

# AEC-Q006 Rev. B

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**04-01-2026**



# Rev. B Development and Background

- **AEC-Q006 became a true success story: Cu wire from turned from a subject of risk assessments into the reliable automotive state of the art interconnect technology**
- **The huge number of AEC-Q006 based qualifications created a mature knowledge in the industry about the relevant failure mechanisms and how to observe the level of degradation**
- **At the same time hundreds of successful qualifications and resulting low failure rates create confidence in the use of Cu wire in the automotive industry.**
- **AEC-Q006 Rev. B is the natural evolutionary step forward out of these learnings. It reflects 7 years of learning of the industry in using the Q006 qualification methodology to release Cu wire packages.**
- **The result is a procedure which achieves an efficient Cu wire qualification without any reduced robustness margin or loss of transparency for the user compared to Rev. A.**



# Overview: Changes of Rev. B

Besides many smaller updates that result from that learnings there are several main changes which include:

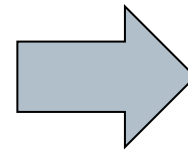
- **Rephrased grandfather clause: clarification of boundary conditions**
- **Clarification on qualification of changes**
- **Update on technology family qualification requirements**
  - Focus on stitch for different lead frame
  - Introduction of 4 lot qualification for copied exactly assembly sites
  - Limitation of delta qualification to TC for smaller dies than reference product
- **Full revision of the qualification test plan**
  - Move PTC back to product qualification
  - Provide two possible qualification options that ensure margin either by physical analysis requirements after 1x stress or by extended stress to 2x. ATE pass is mandatory in both cases.



# Overview: Qualification Plan Changes

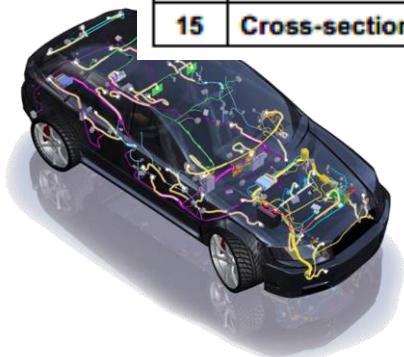
Sequence #	Stress Test / Qualification Step	TC	HAST/THB	PTC	HTSL
1	Initial sampling	Sample sizes as required			
2	CSAM @ T <sub>0</sub> <sup>(1)</sup>	Sample sizes as required			
3	Preconditioning to MSLx	3x77	3x77	1x45	---
4	CSAM after PC <sup>(1)</sup>	3x22	3x22	1x22	---
5	ATE Test	3x77	3x77	1x45	3x45
6	Stress 1X	3x77	3x77	1x45	3x45
7	ATE Test	3x77	3x77	1x45	3x45
8	CSAM post-1X stress <sup>(1,5)</sup>	3x22	3x22 <sup>(6)</sup>	---	---
9a	Ball + Stitch/Wedge pull	3x3 <sup>(4,7)</sup>	3x3 <sup>(4,7)</sup>	---	---
9b	Ball shear	3x3 <sup>(4,7)</sup>	3x3 <sup>(4,7)</sup>	---	---
10	Cross-section	3x1 <sup>(7)</sup>	3x1 <sup>(7)</sup>	---	3x1
11	Stress 2X	3x70 <sup>(2)</sup>	3x70	1x45	3x44
12	ATE Test	3x70 <sup>(2,3)</sup>	3x70 <sup>(3)</sup>	1x45 <sup>(3)</sup>	3x44 <sup>(3)</sup>
13	CSAM post-2X stress <sup>(1)</sup>	3x22 <sup>(2)</sup>	3x22	---	---
14a	Ball + Stitch/Wedge pull	3x2 <sup>(2,4)</sup>	3x2 <sup>(4)</sup>	---	---
14b	Ball shear	3x2 <sup>(2,4)</sup>	3x2 <sup>(4)</sup>	---	---
15	Cross-section	3x1 <sup>(2)</sup>	3x1	---	3x1

Rev. A



Sequence #	Stress Test / Qualification Step	TC	HAST / THB / H3TRB	HTSL <sup>(8)</sup>	Option 1	Option 2	
1	Initial sampling	Sample sizes as required				●	●
2	AM @ T <sub>0</sub> <sup>(1,6)</sup>	Sample sizes as required				●	●
3	Preconditioning to MSLx	3x77	3x77	---	●	●	
4	AM after PC <sup>(1,6)</sup>	3x11	==	---	●	●	
5	ATE Test	3x77	3x77	3x45	●	●	
6	Stress 1X	3x77	3x77	3x45 <sup>(4)</sup>	●	●	
7	ATE Test	3x77	3x77	3x45	●	●	
<b>Items 8-11 may be limited to Q100/101 requirements. In this case, continue at item 12.</b>							
8	AM post-1X stress <sup>(1)</sup>	3x11	==	---	●	●	
9	SEM inspection (stitch) <sup>(5)</sup>	3x1	---	---	●	●	
10a	Ball + Stitch/Wedge pull	3x3 <sup>(3)</sup>	3x3 <sup>(3)</sup>	---	●	●	
10b	Ball shear	3x3 <sup>(3)</sup>	3x3 <sup>(3)</sup>	3x3 <sup>(3)</sup>	●	●	
11	Cross-section <sup>(7)</sup>	3x1	3x1	3x1	●	●	
<b>Continue at item 12 if items 8-11 are not performed or if the criteria according to Section 7.2.1 are not met.</b>							
12	Stress 2X	3x77 <sup>(9)</sup>	3x77 <sup>(9)</sup>	3x45 <sup>(4,9)</sup>	○	●	
13	ATE Test	3x77 <sup>(2,9)</sup>	3x77 <sup>(2,9)</sup>	3x45 <sup>(2,9)</sup>	○	●	
<b>Items 14-17 are optional, but recommended. If item 13 (ATE Test) is pass, it is recommended to perform items 14-17.</b>							
14	AM post-2X stress <sup>(1)</sup>	<div style="border: 1px solid black; padding: 5px;">                     Lot and sample sizes to be defined on a case by case decision depending on the target of the investigation.                 </div>				○	●
15	SEM inspection (stitch)					○	●
16a	Ball + Stitch/Wedge pull					○	●
16b	Ball shear					○	●
17	Cross-section <sup>(7)</sup>					○	●

Rev. B



# Experience on Use of AEC-Q006 Rev. B

- The AEC-Q006 task group much appreciates any feedback on the practical application of Rev. B
- In particular any input with respect to:
  - User acceptance
  - Applicability of physical analysis requirements
  - Clarity of requirements
- Any success stories are welcome as well

→ Did we achieve the big step forward we have been aiming at?

