

HC-STAK35-2phi 90° Sealed Shielded Connection System

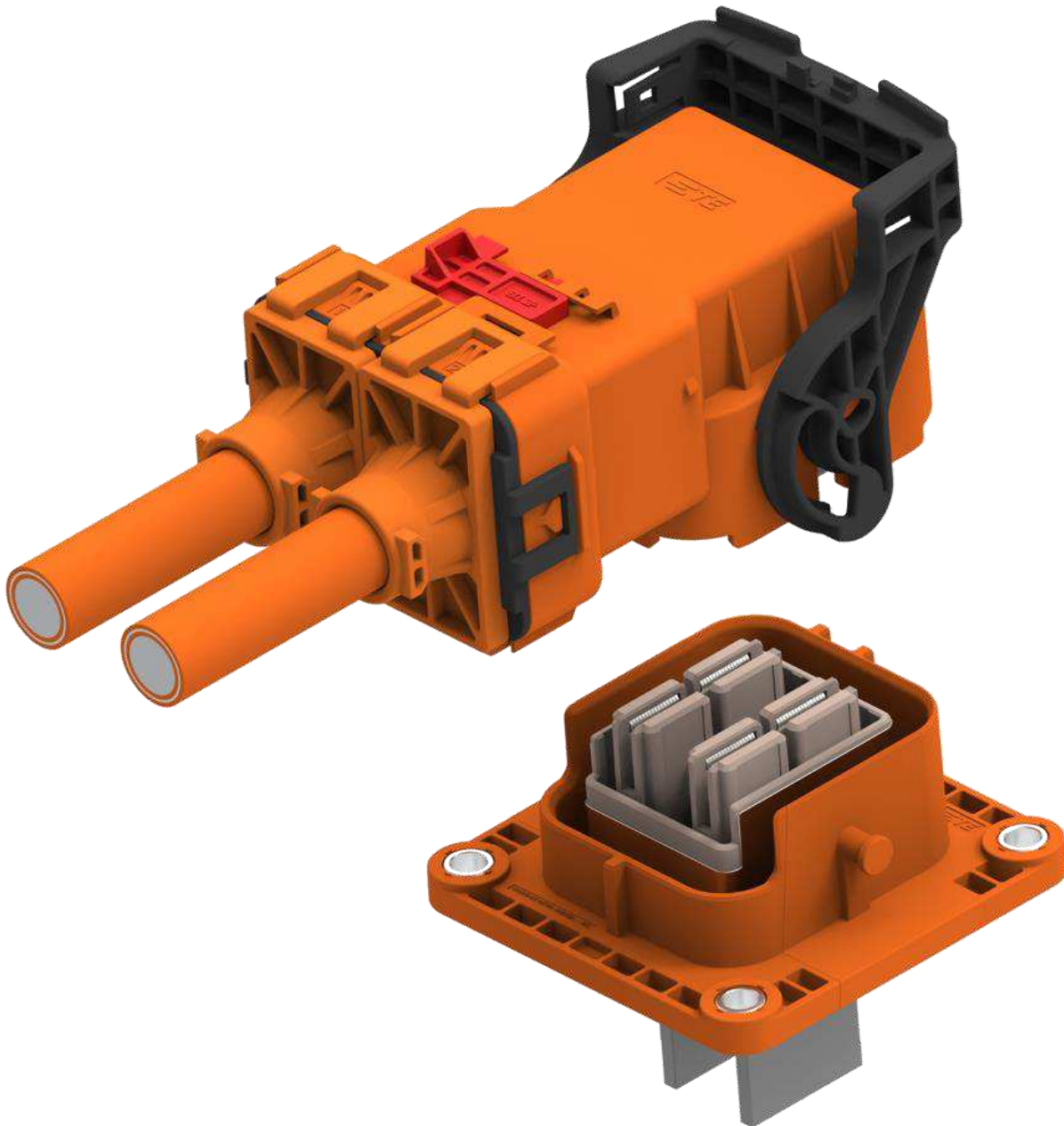


TABLE OF CONTENTS

1. Scope	2
1.1. Content.....	2
1.2. Qualification	2
1.3. Qualification Test Results	2
2. Applicable Documents and Forms	3
2.1. TE Documents	3
2.2. Industry Documents	3
2.3. Customer Drawings.....	3
3. Requirements	3
3.1. Design and Construction.....	3
3.2. Material.....	3
3.3. Ratings	4
3.4. Test Requirements and Procedures Summary.....	4
3.5. Product Qualification and Requalification Test Sequence.....	8
4. Quality Assurance Provisions	122
4.1. Qualification Testing.....	122
4.1.1 Specimen Selection.....	122
4.1.2 Test Sequence	122
4.2. Requalification Testing.....	122
4.3. Acceptance	12
4.4. Quality Conformance Inspection.....	12
5. Appendix	13
5.1. Housing influence on derating	13
5.2. Creepage and Clearance	14
5.3. Dynamic Load	14

1. Scope

1.1. Content

This specification covers the performance, tests and quality requirements for the 2 position Connector and Header with HC-STAK35 Contact System. Performance, tests, and quality requirements of the contact systems are not part of this specification but are included by the validation of the connector system.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Section 3.4 of this document shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

The Qualification Test Report numbers are listed in Section 2.2 of this document. This documentation is on file at and available from Engineering Practices and Standards (EPS).

