

1P Sealed Maxi Fuse Box with Cover

1. Scope:

To define and perform validation tests as per the sequence provided in this specification on the specified product part numbers.

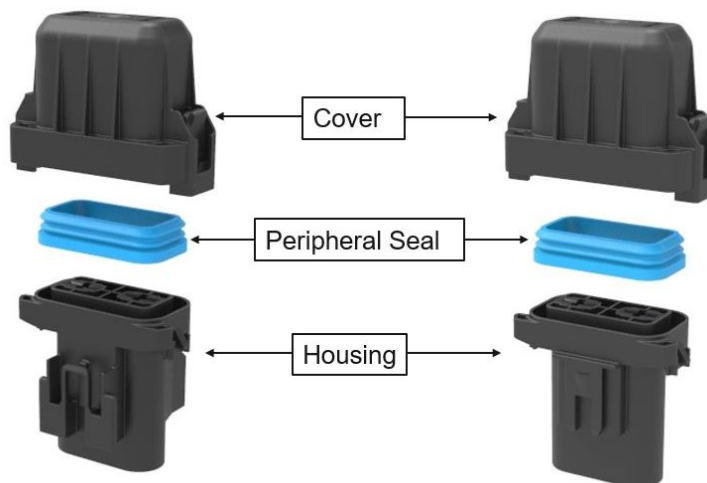
2. Part Numbers:

- 2319826-1, -2: 1 Pos. Sealed Maxi Fuse Housing Assembly
- 2319021-2: Cover, 8 Pos. Mini Fuse and Relay Housing Assembly
- 1-2208766-3: MCON 8 Sealed Contact
- 2300588-1: Wire Seals

3. Applicable Documents:

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

- 109-5000: AMP Test Specification, General Requirements for Test Methods
- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- 114-18148-1: Application Specification, Crimping Contacts
- SAE/USCAR-2, Revision 6
- EIA Specifications
- IEC 60529



Prepared by	Checked by	Approved by
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4. Sample Definition:

- Sample size: Sample for each Test group as specified in the testing sequence (Table 1).

5. Requirements:

5.1 Design and Construction:

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

5.2 Materials:

- I. Contact: Pre-tinned brass or plain brass with Silver plating over nickel underplate.
- II. Housing and Cover: Molded Poly Butyl Terephthalate Confirming to UL-94 V0
- III. Accessories and Hardware:
 - Wire Seal: Silicon
 - Housing Peripheral Seal: Self Lubricated Silicon.

5.3 Ratings:

- I. Temperature Rating: -40°C to + 125°C

6. Performance and Test Descriptions

The product is made to design to meet electrical, mechanical and environmental performance requirements specified. All tests are performed at ambient temperature unless otherwise specified.

7. Test Requirements and Procedures Summary

Para	Test Items	Requirements	Procedures
7.1	Visual Examination	Product shall be conforming to the requirements of applicable product drawing and application Specification	Visually, dimensionally and functionally inspected as per applicable inspection plan.
Mechanical Tests			
7.2	Terminal Retention Force	Minimum retention force of 140N	Test conducted as per EIA-364-29C. Apply Axial load on the wires which are crimped until the primary lock gets damaged.
7.3	Cover Locking Mechanism Strength	Shall withstand disengagement force of 85 N for 1minute without depressing latches.	Test conducted as per EIA-364-98. The force mechanism shall be set to exert an axial force of 85N for 1minute in the retention direction of the cover.

