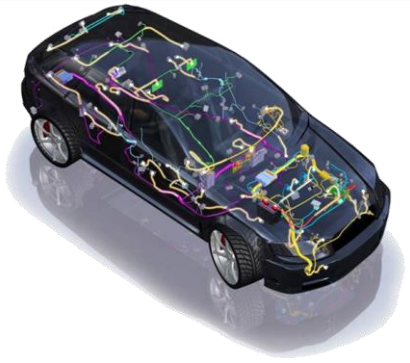
AEC-Q200 Stress Test Qualification for Passive Components

2026 AEC Reliability Workshop
Novi, Michigan, USA

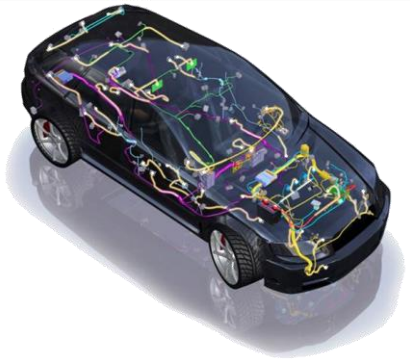
Saad Lambaz, Littelfuse Inc

March 31, 2026



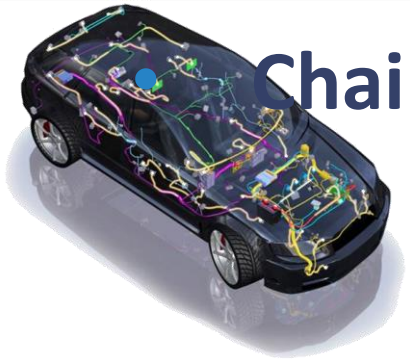
Agenda

- About (Scope, Members, Meetings)
- Document Status
- Voice of the Customer



About

- **Scope:** automotive qualification of passive components such as capacitors, inductors, resistors, thermistors, fuses, varistors, etc.
- **Members:** Aumovio - BorgWarner - Bose Corporation - Coilcraft Inc. - Diodes Inc. - Harman International – IST AG - John Deere – Marelli - Littelfuse - Marelli - Murata – onsemi - Robert Bosch - Schurter – TDK - Texas Instruments – TUV – UCAP Power - Vishay - Yageo Group – ZF
- **Meetings:** weekly on Tuesdays at 9am Central Time Zone
- **Chairs**: Rafael Monreal Vela and Saad Lambaz



Passive Components

- Q200
- Q200-001
- Q200-002
- Q200-003
- Q200-004
- Q200-005
- Q200-006
- Q200-007

Stress Test Qualification For Passive Components (base document)

Q200

- Revision E published March 20, 2023
- Revision F
  - Began reviewing of document – first pass due April 21
  - Corrections and typos missed in Revision E
  - Clarifications on requirements (ex electrical characterization and User Specifications)
  - Addition of new technologies reed switches and gas discharge tubes (GDTs)
  - Finalize open-items. Example: Temperature Cycling

AEC-Q200 Modular Structure Proposal

Q200

- **Why is it needed?**
  - Current document is large and difficult to maintain (100+ pages)
  - Updates to one component require full document revision cycle
  - Adding new technologies is slow and disruptive
  - Increasing need for flexibility and faster updates

AEC-Q200 Modular Structure Proposal

Q200

- **Proposed Solution:** transition AEC-Q200 to a modular document structure
  - Separate General Requirements (Base Document)
  - Split Technology-Specific Tables into standalone documents
  - Maintain alignment with existing AEC-Q200-001 to -007 test methods

AEC-Q200 Modular Structure Proposal

Q200

Core Document

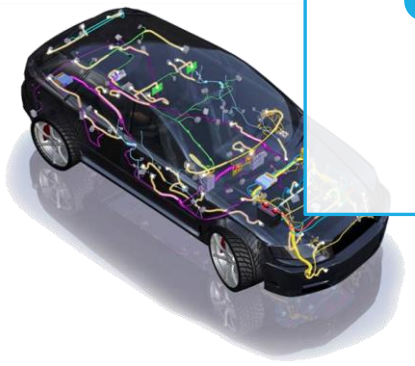
- AEC-Q200-BASE
- Scope, definitions, qualification flow, general requirements

Technology Tables

- One document per component type
- Capacitors, Resistors, Fuses, Varistors

Existing (unchanged)

- AEC-Q200-001 -> 007
- Test Methods (ESD, Terminal Strength, etc)



AEC-Q200 Modular Structure Proposal

Q200

Example

- AEC-Q200-BASE → Sections 1-4
- AEC-Q200-T01 → Tantalum Capacitors
- AEC-Q200-T07 → Resistors
- AEC-Q200-T15 → Fuses
- AEC-Q200-001 → Flame Retardance Test
- AEC-Q200-007 → Voltage Surge Test

Flame Retardance Test

Q200-001

- Current Revision B, June 1, 2010
- Discussions took place as to the need of this test since Flammability test is available
- Finalized that Flame Retardance is flaming caused by electrically overstressing the resistor while Flammability is how the non-metallic material behaves when an external flame is introduced
- New Revision C to be published in 2026

Human Body Model (HBM) Electrostatic Discharge Test

Q200-002

- Current Revision B, June 1, 2010
- Ongoing work
- Initially targeted the use of MIL-STD-883-3, Method 3015.9
- Q200 committee member requested to review this approach due to AEC and ESD Association MOU
- Resulted in following same approach as Q100 and Q101, ie ESD methodology of JS-001
- Murata volunteered to make proposal
- New Revision C to be published in 2026

Beam Load (Break Strength) Test

Q200-003

- Current Revision B, June 1, 2010
- No longer referenced in Q200 base document
- Document will be obsoleted

Measurement Procedures for Resettable Fuses

Q200-004

- Current Revision A, June 1, 2000
- Ongoing work
- Feedback requested by March 31
- Feedback by one company received
- New Revision B to be published in 2026

Board Flex Test

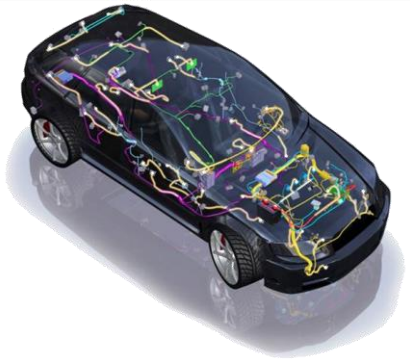
Q200-005

- Current Revision A, June 1, 2010
- Finalized document
- Document to be balloted ASAP
- New Revision B to be published in 2026

Terminal Strength (SMD) Test

Q200-006

- Current Revision A, June 1, 2010
- Changed required force from 17.7N to either the use of Table 1 based on an IEC resistor standard
- 1st ballot sent out and addressed received comments
- Non-agreement on force values is biggest hurdle
- New Revision B to be published in 2026



Voltage Surge Test

Q200-007

- Current Revision A, June 1, 2010
- Ongoing work
- Comments/proposal required by April 14
- New Revision B to be published in 2026

Voice of the Customer

- What should Q200 concentrate on that we are?
- Specific requirements or Supplier-specific requirements?
- Are there pain-points that need to be addressed?
- Alignment with other bodies (ex ZVEI)?
- Anything else?