

## **1.Scope:**

### **1.1 Contents**

This specification covers the requirements for product performance, test methods and quality assurance provisions of .040 III Series Multilock Connector for Wire to board Termination.

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. 114-5217 : Application Specification  
Crimping .040 III Series Unsealed Receptacle Contact.
- C. 501-5308 ;TEST REPORT

### **2.2 Commercial Standards and Specifications.**

- A. JASO D605 : Electric Connector for Automobiles
- B. JASO D611 : Low-tension Cables with Thin Wall Insulation for Automobiles
- 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 and Gold plating Cu Alloy over Ni under plating

**b. Tab Contact**

: Pre-tinned brass and Gold plating brass over Ni under plating

**B. Housing : PBT resin****3.3 Ratings:**

A. Temperature Rating : -40°C to 105°C (Ambient temperature + temperature rise due to energized current)

**3.4 Performance Requirements and Test Descriptions:**

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 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.	Visually, dimensionally and functionally inspected per applicable quality inspection plan.
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	10m $\Omega$ Max. (Initial) 20m $\Omega$ Max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10mA Max. at open circuit voltage of 20mV Max. Figure 3 AMP Spec. 109-5311-1
3.5.3	Dielectric Strength	No creeping discharge nor flashover shall occur.	1kVAC for 1 minute. Test between adjacent circuits of mated connectors. Figure 4 AMP Spec. 109-5301
3.5.4	Insulation Resistance	100M $\Omega$ Min. (Initial, Final)	Impressed voltage 500V DC. Test between adjacent circuits of mated connectors. Figure 4 AMP Spec. 109-5302
3.5.5	Current Leakage	1mA Max. (Initial, Final)	12V DC impressed 1min. Figure 5 AMP Spec. 109-5312
3.5.6	Temperature Rising	25°C Max. under loaded specified current.	Measure temperature rising by energized current, 3A. Current applied to every other positions. AMP Spec. 109-5310
3.5.7	Current Cycling	20m $\Omega$ Max. (Final) No ignition is allowed during the test	Applied Current : 3A Current applied to every other positions. 45minutes "ON", 15minutes "OFF", 200cycles AMP Spec. 109-5308

Figure 1 (To be continued)

Physical Requirements						
Para.	Test Items	Requirements	Procedures			
3.5.8	Vibration (High Frequency)	No electrical discontinuity greater than 1 $\mu$ sec. shall occur. 20m $\Omega$ Max. (Final)	Vibration Frequency: 20~200~20Hz/3min. Accelerated Velocity : 44.1m/s <sup>2</sup> (4.5G)			
			Figure 7 Vibration Direction	Up and Down	Back and Force	Right and Left
			Duration	4hours	2hours	2hours
3.5.9	Connector Mating Force	~16Pos. : 70N Max. 20~24Pos. : 78N Max.	Operation Speed : 100mm/min. Measure the force required to mate connectors. AMP Spec.109-5206			
3.5.10	Connector Unmating Force		Operation Speed : 100mm/min. Measure the force required to unmate connectors. AMP Spec. 109-5206			
3.5.11	Connector Locking Strength	98N Min.	Operation Speed : 100mm/min. Measure housing locking strength. AMP Spec. 109-5210			
3.5.12	Contact Insertion Force	9.8N Max. (per one piece of contact)	Operation Speed : 100mm/min. Measure the force required to insert contact into housing. AMP Spec.109-5211			
3.5.13	Contact Retention Force	Primary lock : 39.2N Min W/TPA : 98N Min.	Operation Speed : 100mm/min. Measure the contact retention force required. AMP Spec.109-5212			

Figure 1 (To be continued)

