

DESIGN OBJECTIVES

The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, AMP (Japan), Ltd makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, AMP (Japan), Ltd. may change these requirements based on the results of additional testing and evaluation. Contact AMP Engineering for further details.

In case when "product specification" is referred to in this document, it should be read as "design objectives" for all times as applicable.

AMP J - 522 (Rev. MAR 9

NUMBER: 108-5405

NUMBER:

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108-5405

.040 II Air Bag I/O Connector

1. Scope :

1.1 Contents :

This specification covers the requirements for product performance, test methods and quality assurance provisions of .040 II Air Bag I/O Connector for P.C.B..

Applicable product descriptions and part number 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 Specification :

- A. 109-5000 Test Specification, General Requirements for Test Methods
- B. 114-5159 Application Specification, Crimping .040 II Series Receptacle Contact
- C. 501- 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 Roin on Spray Test for Automobile-Parts.

					DR. 1 Mar. '94	SHEET 1 OF 12	 AMP (Japan), Ltd. Kawasaki, Japan		
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					CHK. 1 Mar. '94		LOC J	LOC A	NO. 108-5405
					S. Amemiya				
PRINT DIST.	A	Revised FJ00-2120-75	<i>JK YK S/A</i>	APP. 1 Mar. '94	NAME				
	0	Released FJ00-1013-93	Y. K S. A 3/1 '94	K. Oda	040 II Air Bag I/O Connector				
	LTR	REVISION RECORD	DR	CHK	DATE				

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- E. JIS D0204 Method of High and Low Temperature Test for Automobiles - Parts
- F. JIS D1601 Vibration Testing Method for Automobile - Parts
- G. JIS R5210 Portland Cement
- H. MUL-STD-202 Test Method 208 : Method of Soldering

3. Requirements :

3.1 Design and Construction :

Product shall be to the design, construction and physical dimensions specified in the applicable product drawing.

3.2 Materials :

A. Contact :

a. Receptacle Contact : Phosphor Bronze (Selective Gold Plating)
(Pre-Tin)

b. Tab Contact : Bronze (Selective Gold Plating)
(Tin-Lead Plating)

B. Housing :

PBT resin

3.3 Ratings :

A. Temperature Rating: - 40 °C to 105 °C

3.4 Performance and Test Descriptions :

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig. 2. All tests are performed in the room temperature unless otherwise specified.

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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 inspection plan.
Electrical Requirements				
3.5.2	Termination Resistance (Specified Current)	Test (A) Current	Resistance mV / A (Max.)	Measure initial millivolt drop of contact test circuit in mated connectors, Fig. 3. AMP Spec. 109-5311-2
		1 ± 0.05	(Initial) 3 (Final) 10	
3.5.3	Termination Resistance (Low Level)	3 mΩ Max. (Initial) 10 mΩ Max. (Final)		Subject mated contacts assembled in housing to closed circuit current of 10 mA max. at open circuit voltage of 50 mV max. Fig. 3. AMP Spec. 109-5311-1
3.5.4	Dielectric Strength	No creeping discharge nor flashover shall occur.		1 kVAC for 1 minute. Test between adjacent circuits of mated connectors. AMP Spec. 109-5301 Fig. 7
3.5.5	Insulation Resistance	100 MΩ min.		Impressed voltage 500 V DC. Test between adjacent circuits of mated connectors. AMP Spec. 109-5302 Fig. 7
3.5.6	Temperature Rising	50 °C Max. under loaded specified current.		Measure temperature rising by energized current. Fig. 4, 5 AMP Spec. 109-5310
3.5.7	Current Cycling	10 mΩ Max. (Final)		Applied Current I ₁ : Fig. 5. ① 45 minutes "ON", 15 minutes "OFF" 300 cycles.

Fig. 2 (to be continued)

