SAE CE-12 AND JEDEC JC13 COMMITTEES' ACTIVITIES Shri Agarwal

SAE CE-12 Chairs:

Shri Agarwal (NASA JPL): <u>shri.g.agarwal@jpl.nasa.gov</u> Sultan Lilani (Integra): <u>sultan.lilani@integra-tech.com</u>

SAE CE-12 Vice Chair:

Peter Majewicz (NASA GSFC): peter.majewicz@nasa.gov JEDEC JC13 Chair:

Ben Mendoza (Golden Altos): bmendoza@goldenaltos.com



JEDEC JC13 Overview



The JEDEC JC-13 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 practices.

This includes long-term reliability and/or special screening requirements.



JC-13 – Government Liaison Subcommittees

- JC-13.1 Discrete Devices
- JC-13.2 Microelectronic Devices
- JC-13.4 Radiation Hardness Assurance and Characterization
- JC-13.5 Hybrids, RF/Microwave, MCM Technology
- JC-13.6 Fiber Optics Systems in Military & Space Applications *(inactive)*
- JC-13.7 New Electronic Device Technology



Infusion of the New Technology (Class Y) For Space Example of what it took to develop Class Y



BGA / CGA = Ball-Grid Array / Column-Grid Array BME = Base Metal Electrode IDC = Inter Digitized Capacitor

PIDTP = Package Integrity Demonstration Test Plan SMD = Standard Microcircuit Drawing



Microcircuits Standards Development



The revision M of microcircuits specification, MIL-PRF-38535, introduces two new classes of standard parts for space missions:

- (a) Organic Class Y which has been baselined for NASA's high-performance spaceflight computing (HPSC) processor to be developed by Microchip Corporation, and
- (b) Class P, Radiation Hardened/Tolerant Plastic Encapsulated Microcircuits (PEMs) for Space. The flight projects can realize substantial cost/schedule savings by procuring standard Class P parts (rather than buying commercial-off-the-shelf (COTS) PEM devices and getting them upscreened).

The green area shows current standards coverage. This pretty much completes the standards coverage for 38535 devices.



SAE CE-12 Overview



SAE CE-12 Solid State Device Committee

- Has participants from:
 - over 20 companies using of electronic components (System integrators and major subcontractors)
 - and about 10 government agencies (military services, civil agencies both domestic and international)
- Typically have 75-100 participants from these groups
- We work closely with DLA to maintain MIL-PRF-38534, MIL-PRF-38535, MIL-PRF-19500, MIL-STD-750, MIL-STD-883, and others
- We have about 20 industry standards or guidelines created and maintained by our committee
- CE-12 meets jointly with CE-11 and JEDEC JC-13
 - JC-13 is an association of military grade part manufacturers
 - CE-11 focuses on passive devices (capacitors, resistors, connectors, etc.)
 - There are joint task groups and sessions, although each group issues their own documents
 - We meet 3 times a year
 - Task groups frequently meet virtually between meetings



Committee Participant Classifications

- Voting Member- A voting member is to contribute to the work of the Technical Committee, vote on all ballots for standards in a timely manner and maintain active participation on the respective Technical Committee. Balance among the different interest groups of voting members (user, producer, general interest) shall be maintained.
 - Voting members will be required to submit an approve, disapprove, or waive vote on each ballot.
- Liaison- Liaisons receive ballots on standards, and may provide comments; however, they do not have an approve/disapprove vote. If a liaison does provide comments, those comments will be addressed.
- Mailing List Recipient- Mailing List Recipients receive information on Technical Committee meetings. They do not receive information related to ballots for standards. They do not have full access to the website.

NOTE: You do not have to be a dues paying member of SAE to be any of these classes of committee members. The only required fee is the meeting fee. SAE dues give you access to certain SAE general benefits but nothing specific to the committee.



