

**1.Scope:**

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of .025 T.P.S Connector which includes only connection's part of sensor assembly except sensor's part itself.

Applicable product description and part numbers are as shown in Appendix 1.

**2.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.

2.1 AMP Specifications:

A. 109-5000 : Test Specification, General Requirements for Test Methods

B. 114-5278 : Application Specification

Crimping CLEAN BODY 025/040 Receptacle Contact.

C. 501-5586 : Qualification Test Report

2.2 Commercial Standards and Specifications.

A. JASO D605 : Multi-pole Connector for Automobiles

B. JASO D7101 : Test Methods for Plastic Molded Parts

C. JIS C3406 : Low Voltage Wires and Cables for Automobiles

D. JIS D0203 : Method of Moisture, Rain and Spray Test for Automobile Parts

E. JIS D0204 : Method of High and Low Temperature Test for Automobile Parts

F. JIS D1601 : Vibration Testing Method for Automobile Parts

G. JIS R5210 : Portland Cement

**3.Requirements:**

3.1 Design and Construction:

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

3.2 Material:

A. Contact:

a. Receptacle Contact: Pre-tinned Cu Alloy, Brass

b. Tab Contact : Pre-tinned Brass

B. Housing : PBT resin

C. Seal Ring; Wire Seal Rubber: Silicone Rubber

3.3 Ratings:

A. Temperature Rating : -40°C to 120°C

3.4 Performance Requirements and Test Descriptions:

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.1. All tests shall be performed in the room temperature, unless otherwise specified.

3.5 Test Requirements and Procedures Summary:

Para.	Test Items	Requirements	Procedures
3.5.1	Confirmation of Product	Product shall be conforming to the requirements of applicable product drawing and Application Specification. No. 114-5278	Visually, dimensionally and functionally inspected per applicable quality inspection plan.
<b>Electrical Requirements</b>			
3.5.2	Termination Resistance (Specified Current)	10mV/A Max. (Initial) 20mV/A Max. (Final)	Measure initial termination resistance of contact test circuit in mated connectors. Fig.3 AMP Spec.109-5311-2
3.5.3	Termination Resistance (Low Level)	10mΩ Max. (Initial) 20mΩ Max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10mA Max.at open circuit voltage of 20mV Max. Fig.3 AMP Spec.109-5311-1
3.5.4	Dielectric Strength	No creeping discharge nor flashover shall occur.	1kV AC for 1 minute. Cutoff current : 1 mA Test between adjacent contacts and between contacts and housing of mated connectors. Fig.4 AMP Spec. 109-5301
3.5.5	Insulation Resistance	100MΩ Min.	Impressed voltage 500V DC. Test between adjacent contacts and between contacts and housing of mated connectors. Fig.4 AMP Spec. 109-5302
3.5.6	Current Leakage (Non Sealed type connector only)	1mA Max.	12V DC impressed 1min. Fig.5 AMP Spec. 109-5312
3.5.7	Temperature Rising	25°C Max. under loaded specified current.	Measure temperature rising of mated connectors with all contacts series-wired, by energized current. Test Current: 3A (0.5mm <sup>2</sup> wire) AMP Spec. 109-5310
3.5.8	Current Cycling	Termination Resistance (Low Level) 20mΩ Max. (Final) No ignition is allowed during the test.	Test Current: 3A (0.5mm <sup>2</sup> wire) 45minutes"ON", 15minutes"OFF", 1000cycles. AMP Spec.109-5308

Fig.1(To be continued)

Physical Requirements					
Para.	Test Items	Requirements		Procedures	
3.5.9	Vibration (High Frequency)	No electrical discontinuity greater than 1 $\mu$ sec. shall occur. Termination Resistance (Specified Current) 20mV/A Max. (Final)		Vibration Frequency: 20~200Hz/3min. Accelerated Velocity : 44.1m/s <sup>2</sup> Vibration Direction : X.Y.Z Duration: 2 hours each for "X" and "Y" , 4 hours for "Z" Fig.6 AMP Spec.109-5202	
3.5.10	Contact Mating Force	7.8N Max		Operation Speed : 100mm/min. Measure the force required to mate contacts. AMP Spec.109-5206	
3.5.11	Contact Unmating Force	0.98N Min.		Operation Speed : 100mm/min. Measure the force required to unmate contacts. AMP Spec.109-5206	
3.5.12	Connector Mating Force	3Pos. 49N Max.		Operation Speed : 100mm/min. Measure the force required to mate connectors. AMP Spec.109-5206	
3.5.13	Connector Unmating Force	3Pos. 49N Max.		Operation Speed : 100mm/min. Measure the force required to unmate connectors without locking latch set in effect. AMP Spec.109-5206	
3.5.14	Housing Locking Strength	78N Min.		Measure housing locking strength. Operation Speed:100mm/min. AMP Spec. 109-5210	
3.5.15	Contact Insertion Force	9.8N Max. per contact		Measure the force required to insert contacts into housing. Operation Speed:100/mm/min AMP Spec. 109-5211	
3.5.16	Contact Retention Force	39N Min.		Apply axial load to contact without secondary lock set in effect. Operation Speed: 100mm/min. AMP Spec. 109-5212	
3.5.17	Contact Retention Force (Secondary lock)	78.5N Min.		Apply axial load to contact with secondary lock set in effect. Operation Speed: 100mm/min. AMP Spec. 109-5212	
3.5.18	Crimp Tensile Strength	Wire Size		Crimp Tensile(min.)	Apply an axial pull-off load to crimped wire of contact secured on the tester. Operation Speed: 100mm/min. AMP Spec. 109-5205
		mm <sup>2</sup>	(AWG)		
		0.3	22	58	
		0.5	20	88	

