



108-5402

NUMBER:

Customer Release

SECURITY CLASSIFICATION:

3. Requirements :

3.1 Design and Construction :

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

3.2 Materials :

A. Contact :

a. Tab Contact : Pre-tinned Brass, or plain Brass strip with Selective Gold-Plating over Nickel Underplate all over.

b. Receptacle Contact : Pre-tinned Brass or Pre-tinned phosphor bronze, or plain brass with selective Gold plating over nickel underplating or plain phosphor bronze with selective gold plating over nickel under plating.

B. Housing :

a. Plug Housing PBT

b. Cap Housing PBT

c. Double Lock Plate PBT

d. Tine Plate PBT

C. Others :

a. Wire Cover PP

b. M6 Bolt Carbon Steel

c. Bolt Case PBT

d. Indicator Pin PBT

e. Bolt Stopper Plate : Stainless Steel

f. Nut : Carbon Steel

3.3 Ratings :

A. Voltage Rating : 13 VAC

B. Current Rating : .040 1A, .070 5A, allowable current to be applied.

C. Temperature Rating : - 30 °C to 105 °C

SHEET 2 OF 9	<b>AMP</b> AMP (Japan), Ltd. Kawasaki, Japan			REV. <b>B</b>
	LOC	LOC	NO. <b>108-5402</b>	
NAME <b>Impul-Mate Connector</b>				

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## 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 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)	.040 10 m $\Omega$ Max. (Initial) 20 m $\Omega$ Max (Final) .070 3 m $\Omega$ Max (Initial) 10 m $\Omega$ Max (Final)	Subject mated contacts assembled in housing to closed circuit current of 10 mA Max. at open circuit voltage of 20 mV Max. Fig. 3. AMP Spec. 109-5311-1
3.5.3	Dielectric Strength	No creeping discharge nor flashover shall occur. Current leakage : ___ mA Max.	1 kVAC for 1 minute. Test between adjacent circuits of mated connectors.
3.5.4	Insulation Resistance	.040 .070 100 M $\Omega$ Min.	Impressed voltage 500 V DC. Test between adjacent circuits of mated connectors. Fig. 4
3.5.5	Current Leakage	10 $\mu$ A (Initial) 1 mA Max. (Final)	13 V DC impressed. After exposure in test chamber in 60 $\pm$ 5 $^{\circ}$ C, 90~95% RH. for 1 hour, measure current leakage.

Fig. 2 (CONT)

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SECURITY CLASSIFICATION: Customer Release NUMBER: 108-5402	Para.	Test Items	Requirements	Procedures												
	3.5.6	Temperature Rising	.040-25 °C (Initial) .070-35 °C Max. under loaded (Initial) specified current.	After having a half number of the contacts series-wired, apply the specified current to the connector in the draft-free test chamber and after reaching the stabilized temperature, measure the temperature of the wire crimp of the contact. .040-1 A .070-5 A												
	3.5.7	Fuse Matting	Fusion of the housing or ignition of the connector must not occur.	Atmosphere temperature 60 °C After having a half number of contacts series-wired apply the test current "α" for 24 hours, then apply current "β" for 1 hour. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>current α</th> <th>current β</th> <th>wire size</th> </tr> </thead> <tbody> <tr> <td>.040</td> <td>11 A</td> <td>14 A</td> <td>0.5 mm<sup>2</sup></td> </tr> <tr> <td>.070</td> <td>22 A</td> <td>27 A</td> <td>1.25 mm<sup>2</sup></td> </tr> </tbody> </table>		current α	current β	wire size	.040	11 A	14 A	0.5 mm <sup>2</sup>	.070	22 A	27 A	1.25 mm <sup>2</sup>
		current α	current β	wire size												
.040	11 A	14 A	0.5 mm <sup>2</sup>													
.070	22 A	27 A	1.25 mm <sup>2</sup>													
3.5.8	Current Cycling	Termination Resistance (Low Level) .040 20 mΩ Max. (Final) .070 10 mΩ Max. (Final) No ignition is allowed during the test.	After having a half number of contacts series-wired apply the following test current for 45 minutes and deenergize for 15 minutes. in ambient. Temperature of 70 °C, making this a cycle, repeat for 300 cycles.													
3.5.9	Lash Current	Termination Resistance (Low Level) .040 30 mΩ Max. (Final) .070 10 mΩ Max. (Final) Temperature Rising : .040 30 °C Max. (Final) .070 40 °C Max. (Final)	Apply test potential of 13 V in 60 °C ambient atmosphere. 1) Repeat 1,000 cycles of overload current, each cycle consisting of: 200% rated current 1 minute ON, 9 minutes OFF. 2) Repeat 1,000 cycles of overload current, each cycle consisting of: 500% rated current 10 seconds ON, 590 seconds OFF. The test modes (1) and (2) shall be performed independently.													

