

2025 IEEE Radiation Effects Data Workshop (REDW 2025) (in conjunction with 2025 NSREC)

**Nashville, Tennessee, USA
14-18 July 2025**

IEEE Catalog Number:
ISBN:

CFP25422-POD
979-8-3315-5915-1



Copyright © 2025, IEEE

All Rights Reserved

Copyright and Reprint Permissions:

Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP25422-POD
ISBN (Print-On-Demand):	979-8-3315-5915-1
ISBN (Online):	979-8-3315-5914-4
ISSN:	2154-0519

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA

Phone:	(845) 758-0400
Fax:	(845) 758-2633
E-mail:	curran@proceedings.com
Web:	www.proceedings.com

TABLE OF CONTENTS

Threshold Shifts Caused by TID Depending on Memory Cell States in Charge Trap Flash Memories	1
<i>Taiki Ozawa, Jun Furuta, Kazutoshi Kobayashi</i>	
Heavy Ion Induced Single Event Effects on the Agilx Commercial Off-The-Shelf Cmos Field Programmable Gate Array (Fpga)	5
<i>R. Koga, S. Davis, J. Shanney, Kenneth Pham, C. Cao, Kevin Pham</i>	
System-Level Single Event Effects Testing of the PIRT 1280MVCam InGaAs Infrared Camera	11
<i>Landen D. Ryder, Jean-Marie Lauenstein, Michael J. Campola, Matthew Kowalewski</i>	
Soft Error Evaluation of 12nm FinFET Technology Based on COTS GPU Neutron Testing	14
<i>L. Artola, A. Urena, C. Elash, L. Chen, G. Hubert</i>	
Characterization of SEEs on Gemini APU In-Memory Processors Under Heavy Ion Radiation	20
<i>Diego Wildenstein, Matthew Gruber, George Williams, Neil Sampson, Alan D. George</i>	
CHALICE: Calculator for Highly Accurate Laser-Induced Carrier Excitation	30
<i>Adrian Ildefonso, Joel M. Hales, Trevor Crane, Dale McMorro</i>	
Neutron Radiation Testing of Multiple System-on-Chip Devices Using a Unified Test Framework	37
<i>Jeffrey Goeders, Weston Smith, Jacob Bertrand, Ethan Hunter, Maria Kastriotou, Michael Wirthlin</i>	
Single Event Upset Characterization of the Versal® Adaptive SoC Using Proton Irradiation	42
<i>David M. Hiemstra, Nelson Hu</i>	
Guide to the 2024 IEEE Radiation Effects Data Workshop Record	47
<i>David M. Hiemstra</i>	
Impact of Single-Event Upsets on an SPI-Controlled Ka-Band Radiation-Hardened Beamformer Core Chip for Space Applications	52
<i>Nicola Pelagalli, Federico Pergolesi, Fabian L. Vargas, Aniello Franzese, Andrea Malignaggi, Corrado Carta</i>	
Total Ionizing Dose Effects on Clock Systems and Peripheral Modules of the MSP430FR6989	56
<i>I. Hudson, J. Carpenter, T. Peyton, J. Kim, J. Ermi, R. Baltazar Felipe, T. D. Loveless</i>	
Radiation Characterization of Radiation Hardened by Design 12 Nm FinFET Memories	64
<i>Reed K. Lawrence, Jason F. Ross, Megan C. Casey</i>	
The Aerospace Corporation's Compendium of Recent Radiation Testing Results	68
<i>S. C. Davis, R. Koga, K. Lee, J. L. Taggart, G. Tzintzarov, A. W. Wright, M. A. Willhoff</i>	
Investigating the Suitability of High-Performance Linux-Based System-on-Modules for Lunar Applications	74
<i>L. Coïc, G. Giuffrida, E. Le Goulven, S. Yjjou, A. Marino, P. Garcia, L. Turchi, G. Magistrati, A. Cowley</i>	
Multi-Angle Single Event Effects Characterization of 100V GaN-on-Si Power Transistor	80
<i>J. Brandt, R. Strittmatter</i>	
Heavy Ion-Induced Single-Event Effects in eGaN HEMTS	83
<i>Arefa Billa, Patrick Maloney, Grant Mayberry, Tianfang Liu, Benjamin Bolton, Hector Parra, Fahim Ahmed, Joyprakash Debnath, Daniel M. Fleetwood, En Xia Zhang</i>	

