Automotive Electronics Council 2017

Chair Report

HISTORY, STATE OF THE AEC AND CHALLENGES AHEAD

Welcome to the 19th Automotive Electronics Council Reliability Workshop

- This is our sixth year holding this at the Detroit Sheraton Novi. We have a solid and stable working relationship with them.
- Thanks to all who contributed papers, chaired or participated in task groups, participated in technical committee meetings and attended and sponsored these workshops!
- This workshop has a full contingent of papers and workshop sessions. Attendance is projected to exceed 220 participants, a record!

Housekeeping items

- Members, don't forget to submit your credit card details to Jamal
- Lay of the land
  - Activities – Mixer Tuesday after the Workshop sessions in Ballroom C (hors d'oeuvres, beer, wine gratis)
  - Agenda
  - facility locations – ballrooms, rest rooms
  - Handouts – badges must be worn, paper access online
- Please fill out the Workshop survey before you leave for home
- Recognition of AEC Workshop staff

Current Status

- Increased our membership to 61 companies (18 as Sustaining members). With the addition of Lision and Yageo in 2016, we are increasing our partnership with Chinese companies involved in automotive electronics.
- Members are assuming ownership and leadership positions in key subteams to develop new standards faster and more efficiently than the old series way. I will be increasingly scheduling periodic meetings with each team to see how they are doing and to help wherever possible.
- Participation will be monitored by who is/is not on Technical Committee or task group calls as well as ballot votes. We have a very large organization and it should be a privilege to participate in spec development as an AEC member. Members who are just in it for sales/marketing purposes will be identified.

Automotive Electronics Council

Component Technical Committee

Chairperson / Facilitator

- Technical Committee meetings
  - Agenda, Minutes and Actions
- Ballots – tabulation and resolution
- Report on subcommittee activities
- Manage committees

AEC Spec Revisions

- Main Q Specs
- Subspec revisions via subteams
- Subspec issue resolution via task groups

New Memberships

- Process new applications
- Solicit justifications from new applicants
- Recommendation to TC

Reliability Workshop

- Hotel contract
- Advertising
- Set Topic Agenda
- Judge papers
- Operations
  - Printing (handouts)
  - Badges
- Session Chairs
- Attendee survey
- Workshop moderators

Publicity

- Website improvement
  - Appearance
  - Functionality
  - Content
- Communication
  - Print journals
  - On-line publications
  - papers

ISO Relationships

- EIA / JEDEC
  - JC14.0
  - JC14.3
- ESDA
- IPC
- IEC
  - TC47
- JEITA (Japan)
- ZVEI (Germany)
- SAE (U.S.)

New Business

- MEMS
  - Accelerometers
  - Pressure Sensors
- MCM / Hybrids
- LED
- PC Board
- Bare die / KGD
- Touch systems
- Copper wire

Automotive Electronics Council

Component Technical Committee

Chairperson / Facilitator

- Bob Knoell (NXP)
- Mark Kelly (Delphi) co-chair

AEC Spec Revisions

- Subteam leaders and members per activity chart

New Memberships

- Bob Knoell (NXP)
- Mark Kelly (Delphi)
- John Grogan (Macronix)

Reliability Workshop

- XinMiao Zhao (Cirrus)
- Bassel Atala (ST)
- Zhongning Liang (NXP)
- Bob Knoell (NXP)
- Brad Ulery (Cummins)
- Jeff Darrow (GlobalFoundries)
- Mark Kelly (Delphi)
- Paul Ngan (NXP)
- Andy Mackie (Indium)
- Tom Lawler (Lattice)
- Steve Sibrel (Harman)

Publicity

- XinMiao Zhao (Cirrus)
- Jeff Darrow (GlobalFoundries)
- Mark Kelly (Delphi)

ISO Relationships

- David Locker (AMRDEC)
- Zhongning Liang (NXP)
- Bob Knoell (NXP)
- Nick Lycoudes (Freescale)

New Business

- Lawler (Lattice)
- David Locker (AMRDEC)
- Bassel Atala (ST)
- Arthur Chiang (Vishay)
- Ludger Kappius (Hella)
- James Molyneaux (ADI)
- Bankim Patel (Autoliv)
- Daniel Vanderstraeten (ON)
- Tim Haifley (Altera)
- Rene Rodgers (Cypress) (Cu)