2. Applicable Documents and Forms

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- [109-1](#): General Requirements for Testing
- [109-197](#): Test Specification (TE Test Specification vs EIA and IEC test Methods)
- [114-160380](#): Application Specification, HC-STAK35 PLUG CONNECTOR
- [114-160508](#): Application Specification, HC-STAK35 HEADER

2.2. Qualification Test Report

- [501-160761](#): HC-STAK35-2phi 90° SEALED SHIELDED CONNECTION SYSTEM

2.3. Industry Documents

- IEC-60529: Degrees of Protection Provided by Enclosures (IP Code)
- USCAR-2: Performance Specification for Automotive Electrical Connector Systems
- USCAR-37: High Voltage Connector Performance Supplement to SAE/USCAR-2
- USCAR-25: Electrical Connector Assembly Ergonomic Design Criteria

2.4. Customer Drawings

- [C-2385150](#): CU ALLOY, INNER FERRULE, HC-STAK35
- [C-2385151](#): CU ALLOY, OUTER FERRULE, HC-STAK35
- [C-2385152](#): SWS, HC-STAK35, CABLE SEAL, 1POS
- [C-2381178](#): COVER,1POS, HC-STAK35
- [C-2381326](#): COLLET,1POS, HC-STAK35
- [C-2385514](#): 2POS, HC-STAK35, HDR OUTER HSG ASSY
- [C-2477237](#): 2POS, HC-STAK35, HDR OUTER HSG ASSY, BLUSURF
- [C-2385722](#): 2POS, HC-STAK35,TAB OUTER HSG ASSY
- [C-2840535](#): TAB CONTACT, HC-STAK35 PLUG
- [C-929453](#): TABLE PIN CONTACT
- [C-936121](#): MQS CAP ASSY
- [C-2385512](#): 2POS,HC-STAK 35, HDR OUTER HSG ASSY REFERENCE DRAWING (available for part number relationships; not a saleable item)
- [C-2385721](#): PLUG ASSEMBLY, HC-STAK 35, REFERENCE DRAWING (available for part number relationships; not a saleable item)

3. Requirements

3.1. Design and Construction

The Product shall be of design, construction, materials, and physical dimensions specified on the applicable product drawing.

3.2. Material

See customer drawings and material specifications.

3.3. Ratings

Table 1

Description	Range
Temperature class	USCAR-2, Class T3 (-40°to +125°C)
Sealing class	USCAR-2, Class S3
Vibration class	USCAR-2, Class V1
Dielectric Withstand Voltage	4800 V _{DC}
Isolation Resistance	>100 MΩ
Material Group acc. to IEC 60664-1	See Appendix 5.2
Creepage/Clearance	See Appendix 5.2
Current carrying capability:	See Appendix 5.1
Degree of protection (IP code) against access, system un-mated	IP2XB; Touch Proof as per IEC 60529
Degree of protection (IP code), system mated	IP6K9K
Mating Cycles	10
HVIL capable	Yes
Identification of High Voltage component	Housing parts orange

3.4. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed in ambient environmental conditions.

Table 2

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Initial examination of product	Meets requirements of product drawing.	USCAR-2 5.1.8
Final examination of product	Meets visual requirements.	USCAR-2 5.1.8
ELECTRICAL		
Protection against accidental contact, Plug	No contact between HV and Finger probe at 10 N +/-10%	IEC 60529
Protection against accidental contact, Header	No contact between HV and Finger probe at 10 N +/-10%	IEC 60529

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Voltage Drop	USCAR-2, Section 5.3.2.4 1 mΩ maximum (Power)	USCAR-2 5.3.2
Dry Circuit Resistance - HVIL	USCAR-2, Section 5.3.2.4 20 mΩ maximum (Signal, HVIL)	USCAR-2 Section 5.3.1
Dry Circuit Resistance - Shield	USCAR-2, Section 5.3.2.4 10 mΩ maximum (Signal, Shield)	USCAR-2 Section 5.3.1
Isolation Resistance	$R \geq 100M\Omega @ 1000V_{DC}$	USCAR-2 Section 5.5.1
Dielectric Withstand	USCAR-37, Section 5.5.2 No breakdown @ 4800VDC	USCAR-37 Section 5.5.2

