Welcome to CMSE 2017

Dear Military and Space Electronics Professionals,

On behalf of the Program Committee I would like to personally welcome everyone to this year’s 21st annual CMSE Conference and Exhibition. This is an interactive event that requires full participation from the attendees as well as the speakers and exhibitors. The idea is to promote broad discussion about grass root technical issues we all face together in this industry. So please take the time to listen, ask good questions and don’t hesitate to respectfully challenge each other’s ideas and technical opinions.

I’d like to personally thank our sponsors and exhibitors for supporting CMSE. On a programming note an electronic copy of all the presentations will be sent via a secure link to all attendees after completion of CMSE 2017.

I look forward to speaking to each and everyone, welcome!

Tom Green
Program Chairman

Workmanship Standards eBook: Hybrids, Microcircuits and RF/MMIC Modules

This is an online illustrated guide depicting photos of common workmanship defects as seen during production and each defect slide is tied to a particular page in MIL-STD-883. Its intended as an on-the-floor working document for operators, inspectors and quality engineers to facilitate an understanding of defects generated during the manufacture of hybrids, microcircuits and RF/MMIC modules and how they relate to the contractual requirements of MIL-STD-883.

Access over 300 color defect pics linked to Mil-Std-883 source requirements with just a click!

LEARN MORE AT
www.tjgreenllc.com/workmanship-ebook

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Mike McKeown
Hesse Mechatronics
Mike Sampson
NASA
Jeff Sokol
The Aerospace Corp.
Tom Terlizzi
TJ Green Associates LLC
Keynote Speakers

Michael J. Sampson received his MSc in Engineering Management from the University of Maryland, University College, in 1999. He has been co-Manager of the NASA Electronic Parts and Packaging (NEPP) Program since October 1, 2003 and GSFC Alert Coordinator since 2005. The NEPP program is a cross-agency activity that evaluates new and emerging EEE part technologies, shares information and develops tools for EEE parts assurance. Mike has worked for NASA for over 20 years. Before joining NASA, Mike spent five years as a NASA support contractor and before that, more than twenty years as an engineer and engineering manager in electronic parts manufacturing.

David Davis is currently the SMC Chief Systems Engineer at the Space and Missile Systems Center, Air Force Space Command, Los Angeles Air Force Base, CA. He has also served as the Acting Engineering Director. Mr Davis is in his 39th year at SMC where he spent the first ten years supporting the Global Positioning System (GPS) Program and Defense Meteorological Satellite Program (DMSP) working primarily satellite hardware design, manufacturing, quality and test. In his role, he supports the Commander and the Director of Engineering for center wide application of systems engineering, parts, materials and processes, radiation hardening, specifications and standards, industrial base, manufacturing/quality engineering, and space flight worthiness assessment.
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<th>Time</th>
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<td>0700 - 0800</td>
<td>Breakfast and Registration</td>
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<tr>
<td>1300 - 1700</td>
<td>Session A: Non-Hermetic Packaging for Hi Rel Military and Aerospace&lt;br&gt;Thomas J Green&lt;br&gt;TJ Green Associates LLC&lt;br&gt;Robert Lowry&lt;br&gt;Electronic Materials Consultant</td>
<td>Session B: Microelectronic Package &amp; Board Failure Mechanisms and Related Analysis Techniques&lt;br&gt;Steve Greathouse&lt;br&gt;Plexus Corporation</td>
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**TUESDAY**

**EXHIBITOR HOURS: 1100 - 1900**

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<tr>
<th>Time</th>
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<tr>
<td>0845 - 0910</td>
<td>1.1 Hermetic and Non-Hermetic QML ICs – Current Status and Challenges&lt;br&gt;Shri Agarawl&lt;br&gt;NASA JPL</td>
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<td>0910 - 0935</td>
<td>1.2 COTS &amp; COTS + Tantalum Capacitor Failures Confirm Systemic Moisture Sensitivity Issues&lt;br&gt;Aaron Dermarderosian&lt;br&gt;Raytheon Space And Airborne Systems</td>
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<td>0935 - 1000</td>
<td>1.3 The New Tighter Hermeticity Test Leak Requirements – European Overview&lt;br&gt;Gonzalo Fernández Romero&lt;br&gt;Alter Technology</td>
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<td>1015 - 1040</td>
<td>1.4 Hermetic Weld Schedule Optimization Based Tighter TM 1014 Leak Rate Specifications&lt;br&gt;Rich Richardson&lt;br&gt;Microcircuit Labs LLC</td>
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<td>1040 - 1105</td>
<td>1.5 Meeting the New Tighter Hermeticity Requirements with Optical Leak Testing (OLT)&lt;br&gt;Tom Trafford&lt;br&gt;NORCOM</td>
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<td>1105 - 1130</td>
<td>1.6 Gross Leak Standards Development&lt;br&gt;Kathy Laird&lt;br&gt;NASA/MSFC</td>
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<td>1130 - 1200</td>
<td>1.7 Hermetic/Non-Hermetic Panel Discussion&lt;br&gt;Tom Green, Moderator&lt;br&gt;TJ Green Associates LLC</td>
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<td>1200 - 1400</td>
<td>Lunch - In Exhibits Area</td>
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**WEDNESDAY**

