

2013 IEEE Radiation Effects Data Workshop

(REDW 2013)

In conjunction with NSREC 2013

**San Francisco, California, USA
8 – 12 July 2013**



**IEEE Catalog Number: CFP13422-POD
ISBN: 978-1-4799-1138-7**

2013 REDW List of Papers

- Guide to the 2012 IEEE Radiation Effects Data Workshop Record** 1
David M. Hiemstra
- Compendium of Recent Total Ionizing Dose and Displacement Damage for Candidate Spacecraft Electronics for NASA** 7
Alvin J. Boutte, Donna J. Cochran, Dakai Chen, Michael J. Campola, Jonathan A. Pellish, Raymond L. Ladbury, Edward P. Wilcox, Jean-Marie Lauenstein, Robert A. Gigliuto, Kenneth A. LaBel and Martha V. O'Bryan
- Compendium of TID, Neutron, Proton and Heavy Ion Testing of Satellite Electronics for Los Alamos National Laboratory** 16
Tom Fairbanks, Heather Quinn, Justin Tripp, John Michel, Adam Warniment and Nick Dallmann
- Compendium of Recent Single Event Effects for Candidate Spacecraft Electronics for NASA** 22
Martha V. O'Bryan, Dakai Chen, Michael J. Campola, Megan C. Casey, Alyson D. Topper, Kenneth A. LaBel, Jonathan A. Pellish, Jean-Marie Lauenstein, Robert A. Gigliuto, Edward P. Wilcox, Raymond L. Ladbury, Melanie D. Berg and Robert R. Davies
- Compilation of Electronic Components SEE Test Results** 30
Vasily S. Anashin, Alexander S. Kuznetsov, Alexander E. Kozyukov, Linaris R. Bakirov, Anatoly A. Kazyakin and Kirill A. Artemyev
- Compendium of Radiation-Induced Effects for Candidate Particle Accelerator Electronics** 33
G. Spiezia, M. Brugger, S. Danzeca, R. Garcia Alia, R. Gaillard, E. Fadakis, G. Foucard, R. Losito, A. Masi, J. Mekki, P. Oser, P. Peronnard, G. Ruggiero and R. Secondo
- SEE and TID Test Results of Candidate Electronics for LHC Power Converter Control** 40
Slawosz Uznanski, Benjamin Todd, Arend Dinius, Quentin King, Karol Motala, Markus Brugger, Giovanni Spiezia and Evangelia Gousiou
- Compendium of Total Ionizing Dose, Displacement Damage and Single Event Transient Test Data of Various Optocouplers for ESA** 45
Marc Poizat, Maryse Sauvagnac, Anne Samaras, Yannick Padié, Pierre Garcia, Benjamin Renaud, Lionel Gouyet, Jean Paul Abadi, Fabien Widmeer, Enoal Le Goulven, Maxime Vaille, Benjamin Vandavelde, Thomas Caunes, Ludovic Puybusque, Gaël Vignon, Lionel Salvy, Alexandre Rousset, Christian Chatry, Christian Erd, Christian Poivey, Veronique Ferlet-Cavrois, Cesar Boatella-Polo and Ali Zadeh
- TID Tolerance of Popular CubeSat Components** 51
R. Kingsbury, F. Schmidt, W. Blackwell, I. Osarentin, R. Legge, K. Cahoy and D. Sklair
- TID Test Results for 4th Generation iPad™** 55
S. M. Guertin, G. R. Allen, S. S. McClure and K. A. LaBel
- Cosmic Ray Effects on Personal Entertainment Applications for Smartphones** 61
Yuyuan Chen
- Qualification of an Automotive-Grade, State-of-the-Art ASIC for Natural Space Applications** 65
L. Hoffmann and V. Lam