MECHANICAL

Terminal insertion, HC-STAK35 Tab, Plug	TE Specification for HC-STAK35 Plug Tab Harness Insertion: 150N maximum	USCAR-37, Section 5.4.1.4
Terminal push-through, HC-STAK35 Tab, Plug	USCAR-37, Section 5.4.1.4.3 50N minimum or terminal insertion force, whichever is greater.	USCAR-37, Section 5.4.1.4
Terminal retention HC-STAK35 Tab, Primary Lock only, Plug	USCAR-37, Section 5.4.1.4. 330N minimum.	USCAR-37, Section 5.4.1.4
Terminal retention, HC-STAK35 Tab, Primary and Secondary Lock (Ferrule, Cable Seal and Cable Seal Retainer used as Secondary Lock), Moisture Conditioning, Plug	USCAR-37, Section 5.4.1.4 450N minimum.	USCAR-2, Section 5.4.1.3-B8 USCAR-37, Section 5.4.1.4
Terminal insertion, MQS 063 Receptacle, Plug	USCAR-2, Section 5.4.1.4-1 60N max for 2 terminals together	USCAR-2, Section 5.4.1.3-A
Terminal push-through, MQS 063 Receptacle, Plug	USCAR-2, Section 5.4.1.4-2 50N minimum	USCAR-2, Section 5.4.1.3-A
Terminal retention MQS 063 Receptacle, Primary Lock only, Plug	USCAR-2, Section 5.4.1.4-1 60N minimum for 2 terminals together	USCAR-2, Section 5.4.1.3-B
Terminal retention MQS 063 Receptacle, Primary and Secondary Lock, Moisture Conditioning, Plug	USCAR-2, Table 5.4.1.4 120N minimum for 2 terminals together	USCAR-2, Section 5.4.1.3-B8 USCAR-2, Section 5.4.1.3-B
Terminal retention, HC-STAK35 Tab, Primary and Secondary Lock (Ferrule, Cable Seal and Cable Seal Retainer used as Secondary Lock), Temp/Humidity cycling, Plug	USCAR-37, Section 5.4.1.4. 225 N minimum.	USCAR-2, Section 5.6.2 USCAR-37, Section 5.4.1.4
Terminal retention, Tab, Primary and Secondary Lock, Temp/Humidity cycling, Header	USCAR-37, Section 5.4.1.4. 225N minimum	USCAR-2, Section 5.6.2 USCAR-37, Section 5.4.1.4
Terminal retention, MQS Pin, Primary and Secondary Lock, Temp/Humidity cycling, Header	USCAR-2, Section 5.4.1.4 50 N minimum	USCAR-2, Section 5.6.2 USCAR-2, Section 5.4.1.3-B
Terminal retention, HC-STAK35 Tab, Primary and Secondary Lock (Ferrule, Cable Seal and Cable Seal Retainer used as Secondary Lock), High Temperature Exposure, Plug	USCAR-37, Section 5.4.1.4. 225 N minimum.	USCAR-2, Section 5.6.3 USCAR-37, Section 5.4.1.4
Terminal retention, Tab Primary and Secondary Lock, High Temperature Exposure, Header	USCAR-37, Section 5.4.1.4. 225N minimum	USCAR-2, Section 5.6.3 USCAR-37, Section 5.4.1.4
Terminal retention, MQS Pin, Receptacle Primary and Secondary Lock, High Temperature Exposure, Header	USCAR-2, Section 5.4.1.4 50 N minimum	USCAR-2, Section 5.6.3 USCAR-2, Section 5.4.1.3-B
Terminal insertion, Tab, Header	550 N maximum - TE exception to USCAR-37.	USCAR-37, Section 5.4.1.4
Terminal insertion, MQS Pin, Header	USCAR-2, Section 5.4.1.4-1 30 N maximum	USCAR-2, Section 5.4.1.3-A
Terminal push-through, Tab, (TPA in Pre-Lock position), Header	USCAR-37, Section 5.4.1.4.3	USCAR-37, Section 5.4.1.4