Para.	Test Items	Requirements			Procedures
3.5.14	Crimp Tensile Strength	Wire Size		Crimp Tensile strength (min.)	Operation Speed : 100mm/min. Apply an axial pull-off load to crimped wire of contact secured on the tester. AMP Spec. 109-5205
		mm <sup>2</sup>	(AWG)	N	
		0.3	22	58	
		0.5	20	88	
3.5.15	Durability (Repeated Mate/ Unmating)	20m $\Omega$ Max. (Final)			Operation Speed : 100mm/min. No. of Cycles : 30 Cycles AMP Spec.109-5213
3.5.16	Resistance to "Kojiri"	20m $\Omega$ Max. (Final)			Mated/Premated connector Direction:Back/Force,Right/Left No. of cycles : 5cycles Figure 6 AMP Spec.109-5215
3.5.17	Solderability	Wet Solder Coverage;95% MIN. Plating area only			Solder Temperature;230 $\pm$ 5° immersion Duration;3 $\pm$ 0.5seconds Flux;Alpha 100 AMP Spec 109-5203
3.5.18	Handling Ergonomics	No abnormalities allowed in manual mating/unmating handling.			Manually operated

## Environmental Requirements

3.5.19	Thermal Shock	20m $\Omega$ Max. (Final)			Mated connector -30°C/60min.,80°C/60min. Making this a cycle, repeat 5cycles. Figure 8 AMP Spec. 109-5103
3.5.20	Humidity, Steady State	Insulation resistance (Final) 100M $\Omega$ Min. Termination resistance 20m $\Omega$ Max. (Final)			Mated connector, 90~95%R.H. 60°C 96hours AMP Spec. 109-5105
3.5.21	Industrial Gas (SO <sub>2</sub> )	20m $\Omega$ Min. (Final)			SO <sub>2</sub> Gas : 10ppm, 95%R.H. 20°C, 24hours AMP Spec. 109-5107
3.5.22	Temperature Life (Heat Aging)	20m $\Omega$ Max. (Final)			100°C,Duration : 120hours AMP Spec. 109-5104
3.5.23	Resistance to Cold	20m $\Omega$ Max. (Final)			-40°C $\pm$ 5°C,120hours AMP Spec. 109-5108
3.5.24	Dust Bombardment	20m $\Omega$ Max. (Final)			Subject JIS R 5210 cement blow of 1.5kg per 10 seconds in 15 minutes intervals for 60minutes. AMP Spec. 109-5110

Figure 1 (End)

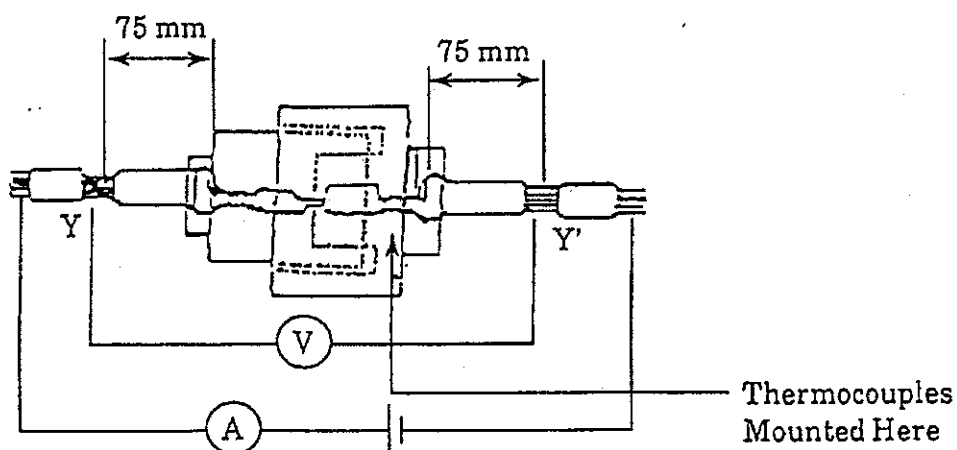
## 3.6 Product Qualification Test Sequence

Para.	Test Items	Test Group									
		1	2	3	4	5	6	7	8	9	10
		Test Sequence (a)									
3.5.1	Confirmation of Product	1	1	1	1	1,9	1,7	1,7	1,9	1,14	1
3.5.2	Termination Resistance (Low Level)			3		3,5,7	2,4,6	2,4,6	2,4,6,8	2,5,8,12	
3.5.3	Dielectric Strength				3					10	
3.5.4	Insulation Resistance				2					9	
3.5.5	Current Leakage				4					3,7	
3.5.6	Temperature Rising		2								
3.5.7	Current Cycling								7		
3.5.8	Vibration (High Frequency)								5		
3.5.9	Connector Mating Force			2							
3.5.10	Connector Unmating Force			4							
3.5.11	Housing Locking Strength		3								
3.5.12	Contact Insertion Force										2
3.5.13	Contact Retension Force										3
3.5.14	Crimp Tensile Strength	2									
3.5.15	Durability (Repeated mate/unmate)									4	
3.5.16	Resistance to "Kojiri"							3	3		
3.5.17	Solderability					2					
3.5.18	Handling Ergonomics					8				13	
3.5.19	Thermal Shock					4					
3.5.20	Humidity (Steady State)					6				6	
3.5.21	Industrial Gas (SO <sub>2</sub> )									11	
3.5.22	Temperature Life (Heat Aging)						3				
3.5.23	Resistance to Cold						5				
3.5.24	Dust Bombardment							5			