Radiation Evaluation of the TPS7H6101-SEP Radiation-Tolerant 200V, 10A GaN Half Bridge Power Stage	89
<i>T. Lew, M. Trevino, A. Marinelarena</i>	
Radiation Evaluation of the TPS7H502X-SP Radiation-Hardness-Assured (RHA) Single-Ended PWM Controller with Integrated Silicon (Si) and Gallium Nitride (GaN) Field Effect Transistor (FET) Gate Driver	94
<i>T. Lew, E. Johnson, A. Marinelarena</i>	
Radiation Evaluation of the TPS7H4104-SP Radiation Hardened 3V to 7V Input, 3A/Channel Quad-Channel Synchronous Step-down Converter	99
<i>A. Marinelarena, J. Cruz-Colon, T. Lew</i>	
Single-Event Effects in Commecrical Photonic Transceivers	104
<i>George N. Tzintzarov, Jenna Ocheltree, Gregory R. Allen, Carl Boone, Amanda Bozovich</i>	
Single Event Latch-Up Performance of the INA240 with Mitigation Technique & Proton Vs. Heavy Ion Rate Prediction	107
<i>A. Dyer, M. Brozak, S. R. Kulkarni, A. Hof</i>	
Development of a Double Scattering System for Radiation Effects	112
<i>Casey Corbridge, Vladimir Derenchuk, Jacob Shamblin</i>	
SEE Evaluation of a Serverless Computing Architecture Under 14-MeV Neutrons	115
<i>David Pacios, Mohammadreza Rezaei, José Luis Vázquez-Poletti, Sara Ignacio-Cerrato, Juan A. Clemente</i>	
Neutron-Induced Upsets and Stuck Bits on COTS Pseudo-Static RAMs	119
<i>Mohammadreza Rezaei, Francisco J. Franco, Andrea Colangeli, Juan A. Clemente</i>	
Neutron Radiation Results of Fault-Tolerant Soft RISC-V Linux SoCs on SRAM-Based FPGAs	123
<i>Andrew E. Wilson, Nathan G. Baker, Michael Wirthlin</i>	
TID and SEE Response of the AMC1350EVM Isolation Amplifier	127
<i>A. Noguera Cundar, D.M. Hiemstra, J. Cardenas Chavez, L. Chen</i>	
Total Ionizing Dose Response of COTS Operational Amplifiers	130
<i>D. Feist, D.M. Hiemstra, A. Noguera Cundar, J. Cardenas Chavez, L. Chen</i>	
Total Dose and Single-Event Effects Testing of the ISL75054 Ultra-Low Noise LDO	133
<i>M. L. Campanella, W. H. Newman, N.W. van Vonno, D. Wackley, L. G. Pearce, C. E. Thomson</i> <i>E. J. Thomson</i>	
The Radiation Performance and Production Flows of Renesas's Radiation Tolerant and Radiation Hardened Space Plastic Parts	138
<i>W. H. Newman, M. Campanella, J. Brewster, E. J. Thomson</i>	
SEE and Total Dose Results of the ISL74324MXX 500MHz–6.5GHz RF Amplifier	144
<i>W. H. Newman, M. Campanella, M. Bailly, D. Thornberry, A. Weittenhiller, E. J. Thomson</i>	
Total Dose and SEE Testing of the ISL74420M Radiation Tolerant Quad Clock Fanout IC	149
<i>N. W. van Vonno, W. H. Newman, L. G. Pearce, E. J. Thomson, M. L. Campanella</i>	