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
	50 N minimum or terminal insertion force, whichever is greater.	
Terminal push-through, MQS Pin, (TPA, HVIL in Pre-Lock position), Header	USCAR-2, Section 5.4.1.4.2 50 N minimum	USCAR-2, Section 5.4.1.3-A
Terminal retention, Tab, (Primary Lock only, TPA in Pre-Lock position), Header	TE Specification for HC-STAK35 Header Tab Retention: 150N minimum	USCAR-37, Section 5.4.1.4
Terminal retention, MQS Pin, (Primary Lock only), Header	USCAR-2, Section 5.4.1.4 30N minimum	USCAR-2, Section 5.4.1.3-B
Terminal retention, Tab, (Primary and Secondary Lock, TPA in Lock position), Moisture Conditioning, Header	USCAR-37, Section 5.4.1.4. 450N minimum	USCAR-2, Section 5.4.1.3-B8 USCAR-37, Section 5.4.1.4
Terminal retention MQS Pin, (Primary lock only, no Secondary lock present), Moisture Conditioning, Header	USCAR-2, Section 5.4.1.4 60N minimum	USCAR-2, Section 5.4.1.3-B8 USCAR-2, Section 5.4.1.4
Terminal retainer insertion (install Cable Seal & Collet, and then record a Force to install Back Cover), Plug	USCAR-2, Section 5.4.5.1.4 60N maximum	USCAR-2, Section 5.4.5.1
Terminal retainer retention (Back Cover), Plug	USCAR-2, Section 5.4.5.2.4 25N minimum	USCAR-2, Section 5.4.5.1
TPA Header Engagement, Header (Unpopulated, Pre-Set → Lock)	USCAR-2, Section 5.4.5.2.4 15N minimum	USCAR-2, Section 5.4.5.2
TPA, Header Inner Push-out (Push on base of the HC-STAK35 Forks)	Push-out Force to be minimum Connector Mate / Un-mate Force	USCAR-2, Section 5.4.5.2
TPA Header Engagement, Header (Fully populated, Pre-Set → Lock)	USCAR-2, Section 5.4.5.2.4 60N maximum	USCAR-2, Section 5.4.5.2
TPA Header Disengage, Header (Fully populated, Lock → Pre-Set)	TE Specification for HC-STAK35 TPA, HDR INR Disengage: 120N maximum	USCAR-2, Section 5.4.5.2
TPA Header Disengage, cycling 2x, Header (Fully populated, Lock → Pre-Set)	USCAR-2, Section 5.4.5.2.4 18N minimum	USCAR-2, Section 5.4.5.2
TPA Header Removal, Header (unpopulated)	USCAR-2, Section 5.4.5.2.4 25N minimum	USCAR-2, Section 5.4.5.2
CPA Engagement, Plug (Unmated, Lever open, Pre-Set → Lock)	USCAR-2, Section 5.4.5.2.4 60N minimum	USCAR-2, Section 5.4.5.2
CPA Engagement, Plug (Mated, Lever closed, Pre-Set → Lock)	USCAR-2, Section 5.4.5.2.4 5N minimum, 25N maximum	USCAR-2, Section 5.4.5.2
CPA Disengagement, Plug (Mated, Lever closed, Lock → Pre-Set)	USCAR-2, Section 5.4.5.2.4 10N minimum, 30N maximum	USCAR-2, Section 5.4.5.2
CPA removal, Plug (Unmated, Lever open, Pre-Set → Remove)	USCAR-2, Section 5.4.5.2.4 30N minimum	USCAR-2, Section 5.4.5.2
Audible Click	USCAR-2, Section 5.4.7.4 Record values for information only	USCAR-2, Section 5.4.7
Audible Click, Moisture Conditioning	USCAR-2, Section 5.4.7.3-4 Record values for information only	USCAR-2, Section 5.4.7
Connector Mating, Pre-Lock Engage Force	USCAR-2, Section 5.4.3.4-1 75N maximum	USCAR-2, Section 5.4.3.3.A
Connector Mating Force (with Lever)	USCAR-2, Section 5.4.3.4-4 75N maximum	USCAR-2, Section 5.4.3.3.C.1
Un-mating Force (using Lever) (CPA disabled)	USCAR-2, Section 5.4.3.4-4 75N maximum	USCAR-2, Section 5.4.3.3.C.3
Pre-Lock Disengagement Force (CPA disabled, Lever open)	USCAR-2, Section 5.4.3.4-2 15N minimum, 75N maximum	USCAR-2, Section 5.4.3.3.A

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Retention Force (Connectors unpopulated, CPA disabled, Lever closed)	USCAR-2, Section 5.4.3.4-6 110N minimum	USCAR-2, Section 5.4.3.3.D
Lever Release Force (from closed position with latches engaged), Fully populated, CPA closed	USCAR-2, Section 5.4.3.4-5 60N minimum	USCAR-2, Section 5.4.3.3.C.2
Force to release Lever from shipping position (Class 3)	USCAR-2, Section 5.4.3.4-3 90N minimum	USCAR-2, Section 5.4.3.3.B
Polarization feature Effectiveness, Correct orientation, Incorrect key, fully populated.	USCAR-2, Section 5.4.4.4.1 No functional damage No electrical contact	USCAR-2, Section 5.4.4.3.4a
Polarization feature Effectiveness, Incorrect orientation (90, 180), Correct Key, fully populated.	USCAR-2, Section 5.4.4.4.1 No functional damage No electrical contact	USCAR-2, Section 5.4.4.3.4b
Drop Test, Plug (Lever closed, CPA in Lock position, TPA in Pre-Lock position)	USCAR-2, Section 5.4.8.4 Record values for information only	USCAR-2, Section 5.4.8
Drop Test, Header (TPA in Pre-Lock position)	USCAR-2, Section 5.4.8.4 Record values for information only	USCAR-2, Section 5.4.8
Cavity Damage, Plug: N/A – Test is non-applicable due to no TPA present on the Plug	USCAR-2, Section 5.4.9.4 TPA does not fully lock	USCAR-2, Section 5.4.9
Connector Seal Retention, Plug	USCAR-2, Section 5.4.13.4 Peripheral seal not displaced	USCAR-2, Section 5.4.13.3
Connector Seal Retention, Header	USCAR-2, Section 5.4.13.4 Face seal not displaced	USCAR-2, Section 5.4.13.3
Connector Seal Retention (mated connector)	USCAR-2, Section 5.4.14.3 Peripheral seal not displaced	USCAR-2, Section 5.4.14.2
Mechanical Assist Integrity	USCAR-2, Section 5.4.12.4 No damage	USCAR-2, Section 5.4.12.3
Shield Termination Ferrule Retention	USCAR-37, Section 5.2.4.5 150N minimum	USCAR-37, Section 5.2.4