Single Event Upset Characterization of the Spartan-6 Field Programmable Gate Array Using Proton Irradiation	73
<i>David M. Hiemstra and Valeri Kirischian</i>	
Single Event Effect Rate Analysis and Upset Characterization of FPGA Digital Signal Processors	77
<i>Roberto Monreal, Gary Swift, Y. C. Wang, Michael Wirthlin and Brent Nelson</i>	
Static, Dynamic, and Application-Level SEE Results for a 49-Core RHBD Processor	85
<i>B. Wie, M. K. Plante, A. Berkley, S. M. Guertin and R. J. Nejad</i>	
The Reliability of Software Algorithms and Software-Based Mitigation Techniques in Digital Signal Processors	94
<i>Heather Quinn, Tom Fairbanks, Justin L. Tripp and Andrea Manuzzato</i>	
Characterization and Mitigation of the MGT-Based Aurora Protocol in a Radiation Environment	102
<i>Alexander Harding, Kevin Ellsworth, Brent Nelson and Michael Wirthlin</i>	
VCSEL and Photodiode Proton Test Results for an Optical Communications Link	106
<i>Steven A. Rogacki, Jonathan A. Pellish, Steven Persyn, Paul W. Marshall and John Stone</i>	
Single Event Effect and Total Ionizing Dose Results of Highly Scaled Flash Memories	113
<i>Farokh Irom, Duc N. Nguyen and Gregory R. Allen</i>	
Single Event Response of the Samsung 16G NAND Flash	117
<i>Timothy R. Oldham, Edward P. Wilcox and Mark R. Friendlich</i>	
Total Dose and Single Event Effects Testing of the Intersil ISL70444SEH Hardened Operational Amplifier	122
<i>N. W. van Vonno, B. Williams, R. Hood, E. J. Thomson and S. K. Bernard</i>	
Radiation Testing Results for the Intersil ISL71590SEH Temperature Sensor	129
<i>N. W. van Vonno, S. D. Turner, E. J. Thomson, B. Williams, S. J. Schulte, L. G. Gough and J. E. Shick</i>	
Radiation Tolerant MESFET-CMOS Low Dropout Linear Regulator for Integrated Power Management at the 45nm Node	133
<i>Trevor J. Thornton, William Lepkowski, Seth J. Wilk, Michael Goryll, Bo Chen, Jason Kam, Bertan Bakkaloglu and Keith Holbert</i>	
Single Event Transient (SET) Susceptibility of the Texas Instruments LM139 Quad Comparator under Proton Irradiation	136
<i>Razvan Gaza and Jaime Cooper</i>	
Single Event Effects Sensitivity of 180 and 350 nm SiGe HBT Microcircuits	139
<i>R. Koga, C. Paul, D. Romeo, V. Petrosyan and J. George</i>	
Effects of Ion Energy on Single Event Effect Performance of LM139 and AD9042	146
<i>Stephen E. Stone, Alexander L. Bogorad, Justin J. Likar, Robert E. Lombardi and Roman Herschitz</i>	
Total Ionizing Dose Characterization of the Calibration Circuit of Texas Instruments' ADC12D1600CCMLS, 12b, 3.2 GSPS Analog-to-Digital Converter	150
<i>Kirby Kruckmeyer, Thang Trinh and Linton Park</i>	

- Single Event Characterization of a Family of Voltage Supervisors Designed in a 0.35- μ m Triple-Well CMOS Technology** 154
David B. Kerwin, Younes Lotfi, Alfio Zanchi, Ken Merkel, Anthony Wilson and Craig Hafer
- Dose Rate Effects on Bipolar Components** 161
F. Toscano, A. Ouellet, F. Tilhac and T. Lagarrigue
- Single Event Burnout Observed in Schottky Diodes** 167
Jeffrey S. George, Rocky Koga, Robert M. Moision and Arturo Arroyo
- Specific Characterization for Destructive Single Event Effects on GaAs Power P-HEMT MMIC** 175
R. Marec, A. Bensoussan, J. L. Muraro, L. Portal, P. Calvel, C. Barillot, M. G. Perichaud, L. Marchand and G. Vignon
- Radiation Effects of High Voltage MESFETs at the 45nm Node** 180
Seth J. Wilk, William Lepkowski, Bo Chen, Jason Kam, Michael Goryll, Keith Holbert and Trevor J. Thornton
- Recent Radiation Test Results for Power MOSFETs** 183
Jean-Marie Lauenstein, Alyson D. Topper, Megan C. Casey, Edward P. Wilcox, Anthony M. Phan, Hak S. Kim and Kenneth A. LaBel
- Characterization and Analyses of RadHard-by-Design CMOS Quad Operational Amplifiers** 189
Ray Benson, Paul Resch and Randall Milanowski
- Hardness Assurance for Total Dose and Dose Rate Testing of a State-of-the-Art Off-Shore 32 nm CMOS Processor** 196
Kenneth A. LaBel, Robert A. Gigliuto, Carl M. Szabo Jr., Martin A. Carts, Matthew Kay, Timothy Sinclair, Matthew Gadlage, Adam Duncan and Dave Ingalls
- In-Situ TID Test of 4-Gbit DDR3 SDRAM Devices** 202
Martin Herrmann, Kai Grürmann, Fritz Gliem, Hagen Schmidt and Véronique Ferlet-Cavrois
- In-Situ, Low Dose Rate, TID Test of the Power Supply Block of RadEx, a CubeSat Class Radiation Experiment Module** 209
Jiri Hofman
- Single-Event Effect Qualification of 24 Bit Analog-to-Digital Converters** 213
Leif Z. Scheick, Greg R. Allen and Larry D. Edmonds
- Compendium of Single Event Effects Radiation Test Results from Ball Aerospace & Technologies Corp.** 218
John Bird, Rob Davies, David DuVal, Forrest Gasdia, Charlie Hamp, Richard Horton, Tim Koval, Jennifer Lee, Kristin Marino, Timothy O'Connor, Sana Rezgui, Dakai Chen, Megan C. Casey, Hak S. Kim and Anthony M. Phan