1. Record Nr. UNINA9910454319803321

Titolo	Radiation effects and soft errors in integrated circuits and electronic devices [[electronic resource] /] / editors, R.D. Schrimpf, D.M. Fleetwood
Pubbl/distr/stampa	Singapore ; ; New Jersey, : World Scientific Pub., c2004
ISBN	1-281-93459-3 9786611934590 981-279-470-0
Descrizione fisica	1 online resource (349 p.)
Collana	Selected topics in electronics and systems ; ; vol. 34
Altri autori (Persone)	SchrimpfRonald Donald FleetwoodD. M (Dan M.)
Disciplina	621.3815
Soggetti	Electronic circuits - Effect of radiation on Integrated circuits - Effect of radiation on Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Also published in the International Journal of High Speed Electronics and Systems, v. 14, no. 2 (2004) p. 285-623.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	CONTENTS ; Preface ; Single Event Effects in Avionics and on the Ground ; 1. Introduction ; 2. Similarities between SEE in Avionics and on the Ground ; 3. Differences Between SEE in Avionics and on the Ground ; 4. Atmospheric and Ground Level Environments ; 5. SEE Data in devices 6. Summary Soft Errors in Commercial Integrated Circuits ; 1. Introduction ; 2. Scaling trends for memory devices ; 3. Seating trend for peripheral logic devices ; 4. Conclusion ; Single-Event Effects in lll-V Semiconductor Electronics ; 1. Introduction 2. Single-Event Effects in lll-V Electronic Devices 3. Summary and Conclusions ; Investigation of Single-Event Transients in Fast Integrated Circuits with a Pulsed Laser

; 1. Basic Mechanisms of a SET ; 2. SET Laser Testing ; 3. Experimental set-up for SET laser testing ; 4. Results
5. Conclusions System Level Single Event Upset Mitigation Strategies ; 1. Introduction ; 2. Systems Engineering for Energetic Particle Environment Compatibility ; 3. Fault Tolerant Systems Strategies ;
Radiation-Tolerant Design for High Performance Mixed-Signal Circuits
1. Introduction 2. Radiation Mechanisms in Mixed-Signal Integrated Circuits ; 3. Process Component and Layout Choices for Hardened-by-Design Circuits ; 4. Total Dose Hardening ; 5. Single-Event Effect Hardening ; 6. Dose-Rate Effect Hardening ; 7. Conclusion
A Total-Dose Hardening-By-Design Approach for High-Speed Mixed-Signal CMOS Integrated Circuits

Sommario/riassunto

This book provides a detailed treatment of radiation effects in electronic devices, including effects at the material, device, and circuit levels. The emphasis is on transient effects caused by single ionizing particles (single-event effects and soft errors) and effects produced by the cumulative energy deposited by the radiation (total ionizing dose effects). Bipolar (Si and SiGe), metal-oxide-semiconductor (MOS), and compound semiconductor technologies are discussed. In addition to considering the specific issues associated with high-performance devices and technologies, the book includes t