst Topics include electron ion bean based techniques deprocessing and sample preparation and physical chemical defect characterization For the fourth ed

The ESD Handbook Steven H. Voldman, 2021-04-12 A practical and comprehensive reference that explores Electrostatic Discharge ESD in semiconductor components and electronic systems The ESD Handbook offers a comprehensive reference that explores topics relevant to ESD design in semiconductor components and explores ESD in various systems Electrostatic discharge is a common problem in the semiconductor environment and this reference fills a gap in the literature by discussing ESD protection Written by a noted expert on the topic the text offers a topic by topic reference that includes illustrative figures discussions and drawings The handbook covers a wide range of topics including ESD in manufacturing garments wrist straps and shoes ESD Testing ESD device physics ESD semiconductor process effects ESD failure mechanisms ESD circuits in different technologies CMOS Bipolar etc ESD circuit types Pin Power Pin to Pin etc and much more In addition the text includes a glossary index tables illustrations and a variety of case studies Contains a well organized reference that provides a quick review on a range of ESD topics Fills the gap in the current literature by providing information from purely scientific and physical aspects to practical applications Offers information in clear and accessible terms Written by the accomplished author of the popular ESD book series Written for technicians operators engineers circuit designers and failure analysis engineers The ESD Handbook contains an accessible reference to ESD design and ESD Noise in Nanoscale Semiconductor Devices Tibor Grasser, 2020-04-26 This book summarizes the state of the art systems regarding noise in nanometer semiconductor devices Readers will benefit from this leading edge research aimed at increasing reliability based on physical microscopic models Authors discuss the most recent developments in the

understanding of point defects e g via ab initio calculations or intricate measurements which have paved the way to more physics based noise models which are applicable to a wider range of materials and features e g III V materials 2D materials and multi state defects Describes the state of the art regarding noise in nanometer semiconductor devices Enables readers to design more reliable semiconductor devices Offers the most up to date information on point defects based on physical microscopic models **Physics Briefs** ,1993

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