Membership

- 56 member companies

AEC std #	Current Rev	AEC standard title
Q100	**H1**	**Failure Mechanism Based Stress Test Qualification of integrated Circuits (reference to Q006)**
Q100-001	C	Wire Bond Shear Test
Q100-002	D	Human Body Model Electrostatic Discharge Test
~~Q100-003~~	~~E~~	~~Machine Model Electrostatic Discharge Test~~
Q100-004	C	IC Latch-Up Test
Q100-005	D	Non-Volatile Memory Program/Erase Endurance, Data Retention and Operating Life Test
~~Q100-006~~	~~D~~	~~Electrothermally-Induced Parasitic Gate leakage Test (GL)~~
Q100-007	B	Fault Simulation and Fault Grading
Q100-008	A	Early Life Failure Rate (ELFR)
Q100-009	B	Electrical Distributions Assessment
Q100-010	A	Solder Ball Shear Test
Q100-011	C	Charged Device Model (CDM) Electrostatic Discharge Test
Q100-012	0	Short Circuit Reliability Characterization of Smart Power Devices for 12V Systems
Q101	**E**	**Stress Test Qualification for Discrete Semiconductors**
Q101-001	A	Human Body Model (HBM) Electrostatic Discharge (ESD) Test
~~Q101-002~~	~~A~~	~~Machine Model (MM) Electrostatic Discharge (ESD) Test~~
Q101-003	A	Wire Bond Shear Test
Q101-004	0	Miscellaneous Test Methods
Q101-005	0	Capacitive Discharge Model (CDM) Electrostatic Discharge (ESD) Test
Q101-006	0	Short Circuit Reliability Characterization of Smart Power Devices for 12V Systems

AEC std #	Current Rev	AEC standard title
Q200	**E**	**Stress Test Qualification for Passive Components**
Q200-001	A	Flame Retardance
Q200-002	A	Human Body Model Electrostatic Discharge Test
Q200-003	A	Beam Load (Break Strength) Test
Q200-004	0	Measurement Methods for Resettable Fuses
Q200-005	0	Board Flex / Terminal Bond Strength Test
Q200-006	A	Terminal Strength Surface Mount / Shear Strength Test
Q200-007	0	Voltage Surge Test
Q001	D	Parts Average Testing
Q002	B	Statistical Yield Analysis
Q003	0	Guide for Characterization of Integrated Circuits
Q004	A	Zero Defects Guideline (unreleased)
Q005	B	Pb-Free Test Requirements
Q006	A	Copper Wire Qualification
Charter	A	AEC Charter
Q104	0	MCM/Module Qualification
		PC Board Qualification
Q103	0	MEMS / Sensors
Q102	0	LED
		Bare Die/KGD
		Touch Systems
		System Level ESD

Accomplishments in the past year

- Issued ballots for Q101 Discrete Qualification, Q103 Pressure Sensor, Q104 MCM/Hybrid Qualification, AEC Charter and new member votes (summary of counts and comments on some still pending)
- Q102 LED Qualification release pending discussion with IEC60810 group for agreement on how to parcel out the work. A Memo of Understanding is almost agreed to.
- Task group work currently ongoing for Q200 Passive Qualification and Q004 Zero Defect Guideline.
- Established a method of communication with the German OEMs via a quarterly review to understand their concerns that can be incorporated in AEC specs. They have committed to require our specs to their customers and we have committed to listen to their concerns and recommendations on improving AEC standards to better represent future trends.

Challenges for 2017

- The increasing push for more consumer and automotive electronics applications to go into vehicles (e.g., IoT, autonomous driving, entertainment, sensors) along with continued function density increase and OEM safety/critical requirements (ISO26262) will force us to look ahead to more varied qualification processes, tests and conditions
- Continue to build and strengthen a working relationship with other outside entities (JEDEC, IEC, USCAR, ZVEI, SAE, JEITA, China) to enable development of relevant standards for the automotive industry.
- Begin to define what we are looking for in new members as we move forward. Define criteria for consideration (e.g., automotive experience, volume/sales, relevance of products to automotive, ability to contribute) as well as criteria for continued membership (e.g., participation in meetings, % of ballots responded to)
- Be able to drive new work but not at the expense of members' jobs.

Challenges for 2017 (continued)

- Continue to consider holding an AEC Reliability Workshop in Europe and/or Asia on an every other year basis to promote our products. We are awaiting a quote for a two day workshop in Europe in 2017 from the Munich Sheraton. Once we get the quote, we can determine who should pay for the conference.
- Begin work on our flagship standard Q100 IC Qualification.
- Better understand what our customers want for future technologies. Andreas Aal of VW gave a good summary of needs at the 2017 IRPS.

Projects for 2017

- ESD-CDM to refer to JS002 (Alan Righter, Scott Ward, Marty Johnson)
- Q100 revision I
- Finish all balloted standards including Q200 Passive Qualification
- Begin to review all the sub-standards attached to the main ones for relevance and revision.
- Consider what we need to do to revise our standards in order to better qualify the upcoming disruptive technologies of autonomous driving, the Internet of Things, cybersecurity, etc. The next 5-10 years could make or break us as a relevant standards organization with others beginning to infringe on our playing field (JEDEC Automotive Forum, SAE/Mil Aero, ZVEI).

Questions?

On with the show!