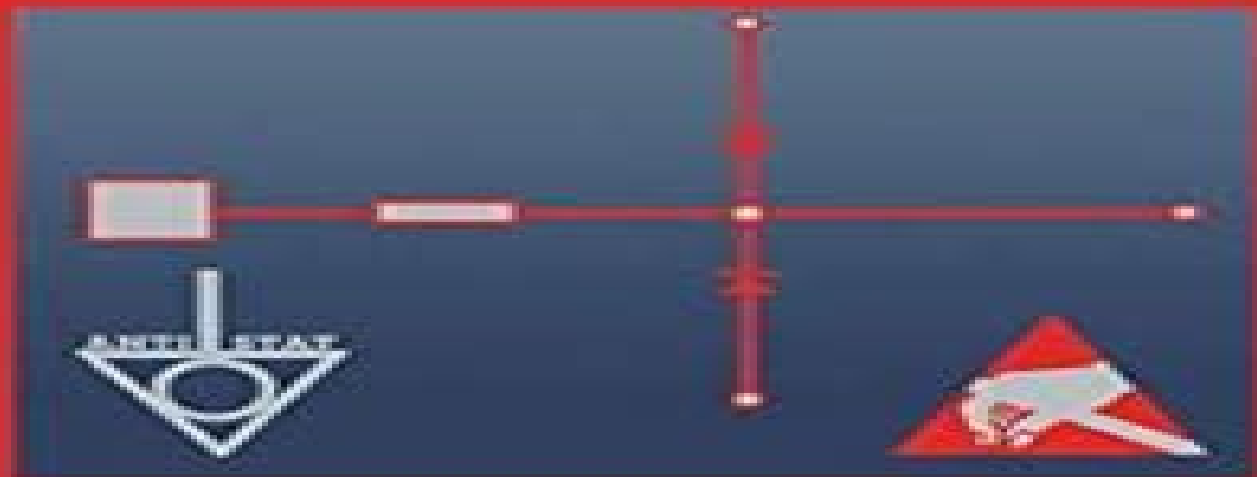


Sten Hellström

ESD – The Scourge of Electronics



Springer

Esd The Scourge Of Electronics

Sten Hellström



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ESD — The Scourge of Electronics Sten Hellström, 2012-12-06 This book on electrostatic discharge phenomena is essentially a translation and update of a Swedish edition from 1992. The book is intended for people working with electronic circuits and equipments in application and development. All personnel should be aware of the ESD hazards especially those responsible for quality. ESD prevention is a part of TQM Total Quality Management. The book is also usable for courses on the subject. Background It was soon realised that the MOS circuits MOS Metal Oxide Semiconductor which appeared in the beginning of the 1960s were sensitive to electrostatic discharges. But a severe accident accelerated the search for materials that do not generate electric charges. In April 1964 three people were working inside a satellite at Cape Kennedy Space Center. They suddenly screamed we are burning. They died. The satellite incapsulation was covered with untreated plastics to protect against dust. When the plastics were pulled off both this and the metal incapsulating got charged. A discharge from the metal ignited inflammable parts of the satellite. Eleven more people were injured and the cost of the accident amounted to about 55 billions USD. *Robust Electronic Design Reference Book: no special title* John R. Barnes, 2004 If you design electronics for a living you need Robust Electronic Design Reference Book. Written by a working engineer who has put over 115 electronic products into production at Sycor IBM and Lexmark. Robust Electronic Design Reference covers all the various aspects of designing and developing electronic devices and systems that Work Are safe and reliable. Can be manufactured tested repaired and serviced. May be sold and used worldwide. Can be adapted or enhanced to meet new and changing requirements. **Reliability Engineering** Alessandro Birolini, 2010-09-02 27 Required function mission profile. Set up the reliability block diagram FMEA where RBD by performing a redundancy appears. Eliminate reliability weaknesses. Determine the component stresses component material selection. Compute the failure rate λ_i of each derating component screening. Compute R_t at the assembly level redundancy. Check the fulfillment of reliability design rules. Perform a preliminary design review. no yes. Go to the next assembly or to the next integration level. Figure 2.1 Reliability analysis procedure at assembly level. Taking account of the above considerations Fig 2.1 shows the reliability analysis procedure used in practical applications at assembly level. The procedure of Fig 2.1 is based on the part stress method discussed in Section 2.2.4 see Section 2.2.7 for the part count method. Also included are a failure modes and effect analysis FMEA FMECA to check the validity of the assumed failure modes and a verification of the adherence to design guidelines for reliability in a preliminary design review. Section 5.1 Appendices A3.3.5 A4 Verification of the assumed failure modes is mandatory where redundancy appears in particular because of the series element in the reliability block diagram see for instance Example 2.6 Sections 2.3.6 for elements with more than one failure mode 6.8.7 for common cause failures and Figs 2.8.2 9.6 17.6. Reliability Engineering A. Birolini, 2013-04-17 Reliability engineering is a rapidly evolving discipline whose purpose is to develop methods and tools to predict evaluate and demonstrate reliability maintainability and availability of