Fig.1(To be continued)

Para.	Test Items	Requirements	Procedures
3.5.19	Resistance to "Kojiri"	Termination Resistance (Specified Current) 20mV/A Max. (Final)	Repeated mating / unmating by hand, 50cycles. AMP Spec.109-5215
3.5.20	Watertight Sealing  (Sealed type connector only)	98kPa Min. (Initial) 29.4kPa Min. (Final)	Blow compressed air into mated pair of connectors through a small hole. For this test, wire ends are sealed. Put the connectors into water and must withstand the air pressure of 9.8kPa for 30 seconds. Increase the air pressure at a rate of 9.8kPa each time until air leakage takes place.
3.5.21	Handling Ergonomics	No abnormalities allowed in manual mating/unmating handling.	Manually operated
<b>Environmental Requirements</b>			
3.5.22	Thermal Shock	Termination Resistance (Low Level) 20mΩ Max. (Final) Watertight Sealing 29.4kPa Min. (Final) (Sealed type connector only)	Mated connector -30°C/120min.,80°C/120min. Making this a cycle, repeat 5cycles. AMP Spec. 109-5103
3.5.23	Humidity, Steady State (Non Sealed type connector only)	Insulation resistance (Final) 100MΩ Min. Termination resistance (Low Level) 20mΩ Max. (Final) Current Leakage : 1mA Max.	Mated connector, 90~95%R.H.,60°C 96hours AMP Spec. 109-5105
3.5.24	Industrial Gas (SO <sub>2</sub> )	Termination resistance (Low Level) 20mΩ Max. (Final)	SO <sub>2</sub> Gas : 10ppm, 90~95%R.H. 40°C, 24hours (AMP Spec.109-5107)
3.5.25	Temperature Life (Heat Aging)	Termination resistance (Low Level) 20mΩ Max. (Final) Watertight Sealing 29.4kPa Min. (Final) (Sealed type connector only)	120°C ± 2°C, 120hours AMP Spec. 109-5104
3.5.26	Resistance to Cold	Termination resistance (Low Level) 20mΩ Max. (Final) Watertight Sealing 29.4kPa Min. (Final) (Sealed type connector only)	-50°C ± 5°C, 120hours AMP Spec. 109-5108
3.5.27	Dust Bombardment	Termination Resistance (Specified Current) 20mV/A Max. (Final)	Subject JIS R 5210 cement blow 1.5kg per 10 seconds in 15 minutes intervals for 60 minutes. After completion of duration, repeat mating / unmating for 3 cycles. AMP Spec. 109-5110
3.5.28	Water Splash (Sealed type connector only)	Termination Resistance (Specified Current) 20mV/A Max. (Final) Current Leakage : 100 μ A Max.	Expose mated connectors under 120°C ± 3°C for 40 minutes, splash Water for 20 minutes. 48 cycles, Test Voltage : 12V AMP Spec. 109-5109 Condition: JIS D 0203, S2

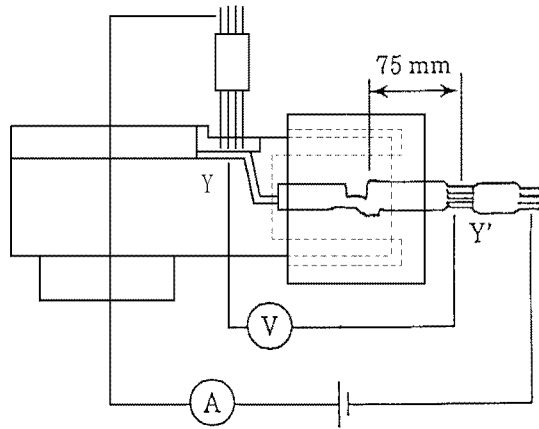
Fig.1 (End)