Single-Event Latch-Up Data from Heavy-Ion Irradiation of COTS Components with Inter-Lot Variability Study	154
<i>Daniel Söderström, Ivan Slipukhin, Mario Sacristán Barbero, Marc Poizat, Thomas Borel, Heikki Kettunen Michael Sivertz, Natalia Emriskova, Andreas Waets, Kacper Biłko, Marc Delrieux, Rubén García Alía</i>	
SEE and TID Test Results of Microchip's M6™ Power MOSFET Technology	162
<i>Oscar Mansilla, Joseph Smith, Sylvester Kane, Jim LeClare, Fiachra O'Callaghan, Saeed Shafiyar-rad</i>	
Compendium of NASA Goddard Space Flight Center's Current Radiation Effects Test Results	169
<i>Martha V. O'Bryan, Kenneth A. LaBel, Landen D. Ryder, Jean-Marie Lauenstein, Edward P. Wilcox Kaitlyn L. Ryder, Thomas A. Carstens, Seth S. Roffe, Adia M. Wood, Michael J. Campola Jason M. Osheroff, Matthew B. Joplin, Steven M. Guertin, Edward J. Wyrwas</i>	
Heavy Ions Single Event Latchup Test Results for the NA2200 Analog Front-End	175
<i>Tomasz Rajkowski, Grzegorz Szaciłowski, Andrzej Dziedzic</i>	
Total Ionizing Dose Effects on 28nm Microchip RT Polarfire® FPGA SRAM Physical Unclonable Functions	179
<i>Mairely Urias, Alex Cai, Krunal Dave, Nadia Rezzak, G. Richard Newell</i>	
2025 CERN Compendium of Radiation Effects in Candidate Electronics for High-Energy Particle Accelerator Systems	187
<i>Rudy Ferraro, Alessandro Zimmaro, Antonio Scialdone, Gilles Foucard, Eleftheria Vasileiadi Spyridon Georgakakis, Vasja Pirc, Salvatore Danzeca, Alessandro Masi</i>	
Functional Failure Induced by TID at Low-Dose Rate and High Energy Proton SEE Response of Commercial-Off-the-Shelf Electronics	192
<i>Benjamin Torres-Kulik, Manzar Mahmud, David M. Hiemstra</i>	
TID Induced Parametric Degradation of Commercial-Off-the-Shelf Electronics and their SEE Responses	197
<i>Manzar Mahmud, Benjamin Torres-Kulik, David M. Hiemstra</i>	
Single-Event Latchup Analysis and Mitigation Techniques on I/O Standard Cells in a 12nm Bulk FinFET Technology Node	204
<i>Marcus S. Evans, Grant D. Poe, Andrew K. Wright, Joseph S. Laporte, Sean T. Vibbert Timothy D. Haeffner, Jeffrey S. Kauppila, Lloyd W. Massengill</i>	
Characterization of Several RF Integrated Devices Sensitivity to Total Ionizing Dose	209
<i>Jean-Christophe Diot, Gilles Assallit, David Poujols</i>	
Compendium of Single-Event Effects Test Results for Candidate Electronics at NASA Johnson Space Center from 2024	213
<i>Ryan D. Rinderknecht, Stephen J. Martinez, Kyson V. Nguyen, Evan C. Agarwal, Joshua M. Pritts Brandon D. Reddell, Razvan Gaza</i>	
See Results of a Custom Power Management Integrated Circuit (PMIC) Using Globalfoundries 130 Nm Technology	219
<i>M.E. Byers, A. Omprakash, R. Young, B. Liu, R. Ng, F. Lara, A. Huynh, J. Steffan, A. Soto, M. Herrera D. Kachuche, E. Normandy, B. Do, R. De Jesus, R. Lyons</i>	
Complexities of Ionizing Radiation Testing of State Of-The-Art Single Board Computers	223
<i>Christopher J. Billie, Ryan E. Pinson, Benjamin B.W. Rutherford, Matthew E. Spear, Windy S. Slater Heather M. Quimm</i>	