Fig. 2 (CONT)

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NUMBER: 108-5402	Para.		Test Items		Requirements		Procedures	
	3.5.10	Insertion / Extraction Current Cycling		Termination Resistance (Low Level) .040 20 mΩ Max (Final) .070 10 mΩ Max. (Final) Temperature Rising : .040 30 °C Max. (Final) .070 40 °C Max. (Final)		After applying repeated mating unmating preconditioning per Para. 3.5.15, apply current cycling test per Para. 3.5.8.		
<b>Physical Requirements</b>								
SECURITY CLASSIFICATION: CUSTOMER Release	3.5.11	Vibration (High Frequency)		No electrical discontinuity greater than 10 μsec. shall occur. .040 20 mΩ Max. (Final) .070 10 mΩ Max. (Final)		Vibration Frequency : 10~50 Hz / 8 min. Accelerated Velocity : 66.6 m / s <sup>2</sup> (6.8 G) Vibration Direction : X. Y. Z Duration : 8 hours each X 2 hours Y 4 hours Z 2 hours		
	3.5.12	Contact Retention Force		39.2 N (4 kgf) Min. (Plug) 19.6 N (2 kgf) Min. (Cap)		Apply an axial pull-off to crimped wire. Operation Speed : 200 mm / min. AMP Spec 109-5212		
3.5.13	Contact Retention Force (Secondary Lock)		98 N (10 kgf) Min.		Measure contact retention force with secondary lock set it effect. Operation Speed : 200 mm / min.			
3.5.14	Crimp Tensile Strength		Wire size    Tensile Strength		Apply an axial pull-off load to crimped wire of contact secured on the tester, Operation Speed : 200 mm / min. Amp. Spec. 109-5205 Condition			
			mm <sup>2</sup>	(AWG)	N	(kgf)		
			0.3	#22	58.8	6		
			0.5	#20	88.2	9		
			0.85	#18	127.4	13		
			1.25	#16	166.6	17		
			2	#14	245	25		
3.5.15	Durability (Repeated Mate / Unmating)		.040 20 mΩ max. (Final) .070 10 mΩ Max. (Final) Temperature Rising : .040 30 °C (Max.) .070 40 °C (Max.)		No. of Cycles : 50 cycles. AMP Spec. 109-5213			

Fig. 2 (CONT)

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NUMBER : 108-5402  SECURITY CLASSIFICATION : Customer Release	Para.	Test Items	Requirements	Procedures
	3.5.16	Contact engaging and separating force.	.040 0.98~5.88 N (0.1~0.6 kgf)Initial 0.69~5.88 N (0.07~0.6 kgf)Final .070 0.98 N (0.1 kgf Min.) Initial 0.98 N (0.1 kgf Min.) Final	Measure the force required to insert male contact into female contact to the designated depth. Them, unmate. Head operating speed : 20 mm a minute Measure initially and after durability test conditioning.
	3.5.17	Bolt Tightening Torque :	4.9 N · m (50 kgf cm) Max.	After setting contact in preparatory position to mate, measure the maximum titening torque to have the pair of contacts to be fully mated as designated.
	3.5.18	Bolt Break-off Tensile Strength :	12.7~17.6 N · m 130~180 kgf · cm	Measure the force at which the bolt is broken off when tested by applying torque force.
	3.5.19	"Kojiri"	After mated by tightening the bolt, connector shall show normal mechanical / electrical functions.	Subject assembled plug connector to repeated Kojiri motions of 80 N as shown in Fig. 6 to travel mating by tightening the bolt with the rotating torque of 9.8 N.m.
<b>Environmental Performance</b>				
3.5.20	Temperature Life	Termination Resistance (Low Level) .040 20 mΩ Max. (Final) .070 10 mΩ max. (Final) Temperature Rising : .040 30 °C Max. (Final) .070 40 °C Max. (Final)	Subject mated connectors to exposure under elevated temperature at 100 °C for 120 hours.	
3.5.21	Humidity Steady State	Termination Resistance (Low Level) .040 20 mΩ Max. (Final) .070 10 mΩ max. (Final) Current Leakage : 1 mA Max. (Final)	Subject mated connectors to exposure under elevated temperature at 60 °C with 90% relative humidity for 1 hour with the connector in vehicle-equipped condition.	