3.6 Product Qualification Test Sequence

Para.	Test Items	Test Group												
		1	2	3	4	5	6	7	8	9	10	11	12	13
		Test Sequence												
3.5.1	Confirmation of Product	1	1	1	1	1,5	1,5	1	1	1	1	1	1	1
3.5.2	Termination Resistance ( Specified Current )		3,5	3,6				2,4					2,4	2,4
3.5.3	Termination Resistance ( Low Level )					2,4			2,5	2,5	2,4	2,5,8		
3.5.4	Dielectric Strength						4							
3.5.5	Insulation Resistance						3			7				
3.5.6	Current Leakage						2							
3.5.7	Temperature Rising			4										
3.5.8	Current Cycling					3								
3.5.9	Vibration ( High Frequency )							3						
3.5.10	Contact Mating Force	2												
3.5.11	Contact Unmating Force	3												
3.5.12	Connector Mating Force			2										
3.5.13	Connector Unmating Force			5										
3.5.14	Housing Locking Strength				5									
3.5.15	Contact Insertion Force				2									
3.5.16	Contact Retention Force				3									
3.5.17	Contact Retention Force (Secondary lock)				4									
3.5.18	Crimp Tensile Strength	4												
3.5.19	Resistance to "Kojiri"		4											
3.5.20	Watertight Sealing								3,6	3,6		4,7		
3.5.21	Handling Ergonomics		2											
3.5.22	Thermal Shock								4					
3.5.23	Humidity ( Steady State )									4				
3.5.24	Industrial Gas (SO <sub>2</sub> )										3			
3.5.25	Temperature Life ( Heat Aging )											3		
3.5.26	Resistance to Cold											6		
3.5.27	Dust Bombardment												3	
3.5.28	Water Splash													3

Numbers indicate sequence in which tests are performed.

Fig.2



From the measured readings, deduct the resistance of the wire used for termination. When testing for rated current measurement, apply 12 V DC, 1A to the circuit. For obtaining uniformity of the current density on probing points Y-Y', apply soldering on the probing points prior testing.

Fig.3 Measurement of Termination Resistance

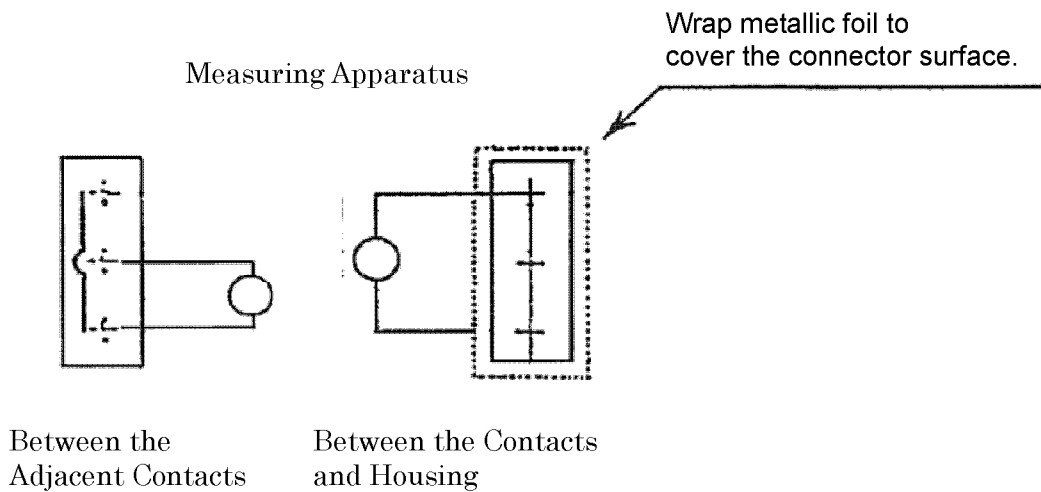


Fig. 4

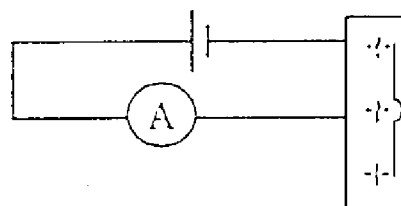


Fig.5

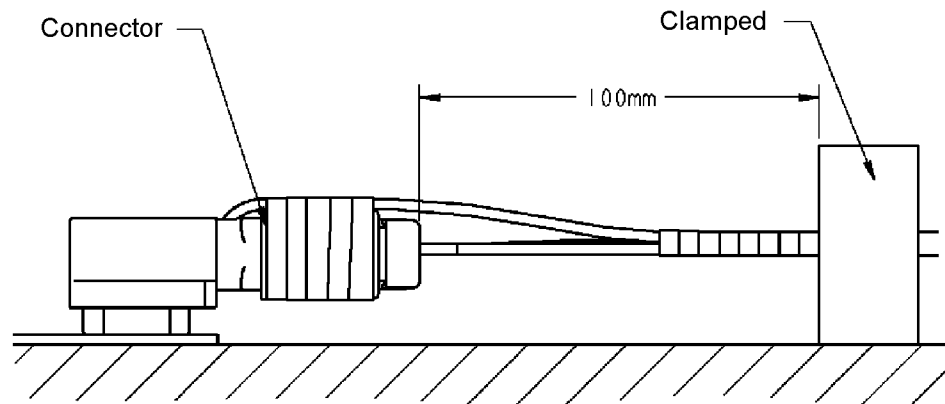


Fig.6

The applicable product descriptions and part numbers are as shown in Appendix. 1

Appendix 1

Product Part No.	Description
1318670	.025 Sealed T.P.S Conn. 3Pos. Plug Hsg. Assy
1318671	.025 T.P.S Conn. 3Pos. Plug Hsg. Assy (Non Sealed Type)
1318540	Sensor Assy
1318329	CLEAN BODY 025 Receptacle Contact