components equipment and systems as well as to support development and production engineers in building in reliability and maintainability To be cost and time effective reliability engineering has to be coordinated with quality assurance activities in agreement with Total Quality Management TQM and Concurrent Engineering efforts To build in reliability and maintainability into complex equipment or systems failure rate and failure mode analyses have to be performed early in the development phase and be supported by design guidelines for reliability maintainability and software quality as well as by extensive design reviews Before production qualification tests on prototypes are necessary to ensure that quality and reliability targets have been met In the production phase processes need to be selected and monitored to assure the required quality level For many systems availability requirements have also to be satisfied In these cases stochastic processes can be used to investigate and optimize availability including logistical support as well Software often plays a dominant role requiring specific quality assurance activities This book presents the state of the art of reliability engineering both in theory and practice It is based on over 25 years experience of the author in this field half of which was in industry and half as Professor for reliability engineering at the ETH Swiss Federal Institute of Technology Zurich

The Bubble Universe: Psychological Perspectives on Reality Eugene Subbotsky, 2020-07-28 This book examines the role that human subjective experience plays in the creation of reality and introduces a new concept the Bubble Universe to describe the universe as it looks from the subjective viewpoint of an individual Drawing on a range of research the author questions the extent to which the scientific study of the origins of life consciousness and subjective experience is itself influenced by scientists subjective worlds The author argues that in many respects the Bubble Universe differs from the universe as described by science and religion and analyzes these differences The fabric and structure of subjective reality is described and various aspects of the Bubble Universe are examined including science religion life morality and history The differences between the views from inside the subjective universe and from scientific religious and sociocultural versions of the universe are outlined and their significance for practical and theoretical problems are highlighted and illustrated with psychological experiments This book will be of value to all scholars interested in how subjectivity influences research and appeal in particular to those working in developmental and theoretical psychology consciousness epistemology phenomenology and the philosophy of science and of the mind

Robust Electronic Design Reference Book John R. Barnes, 2004-03-31 If you design electronics for a living you need Robust Electronic Design Reference Book Written by a working engineer who has put over 115 electronic products into production at Sycor IBM and Lexmark Robust Electronic Design Reference covers all the various aspects of designing and developing electronic devices and systems that Work Are safe and reliable Can be manufactured tested repaired and serviced May be sold and used worldwide Can be adapted or enhanced to meet new and changing requirements Robust Electronic Design Reference Book is an electronics designer s reference library condensed into two volumes It guides you through the entire process of Gathering user requirements Developing the design specification Partitioning the design into

electronics software and other technologies Designing circuits for signal integrity EMC EMI and ESD Choosing components and materials Reviewing the design Designing printed circuit boards backplanes and cables Bringing up prototypes Testing characterizing and refining your design Getting approvals Putting your product into production or your equipment into service Includes over 600 illustrations nearly 200 tables and an extensive Glossary and Index **American Book**

