

1. Record Nr.	UNINA9910829999903321
Autore	Kursun Volkan
Titolo	Multi-voltage CMOS circuit design [[electronic resource] /] / Volkan Kursun, Eby G. Friedman
Pubbl/distr/stampa	Chichester, England ; ; Hoboken, NJ, : John Wiley, 2006
ISBN	1-280-64869-4 9786610648696 0-470-03337-1 0-470-01024-X
Descrizione fisica	1 online resource (243 p.)
Altri autori (Persone)	FriedmanEby G
Disciplina	621.39732
Soggetti	Metal oxide semiconductors, Complementary Low voltage integrated circuits - Design and construction
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 and index.
Nota di contenuto	Multi-voltage CMOS Circuit Design; Contents; About the Authors; Preface; Acknowledgments; Chapter 1 Introduction; 1.1 Evolution of Integrated Circuits; 1.2 Outline of the Book; Chapter 2 Sources of Power Consumption in CMOS ICs; 2.1 Dynamic Switching Power; 2.2 Leakage Power; 2.2.1 Subthreshold Leakage Current; 2.2.1.1 Short-Channel Effects; 2.2.1.2 Drain-Induced Barrier-Lowering; 2.2.1.3 Characterization of Subthreshold Leakage Current; 2.2.2 Gate Oxide Leakage Current; 2.2.2.1 Effect of Technology Scaling on Gate Oxide Leakage; 2.2.2.2 Characterization of Gate Oxide Leakage Current 2.2.2.3 Alternative Gate Dielectric Materials2.3 Short-Circuit Power; 2.4 Static DC Power; Chapter 3 Supply and Threshold Voltage Scaling Techniques; 3.1 Dynamic Supply Voltage Scaling; 3.2 Multiple Supply Voltage CMOS; 3.3 Threshold Voltage Scaling; 3.3.1 Body Bias Techniques; 3.3.1.1 Reverse Body Bias; 3.3.1.2 Forward Body Bias; 3.3.1.3 Bidirectional Body Bias; 3.3.2 Multiple Threshold Voltage CMOS; 3.4 Multiple Supply and Threshold Voltage CMOS; 3.5 Dynamic Supply and Threshold Voltage Scaling; 3.6 Circuits with Multiple Voltage and Clock Domains; 3.7 Summary Chapter 4 Low-Voltage Power Supplies4.1 Linear DC-DC Converters;

4.2 Switched-Capacitor DC-DC Converters; 4.3 Switching DC-DC Converters; 4.3.1 Operation of a Buck Converter; 4.3.2 Power Reduction Techniques for Switching DC-DC Converters; 4.4 Summary; Chapter 5 Buck Converters for On-Chip Integration; 5.1 Circuit Model of a Buck Converter; 5.1.1 MOSFET-Related Power Losses; 5.1.2 Filter Inductor-Related Power Losses; 5.1.3 Filter Capacitor-Related Power Losses; 5.1.4 Total Power Consumption of a Buck Converter; 5.2 Efficiency Analysis of a Buck Converter  
5.2.1 Circuit Analysis for Global Maximum Efficiency  
5.2.2 Circuit Analysis with Limited Filter Capacitance; 5.2.3 Output Voltage Ripple Constraint; 5.3 Simulation Results; 5.4 Summary; Chapter 6 Low-Voltage Swing Monolithic DC-DC Conversion; 6.1 Circuit Model of a Low-Voltage Swing Buck Converter; 6.1.1 MOSFET Power Dissipation; 6.1.2 MOSFET Model; 6.1.3 Filter Inductor Power Dissipation; 6.2 Low-Voltage Swing Buck Converter Analysis; 6.2.1 Full Swing Circuit Analysis for Global Maximum Efficiency; 6.2.2 Low Swing Circuit Analysis for Global Maximum Efficiency; 6.3 Summary  
Chapter 7 High Input Voltage Step-Down DC-DC Converters  
7.1 Cascode Bridge Circuits; 7.1.1 Cascode Bridge Circuit for Input Voltages up to  $2V_{max}$ ; 7.1.2 Cascode Bridge Circuit for Input Voltages up to  $3V_{max}$ ; 7.1.3 Cascode Bridge Circuit for Input Voltages up to  $4V_{max}$ ; 7.2 High Input Voltage Monolithic Switching DC-DC Converters; 7.2.1 Operation of Cascode DC-DC Converters; 7.2.2 Efficiency Characteristics of DC-DC Converters Operating at Input Voltages up to  $2V_{max}$ ; 7.2.3 Efficiency Characteristics of DC-DC Converters Operating at Input Voltages up to  $3V_{max}$ ; 7.3 Summary  
Chapter 8 Signal Transfer in ICs with Multiple Supply Voltages

---

Sommario/riassunto

This book presents an in-depth treatment of various power reduction and speed enhancement techniques based on multiple supply and threshold voltages. A detailed discussion of the sources of power consumption in CMOS circuits will be provided whilst focusing primarily on identifying the mechanisms by which sub-threshold and gate oxide leakage currents are generated. The authors present a comprehensive review of state-of-the-art dynamic, static supply and threshold voltage scaling techniques and discuss the pros and cons of supply and threshold voltage scaling techniques.

---