ENVIRONMENTAL

Vibration/Mechanical Shock USCAR-2, V1 profile	USCAR-2, Section 5.1.9 No loss of continuity for more than 1μs	USCAR-2, Section 5.4.6
Thermal Shock Max temp. 125°C, 100x cycles	USCAR-2, Section 5.6.1.4 Conditioning only	USCAR-2, Section 5.6.1
Temperature/Humidity cycling Max temp. 125°C, 40x cycles, 8hr/cycle	USCAR-2, Section 5.6.2.4 Conditioning only	USCAR-2, Section 5.6.2
High Temperature Exposure Max temp. 125°C, 1008hr	USCAR-2, Section 5.6.3.4 Conditioning Only	USCAR-2, Section 5.6.3
Fluid Resistance	No excessive swelling that impacts function	USCAR-2, Section 5.6.4 9 fluids per table 5.6.4.3
Submersion	USCAR-2, Section 5.6.5.4 Conditioning only	USCAR-2, Section 5.6.5
Pressure/Vacuum Leak	USCAR-2, Section 5.6.6.4 No bubbles visible	USCAR-2, Section 5.6.6
High Pressure Spray	USCAR-2, Section 5.6.7.4 Conditioning only	USCAR-2, Section 5.6.7



NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Section 3.5.

3.5. Product Qualification and Requalification Test Sequence

Table 3

TEST OR EXAMINATION	TEST GROUP																
	1							2		3							
	SAMPLE SIZE																
	10	10	10	10	10	10	10	20	20	10	10	10	10	10	10	10	10
	TEST SEQUENCE (a)																
Visual Inspection	1,5	1,5	1,4	1,5	1,4	1,6	1,6	1,8	1,5	1,4	1,4	1,4	1,4	1,4	1,3	1,3	1,4
Terminal insertion, HC-STAK35 Plug Tab to the PLUG INR ASSY (assembled into the Plug OTR HSG)	2																
Terminal push-through, HC-STAK35 Plug Tab to the PLUG INR ASSY (assembled into the Plug OTR HSG)	3																
Terminal retention, HC-STAK35 Plug Tab to the PLUG INR ASSY (assembled into the Plug OTR HSG) (Primary Lock Only)	4																
Terminal insertion, HC-STAK35 Plug Tab to the Plug Inner Housing		2															
Terminal push-through, HC-STAK35 Plug Tab to the Plug Inner Housing		3															
Terminal Retention, HC-STAK35 Plug Tab to the Plug Inner Housing (Primary Lock Only)		4															
Moisture Conditioning			2		2				2								
Terminal retention, HC-STAK35 Plug Tab Primary and Secondary Lock (seal & seal retainer together are secondary lock)			3														
Terminal Insertion, MQS 063 Receptacle (HVIL Shunt)				2													
Terminal Push-Through, MQS 063 Receptacle (HVIL Shunt)				3													
Terminal Retention, MQS 063 Receptacle (HVIL Shunt) (Primary Lock Only)				4													
Terminal Retention, MQS 063 Receptacle (HVIL Shunt) (Primary and Secondary Lock)					3												
Temp/Humidity Cycling						2											
Terminal retention, HC-STAK35 Plug Assy, HC-STAK35 Plug Tab (Primary and Secondary Lock)						3											
Terminal retention, HC-STAK35 Header Assy, HC-STAK35 Header Tab (Primary and Secondary Lock, TPA lock)						4											
Terminal retention, HC-STAK35 Header Assy, MQS Pin Contact (Primary and Secondary Lock)						5											
High-Temp Exposure							2										
Terminal retention, HC-STAK35 Plug Assy, HC-STAK35 Plug Tab (Primary and Secondary Lock)							3										
Terminal retention, HC-STAK35 Header Assy, HC-STAK35 Header Tab (Primary and Secondary Lock, TPA lock)							4										
Terminal retention, HC-STAK35 Header Assy, MQS Pin Contact (Primary and Secondary Lock)							5										
Terminal insertion, HC-STAK35 Header Tab								2									
Terminal insertion, MQS Pin Contact								3									
Terminal push-through HC-STAK35 Header Tab								4									
Terminal push-through, MQS Pin Contact								5									

