

2P Sealed Mini 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:

- 2066046-1/-2/-3/-4: 2 Pos sealed Minifuse Box Assembly
 - 2066045-1/-2/-3/-4: 2 Pos sealed Minifuse Box Housing
 - 1544767-1: Housing Peripheral Seal
- 0-/1-2066502-1/-2/-3/-4: Cover, 2 Pos. sealed Minifuse Box
- 1-968857-1: AMP MCP 2.8 Receptacle terminal (Pre-Tinned)
- 1-968882-1: AMP MCP 2.8 Receptacle terminal (Pre-Tinned)
- 828904-1 & 828905-1: 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 4
- EIA Specifications
- IEC 60529



Fig.1

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.

5. Requirements:

5.1. Design and Construction:

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

5.2 Materials:

- I. Contact: CuNiSi, (Pre-Tin)
- II. Housing and Cover: PBT conforming to UL 94 HB
- III. Accessories and Hardware:
 - Wire Seal: Silicon
 - Housing Peripheral Seal: Silicon (2% Oil Self Lubricated)

5.3 Ratings:

- I. Temperature Rating: -40°C to +80°C (Ambient Temperature + Temperature Rise due to energized current)

6. Performance & Test Description

The product is made to design to meet the electrical, mechanical and environmental performance requirements specified. All testes are performed at ambient temperature unless otherwise specified. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

7. Test Requirements & Procedures Summary

S. No	Test Description	Requirement	Test Methods
7.1	Visual Examination	No visible damage, cracking or defect	Visual examination shall be performed by the unaided eye, corrected to normal vision.
MECHANICAL			
7.2	Free Fall Cover	Ensured functionality, some chips and dents permitted but not over seal area. Meets water tightness test.	Drop from a height of 1 m onto a concrete floor on 3 corners and flat on latches. Two corners at bottom of cover (closed corners), 1 corner at seal area.
7.3	Contact Insertion Force	15 N Max.	EIA-364-05B
7.4	Contact Retention Force	80 N Min.	EIA-364-05B
7.5	Vibration	S.No. 7.11 shall be performed before and after the test	USCAR 2- Rev 6 for Vibration profile V1.
7.6	Mechanical Shock	No discontinuities greater than 1 milli second.	EIA-364-27, Method H
7.7	Durability	No visible hinge cracking.	Cover shall withstand a total of 20 mounting-dismounting cycles.

7.8	Cover Locking Mechanism Strength	Housing shall withstand disengagement force of 88.96 N for 1 minute without depressing latches.	Cover latches shall be tested by pulling axially on a string passed through a hole drilled in the center of the cover and anchored inside the cover by a metal bar until a force of 88.96 N is attained and then held for 1 minute. Cover latches shall be tested to destruction and forces recorded
7.9	Drop Test (Whole Assembly)	Visual Inspection	SAE/USCAR-2 Revision 4, 5.4.8
7.10	Mounting Feature Mechanical Strength	Min Force Require to break the mounting feature > 50 N	SAE/USCAR-2 Revision 4, 5.7.2 (Fig 2)
ELECTRICAL			
7.11	Dry circuit Test	2 mΩ Max initial 20 mΩ Max final	EIA-364-23, Subject specimens to 100mA max and 20mV max open circuit voltage.
7.12	Insulation Resistance	100 MΩ Min	SAE/USCAR-2 Revision 4, 5.5.1
7.13	Temperature Rise vs Current at elevated ambient conditions	Shall not exceed 40° C temperature rise above ambient	EIA-364-70. IEC 60512-5-1. Ampere terminals higher than 10 amperes due to thermal runaway. Conduct test at 80° C
7.14	Dielectric Withstanding Voltage	Two-minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 500 volts DC, Test between adjacent contacts. Instantaneous rate of rise.
7.15	135% Short Circuit Test	No plastic or terminal interface degradation.	Use 25A fuse. Apply 110% load (wire rated current of input/output mated circuit) at 13.5 volt for 15 minutes followed by 135% load for 60 Seconds to each circuit not protected by a fuse/circuit breaker within the fuse box one at a time.
ENVIRONMENTAL			
7.16	Degrees of Protection.	No dust & water ingress	IP 67 as per IEC 60529
7.17	Salt Spray Test	S.No. 7.11 shall be performed before and after the test	EIA-364-26B, Condition A (96 hours)
7.18	Temperature Life	S.No. 7.11 shall be performed before and after the test	EIA-364-17, Method A, Test Condition 5, Test Time Condition A,
7.19	Thermal Shock	S.No. 7.12 shall be performed after the test	EIA-364-32, Test Condition I. Subject specimens to 10 cycles between -40° C and 125° C

7.20	Humidity - Temperature Cycling	S.No. 7.11 shall be performed before and after the test	EIA 364-31 Method IV, Test Condition B (240 hours) Specimens were exposed to 10 cycles (10 days) of humidity temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25 and 65°C twice while maintaining high humidity. A -10°C cold shock was administered during the 7 th cycle
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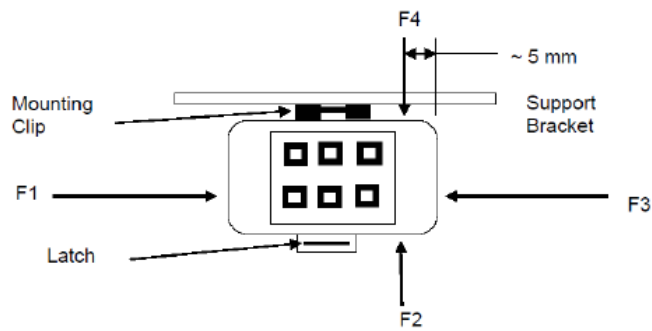


Fig.2

8. Test Sequence:

Test or Examination	Test Group (a)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Test Sequence (b)															
Sample Size	5	10	5	5	10	10	10	5	5	5	5	10	5	5	5	10
<i>Visual examination</i>	1,3	1,3	1,5	1,5	1,3	1,3	1,3	1,3	1,3	1,5	1,5	1,6	1,5	1,5	1,5	1,5
<i>Free fall, cover.</i>																
<i>Contact Insertion Force</i>	2															
<i>Contact Retention Force</i>		2														
<i>Vibration</i>			3													
<i>Mechanical Shock</i>				3												
<i>Durability</i>					2											
<i>Cover locking mechanism strength.</i>						2										
<i>Drop Test (Whole Assy)</i>							2									
<i>Mounting Feature Mechanical Strength</i>								2								
<i>Dry Circuit Test</i>			2,4	2,4						2,4	2,4		2,4	2,4	2,4	
<i>Insulation Resistance</i>									2			2,5				
<i>Temperature Rise</i>										3						
<i>Dielectric Withstanding Voltage.</i>																2,4
<i>135% Short Circuit Test</i>											3					
<i>Degrees of Protection.</i>												4				
<i>Salt Spray Test</i>													3			
<i>Temperature Life</i>														3		
<i>Thermal Shock</i>												3			3	
<i>Humidity-Temperature Cycling</i>																3

#5 Samples will be virgin and 5 Samples will from free fall

§ After Humidity Test, 5 Samples will be validated with dry circuit test and 5 samples will be validated with dielectric withstanding voltage

Document history

Rev LTR	DESCRIPTION	DATE	DWN	APVD
C	Part numbers 2066046-3, -4 and 1-2066502-1,2,3,4 Added	01Dec2019	STK	DH