1. Record Nr. UNINA9910143174803321

Autore	Kuo James B. <1956->
Titolo	Low-voltage SOI CMOS VLSI devices and circuits / / James B. Kuo, Shih-Chia Lin
Pubbl/distr/stampa	New York, : Wiley, c2001
ISBN	1-280-26478-0 9786610264780 0-470-32128-8 0-471-46417-1 0-471-22156-2
Edizione	[1st edition]
Descrizione fisica	1 online resource (424 p.)
Altri autori (Persone)	LinShih-Chia
Disciplina	621.39 621.39/5 621.395
Soggetti	Low voltage integrated circuits Integrated circuits - Very large scale integration Metal oxide semiconductors, Complementary
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"A Wiley-Interscience publication."
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Contents; Preface; Acknowledgments; 1 Introduction; 1.1 Evolution of CMOS VLSI; 1.2 SOI versus Bulk; 1.3 Low-Voltage SOI VLSI; 1.4 Objectives; References; 2 SOI CMOS Devices-Part I; 2.1 Basic SOI Technology; 2.1.1 SOI Wafers; 2.1.2 Shallow Trench Isolation; 2.1.3 SOI Device Structure; 2.2 Back Gate Bias Effects; 2.2.1 PD versus FD; 2.2.2 Inversion versus Accumulation; 2.3 Short Channel Effects; 2.3.1 Biasing Dependence; 2.3.2 Structure Dependence; 2.3.3 Processing Dependence; 2.3.4 Subthreshold; 2.4 Narrow Channel Effects; 2.4.1 Structure Dependence; 2.4.2 Subthreshold 2.4.3 Back Gate Bias Dependence2.4.4 Isolation Dependence; 2.5 Mobility; 2.5.1 Vertical Field Dependence; 2.5.2 Lateral Field Dependence; 2.6 Floating Body Effects; 2.6.1 Strong Inversion Kink Effects; 2.6.2 Body Contact; 2.6.3 Various Techniques to Reduce Kink Effects; 2.7 Subthreshold Behavior; 2.7.1 FD versus PD; 2.7.2 PD; 2.7.3 DIBL Dependence; 2.7.4 Latch/GIDL Behavior; 2.8 Impact Ionization;

2.8.1 Basic Analysis; 2.8.2 Body Current; 2.8.3 Monitoring Techniques; 2.9 Breakdown; 2.9.1 Structure Dependence; 2.9.2 Bipolar Induced Effects; 2.9.3 LDD; 2.10 Transient-Induced Leakage
2.11 History Effects2.12 Self-Heating; 2.12.1 Drain Current; 2.12.2 Thermal Resistance; 2.12.3 Thermal Coupling; 2.12.4 AC Behavior; 2.13 Transient Behaviors; 2.13.1 Floating-Body Induced; 2.13.2 History Effect; 2.14 Summary; References; Problems; 3 SOI CMOS Devices-Part II; 3.1 Hot Carriers; 3.1.1 NMOS; 3.1.2 PMOS; 3.1.3 Substrate Current; 3.1.4 Back Gate Bias; 3.1.5 Device Structure Dependence; 3.1.6 Stress Time; 3.1.7 Isolation Structure; 3.1.8 SOI Wafers; 3.1.9 Lifetime; 3.2 Accumulation-Mode Devices; 3.2.1 DC Behavior; 3.2.2 AC Behavior; 3.2.3 Thin-Film Thickness
3.2.4 Accumulation versus Inversion3.3 Double Gate; 3.4 DTMOS; 3.4.1 Basic Performance; 3.4.2 Second-Order Effects; 3.5 Scaling Trends; 3.6 Single Electron Transistors (SET); 3.7 Electrostatic Discharge (ESD); 3.8 Temperature Dependence; 3.8.1 Noise; 3.9 Sensitivity; 3.10 Radiation Effects; 3.11 Summary; References; Problems; 4 Fundamentals of SOI CMOS Circuits; 4.1 Basic Circuit Issues; 4.1.1 Layout; 4.1.2 High Speed and Low Power; 4.1.3 Floating Body; 4.1.4 Self-Heating; 4.2 Floating Body Effects; 4.2.1 Static Logic Circuits; 4.2.2 Pass Gate Transistors; 4.2.3 Switch Network Logic (SNL)
4.2.4 Hysteresis4.2.5 Analog Circuits; 4.3 Low-Voltage Circuit Techniques; 4.3.1 Low-Voltage Technology; 4.3.2 Dynamic Body Control; 4.3.3 Sense Amp; 4.4 DTMOS Circuits; 4.4.1 DTMOS Device; 4.4.2 DTMOS Inverter; 4.4.3 DTMOS Buffer; 4.4.4 Advanced DTMOS Devices; 4.4.5 Active Body Control; 4.5 MTCMOS Circuits; 4.6 Noise; 4.7 Self-Heating; 4.8 ESD Circuits; 4.9 System-on-a Chip (SOC) Technology; 4.10 Summary; References; Problems; 5 SOI CMOS Digital Circuits; 5.1 Static Logic Circuits; 5.1.1 SOI CPL; 5.1.2 DTPT; 5.1.3 SOI CVSL; 5.1.4 SOI Adiabatic CVSL; 5.2 Dynamic Logic Circuits
5.2.1 SOI DTMOS Dynamic Logic Circuit

Sommario/riassunto

A practical, comprehensive survey of SOI CMOS devices and circuits for microelectronics engineersThe microelectronics industry is becoming increasingly dependent on SOI CMOS VLSI devices and circuits. This book is the first to address this important topic with a practical focus on devices and circuits. It provides an up-to-date survey of the current knowledge regarding SOI device behaviors and describes state-of-the-art low-voltage CMOS VLSI analog and digital circuit techniques.Low-Voltage SOI CMOS VLSI Devices and Circuits covers the entire field, from basic concepts to the most adva