TEST OR EXAMINATION	TEST GROUP															
	1								2		3					
	SAMPLE SIZE															
	10	10	10	10	10	10	10	10	20	20	10	10	10	10	10	10
	TEST SEQUENCE (a)															
Terminal retention, HC-STAK35 Header Tab (Primary Lock Only; TPA not engaged with the Header Tab)								6								
Terminal retention, MQS Pin Contact (Primary Lock only)								7								
Terminal retention, HC-STAK35 Header Tab (Primary and Secondary Lock)									3							
Terminal retention, MQS Pin Contact Primary Lock (no Secondary Lock present)									4							
Terminal retainer insertion, Plug (unpopulated)										2						
Terminal retainer retention, Plug (unpopulated)										3						
TPA, HDR INR Engagement, Header Inner Assy (Forks populated, No Header Tabs populated, Pre-set → Lock)											2					
TPA, HDR INR Push-out (Push on base of forks using tool provided)											3					
TPA, HDR INR Engagement (Header Inner Assy, Header Tabs populated, Header TPA in pre-set position Pre-Set → Lock)												2				
TPA, HDR INR Disengage (Header Inner Assy, Header Tabs populated, Pre-Set → Lock)												3				
TPA, HDR INR Cycling (Pre-condition 2 cycles)													2			
TPA, HDR INR Disengage (Header Inner Assy, fully populated, Pre-Set → Lock)													3			
TPA HDR INR Removal (Header Inner Assy, No Header Tabs populated, Pre-Set → Remove)														2		
CPA Engagement (Unmated, Plug, Pre-set → Lock, Lever open)															2	
CPA Engagement (Mated, Plug, Pre-set → Lock, Lever closed)																2
CPA Disengagement, (Mated, Plug, Pre-set → Lock, Lever closed)																3

Table 3, Continued

TEST OR EXAMINATION	TEST GROUP												
	3	4		5					6	7	9 a	9 b	17
	SAMPLE SIZE												
	10	8	8	10	5	1	10	10	2	18	10	10	10
	TEST SEQUENCE (a)												
Visual Inspection	1,3	1	1	1,6	1,3	1,3	1,3	1,3	1,3	1,4	1,3	1,3	1,3
CPA Removal (Unmated, Plug, Pre-Set → Remove, Lever)	2												
Moisture Conditioning			2										
Audible Click		2	3										
Pre-Lock Engage Force (Fully populated)				2									
Connector Mating Force (with Lever) (Fully populated)				3									
Un-mating Force (using Lever) (Fully populated, CPA disabled)				4									
Pre-Lock Disengagement Force (Fully populated, CPA open, Lever open)				5									
Retention Force (Unpopulated, CPA open, Lever closed)					2								
Lever Release Force (from closed position with latches engaged, Fully Populated, CPA closed)							2						
Force to release Lever from shipping position (Class 3 Plug HSG w/Lever, Lever open/lock)								2					
Polarization feature Effectiveness (incorrect orientation 90, 180, correct key, populated)									2				
Drop Test, Plug (Lever closed, CPA locked)										2			
Drop Test, Header (TPA in Pre-Lock position)										3			
Connector Seal Retention, (Unmated Plug Connector)											2		
Connector Seal Retention, (Unmated Header Connector)												2	
Mate / Un-mate connector halves													2

Table 3, Continued

TEST OR EXAMINATION	TEST GROUP											
	18	19		11	12	13	14	15	16	20	22	23
	SAMPLE SIZE											
	5	5	10	10	10	10	10	10	10	9	1	1
	TEST SEQUENCE (a)											
Visual Inspection	1,3	1,3	1,3	1,9	1,3, 11	1,9	1,9	1,15	1,15	1,3	1	1
Mechanical Assist Integrity	2											
Shield termination isolation test		2										
Shield termination retention			2									
Connector Cycling (10 Mating / Unmating cycles) (9 cycles if 1 cycle already done)				2	4	2	2	2	2			
Voltage Drop (HV Conductors only, use 350A on 70mm^2 wire, use 475A on 95mm^2 wire)				3,6	5,8	3,6	3,6					
Dry Circuit Resistance (HVIL, Shield)				4,7	6,9	4,7	4,7					
Vibration/Mechanical Shock (V1 profile, 8hrs random, 10x shocks/axis @35g)				5								
Thermal Shock (max. temp. 125°C, 100x cycles)					7							
Temp/Humidity Cycling (max. temp. 125°C, 40x cycles)						5		6				
High Temp Exposure (max. temp. 125°C, 1008hrs)							5		6			
Dielectric Withstand				8	10	8	8	14	14			
Mate/Unmate connector (1 cycle only.)					2							
Isolation Resistance (1000VDC)								3,5,7,9, 11,13	3,5,7, 9,11,13			
Pressure/Vacuum Leak (48kPa)								4	4			
Pressure/Vacuum Leak (28kPa)								8	8			
Submersion								10	10			
High Pressure Spray								12	12			
Fluids Resistance, 30 min soak, 9 fluids										2		
Protection against accidental contact (Header)											2	
Protection against accidental contact (Plug)												2


NOTE

(a) Numbers indicate sequence in which tests are performed.

