108-160416 SPECIFICATION

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1. SCOPE:

1.1 Content

This specification covers the performance, test and quality requirements for 67way Header
This specification applies to the product 2359790-1, but not limited to it.

67way Header TE part No.: 2359790-X

Test with mating parts TE part No.:
67 Pos Plug Housing: 2278584-1
67Pos Plug Cover: 2278586-1
MCP2.8 terminal: 1-968857-3
MCON 1.2 terminal: 1670144-3

1.2 Qualification

When tests are performed, the following specifications and standards shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS:

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

2.1 TE connectivity Specifications:

109-1: General requirements for Test Specifications

2.2 Other documents:

A. SMTC 3 862 001_2010

B. SMTC 3 800 001_2014

C. BV 1269927797_ 20.12.02

D. USCAR_2 Rev.6 2013-02

E. ISO 12103-1

F. DIN40050 Part 9

3. REQUIREMENTS:

3.1 Design and Construction

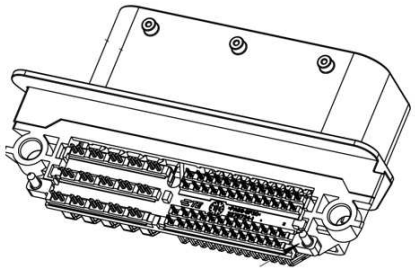
Product shall be of the design, construction and physical dimensions specified in the applicable product drawings.

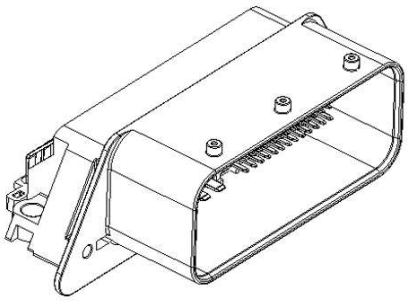
3.2 Materials

material sees the related product drawings.

Component List	Raw material	Surface Treatment
Housing	PA66-GF30 A3E6G	NA
1.2x0.6 Tab	CuSn6	3~6um Ag over 1.3~2.2um Nickel plating
2.8x0.8 Tab	CuFe2P	3~6um Ag over 1.3~2.2um Nickel plating
Jointer	PA66-GF30 A3EG6	NA

The product view please see below pictures:





3.3 Test parameters and tolerances

Test parameters and tolerance please refer to 3.6 Table

3.4 Ratings

A. Application Temperature: -40~+125°C
B. Application Place: On engine, transmission

3.5 General Performance and Test description

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in 3.6 table list. All testes must be performed at the test condition of the TE test specification 109-1 unless otherwise specified.

3.6 Tests requirement and method summary

Para.	Test items	Requirements	Procedures
MECHANICAL TEST			
3.6.1	Visual inspection	Product shall be conforming to the requirements of applicable product drawing and Application Specification	Visually, Dimensionally and Functionally inspected per applicable inspection plan Acc. To SMTC 3 862 001_2010 7.23
3.6.2	Connection and Disconnection of Terminal	Only record 1st and 10th data	The rate for connection and disconnection shall rise at a constant speed between 50 mm/min and 150 mm/min. Connection and disconnection 10cycles. Acc. To SMTC 3 862 001_2010 7.2
3.6.3	Connection of Assembled Connectors	F≤80N	The rate for the applied force shall rise to a constant speed between 50 mm/min until full engagement is achieved. Acc. To SMTC 3 862 001_2010 7.8
3.6.4	Intentional Disconnection of Assembled Connectors	F≤80N	The rate for the applied force shall rise to a constant speed between 50 mm/min until full dis-engagement is achieved Acc. To SMTC 3 862 001_2010 7.9
3.6.5	Unintentional Disconnection of Assembled Connectors	F≥140N	The housings shall be fully terminated,With the latch fully engaged an increasing tensile force perpendicular to the mating faces shall be gradually applied to the housing until the connectors disengage. Acc. To SMTC 3 862 001_2010 7.10
3.6.6	Pin retention force	1.2x0.6 pin: 40N Min. 2.8x0.8 pin: 55N Min.	Apply the load to pin to axis direction at the rate of 50±10mm/min and measure the force when the pin begins to move from plastic housing. Acc. To TE Connectivity spec: 109-30
3.6.7	Misalignment Test	The sample shall suffer no damage to housing, pins and where applicable seals	The sample connector shall be misaligned 10 degrees from its mating part and a force, rising from 0 to 35 N, applied to attempt to mate it. This shall be repeated at decreasing angles, in increments of 2 degrees, until mating is achieved. Acc. To SMTC 3 862 001_2010 7.25
3.6.8	Bump Test	The monitored terminal pairs show no loss of electrical continuity R > 7Ω for t > 1μs Meet 3.6.8	The sample shall be bump tested to the requirements of BS EN 60068-2-29. The test shall consist of 4000 time at 40G/ 6ms in one sense in each of three mutually perpendicular axes Acc. To SMTC 3 862 001_2010 7.21
3.6.9	Housing Ergomonics	Housings will be free of sharp/rough edges that will affect eitheoperator assembly or snagging in manufacturer.	Visual inspection Acc. To SMTC 3 862 001_2010 7.24

