

1. Record Nr.	UNINA9910807232603321
Autore	Voldman Steven H.
Titolo	ESD : analog circuits and design // Steven H Voldman
Pubbl/distr/stampa	Chichester, England : , : Wiley, , 2015 ©2015
ISBN	1-118-70147-X 1-118-70140-2 1-118-70168-2
Edizione	[1st edition]
Descrizione fisica	1 online resource (292 p.)
Collana	ESD Series
Disciplina	621.3815/3
Soggetti	Semiconductors - Protection Analog integrated circuits - Protection Analog integrated circuits - Design and construction Electrostatics Static eliminators
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	ESD: Analog Circuits and Design; Copyright; Contents; About the Author; Preface; Acknowledgments; Chapter 1 Analog, ESD, and EOS; 1.1 ESD in Analog Design; 1.2 Analog Design Discipline and ESD Circuit Techniques; 1.2.1 Analog Design: Local Matching; 1.2.2 Analog Design: Global Matching; 1.2.3 Symmetry; 1.2.3.1 Layout Symmetry; 1.2.3.2 Thermal Symmetry; 1.2.4 Analog Design: Across Chip Linewidth Variation; 1.3 Design Symmetry and ESD; 1.4 ESD Design Synthesis and Architecture Flow; 1.5 ESD Design and Noise; 1.6 ESD Design Concepts: Adjacency; 1.7 Electrical Overstress 1.7.1 Electrical Overcurrent 1.7.2 Electrical Overvoltage; 1.7.3 Electrical Overstress Events; 1.7.3.1 Characteristic Time Response; 1.7.4 Comparison of EOS versus ESD Waveforms; 1.8 Reliability Technology Scaling and the Reliability Bathtub Curve; 1.8.1 The Shrinking Reliability Design Box; 1.8.2 Application Voltage, Trigger Voltage, and Absolute Maximum Voltage; 1.9 Safe Operating Area; 1.9.1 Electrical Safe Operating Area; 1.9.2 Thermal Safe Operating Area (T-SOA); 1.9.3

Transient Safe Operating Area; 1.10 Closing Comments and Summary; References; Chapter 2 Analog Design Layout
2.1 Analog Design Layout Revisited 2.1.1 Analog Design: Local Matching; 2.1.2 Analog Design: Global Matching; 2.1.3 Symmetry; 2.1.4 Layout Design Symmetry; 2.1.5 Thermal Symmetry; 2.2 Common Centroid Design; 2.2.1 Common Centroid Arrays; 2.2.2 One-Axis Common Centroid Design; 2.2.3 Two-Axis Common Centroid Design; 2.3 Interdigitation Design; 2.4 Common Centroid and Interdigitation Design; 2.5 Passive Element Design; 2.6 Resistor Element Design; 2.6.1 Resistor Element Design: Dogbone Layout; 2.6.2 Resistor Design: Analog Interdigitated Layout; 2.6.3 Dummy Resistor Layout 2.6.4 Thermoelectric Cancellation Layout 2.6.5 Electrostatic Shield; 2.6.6 Interdigitated Resistors and ESD Parasitics; 2.7 Capacitor Element Design; 2.8 Inductor Element Design; 2.9 Diode Design; 2.10 MOSFET Design; 2.11 Bipolar Transistor Design; 2.12 Closing Comments and Summary; References; Chapter 3 Analog Design Circuits; 3.1 Analog Circuits; 3.2 Single-Ended Receivers; 3.2.1 Single-Ended Receivers; 3.2.2 Schmitt Trigger Receivers; 3.3 Differential Receivers; 3.4 Comparators; 3.5 Current Sources; 3.6 Current Mirrors; 3.6.1 Widlar Current Mirror; 3.6.2 Wilson Current Mirror
3.7 Voltage Regulators 3.7.1 Buck Converters; 3.7.2 Boost Converters; 3.7.3 Buck-Boost Converters; 3.7.4 Cuk Converters; 3.8 Voltage Reference Circuits; 3.8.1 Brokaw Bandgap Voltage Reference; 3.9 Converters; 3.9.1 Analog-to-Digital Converter; 3.9.2 Digital-to-Analog Converters; 3.10 Oscillators; 3.11 Phase Lock Loop; 3.12 Delay Locked Loop; 3.13 Closing Comments and Summary; References; Chapter 4 Analog ESD Circuits; 4.1 Analog ESD Devices and Circuits; 4.2 ESD Diodes; 4.2.1 Dual Diode and Series Diodes; 4.2.2 Dual Diode-Resistor; 4.2.3 Dual Diode-Resistor-Dual Diode
4.2.4 Dual Diode-Resistor-Grounded-Gate MOSFET

Sommario/riassunto

A comprehensive and in-depth review of analog circuit layout, schematic architecture, device, power network and ESD design. This book will provide a balanced overview of analog circuit design layout, analog circuit schematic development, architecture of chips, and ESD design. It will start at an introductory level and will bring the reader right up to the state-of-the-art. Two critical design aspects for analog and power integrated circuits are combined. The first design aspect covers analog circuit design techniques to achieve the desired circuit performance. The second and main aspect pres
