EIA G-12 and JC-13
Standardization of Solid State Devices in a Collaborative Global Environment

MEWS 16

Michael A. Cooper
GEIA G-12 Chairman
General Dynamics
C4 Systems
Mike.Cooper@gdc4s.com

Presentation Overview

• EIA G-12 and JC-13 Committee Structures
• Collaborative Working Partners
• Cooperative Efforts
• Global Involvement
• Major Initiatives
• Conclusions
Electronic Industries Alliance (EIA)

- The EIA is a trade organization that includes the full spectrum of U.S. manufacturers, representing more than 80% of the $550 billion electronics industry.
- The Alliance is a partnership of electronic and high tech associations and companies whose mission is promoting the market development and competitiveness of the U.S. high tech industry through domestic and international policy efforts.
- EIA is comprised of more than 2,300 member companies whose products and services range from the smallest electronic components to the most complex systems used by defense, space and industry, including the full range of consumer electronic products.
JEDEC Solid State Products Technology Association

JEDEC is the semiconductor engineering standardization body of the Electronic Industries Alliance (EIA), which represents an array of high technology trade associations serving the needs of member companies in the electronics and information technology, telecommunications, consumer electronics and component parts industries.

JEDEC JC-13

The JC-13 Committee represents the manufacturing segment of the solid state device industry.

The committee is responsible for standardizing quality and reliability methodologies for solid state products used in military, space, and environments requiring special use condition capabilities beyond those of standard commercial products. This includes long-term reliability and/or special screening requirements.
JC-13 Member Companies

Actel Corporation
Aeroflex Labs
Aeroflex UTMC
Agilent Technology
Advanced Micro Devices
Amkor Technology
Analog Devices
Arrow/Zeus Electronics
Austin Semiconductor
Avnet
BAE Systems
Boeing
California Eastern Labs
Chip Supply, Inc.
Cisco Systems
C-MAC Microcircuits
CMC Electronics
Crane Interpoint
Cypress Semiconductor
Data Device Corporation
EMS Technologies
General Test Laboratory
Hi/Fn
Honeywell SSEC
Hytek Microsystems IR
Intersil Corporation
Intel
Kingsmax Semiconductor (China)
Lansdale Semiconductor
Linear Technology Corporation
LSI Logic Corporation
Manufacturing Technology Inc.
Micropac Industries Inc.
Microsemi Corporation
Mictro Technology Inc
Mini-Systems Inc.
Motorola
M.S. Kennedy Corporation
National Semiconductor
New Jersey Micro Electronic
Northrup Grumman-ESID
Olin Aegis Inc.
QP Labs
REMEC
Rochester Electronics
San Disk Corporation
Sarnoff Corporation
Semicoa Semiconductors
Semtech Corporation
Sensitron Semiconductor
STMicroelectronics
Sun Microsystems
Teledyne Elec.Tech.
Texas Instruments
U.S. Army
Vishay – General Semi
Vishay - Siliconix Inc
White Electronic Design
Xilinx

MANY OF THESE COMPANIES HAVE NON-US OPERATIONS

JC-13 Task Groups

• Twenty Nine (29) active JC13 task groups addressing for example:
- Known Good Die Std Update, RGA Process Monitor,
- DPA Test Method (TM), SEM TM
- Time-Temp Regression for Burn-in, Plastic spec baseline
- Requirements for die from 3rd party sources
- ELDRS TM, Low Alpha Material TM, Proton TM
- Flip Chip Criteria in Hybrids, Die Shear TM Review
- Hybrid ceramic chip quality and reliability issues
- Review Radiation Requirement in JEP 133 and MIL-Perfs
- Class K Requirements Review
- Mil Performance Spec Reviews (19500, 38534, 38535)
Government Electronics and Information Technology Association (GEIA)

- GEIA represents the high-tech industry doing business with the government.
- Association members include companies involved in producing information technology (IT) solutions as well as advanced electronics products and services for defense and civil government markets.
- GEIA Members are systems integrators, suppliers, contractors, hardware manufacturers, and software providers in the IT, Defense and Communications Industries.
- GEIA connects industry to government through its renowned forecasting process and maintains an active technical and standards development program to provide industry with proven solutions to business process challenges.

G Panels / Committees
- G-11 Component Parts
- G-12 Solid State Devices
- G-33 Data and Configuration Management
- G-34 Computer Resources
- G-43 Quality
- G-45 Human Factors
- G-46 Electromagnetic Compatibility
- G-47 Systems Engineering
- G-48 Systems Safety
- Avionics Process Management Committee
- Compact Model Council
- Input Output Buffer Information Spec.
- Quality & Reliability Engineering

G-12 Solid State Devices Committee

- The G-12 Committee develops solutions to technical problems in the application, standardization, and reliability of solid state devices.
- This is implemented by evaluation and preparation of recommendations for specifications, standards, and other documents, both government and industry, to assure that solid state devices are suitable for their intended purposes.
- Focus Areas ...
  - Standardization
  - Manufacturability
  - Specifications and Standards Impacting Solid State Devices
  - Quality and Reliability
  - System Performance (End Use)
  - Diminishing Manufacturing Sources (DMS)
  - Market Consistency
  - Continued Improvement
  - Acquisition Reform
  - Best Commercial Practices
  - Commercial Part Insertion
G-12 Active Member Companies

- Astrium
- BAE Systems
- Boeing Company
- Boeing Space Systems
- British National Space Center
- CMC Electronics
- Defense Microelectronics Activity
- Dyncorp I & ET
- General Dynamics Corp.
- Kollsman Inc.
- L-3 Communications Sys.
- Lockheed Martin
- NASAM, Inc.
- Northrop-Grumman
- Raytheon Systems Co.
- Rockwell Collins
- Spectrum Astro Inc
- Tecnológica Componentes Electrónicos S. A.
- Textron, Inc.
- United Space Alliance

