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Nota di contenuto	CONTENTS; Preface; About the Authors; Chapter 1 Introduction; 1.1 Background; 1.2 General Description of the SEE Mechanism; 1.3 Overview of Quantitative Evaluation Methods; Chapter 2 Terrestrial Neutron Spectrometry and Dosimetry; 2.1 Introduction; 2.2 Neutron Detection Method; 2.2.1 Multi-moderator spectrometer (Bonner Ball, Bonner sphere); 2.2.2 Organic liquid scintillation spectrometer; 2.2.3 Dose equivalent counter (rem counter); 2.2.4 Phoswich-type detector; 2.3 Experimental Procedure; 2.3.1 Sequential neutron measurements on the ground at sea level 2.3.2 Neutron measurements aboard an airplane and at mountain level2.3.3 Data analysis; 2.4 Results and Discussions; 2.4.1 Atmospheric pressure effect; 2.4.2 Neutron energy spectra; 2.4.3 Time-sequential results of neutron ambient dose equivalent rates; 2.4.4 Average values of neutron flux and ambient dose equivalent; 2.4.5 Variation with latitude, altitude and solar activity; 2.4.6 Calculation of the cosmic-ray neutron spectrum; 2.5 Concluding Remarks; Chapter 3 Irradiation Testing in the Terrestrial Field; 3.1 What Does Real-Time SER Mean?; 3.2 Statistics and FIT Estimation

Methodology

3.2.1 Confidence level3.2.2 SER FIT rate calculation (example); 3.3 Overview of the Real-Time SER Evaluation System for Memory Devices; 3.3.1 Overview of the memory devices; 3.3.2 General description of a Real-Time SER evaluation system; 3.4 Environmental Conditions of Real-Time SER Testing; 3.4.1 Spatial and temporal variation of the terrestrial neutron energy spectrum and dose; 3.4.2 Geomagnetic latitude, longitude and altitude of Real-Time SER tests; 3.4.3 Day-, night-time and monthly variation of neutron dose at ground level; 3.4.4 Monitoring of neutron dose during Real-Time SER testing
3.5 Real-Time SER Pre-test Preparations3.5.1 Sample selection; 3.5.2 DUT preparation and orientation; 3.5.3 Test program verification; 3.5.4 Effective neutron flux at the test location; 3.5.5 Test locations of Real-Time SER testing; 3.6 The Impact of Noise on Real-Time SER and Neutron Dose Rate: An Example of Field-testing; 3.6.1 Concrete attenuation length; 3.6.2 Verification of the altitude dependence at field-testing; 3.6.3 Correlation between neutron dose rate and neutron-induced soft error in the field; 3.6.4 Neutron dose equivalent rate in the environment
3.6.5 Comparison of MCU ratio between RTSER and neutron-induced SER3.6.6 Analysis of MCU and anomalous noise results from SER testing at the USA test sites; 3.6.7 Relation between the influence of solar wind and the change in neutron dose rate; 3.6.8 Verification of proper operation of the rem counter after the SER test; 3.7 Summary; Chapter 4 Neutron Irradiation Test Facilities; 4.1 Overview of Neutron Sources used in Neutron Irradiation Test Facilities; 4.2 Monoenergetic Neutron Source below 20 MeV; 4.2.1 14 MeV neutron source; 4.2.2 Variable energy sources
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Sommario/riassunto

Terrestrial neutron-induced soft errors in semiconductor memory devices are currently a major concern in reliability issues. Understanding the mechanism and quantifying soft-error rates are primarily crucial for the design and quality assurance of semiconductor memory devices. This book covers the relevant up-to-date topics in terrestrial neutron-induced soft errors, and aims to provide succinct knowledge on neutron-induced soft errors to the readers by presenting several valuable and unique features. Sample Chapter(s)
Chapter 1: Introduction (238 KB)
Table A.30 mentioned in Ap