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Para.	Test Items	Requirements	Procedures								
3.5.8	Overcurrent Loading	No ignition is allowed during the test.	5 minutes "ON". Fig. 6								
Physical Requirements											
3.5.9	Vibration (High Frequency)	No electrical discontinuity greater than 1 μ sec. shall occur. 10 m Ω Max. (Final)	Vibration Frequency : 20~200~20 Hz / 3 min. Accelerated Velocity : 44.1 m / s ² (4.5 G) <table border="1"> <tr> <td>Vibration Direction</td> <td>Up and Down</td> <td>Back and Forth</td> <td>Right and Left</td> </tr> <tr> <td>Duration</td> <td>4 Hours</td> <td>2 Hours</td> <td>2 Hours</td> </tr> </table> AMP Spec. 109-5202 Fig. 8	Vibration Direction	Up and Down	Back and Forth	Right and Left	Duration	4 Hours	2 Hours	2 Hours
Vibration Direction	Up and Down	Back and Forth	Right and Left								
Duration	4 Hours	2 Hours	2 Hours								
3.5.10	Contact Mating Force	2.0~7.8 N (0.2~0.8 kgf)	Operation Speed : 20~200 mm / min. Measure the force required to mate contact. AMP Spec. 109-5206								
3.5.11	Contact Unmating Force	1.5~7.8 N (0.15~0.8 kgf)	Operation Speed : 20~200 mm / min. Measure the force required to mate contact. AMP Spec. 109-5206								
3.5.12	Connector Mating Force	21 Pos. (Au Plating) : 78.5 N (8 kgf) Max. 21 Pos. (Tin-Lead Plating) : 127.5 N (13 kgf) Max.	Operation Speed : 20~200 mm / min. Measure the force required to mate connectors. AMP Spec. 109-5206								
3.5.13	Connector Unmating Force	21 Pos. (Au Plating) : 78.5 N (8 kgf) Max. 21 Pos. (Tin-Lead Plating) : 127.5 N (13 kgf) Max.	Operation Speed : 20~200 mm / min. Measure the force required to unmate connectors. AMP Spec. 109-5206								
3.5.14	Connector Locking Strength	98 N (10 kgf) Min.	Measure connector locking strength. Operation Speed : 20~200 mm / min. AMP Spec. 109-5210								
3.5.15	Contact Insertion Force	9.8 N (1 kgf) Max. per contact	Measure the force required to insert contact into housing. AMP Spec. 109-5211								

Fig.2 (to be continued)

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NUMBER: 108-5405 SECURITY CLASSIFICATION: Customer Release	Para.	Test Items	Requirements				Procedures
	3.5.16	Contact Retention Force (Pre-Lock)	49 (5 kgf) Min.				Apply an axial pull-off load to crimped wire. Operation Speed : 20~200 mm/ min. AMP Spec. 109-5212
	3.5.17	Contact Retention Force (Secondary Lock)	78 N (8.0 kgf) Min.				Measure contact retention force with secondary lock set it effect. Operation Speed : 20~200 mm/ min.
	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 : 20~200 mm/ min. AMP Spec. 109-5205
			mm ²	(AWG)	N	(kgf)	
			0.3	22	59	6	
	0.5	20	78	8			
3.5.19	Resistance to "Kojiri"	10 mΩ Max. (Final)				Direction : Back & Forth Right & Left Force 78 [N] (8 kgf) Cycles 10 cycles AMP Spec. 109-5215	
3.5.20	Solderability	Wet Solder Coverage : 95 % Min.				Solder Temperature : 230 ± 5 °C Immersion Duration : 3 ± 0.5 seconds Flux : Alpha 100 AMP Spec. 109-5203	
3.5.21	Handling Ergonomics	No abnormalities allowed in manual mating / unmating handling.				Manually operated	
Environmental Requirements							
3.5.22	Thermal Shock	10 mΩ Max. (Final)				- 30 °C/ 120 min., 80 °C/ 120 min. Making this a cycle, repeat 5 cycles. AMP Spec. 109-5103 Condition	
3.5.23	Humidity, Steady State	Insulation resistance (Final) 100 MΩ Min. Termination resistance 10 mΩ Max. (Final)				Mated Connector, 90~95 % R. H. 60 °C 96 hours AMP Spec. 109-5105 Fig. 9	

Fig.2 (to be continued)

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Para.	Test Items	Requirements	Procedures
3.5.24	Industrial Gas (SO ₂)	10 mΩ Max. (Final)	SO ₂ Gas : 10 ppm, 95 % R. H. 20 °C, 24 hours AMP Spec. 109-5107 Condition
3.5.25	Temperature Life (Heat Aging)	10 mΩ Max. (Final)	120 °C, Duration : 5 days AMP Spec. 109-5104-
3.5.26	Resistance to Cold	10 mΩ Max. (Final)	- 40 °C ± 5 °C, 120 hours AMP Spec. 109-5108-
3.5.27	Dust Bombardment	10 mΩ Max. (Final)	Subject JIS R 5210 cement blow of 14.7 N (1.5 kgf) per 10 seconds in 15 minutes intervals for 90 minutes. AMP Spec. 109-5110
3.5.28	Compound Environment		Test by fig condition Fig. 10

