

Microelectronics Reliability & Qualification Workshop



Manhattan Beach Marriott, Manhattan Beach, Calif.
Dec. 8–9, 2009

Tuesday, Dec. 8

7:00 Registration and Continental Breakfast

8:00 Welcoming Remarks and Overview of the Technical Program

Ronald Lacoce, MRQW General and Technical Program Chair
The Aerospace Corporation

8:20 Keynote

Space Electronics Reliability in 2020
Dave Alexander, Air Force Research Laboratory, Space Electronics Branch

Session I: Failure Analysis

Session Chair: Brendan Foran, The Aerospace Corporation

9:15 Infrared Backside Imaging for Flip-Chip DPA

Terence Yeoh, The Aerospace Corporation

9:35 Whole Chip Circuit Extraction by Automated SEM Mapping

Jerzy Gazda, Cerium Laboratories, Spansion

Session II: Memories

Session Chair: Ken Hunt, Air Force Research Laboratory, Space Vehicle Directorate

9:55 Methodology to Assess Yield Limitations of a 32M SRAM

Dave Gifford, Silicon Space Tech

10:15 Break

10:45 BAE Systems CRAM Update

Scott Doyle, BAE Systems

Session III: FPGAs

Session Chair: Jon Osborn, The Aerospace Corporation

11:05 Radiation Performance of Embedded CoreABC Controller on the New Radiation-Tolerant Flash-Based FPGA: RT-ProASIC3

Sana Rezgui, Actel

11:25 Qualification and Release Plans for the XQR5VF130T-1CF1752V aka SIRF

Joe Fabula, Xilinx

11:45 Achronix picoPIPE Redundancy Voting Circuit Single Event Effects Mitigation Methodology

Daniel Elftmann, Achronix Semiconductor

Please note that this program is subject to change.

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12:05 Conference Luncheon

Session IV: Packaging

Session Chair: Keith Avery, Air Force Research Laboratory, Space Vehicle Directorate

1:25 Introduction to Packaging Session

Keith Avery, Air Force Research Laboratory, Space Vehicle Directorate

1:30 3-D Memory Integration

Robert Patti, Tezzaron Semiconductor

1:50 3-D Architectures for Semiconductor Integration and Packaging

Glenn Forman, GE Global Research

2:10 Class X Devices: New MIL-PRF 38535 Proposals

Ramin Roosta, Jet Propulsion Laboratory

2:30 Plastic Encapsulated Microelectronics (PEM) Screening and Qualification Procedures for Various Duration Space Missions

Mark S. Cooper, Jet Propulsion Laboratory

2:50 Update on High I/O Area Array Packages and Assembly Reliability

Reza Ghaffarian, Jet Propulsion Laboratory

3:10 Break

Session V: HiReV Program

Session Chair: Chris Bozada, Air Force Research Laboratory, Sensor Directorate

3:30 HiREV Overview and Update

Donald Dorsey, Air Force Research Laboratory, Materials and Manufacturing Directorate

3:50 Reliability Mathematics and Statistics

James Theimer, Air Force Research Laboratory, Sensor Directorate

4:10 Stress Testing and Multi-Stressor Experiments

Glen "Dave" Via, Air Force Research Laboratory, Sensor Directorate

4:30 Electrothermal Modeling

Eric Heller, Air Force Research Laboratory, Materials and Manufacturing Directorate

5:00 On-Site Reception

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7:15 Registration and Continental Breakfast

Session VI: Radiation Effects

Session Chair: Steve McClure, Jet Propulsion Laboratory

8:15 SEE Effects in Advanced Commercial CMOS Processes
Dave Mavis, Micro-RDC

8:55 Radiation Performance of 45 nm SOI RHBD Designs
Ethan Cannon, Boeing

9:15 On-Orbit Performance of a Triple-Voted, COTS-Based Computer
Keith Williamson, Boeing

9:35 MAESTRO Processor Single Event Error Analysis
Manuel Cabanas-Holmen, Boeing

9:55 Using FLUKA to Calculate Spacecraft Single Event Environments
Steve Koontz, NASA Johnson Space Center

10:15 Break

10:45 Effects of Molecular Hydrogen on Total Dose Response in Semiconductor Oxides
Hugh J. Barnaby, Arizona State University

Session VII: Government Programs

Session Chair: Joel Schulman, The Aerospace Corporation

11:10 DTRA Rad-Hard Microelectronic Programs
Tim Oldham, Defense Threat Reduction Agency/Perot Systems

11:30 RVSE Branch Overview
Marc Owens, Air Force Research Laboratory, Space Vehicle Directorate

11:50 NASA NEPP Program
Ken LaBel, NASA Goddard Space Flight Center

12:10 Conference Luncheon

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Session VIII: Product Qualification and Reliability

Session Chair: Doug Sheldon, Jet Propulsion Laboratory

- 1:30** Reliability Plan for 130-nm CMOS Technology
Robert Ciccariello, Aeroflex
- 1:50** Transient TCAD Modeling of Electro-Thermal Self Heating in GaN HEMTs
Scott Tracey, Naval Postgraduate School
- 2:10** Joule Heating TCAD Analysis of GTO Thyristors
T. Weatherford, Naval Postgraduate School
- 2:30** Soldering Effects on MIL-PRF-55365 Capacitors
Penelope Spence, Jet Propulsion Laboratory
- 2:50** **Break**

Session IX: Optoelectronics

Session Chair: Keith Avery, Air Force Research Laboratory, Space Vehicle Directorate

- 3:10** Test and Qualification Standards for Harsh Environment Fiber Optic Components
Chuck Tabbert, Ultra Communications Inc.
- 3:30** Reliability Considerations for Opto-Electronic Components in Military Environments
Rick Stevens, Lockheed Martin Tactical Systems
- 3:50** **Closing Remarks**

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