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1.3 SENSITIVITY OF SEMICONDUCTOR COMPONENTS 1.3.1 ESD Sensitivity as a Function of Materials; 1.3.2 ESD Sensitivity as a Function of Semiconductor Devices; 1.3.3 ESD Sensitivity as a Function of Product Type; 1.3.4 ESD and Technology Scaling; 1.3.5 ESD Technology Roadmap; 1.4 HOW DO SEMICONDUCTOR CHIPS FAIL--ARE THE FAILURES RANDOM OR SYSTEMATIC?; 1.5 CLOSING COMMENTS AND SUMMARY; PROBLEMS; REFERENCES; 2 Failure Analysis Tools, Models, and Physics of Failure; 2.1 FA TECHNIQUES FOR EVALUATION OF ESD EVENTS; 2.2 FA TOOLS; 2.2.1 Optical Microscope; 2.2.2 Scanning Electron Microscope
2.2.3 Transmission Electron Microscope 2.2.4 Emission Microscope; 2.2.5 Thermally Induced Voltage Alteration; 2.2.6 Superconducting Quantum Interference Device Microscope; 2.2.7 Atomic Force Microscope; 2.2.8 The 2-D AFM; 2.2.9 Picosecond Current Analysis Tool; 2.2.10 Transmission Line Pulse--Pico second Current Analysis Tool; 2.3 ESD SIMULATION: ESD PULSE MODELS; 2.3.1 Human Body Model; 2.3.2 Machine Model; 2.3.3 Cassette Model; 2.3.4 Socketed Device Model; 2.3.5 Charged Board Model; 2.3.6 Cable Discharge Event; 2.3.7 IEC System-Level Pulse Model; 2.3.8 Human Metal Model
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Sommario/riassunto

Electrostatic discharge (ESD) failure mechanisms continue to impact semiconductor components and systems as technologies scale from micro- to nano-electronics. This book studies electrical overstress, ESD, and latchup from a failure analysis and case-study approach. It provides a clear insight into the physics of failure from a generalist perspective, followed by investigation of failure mechanisms in specific technologies, circuits, and systems. The book is unique in covering both the failure mechanism and the practical solutions to fix the problem from either a technology or circuit method