Fig.2 (end)

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Product Qualification Test Sequence

Test or Examination	Test Group (a)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Confirmation of Product	1												
Contact Mating Force		1											
Contact Unmating Force			1										
Crimp Tensile Strength				1									
Contact Retention Force					1								
Contact Retention Force (Double Lock)						1							
Handing Ergonomics							1						
Connector Mating Force								1					
Connector Unmating Force									1				
Housing Locking Strength										1			
Contact Insertion Force											1		
Termination Resistance (Low Level)												1	
Termination Resistance (Rated Current)													1
Temperature Rising													
Over Current Loading													
Insulation Resistance													
Dielectric Strength													
Resistance to "Kojiri"													
Solderability													
Vibration													
Current Cycle													
Resistance to Thermal													
Resistance to Cold													
Thermal Shock													
Dust Bombardment													
Resistance to Humidity													

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

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Test or Examination	Test Group (a)												
	14	15	16	17	18	19	20	21	22	23	24	25	26
	Test Sequence												
Confirmation of Product													
Contact Mating Force													
Contact Unmating Force													
Crimp Tensile Strength													
Contact Retention Force													
Contact Retention Force (Double Lock)													
Handing Ergonomics													
Connector Mating Force													
Connector Unmating Force													
Housing Locking Strength													
Contact Insertion Force													
Termination Resistance (Low Level)		1, 4			1, 3		1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3
Termination Resistance (Rated Current)		2, 5											
Temperature Rising	1							4					
Over Current Loading		3											
Insulation Resistance			1										
Dielectric Strength				1									
Resistance to "Kojiri"					2								
Solderability						1							
Vibration							2						
Current Cycle								2					
Resistance to Thermal									2				
Resistance to Cold										2			
Thermal Shock											2		
Dust Bombardment												2	
Resistance to Humidity													2

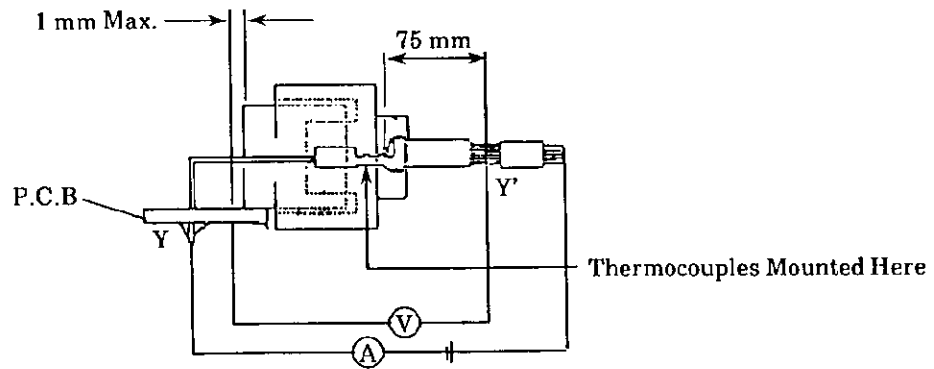
(a) Numbers indicate the sequence in which the tests are performed.

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From the measured readings, deduct resistance of the 150 mm long wire used for termination. When testing rated current measurement, apply 12 V DC, 1 A to the circuit. For obtaining uniformity of the current density on the probing points Y-Y', apply soldering on the probing points prior to testing.

Fig. 3 Measurement of Termination Resistance

Wire Size (mm ²)	I _{max} (A)
0.3	8
0.5	11

Fig. 4

- ① I₁ = I_{max} × K_d ... Current applied to all positions.
- ② I₂ = I_{max} ... Current applied to every other positions in multiple connector.

Pos.	K _d (XXXX)
21	0.4

Fig. 5

Wire Size (mm ²)	Test Method I		Test Method II	
	Test Current (A)	Duration (Minutes)	Test Current (A)	Duration (Minutes)
0.3	16	5 min.	50	5 sec.
0.5	25		85	