Fig.2(END)

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

Number of Specimens; Each sample group used for the specified performance test, shall consist of not less than 20 sets of contacts and not less than 3 sets of connector assemblies.



From the measured readings, deduct the resistance of the 150mm long wire used for termination. For obtaining uniformity of the current density on probing points Y-Y', apply soldering on the probing points prior testing.

Figure 3 Measurement of Termination Resistance

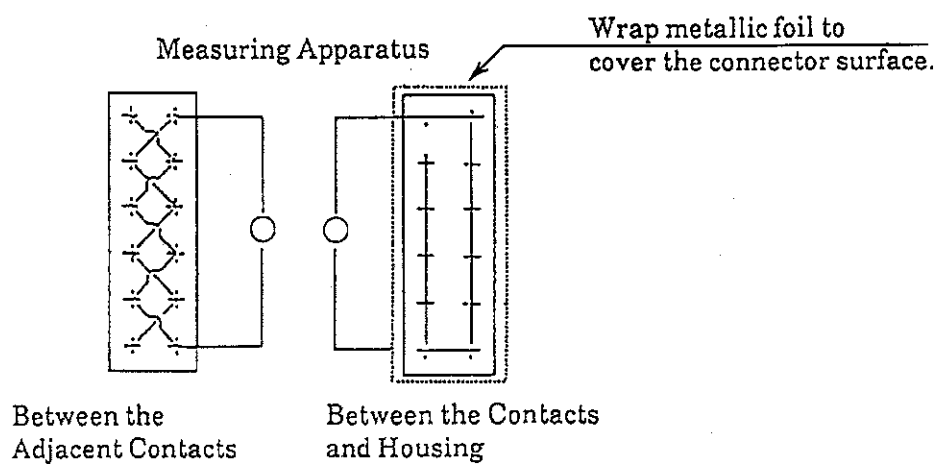


Figure 4

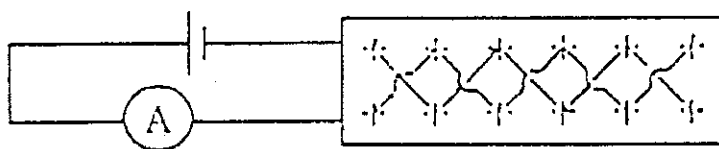


Figure 5

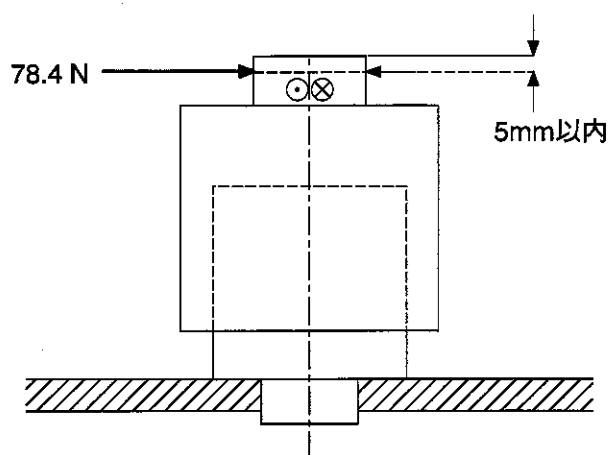


Figure 6



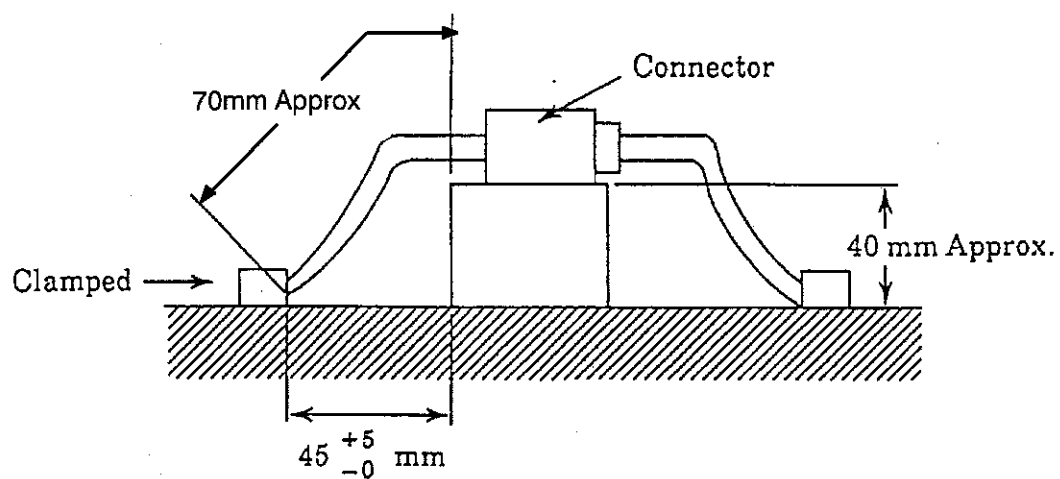


Figure 7

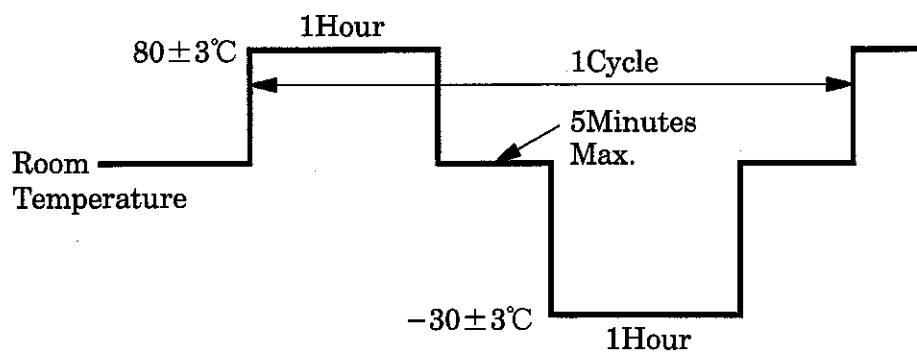


Figure 8

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

Appendix 1

Product Part No.	Description
1123371,1123375,1123377	.040 III Unsealed Connector 16Position Plug Housing Assembly
1123379,1123383,1123385	.040 III Unsealed Connector 20Position Plug Housing Assembly