4. Quality Assurance Provisions

4.1. Qualification Testing

4.1.1 Specimen Selection

The samples shall be prepared in accordance with product drawings and shall be selected at random from current production.

4.1.2 Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Chapter 3.5.

4.2. Requalification Testing

If changes significantly affecting form, fit, or function depending on the product or manufacturing process, product engineering shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality, and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of chapter 4. Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken, and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable customer drawing and this specification.

5. Appendix

5.1. Housing influence on de-rating

HC-STAK35 Connector System

Maximum Material Service Temperature for the HC-STAK35 Terminals (T_M): 150 °C

Receptacle: C15100 base material with Ag/Ni plating

Tab: C11000 base material with Ag/Ni plating

Cable: APTIV M6488FZ1, 70mm², Copper, Shielded

APTIV M6488AFX, 95mm², Copper, Shielded

Test # WE-20210912 (70 mm² cable)

Test # WE-20210901 (95 mm² cable)

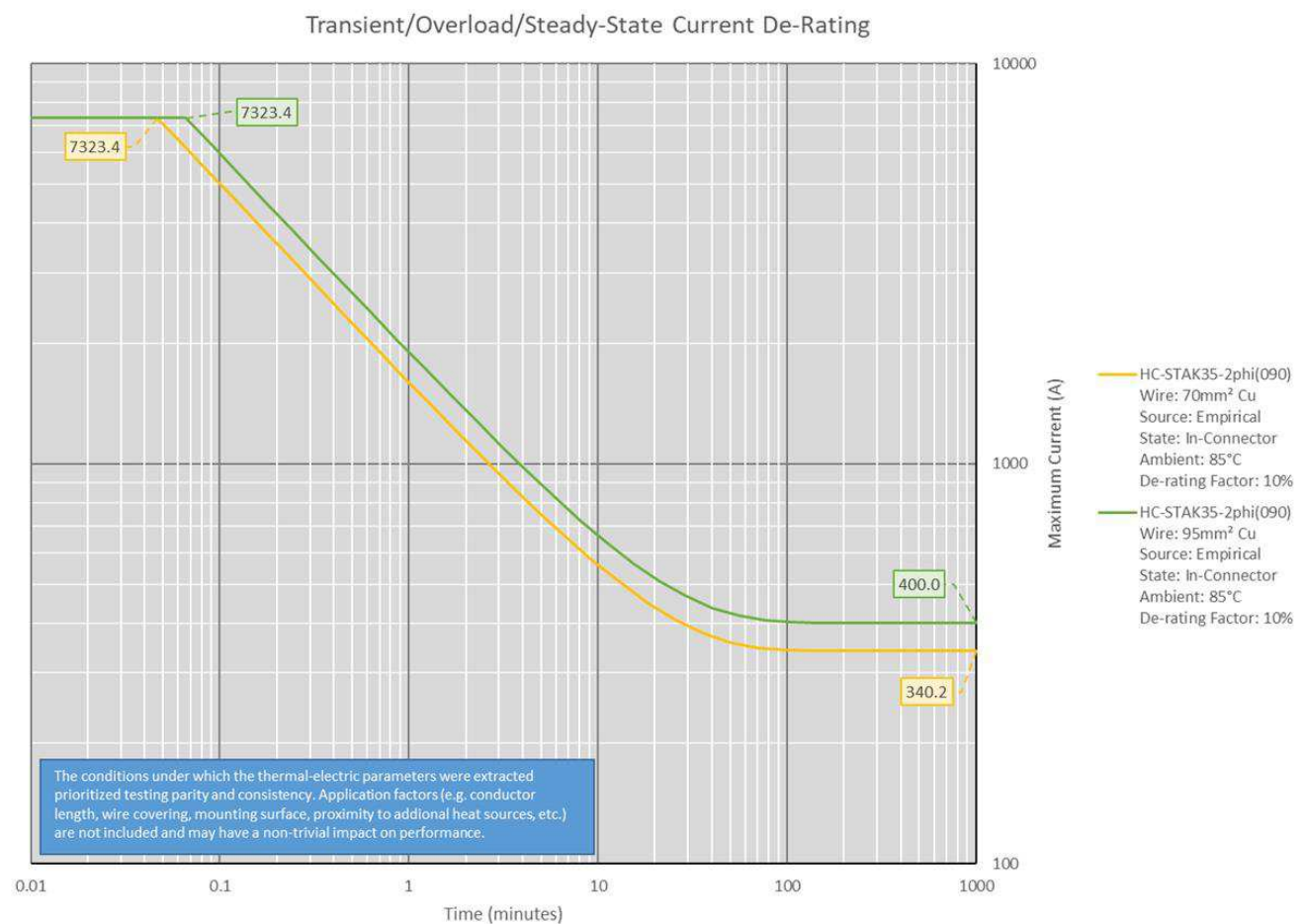


Figure 1: Transient/Overload/Steady-State Current De-Rating

5.2. Creepage and Clearance

Table 4

Assembly	Description	Minimum Clearance Distance (mm)	Minimum Creepage Distance (mm)
Header Assembly – Unmated Condition (Header Inner Housing: CTI 600)	HV to HV	17.50	17.50
	HV to Ground/Shield	8.80	12.58
	HV to HVIL	10.84	15.61
Plug Assembly – Unmated Condition (Plug Inner Housing: CTI 600)	HV to HV	21.43	22.79