Global Interest and Participation

G-12 Sub-Committees & Active Tasks

- Solid State Device Requirements for Space Applications Sub-Committee
- Plastic Encapsulated Microcircuit (PEM) Sub-Committee
- RF / Microwave Component Standards Sub-Committee
- Hybrid/MCM Sub-Committee

- MIL-PRF-19500, Key Parametric Control
- RGA Issues – Test Method, Monitor
- Discrete Power Devices Standardization
- Procurement of PEMs for High Rel. End Use
- PIND Test Method Study
- Design Guide for Commercial Satellite Parts
- Surface Mount Device TM (CTE Mismatch)
- Resistance to Solder Heat Requirements for Hybrids
- Glass Strain Test Method
- DSCC Request for Class 1 Check List Change
- Thermal Impedance for JFETS
- Failure Rate Estimating Methods
- Scanning Acoustical Microscopy
- Corona Breakdown Test Method
- Lead-Free Issues – Mitigation Guideline
- MIL-STD-1580 DPA Rewrite & Coordination
- MIL-S-19500 Major Revision Review Coordination
- SD-18 Update - G-12 Inputs
Standards Purview

- MIL-PRF-19500, Semiconductor Devices, General Specification for
- MIL-PRF-38534, Hybrid Microcircuits, General Specification for
- MIL-PRF-38535, Integrated Circuits (Microcircuits) Manufacturing, General Specification For
- MIL-STD-883, Test Method Standard for Microcircuits
- MIL-HDBK-103, List of Standard Microcircuit Drawings
- MIL-STD-1835, Electronic Component Case Outlines

- EIA GEB1, DMSMS Management Practices
- EIA SSB-1, Guidelines for Using Plastic Encapsulated Microcircuits and Semiconductors in Military, Aerospace and Other Rugged Applications
- Design Guideline for Electrical & Electronic Parts Used in Satellite Applications
- Related Areas …
  - Associated JEDEC Standards
  - SD-18, Defense Standardization Program Guide for Part Requirement & Application
  - MIL-STD-1686 & ANSI-ESD S20.20, ESD
  - Solderability Requirements & Lead-Free Issues

Collaborative Relationships

Government Liaisons
- US Army
- US Navy
- US Air Force
- NASA
- DSCC
- DMEA
- GIDEPI

Europe & Asia
- British National Space Centre (BNSC)
- European Space Agency (ESA)
- Deutsches Zentrum für Luft- und Raumfahrt e.V (DLR)
- Joint Aerospace Exploration Agency (JAXA)

Concurrent Joint Meetings Three Times a Year
Collaborative Relationships

• Information Sharing and Communications with …
  – Automotive Electronics Council
  – Best Manufacturing Practices Center of Excellence
  – Center for Commercial Component Insertion (The C3I)
  – Centre National d'Etudes Spatialies (CNES)
  – Defense Microcircuit Planning Group
  – Defense Semiconductor Association
  – International Electrotechnical Commission (IEC)
  – IPC
  – Italian Ministry of Defense
  – Semiconductor Assembly Council (SAC)
  – Society of Japanese Aerospace Companies
  – STACK International

DSCC & Other Working Partners

• Defense Supply Center Columbus (DSCC)
  – Specifications, Standards, and Qualification
• Armed Services - Navy, Army, Air Force
• NASA, JAXA, ESA, JPL, Aerospace, Mitre, other liaisons
• National Laboratories and Test Centers
Global Involvement

- Global aspects of the high reliability solid state device business needs to have global solutions
- Scope and representation expanded to address issues

Matra-Marconi Space 1/97
Alcatel 9/99
Tecnologica 1/99
ESA / ESTEC - SCSB 1/98
CNES occasional
NASDA 5/99
British Nat Space Ctr/DSTAN 1/99
Kollsman Israel 9/99
STMicroelectronics 1/97
Tekelec 1/97
Microsemi Ireland 5/99
Italian MOD
MHS Temic

Major Initiatives

- Lead Free Task Group
  - Reducing the Risk of Tin Whisker Induced Failures in Electronic Equipment: GEB2

- RGA Task Group
  - Addressing RGA TM, acceptance criteria, process monitor, packaging and hermeticity related issues.
Major Initiatives, cont.

• G-12 Plastic Parts Subcommittee
  – Development of Vendor Item Drawing System for Commercial Plastic Devices with pedigree
  – EIA Bulletin SSB-1 "Guidelines for Using Plastic Encapsulated Microcircuits and Semiconductors in Military, Aerospace and Other Rugged Applications"
  – SSB-1 annexes which cover:
    • Qualification and Reliability Monitors
    • Environmental Tests and Associated Failure Mechanisms
    • Acceleration Factors
    • Failure Rate Estimating

Major Initiatives

• G12 Space Parts Subcommittee
  – Class T and J commercial space QML program, Optimization of requirements to meet needs

• Diminishing Manufacturing Sources and Material Shortages (DMSMS) Management Practices : GEB1
Conclusions

G12, JC13, DSCC, other agencies and partners meeting jointly (and electronically), with joint task groups and sub-committees, working common problems and solutions.

HAS SUCCESSFULLY FOSTERED:

– Strong cooperative efforts
– Efficient cost effective solutions
– Reduced cycle time for needed changes

For More Information

GEIA G-12
• WebSite: http://www.geia.org/sstc/G12/index.htm
• Contact … Michael Cooper, Chair
  General Dynamics C4 Systems
  Mike.Cooper@gdc4s.com

JEDEC JC-13
• Web Site: http://www.jedec.org/
• Contact … Dottie Fields, Chair
  Microsemi
  dfields@microsemi.com