Publishing Record Cumulative 1998 R R Bowker Publishing,1999-03 **Elektronische Gerätetechnik** Jens Lienig,Hans Brümmer,2024-05-02 Das Buch vermittelt die Grundlagen des konstruktiven Entwicklungsprozesses sowie des funktionellen und geometrisch stofflichen Aufbaus elektronischer Baugruppen und Ger te Aktuelle Anforderungen wie Ger teschutz Zuverl ssigkeit thermische Dimensionierung und Schirmung EMV stehen dabei im Vordergrund Richtlinien zum Recycling runden den Inhalt ab Damit soll der Leser zum ingenieurm igen Vorgehen bei der Entwicklung und Konstruktion moderner elektronischer Produkte unter Einbeziehung aller relevanten Aspekte bef higt werden **Deutsche Nationalbibliographie**

und Bibliographie der im Ausland erschienenen deutschsprachigen Veröffentlichungen ,1996 *Cumulated Index to the Books* ,1999 **Electrostatic Discharge and Electronic Equipment** Warren Boxleitner,1989 ESD from A to Z

John M. Kolyer,Donald Watson,2012-12-06 Existing sections in ESD Frim A to Z have been thoroughly revised and updated New examples have been added to the troubleshooting chapter and new versions of model specifications for ESD safe handling and packaging can be found in the specifications chapter The Appendix now includes ten recently published papers making a total of 20 whose topics span the field of ESD control **Electro Static Discharge** Michel Mardiguian,2011-09-20

A thorough and concise treatment of ESD Recognizing its methodic step by step attack of the electrostatic discharge ESD problem the initial release of this book was quoted by specialists as the most thorough and concise treatment of the broad ESD continuum that is available Now in its Third Edition this book delivers the same trusted coverage of the topic while also incorporating recent technological advances that have taken place in the engineering community The book begins with the basics of ESD for humans and objects and goes on to cover Effects of ESD coupled to electronics Principal ESD specifications ESD diagnostics and testing Design for ESD immunity To help with troubleshooting many ESD case histories are given along with their successful fixes Electrostatic Discharge is essential reading for all designers who want to avoid component failures no trouble found incidents and random errors

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 *ESD Basics* Steven H. Voldman, 2012-10-22

Electrostatic discharge ESD continues to impact semiconductor manufacturing semiconductor components and systems as technologies scale from micro to nano electronics This book introduces the fundamentals of ESD electrical overstress EOS electromagnetic interference EMI electromagnetic compatibility EMC and latchup as well as provides a coherent overview of the semiconductor manufacturing environment and the final system assembly It provides an illuminating look into the integration of ESD protection networks followed by examples in specific technologies circuits and chips The text is unique in covering semiconductor chip manufacturing issues ESD semiconductor chip design and system problems confronted today as well as the future of ESD phenomena and nano technology Look inside for extensive coverage on The fundamentals of electrostatics triboelectric charging and how they relate to present day manufacturing environments of micro electronics to nano technology Semiconductor manufacturing handling and auditing processing to avoid ESD failures ESD EOS EMI EMC and latchup semiconductor component and system level testing to demonstrate product resilience from human body model HBM transmission line pulse TLP charged device model CDM human metal model HMM cable discharge events CDE to system level IEC 61000 4 2 tests ESD on chip design and process manufacturing practices and solutions to improve ESD semiconductor chip solutions also practical off chip ESD protection and system level solutions to provide more robust systems System level concerns in servers laptops disk drives cell phones digital cameras hand held devices automobiles and space applications Examples of ESD design for state of the art technologies including CMOS BiCMOS SOI bipolar technology high voltage CMOS HVCMOS RF CMOS smart power magnetic recording technology micro machines MEMs to nano structures ESD Basics From Semiconductor Manufacturing to Product Use complements the author s series of books on ESD protection For those new to the field it is an essential reference and a useful insight into the issues that confront modern technology as we enter the Nano electronic Era *Books in Print Supplement* ,2002 Electrostatic Discharge Protection Juin J. Liou, 2017-12-19 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 robust ESD protection solutions for semiconductor devices and integrated circuits *Subject Guide to Books in Print* ,1991 **Serials & Newspapers in Microform** ,1992
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