	HV to Ground/Shield	8.59	8.63
	HV to HVIL	10.46	11.77
Plug and Header Assembly - Mated	HV to HV	17.50	17.50
	HV to Ground/Shield	8.59	8.63
	HV to HVIL	10.23	10.28



NOTE

Values are derived from CAD model with nominal geometry.

5.3. Dynamic Load

System will be validated with strain relief at 100mm. Each application must be evaluated independently regarding the external influences on the system. Having strain relief, which moves with the connector body, close to the end of the connector will have a positive influence on the performance of the connector. Having strain relief further from the end of the connector or that moves independent of the connector body will have a negative influence on the performance of the connector.

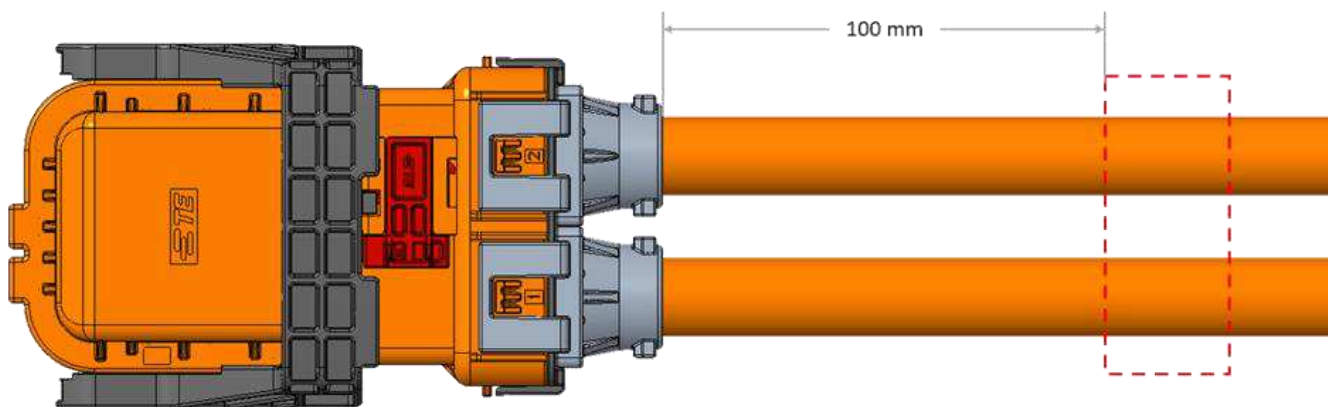


Figure 2: Conductor attachment

Table 5: Class Schedule for Shock (USCAR-2 Revision 6)

Vibration Class	Shocks per Axis	Wave Shape	Direction (+/-)	Duration (ms)	Acceleration (g)
V1	10	Half Sine Wave	Positive	5 ~ 10	35

Table 6: Vibration Duration

Vibration Class	Sine Duration (Hrs./axis)	Random Duration (Hrs./axis)	Thermal Cycling
V1	N/A	8	N/A

Table 7: Vibration Schedule: V1 - Random

F (Hz)	PSD (m/s ²) ² /Hz	PSD (g ² /Hz)
5.0	0.192	0.00200
12.5	23.8	0.24800
77.5	0.307	0.00320
145.0	0.192	0.00200
200.0	1.13	0.01180
230.0	0.031	0.00032
1000.0	0.002	0.00002
g _{rms}	17.74	1.81 g

<u>LTR</u>	<u>REVISION RECORD</u>	<u>DWN</u>	<u>APP</u>	<u>DATE</u>
1	Initial Report	Z. Krnetic	Z. Krnetic	18 JAN 2023
A	Section 2.2, 2.4, table 2 & 3 updated	Girish T G	Z. Krnetic	24 SEP 2025