Fig. 6

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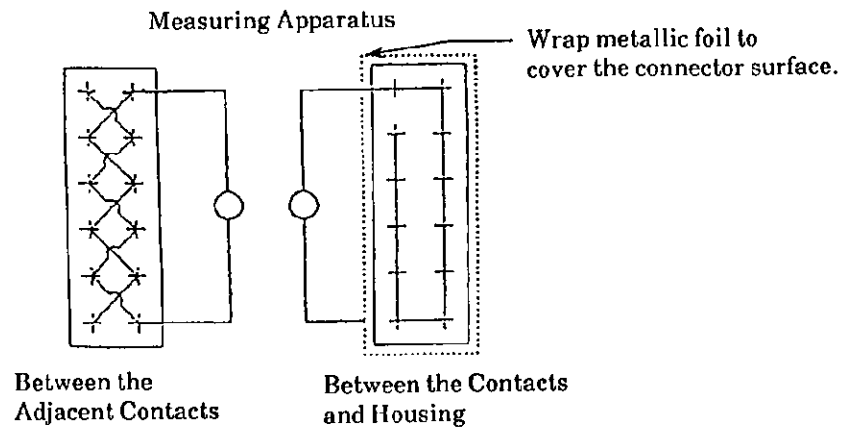


Fig. 7

Current Condition

	Open Circuit Voltage	Current	Electrical discontinuity
I	12 V	1 A	1 ms Min.
II	1 V Max.	10 ± 0.5 mA	1 ms Min.

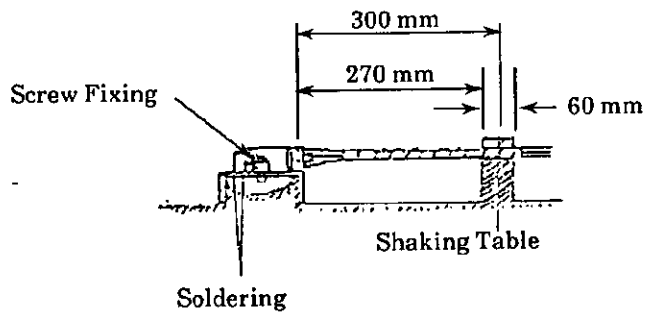


Fig. 8

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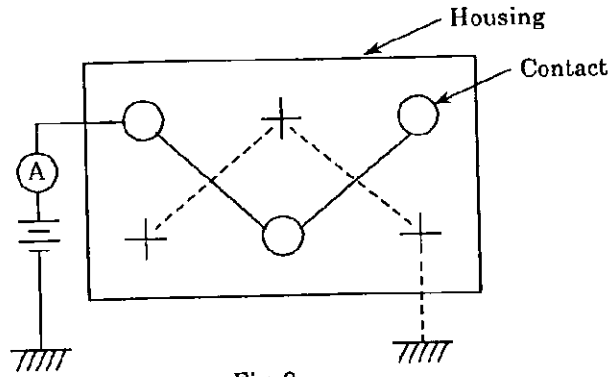
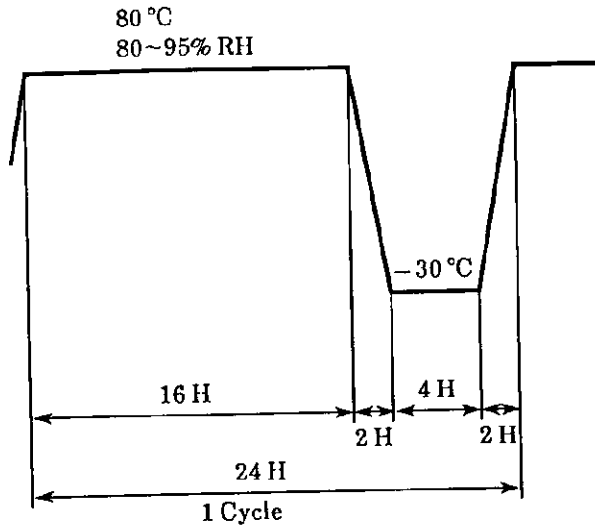


Fig. 9



Room Temperature } $80 \pm 3^\circ\text{C}$ 80~95% RH $-30 \pm 3^\circ\text{C}$
 Humidity
 Vibration 3.5.9 Vibration

Current

Open circuit Voltage	Current	Electrical Discontinuity
12 V	1 A	1 ms Min.

Time

300 Hours (Up and Down, Back and Forth, Right and Left : 100 Hours)

Fig. 10

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

Appendix 1

Prod. P/N	Description
177741	.040 II Air Bag I/O Connector 21 Pos. Cap Housing Assy
177746	.040 II Air Bag I/O Connector 21 Pos. Plug Housing Assy
175266	.040 II S Receptacle Contact (Selective Gold)
177747	.040 II MS Receptacle Contact (Selective Gold)
175265	.040 II S Receptacle Contact (Pre-Tin)

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