Para.	Test items	Requirements	Procedures
ELECTRICAL TEST			
3.6.10	Contact Resistance-Low Voltage	R≤ 5 mΩ	A mated connection attached by the proposed production method to cables shall with direct current source not exceeding 50 mA flowing. (see fig.1) Acc. To SMTC 3 862 001_2010 7.12
3.6.11	Short Circuit	No Short circuit	Apply 12 – 24V on connector, limit value: 100 mA. Acc. To BV1269927797-4.1.3b
3.6.12	Insulation Resistance	R>100MΩ	The insulation resistance shall be measured by applying 500V DC between all contacts connected and a metal foil surrounding the housing for a minimum period of 1 minute. (see fig.2) Acc. To SMTC 3 862 001_2010 7.13
3.6.13	Dielectric Strength	No dielectric breakdown or flash-over shall occur during the test	Applying AC voltage of 1000V at 50 Hz shall be applied for 1 minute across all contacts connected and a metal foil surrounding the housing Acc. To SMTC 3 862 001_2010 7.14
3.6.14	Nominal Current Rating	Value determination	This test shall be carried out in accordance with DIN IEC512-3 with the following criteria applied: After fitting temperature probes to the contacts as close as possible to the separable interface. 1.Temperature rise test with continue increasing current step by step; 2. Construct the Base Curve with the temperature on the X-axis and the current on the Y-axis; 3. Reduce the current values of the base curve by 20% to create the derating curve. Acc. To SMTC 3 862 001_2010 7.11
ENVIRONMENTAL TEST			
3.6.15	Low Temperature	Appearance accepts: no deterioration, cracks deformities, etc.	The mated connections shall be subjected to a 16 hour soak at -40±2℃,followed by 16hours at room ambient temperature with no current flow throughout test. Acc. To SMTC 3 862 001_2010 7.29
3.6.16	Thermal Aging	R>100MΩ	The fully equipped test sample shall be placed in a test chamber at the class temperature 125℃ Connector Temperature Classes for 100h Acc. To SMTC 3 862 001_2010 7.30
3.6.17	Leak rate test	Q≤0.5 l/h	Test Pressure：0.5bar; Test duration：10s

Para.	Test items	Requirements	Procedures
3.6.18	Temperature/ Humidity Test	Meet 3.6.17	The samples should follow below condition: 1. Temperature 22°C, Humidity 50%RH for 24h; 2. Temperature 22°C Humidity 50%RH for 7x24h 3. Temperature 120°C for 2H. Acc. To BV1269927797-4.25
3.6.19	Humidity test (HT/HF 85/85)	Appearance accepts: no deterioration, cracks deformities, etc.	Storage at 85°C and 85%RH Humidity for 1000h. Acc. To BV1269927797-4.26
3.6.20	Dust Ingress Test	No dust entry	The test is based on DIN 40050, Part 9 and uses a dust chamber without generation of vacuum as per this standard. The test dust is fine Arizona dust as per ISO 12103-1. Test duration: 15 cycles; cycle definition 5 s of dust subjection then 15 min of dormant time. Acc. To SMTC 3 800 001_2014 6.11 ISO 12103-1
3.6.21	Water Tightness Test	. No water entry	High-pressure washing, IPX 9K Temperature:80+/-5 ℃ Flow rate: 14 to 16 l/min. Pressure 8000 to 10000 kPa Distance nozzle-test object: 10 to 15cm Test duration per side: 30s Temperature room: 25℃; Acc. To DIN40050 Part 9
3.6.22	Chemical Fluids	1. No deterioration, cracks deformities, fretted etc. 2. Meet 3.6.9	Completely submerse test samples in each fluid listed for 30 minutes and leave the samples in a suitable container or area at lab ambient temperature for 7 days. Chemical fluids and test condition see table 1. Acc. To USCAR_2 Rev.6 2013-02 5.6.4.

