

2003 NSREC Late News Posters

PA-9L

Chalcogenide Memory Arrays: Recent Radiation Effects Test Results

John Rodgers, Laura Burcin, BAE Systems; Jon Maimon, Ovonyx Inc.; Ken Hunt, AFRL

BAE Systems has fabricated 64-kbit GeSbTe (chalcogenide) memories in a radiation-hardened CMOS technology. Recent radiation test results show this to be a viable solution for high-density, low-power, fast, non-volatile, radiation-hardened memories for future spacecraft applications.

PC-6L

14 MeV Neutron and Gamma Testing of the Micropac Mii53111 Power MOSFET Optocoupler

Patrick J. McMarr, SFA/NRL; M. E. Nelson, K. J. Delikat, US Naval Academy; H. Hughes, Naval Research Lab

Power MOSFET optocouplers were exposed to 14 MeV neutrons and Co-60 gammas. Radiation from neutron activation of the package materials had a significant effect on the electrical parameters of the devices.

PF-7L

Simulation Study of Single Event Gate Rupture Using Radiation-Hardened Stripe Cell Power MOSFET Structures

Jeffrey L. Titus, Mark W. Savage, NAVSEA Crane; Yen-Sheng Su, Vidas Mickevicius, Integrated Systems Engineering, Inc.; C. Frank Wheatley, Private Consultant

Multi-dimensional simulations were performed upon stripe-cell structures employing different neck widths to investigate the effects of various physical mechanisms and input parameters. We found that impact ionization played a crucial role in SEGR.

PF-8L

Evaluating Average and Atypical Response in Radiation Effects Simulations

Robert A. Weller, Andrew L. Sternberg, Lloyd W. Massengill, Ronald D. Schrimpf, Daniel M. Fleetwood, Vanderbilt University

We examine the limits of single-event simulation using pre-averaged radiation events. GEANT4 simulations show the necessity, for future devices, to supplement current methods with ensemble averaging of responses to physically realistic radiation events.

PG-5L

Carrington Flare of 1859 as a Prototypical Worst Case Solar Energetic Particle Event

Lawrence W. Townsend, Daniel L. Stephens, Jr., Jennifer L. Hoff, University of Tennessee; E. Neal Zapp, Lockheed Martin Space Operations

Recent analyses of ice core samples indicate that the Carrington flare of 1859 was the largest event observed in the past 500 years. Estimates of total ionizing doses are catastrophic unless substantial shielding is provided.

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W-26

Single Event Effects Hardening and Characterization of Honeywell's RHPPC Processor Integrated Circuit

J. P. Lintz, L. F. Hoffmann, D. J. Bastyr, G. R. Brown, D. K. Nelson, Honeywell Defense and Space Electronic Systems

We describe SEE testing of Honeywell's radiation-hardened RHPPC Processor chip, which is functionally and pin-compatible with the commercial PowerPC 603e™. Results support an upset rate of 1.1×10^{-5} upsets/chip-day in geosynchronous orbit.

W-27

Proton Irradiation Testing of ATMEL 68360 Processor and GaAs MMICS

J. Seon, S. H. Min, K. W. Min, T. J. Cheong, H. J. Chun, SaTReCi; S. J. Kim, KAIST; Y. M. Kim, J. W. Park, ETRI

A summary of the proton irradiation testing for ATMEL 68360 processor and GaAs MMICs is provided. The results show sufficient qualifications of the components for Korean space missions.

W-28

Compendia of TID and SEE Test Results of Space Qualified Integrated Circuits

P. Layton, G. Williamson, B. Kazak, C. Sloan, R. Hillman, C. Thibodeau, L. Longden, Maxwell Technologies

SEE and TID data taken for existing and potential space products are presented. The data was collected to evaluate these devices for radiation effects in space environments.