Electrostatic Discharge Protection

Advances and Applications

EDITED BY JUIN J. LIOU



<u>Electrostatic Discharge Protection Advances And</u> <u>Applications Devices Circuits And Systems</u>

Stanley A. White, Institute of Electrical and Electronics Engineers

Electrostatic Discharge Protection Advances And Applications Devices Circuits And Systems:

Electrostatic Discharge Protection Juin J. Liou, 2017-07-26 Electrostatic discharge ESD is one of the most prevalent threats to electronic components In an ESD event a finite amount of charge is transferred from one object i e human body to another i e microchip This process can result in a very high current passing through the microchip within a very short period of time Thus more than 35 percent of single event chip damages can be attributed to ESD events and designing ESD structures to protect integrated circuits against the ESD stresses is a high priority in the semiconductor industry Electrostatic Discharge Protection Advances and Applications delivers timely coverage of component and system level ESD protection for semiconductor devices and integrated circuits Bringing together contributions from internationally respected researchers and engineers with expertise in ESD design optimization modeling simulation and characterization this book bridges the gap between theory and practice to offer valuable insight into the state of the art of ESD protection Amply illustrated with tables figures and case studies the text Instills a deeper understanding of ESD events and ESD protection design principles Examines vital processes including Si CMOS Si BCD Si SOI and GaN technologies Addresses important aspects pertinent to the modeling and simulation of ESD protection solutions Electrostatic Discharge Protection Advances and Applications provides a single source for cutting edge information vital to the research and development of effective ESD Protection Device and Circuit robust ESD protection solutions for semiconductor devices and integrated circuits Design for Advanced CMOS Technologies Oleg Semenov, Hossein Sarbishaei, Manoj Sachdev, 2008-04-26 ESD Protection Device and Circuit Design for Advanced CMOS Technologies is intended for practicing engineers working in the areas of circuit design VLSI reliability and testing domains As the problems associated with ESD failures and yield losses become significant in the modern semiconductor industry the demand for graduates with a basic knowledge of ESD is also increasing Today there is a significant demand to educate the circuits design and reliability teams on ESD issues This book makes an attempt to address the ESD design and implementation in a systematic manner A design procedure involving device simulators as well as circuit simulator is employed to optimize device and circuit parameters for optimal ESD as well as circuit performance This methodology described in ESD Protection Device and Circuit Design for Advanced CMOS Technologies has resulted in several successful ESD circuit design with excellent silicon results and demonstrates its strengths Flexible, Wearable, and Stretchable Electronics Katsuyuki Sakuma, 2020-11-19 Remarkable progress has been achieved within recent years in developing flexible wearable and stretchable FWS electronics These electronics will play an increasingly significant role in the future of electronics and will open new product paradigms that conventional semiconductors are not capable of This is because flexible electronics will allow us to build flexible circuits and devices on a substrate that can be bent stretched or folded without losing functionality. This revolutionary change will impact how we interact with the world around us Future electronic devices will use flexible electronics as part of ambient intelligence and