7.4	Connector Mounting feature mechanical strength	For 2319826-1, Mounting feature withstands retention force of 200N For 2319826-2, Mounting feature withstands retention force of 89N.	Test conducted as per USCAR-2, 5.4.11. Assemble the connector to a fixture and apply a downward force with a probe at a constant rate of 50mm/min in directions as specified in the specification.																						
Mounting Clips Retention forces for 2319826-2 (For Clip details refer Application specification)																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Part Number</th> <th style="width: 25%;">Material</th> <th style="width: 25%;">Retention Force</th> </tr> </thead> <tbody> <tr> <td>1027-003-1200</td> <td rowspan="2" style="text-align: center;">Stainless steel</td> <td rowspan="2" style="text-align: center;">89N</td> </tr> <tr> <td>1027-005-1200</td> </tr> <tr> <td>1027-004-1200</td> <td style="text-align: center;">Steel</td> <td rowspan="2" style="text-align: center;">89N</td> </tr> <tr> <td>1011-026-0205</td> <td style="text-align: center;">PA6/6 GF13-15</td> </tr> <tr> <td>1011-030-0205</td> <td style="text-align: center;">Nylon 6/6</td> <td rowspan="2" style="text-align: center;">50N</td> </tr> <tr> <td>1011-310-0205</td> <td style="text-align: center;">Nylon 6/6</td> </tr> <tr> <td>1027-008-1200</td> <td rowspan="3" style="text-align: center;">Steel</td> <td rowspan="3" style="text-align: center;">89N</td> </tr> <tr> <td>1027-009-1200</td> </tr> <tr> <td>1027-017-1200</td> </tr> </tbody> </table>				Part Number	Material	Retention Force	1027-003-1200	Stainless steel	89N	1027-005-1200	1027-004-1200	Steel	89N	1011-026-0205	PA6/6 GF13-15	1011-030-0205	Nylon 6/6	50N	1011-310-0205	Nylon 6/6	1027-008-1200	Steel	89N	1027-009-1200	1027-017-1200
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7.5	Fuse mating and un-mating	Perform this test before and after dry connection resistance (7.8)	Mate and un-mate Fuse for 10 cycles.																						
7.6	Connector Cover Durability	No visible hinge cracking.	Mount and unmount cover 50 times at ambient room temperature.																						
7.7	Vibration and Mechanical Shock	No discontinuities of 10 microseconds or longer duration.	<u>Vibration</u> : V1 profile, Eight hours in each of 3 mutually perpendicular planes. <u>Mechanical shock</u> : EIA-364-27, Method H. Subject specimens to 30 G's half sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. Component population limited to fuses. Perform 7.8 before and after Vibration and Mechanical shock.																						
Electrical Tests																									
7.8	Connection Resistance	Max voltage drop should be 100 mV.	Test conducted as per SAE J2030 Rev 2009-06																						
7.9	Dielectric Withstand Voltage	Two-minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 500 volts DC, Test between adjacent contacts.																						
7.10	Insulation Resistance	Insulation resistance: 100MΩ min. at 500VDC	EIA-364-21E. Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connectors.																						

7.11	Temperature Rise	T Rise and Derating Curve are as shown below	<p>Test conducted as per DIN EN 60512-5-1/2.</p> <p>Fully equipped housings energized at the rated current of the fuse at room temperature environment before excessive thermal degradation and or resistance begins to occur.</p>
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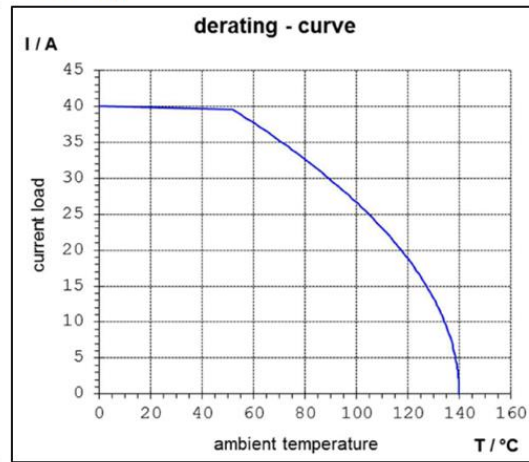
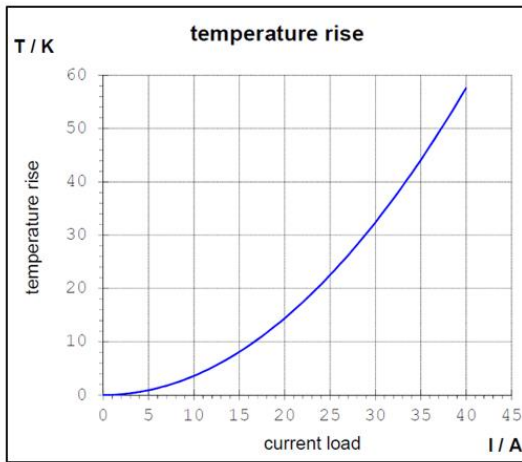
Receptacle: CuSn, Silver Plated
 Wire Size: 6mm², FLRY
 Housing: PBTGF15
 Cover: PBT
 Fuse: 40A