1123387,1123391,1123393	.040 III Unsealed Connector 24Position Plug Housing Assembly
1123476,1123478	.040 III Unsealed Connector 3Position Cap Housing Assembly(1ROW)
1123395,1123397	.040 III Unsealed Connector 4Position Cap Housing Assembly(1ROW)
1123619,1123621	.040 III Unsealed Connector 6Position Cap Housing Assembly(2ROW)
1123451,1123453	.040 III Unsealed Connector 8Position Cap Housing Assembly(2ROW)
1123413,1123415,1123417	.040 III Unsealed Connector 12Position Cap Housing Assembly(2ROW)
1123419,1123421,1123423	.040 III Unsealed Connector 16Position Cap Housing Assembly(2ROW)
1123425,1123427,1123429	.040 III Unsealed Connector 20Position Cap Housing Assembly(2ROW)
1123431,1123433,1123435	.040 III Unsealed Connector 24Position Cap Housing Assembly(2ROW)
316836-1	.040 III Unsealed Receptacle Contact (Pre-Tin)
316837-2	.040 III Unsealed Receptacle Contact (Au)
1376954	.040 III Unsealed Connector 8Position Cap Housing Assembly V-Type
1376955	.040 III Unsealed Connector 20Position Cap Housing Assembly V-Type

\* 3~12Pos. plug housing Assembly made by YAZAKI PARTS CO.,LTD