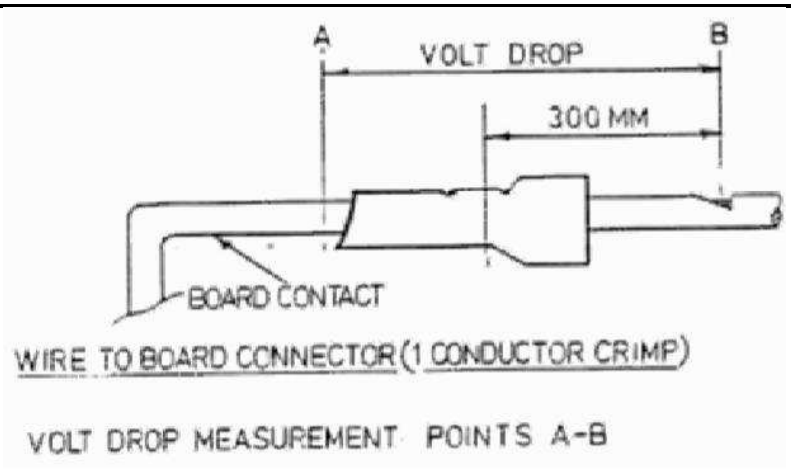


Fig.1 Contact Resistance-Low Voltage

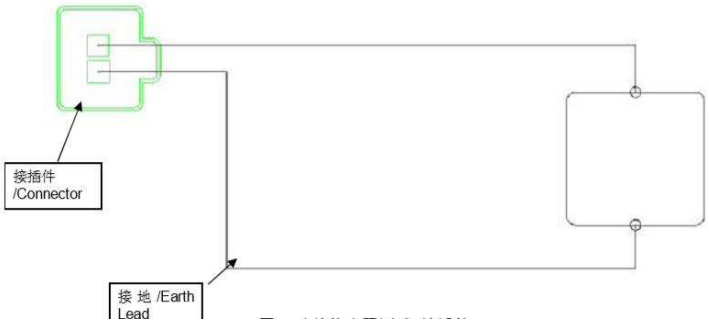


Fig.2 Insulation Resistance

Table 1: Chemical Fluids

Automotive Fluids

Fluid	Specification	Test Temp. (°C)
Gasoline	ISO1817, liquid C	23 ± 5
Diesel fuel	90% ISO 1817, Oil No. 3 + 10% p-xylene*	23 ± 5
Engine oil	ISO 1817, Oil No. 2	50 ± 3
Ethanol	85% Ethanol + 15% ISO 1817 liquid C*	23 ± 5
Power steering fluid	ISO 1817, Oil No. 3	50 ± 3
Automatic transmission fluid	Dexron VI (North American specified material)	50 ± 3
Engine Coolant	50% ethylene glycol + 50% distilled water*	50 ± 3
Brake Fluid	SAE RM66xx (Use latest available fluid for xx)	50 ± 3
Diesel Exhaust Fluid (DEF)	API certified per ISO22241	23 ± 5

3.7 Tests sequence

SAMPLE QUANTITIES															
Test or examination	**TEST GROUP**														
	A	B	C	D	E	F	G	H	I	J					
3.6.1 Visual inspection			1	1	1	1	1,6	3,5							
3.6.2 Connection and Disconnection of Terminal	2														
3.6.3 Connection of Assembled Connectors		1													
3.6.4 Intentional Disconnection of Assembled Connectors		2													
3.6.5 Unintentional Disconnection of Assembled Connectors		3						7							
3.6.6 Pin retention force			2												
3.6.7 Misalignment Test								2							
3.6.8 Bump Test							5								
3.6.9 Housing Ergomonics				2	2										
3.6.10 Contact Resistance-Low Voltage	1			3,5	3,5	2,5	2,4	1,6							
3.6.11 Short Circuit						7									
3.6.12 Insulation Resistance									1						
3.6.13 Dielectric Strength									2						
3.6.14 Nominal Current Rating										1					
3.6.15 Low Temperature				4											
3.6.16 Thermal Aging					4										
3.6.17 Leak rate test						6									
3.6.18 Temperature/ Humidity Test						3									
3.6.19 Humidity test (HT/HF 85/85)						4									
3.6.20 Dust Ingress Test							3								
3.6.21 Water Tightness Test									3						
3.6.22 Chemical Fluids								4							
Sample size	4	4	4	4	4	4	4	9	4	4					

Table 2

4. QUALIFICATION TEST

4.1 Qualification test

Samples must be in accordance with drawings and be taken in a random way in the production in progress.

4.2 Requalification test

If changes significantly affecting form, fit, or function are made to the product or to the manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by product engineering.

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4.3 Acceptance

Acceptance is based on verification that the product meets the requirements of section **Error! R eference source not found.** 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 resubmitted.

4.4 Quality conformance inspection

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