Standards Works

- SAE Standards Works is a workflow and collaboration tool used by all SAE Technical Committees. This website not only allows committee members and SAE staff to work our standards through the balloting process and on to publication, but also acts as a communication tool that contains information such as meeting minutes, future meeting information and other useful resources.
- <u>https://standardsworks.sae.org/standards-committees/ce-12-solid-state-devices</u>

You will see only very limited information unless you are a committee member or liaison (and logged in).



NASA Electronic Parts Assurance Group (NEPAG) is a part of NASA SMA's Mission Assurance Standards and Capabilities (MASC) Division, a core portion of NEPP, about collaboration. This year is the 25th anniversary of NEPAG



JEDEC/SAE Tutorial is a part of NASA Parts 101 Training

EEE Parts 101 Training Workshop				
Tuesday, December 3 rd		Wednesday, December 4 th		
	8:00 am - 8:15 am	Welcome Statement Opening Remarks Dr. Robert Hodson, NASA Technical Fellow for Avionics		
	8:15 am – 8:20 am	Tribute to John Evans and Mike Sampson Shri Agarwal	8:00 am – 9:00 am	Screening Method for Bulk Metal Foil or Thin Film Resistors Jay Brusse, GSFC
	8:20 am - 9:15 am	Parts Engineering School Discussion Auburn University University of Central Florida NASA School Team	9:00 am – 10:00 am	Part Failures and Analysis Lyudmyla Ochs, GSFC
			10:00 am – 10:45 am	ESD Effects Irene Yeh, JPL
	9:15 am - 9:45 am	SCALE Discussion Peggy Williams, Scalable Asymmetric Lifecycle Engagement (SCALE)	10:45 am – 11:30 am	Techniques to Assess Delamination John Bescup, JPL
	9:45 am – 10:15 am	45 am – 10:15 Golden Altos Training am Ben Mendoza, Golden Altos	11:30 am – 12:30 pm	Lunch
	10:15 am – 11:15	0:15 am – 11:15 Radiation Tutorial	12:30 pm – 1:30 pm	Physics of Failure for Fracture Mechanics Scott Popelar, Frontgrade
	am 11:15 am - 12:15	Greg Allen, JPL	1:30 pm – 1:40 pm	Development of Course in Fracture Mechanics Dr. Ali Gordon, UCF
	pm 12:15 pm – 1:00 pm	Overview of NASA-STD-8739.11 Pete Majewicz, GSCF	1:40 pm – 2:00 pm	Fracture Mechanics Status Shri Agarwal, JPL
	1:00 pm – 1:15 pm	Parts Engineering School Discussion University of Maryland	2:00 pm – 3:30 pm	Fracture Mechanics: Testing of Small and Large Packages Scott Popelar, Frontgrade Ben Mendoza, Golden Altos Dr. Reza Ghaffarian, JPL Ray Kuang, Microchip
	1:15 pm – 2:45 pm	JEDEC/SAE Tutorial Larry Harzstark, Aerospace Shri Agarwal, JPL Sultan Lilani, Integra		
	2:45 pm – 3:30 pm	Part Manufacturing Process: Discrete Devices Benny Damron, MSFC		



NASA Parts Engineering School Resources and Other Specialized Programs

- Program Website
 - <u>https://www.jpl.nasa.gov/go/parts-engineering-school</u>
- Parts Bulletin
 - Bulletin
- Social Media Posts
 - LinkedIn
 - Instagram
 - <u>Twitter</u>
 - Facebook
- Strategic Radiation-Hardened Electronics Council (SRHEC)
- Radiation Test Training Workshops
- December 2024 Workshop:
 - Total Number to Register = 751
 - Total Number of Attendees on Dec 3rd = 495
 - Total Number of Attendees on Dec 4th = 341



- JEDEC JC13 and SAE CE-11 / 12 are as effective as we want them to be. Inputs from user community is very important. We need your active participation in various sub-committees. It is valuable
- Please feel free to contact us anytime for any questions related to Mil Stds, SAE and JEDEC JC13 workings or any parts / component engineering related questions. Our emails are on page 1 of this tutorial

Thank You