ubiquitous computing for many different applications such as consumer electronics medical healthcare and security devices Thus these devices have the potential to create a huge market all over the world Flexible Wearable and Stretchable Electronics provide a comprehensive technological review of the state of the art developments in FWS electronics This book offers the reader a taste of what is possible with FWS electronics and describes how these electronics can provide unique solutions for a wide variety of applications Furthermore the book introduces and explains new applications of flexible technology that has opened up the future of FWS electronics ESD Steven H. Voldman, 2015-04-24 ESD Circuits and Devices 2nd Edition provides a clear picture of layout and design of digital analog radio frequency RF and power applications for protection from electrostatic discharge ESD electrical overstress EOS and latchup phenomena from a generalist perspective and design synthesis practices providing optimum solutions in advanced technologies New features in the 2nd edition Expanded treatment of ESD and analog design of passive devices of resistors capacitors inductors and active devices of diodes bipolar junction transistors MOSFETs and FINFETs Increased focus on ESD power clamps for power rails for CMOS Bipolar and BiCMOS Co synthesizing of semiconductor chip architecture and floor planning with ESD design practices for analog and mixed signal applications Illustrates the influence of analog design practices on ESD design circuitry from integration synthesis and layout to symmetry matching inter digitation and common centroid techniques Increased emphasis on system level testing conforming to IEC 61000 4 2 and IEC 61000 4 5 Improved coverage of low capacitance ESD scaling of devices and oxide scaling challenges ESD Circuits and Devices 2nd Edition is an essential reference to ESD circuit semiconductor engineers and quality reliability analysis engineers It is also useful for graduate and undergraduate students in electrical engineering semiconductor sciences microelectronics and IC design **Electrical Overstress/Electrostatic** Discharge Symposium Proceedings ,2000 IEEE Transactions on Circuits and Systems ,2006 **Textiles for Advanced Applications** Bipin Kumar, Suman Thakur, 2017-09-20 This book presents a global view of the development and applications of technical textiles with the description of materials structures properties characterizations functions and relevant production technologies case studies challenges and opportunities Technical textile is a transformative research area dealing with the creation and studies of new generations of textiles that hoist many new scientific and technological challenges that have never been encountered before The book emphasizes more on the principles of textile science and technology to provide solutions to several engineering problems All chapter topics are exclusive and selectively chosen and designed and they are extensively explored by different authors having specific knowledge in each area 1997 International Symposium on VLSI Technology, Systems, and Applications ,1997 Proceedings of the ... IEEE International Caracas Conference on Devices, Circuits and Systems, 2004 Proceedings of the ... Midwest Symposium on Circuits and Systems ,1994 Proceedings ,2001 **ESD** Steven H. Voldman,2015-06-22 ESD Circuits and Devices 2nd Edition provides a clear picture of layout and design of digital analog radio frequency RF and power applications for protection from

electrostatic discharge ESD electrical overstress EOS and latchup phenomena from a generalist perspective and design synthesis practices providing optimum solutions in advanced technologies New features in the 2nd edition Expanded treatment of ESD and analog design of passive devices of resistors capacitors inductors and active devices of diodes bipolar junction transistors MOSFETs and FINFETs Increased focus on ESD power clamps for power rails for CMOS Bipolar and BiCMOS Co synthesizing of semiconductor chip architecture and floor planning with ESD design practices for analog and mixed signal applications Illustrates the influence of analog design practices on ESD design circuitry from integration synthesis and layout to symmetry matching inter digitation and common centroid techniques Increased emphasis on system level testing conforming to IEC 61000 4 2 and IEC 61000 4 5 Improved coverage of low capacitance ESD scaling of devices and oxide scaling challenges ESD Circuits and Devices 2nd Edition is an essential reference to ESD circuit semiconductor engineers and quality reliability analysis engineers It is also useful for graduate and undergraduate students in electrical engineering semiconductor sciences microelectronics and IC design Semiconductor Process Reliability in Practice Zhenghao Gan, Waisum Wong, Juin J. Liou, 2012-10-06 Proven processes for ensuring semiconductor device reliability Co written by experts in the field Semiconductor Process Reliability in Practice contains detailed descriptions and analyses of reliability and qualification for semiconductor device manufacturing and discusses the underlying physics and theory The book covers initial specification definition test structure design analysis of test structure data and final qualification of the process Real world examples of test structure designs to qualify front end of line devices and back end of line interconnects are provided in this practical comprehensive guide Coverage includes Basic device physics Process flow for MOS manufacturing Measurements useful for device reliability characterization Hot carrier injection Gate oxide integrity GOI and time dependent dielectric breakdown TDDB Negative bias temperature instability Plasma induced damage Electrostatic discharge protection of integrated circuits Electromigration Stress migration Intermetal dielectric breakdown

 step by step how to take full advantage of all the capabilities of the PICAXE and build your own control projects This practical guide is packed with helpful illustrations detailed examples and do it yourself experiments Perfect for beginners and students the book also contains advanced information for more experienced programmers hobbyists manufacturers and research institutions Programming and Customizing the PICAXE Microcontroller Second Edition covers PICAXE architecture The latest chips including M2 M X XI and X2 series Windows Mac and UNIX platforms Interfacing and input output techniques BASIC programming and compilers PICAXE arithmetic and data conversion Dozens of ready to run projects Useful routines to plug into your own designs Hands on projects include LED and LCO display control Motor control Water detector Bipolar transistor output driver Interfacing MOSFETs to a PICAXE Radio control servo motor Infrared wireless links Telephone intercom Dual temperature display Radio frequency identification RFID reader display Memory and I O expansion Real time clock calendar Data logger Robotic components Many more

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