**TRAINING SEMINARS**

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<th>Time</th>
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<td>1400 - 1425</td>
<td>2.1 Degradation and ESR Failures in MnO2 Chip Tantalum Capacitors&lt;br&gt;Alexander Teverovsky&lt;br&gt;ASRC Federal Space and Defense</td>
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<td>1425 - 1450</td>
<td>2.2 Tantalum Polymer Capacitors: COTS plus Solutions for Space Applications&lt;br&gt;Chris Reynolds&lt;br&gt;AVX</td>
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<td>1450 - 1515</td>
<td>2.3 Polymer Tantalum Capacitors Under Vacuum&lt;br&gt;Michael Cozzolino&lt;br&gt;Vishay</td>
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<td>1515 - 1540</td>
<td>2.4 Advanced Polymer Capacitors&lt;br&gt;Chuck Pothier&lt;br&gt;Vishay</td>
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<td>1540 - 1600</td>
<td>Coffee Break</td>
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<td>1600 - 1625</td>
<td>2.5 Hermetic Tantalum Caps for High Power Pulse Applications&lt;br&gt;Charlie Dewey&lt;br&gt;Evans Capacitor Company</td>
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<td>1625 - 1650</td>
<td>2.6 Base Metal Ceramic Capacitors for High Reliability Applications&lt;br&gt;John Marshall&lt;br&gt;AVX</td>
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<td>1650 - 1715</td>
<td>2.7 A Low Profile High Power Inductor for High Reliability Applications&lt;br&gt;David Olson&lt;br&gt;Vishay</td>
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<td>1715 - 1740</td>
<td>2.8 Polymer Tantalum Capacitors for Use in Mission Critical Applications&lt;br&gt;Ed Jones&lt;br&gt;KEFET Electronics Corporation</td>
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<td>1745 - 2000</td>
<td>Welcome Reception Buffet</td>
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THURSDAY

0800 - 0830  **Keynote**  Challenges for Future Space Systems Acquisitions  
Dave Davis  USAF-SMC

Session 3 - Copper Wire Bonding for High Reliability Applications

0830 - 0855  3.1 Introduction of High Reliability Copper Bonding Wire for High Rel Industrial, A&D Automotive Applications  
William (Bud) Crockett, Jr.  Tanaka Denachi Group Saga

0855 - 0920  3.2 A Review on Copper Wirebond Technology in PEMs  
Dr. Mukul Saran, QRE Texas Instruments

0920 - 0945  3.3 Assessment of Copper Bond Wire for Use in Long Term Military Applications  
Aaron Lecomte  Raytheon Integrated Defense Systems

0945 - 1010  3.4 Decapsulation of Copper Wire Bonded Devices  
Subramani Manoharan  CALCE

1010 - 1030  **COFFEE BREAK**

1030 - 1055  3.5 CU Bond Wire Reliability & Decapsulation Process  
S. Ali Lilani  Integra Technologies LLC

1050 - 1115  3.6 Flexible Copper Welded Interconnects for Crosstalk Reduction in WBG Power Modules  
Dr. Doug Hopkins and Adam Morgan  NC State

1115 - 1140  3.7 High Performance Packaging for Space  
Arne K. Knudsen  Kyocera America Inc.

1140 - 1205  3.8 High Reliability Rad Hard e-Mode Gallium Nitride HEMT GaN Power Technologies & Packaging for Space  
Jim Larrauri  Freescale Semiconductor

1205 - 1330  **LUNCH - IN EXHIBITS AREA**

Session 4 - COTS: SUCCESS STORIES AND CHALLENGES

1330 - 1355  4.1 Understanding PCB Design & Material Warpage Challenges which Occur during B2B Board-to-Board/Module-Carrier Attachment  
Eric Moen  Akrometrix

1355 - 1420  4.2 3D Digital Stitching in the Electronics World and its Use with Dendritic Growth Studies  
Steve Greathouse  Plexus Corporation

1420 - 1445  4.3 HALT Testing for Use of COTS Parts on NASA Missions  
Anupam Chourey  NASA JPL

1445 - 1510  4.4 Deployed Forensic Cloud-Based Track and Trace Platform for Microcircuits  
Bob MacDowell  Applied DNA Sciences

1510 - 1530  **BREAK**

Session 5 - OBSOLETE COMPONENTS and COUNTERFEIT PARTS

1530 - 1555  5.1 A Counterfeit Component Case History  
Bob Lowry  Electronic Materials Consultant

1555 - 1620  5.2 Integrated Circuit Redesign Obsolescence: Assembly Options and Solutions  
Tim Flaherty  Golden Atlas

1620 - 1645  5.3 Implications of COTS Packaging Modifications in Legacy Systems  
Aaron DerMarderosian  Raytheon Space and Airborne Systems

1645 - 1710  5.4 Risks with Obsolete Military Marked Components from the Open Market  
Leon Hamiter  Components Technology Institute Inc.
HIGH RELIABILITY CERAMIC CAPACITORS

10V to 10kV in Multiple Dielectrics
X7R, BX, N2200, NPO

Capacitors for High Temperature Applications (250°C+)

Lead Frames for Board Flex Compliance

Stacked Capacitors for Increased Energy Density

Pulse Capacitors with Bleed Resistors

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