Test setup



Thermocouple on Rec. contact



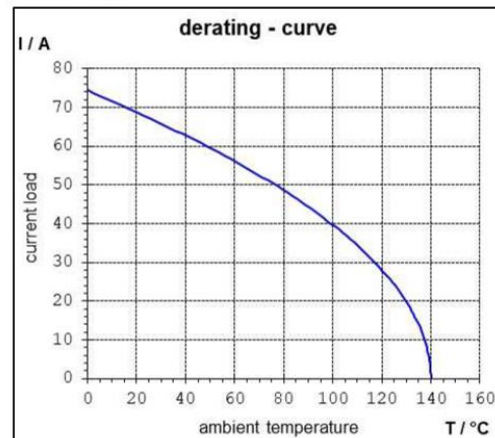
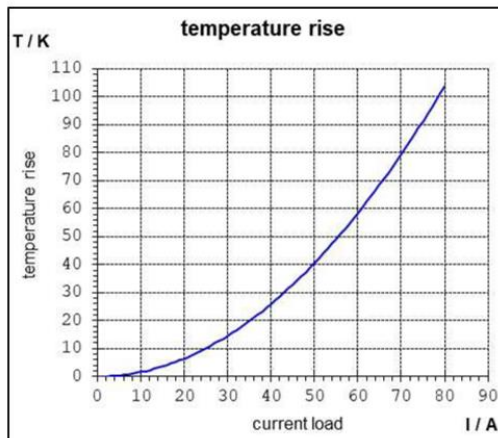
Receptacle: CuSn, Silver Plated
 Wire Size: 10mm², FLRY
 Housing: PBTGF15
 Cover: PBT
 Fuse: 80A



Test setup



Thermocouple on Rec. contact



Environmental Tests			
7.12	Humidity Temperature Cycling	7.9 to be performed before and after this test.	Conduct the humidity temperature cycling as per EIA 364-32F, Test Condition Method IV.
7.13	IPX7	No water ingress.	Test conducted as per IEC 60529. Fully equipped assemblies to be immersed in an enclosure of water at the depth of 1m for duration of 30 minutes.
7.14	IP6X	No dust ingress	Test conducted as per IEC 60529. The test is made in a dust chamber suitable to maintain the talcum powder in suspension in a closed test chamber. The talcum powder used shall be able to pass through a square-meshed sieve the nominal wire diameter of which is 50 µm and the nominal width of a gap between wires 75 µm. The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber volume. It shall not have been used for more than 20 tests.
7.15	Thermal Shock	-	Test conducted as per EIA-364-32F. Tmin= -40 Deg C Tmax= +125 Deg C Dwell Time= 30 min. Transfer time= 5 min. Cycles = 10

8. Test Sequence:

Test or Examination	Sequence 1	Sequence 2	Sequence 3	Sequence 4	Sequence 5	Sequence 6	Sequence 7	Sequence 8
Samples Size	3	3	3	5	5	5	5 In each direction	5
Visual examination	1,3	1,7	1,7	1,4	1,5	1,6	1,3	1,5
Contact Retention Force				2				
Random Vibration		3						
Mechanical Shock		5						
Durability						5		
Fuse Mating, Un-mating								3
Cover locking mechanism strength				3,5				
Mounting Feature Mechanical strength							2,4	
Connection resistance (Dry Circuit Test)		2,4,6				2,4		2,4
Insulation Resistance			3,6					
Temperature Rise	2							
Dielectric Withstanding Voltage					2,4			
135% Short Circuit Test						3		
Degrees of Protection IPX7			4					
Degrees of Protection IP6X			5					
Voltage Drop								
Thermal Shock			2					
Humidity-Temperature Cycling					3			

Table 1