Fig. 2 (END)

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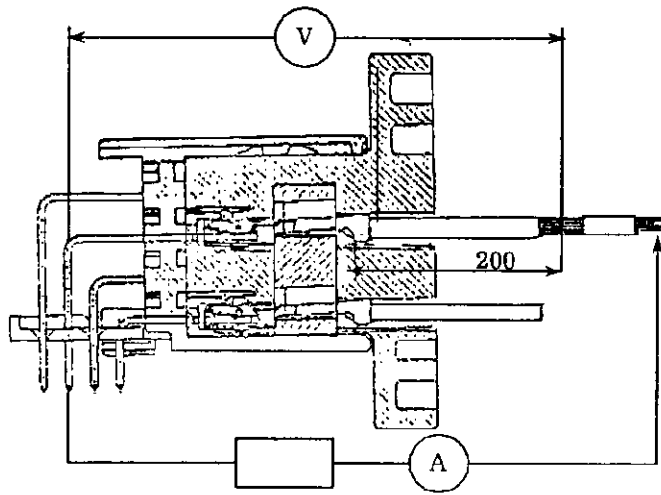


Fig. 3

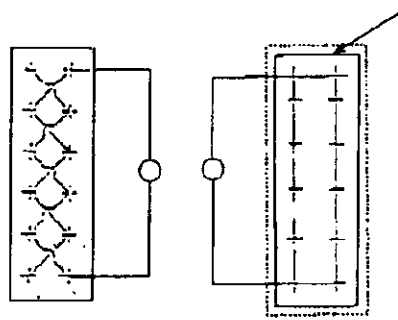


Fig. 4

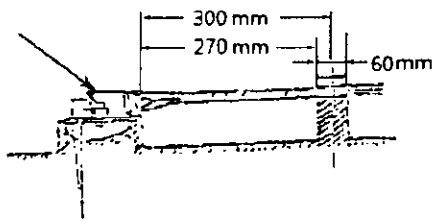


Fig. 5

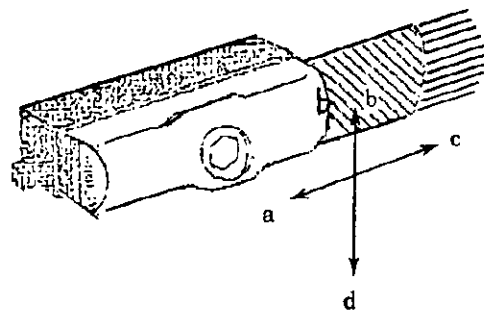


Fig. 6

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2. Product Qualification Test Sequence

Test or Examination	Test Group															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Test Sequence (a)															
Examination of Product	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Termination Resistance (Low Level)	2					2, 4 6	2, 5	2, 4							2, 5	2, 5
Dielectric Strength Voltage		2														
Insulation Resistance			2													
Current Leakage				2												4
Temperature Rise Vs. Current	3					7	4								4	
Fuse Matting					2											
Current Cycling						5										
Over Current Loading							3									
Vibration (High Frequency)								3								
Contact Unmating											2					
Contact Retention Force									2							
Contact Retention Force (Secondary lock)										2						
Crimp Tensile Strength																
Durability (Repeated Mate / Unmating)						3										
Bolt Tightening Torque												2				
Bolt Torque Tensile Strength													2			
"Kojiri"														2		
Temperature Life															3	
Humidity, Steady State																3

- (a) Discontinuities shall not take place in this test group, during tests.
- (b) Numbers indicate sequence in which tests are performed.

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

## Appendix 1

Prod. P/N	Description
175265	.040 II Series "S" Receptacle Contact Pre-Tinned
175266	.040 II Series "S" Receptacle Contact Selective Gold
175268	.070 II Series "S" Receptacle Contact Pre-Tinned
175275	.070 II Series "S" Receptacle Contact Selective Gold
175269	.070 II Series "M" Receptacle Contact Pre-Tinned
175276	.070 II Series "M" Receptacle Contact Selective Gold
177654	.070 II Series "ML" Receptacle Contact Pre-Tinned
178078	88 Pos. Cap Housing Ass'y
178079	104 Pos. Cap Housing Ass'y
178080	88 Pos. Plug Housing Ass'y
178081	104 Pos. Plug Housing Ass'y
177653	Bolt Case Ass'y
178072	Wire Cover For 88 Pos.
178073	Wire Cover For 106 Pos.
174831	48 Pos. Cap Housing Ass'y
174836	64 Pos. Cap Housing Ass'y
174385	76 Pos. Cap Housing Ass'y
917940	120 Pos. Cap Housing Ass'y
177698	48 Pos. Plug Housing Ass'y
177699	64 Pos. Plug Housing Ass'y
177700	76 Pos. Plug Housing Ass'y
917937	120 Pos. Plug Housing Ass'y
177688	Wire Cover For 48 Pos.
177694	Wire Cover For 64 Pos.
177697	Wire Cover For 76 Pos.
917943	Wire Cover For 120 Pos.

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