

108-5158

Product Specification
3-Pos. Positive Lock Triac Connector

NUMBER 1 3158

Customer Release
AMP SECURITY CLASSIFICATION

1. Scope:

This specification covers product performance requirements and test methods for AMP 3-Position, Positive Lock Triac Connectors.

2. Product Part Numbers and Descriptions:

The products of the following part numbers shall be covered under this specification.

Part Number	Descriptions
170324-X	187 Series, Positive Lock Receptacle Contact
170325-X	" " "
170326-X	" " "
170327-X	250 Series, Positive Lock Receptacle Contact
170328-X	" " "
170329-X	" " "
172410-X	3-Position, Positive Lock Triac Connector Housing

3. Definitions of Terms:

For the purpose of this product specification, the following definitions shall apply.

3.1 Contact:

A contact is an electrically conductive, metallic component member of connector used to form single or multi circuit termination.

3.2 Housing:

A housing is an electrically insulating, plastic block component to encapsulate contacts within its contact cavities.

3.3 Connector Assembly:

A connector assembly is an assembly of a housing and contacts, which are properly crimped and encapsulated in connector housing.

4. Materials:

4.1 Contact:

Contact is made of pretinned brass.

4.2 Housing:

Housing is made of molded 6/6 Nylon resin, conforming to UL 94V-2.

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4.3 Mating Tab Contact Prepared by Customers:

Mating tab contacts prepared by customers are made of 70% copper, 30% zinc, brass, conforming to C2600P-1/2H of JIS H 3100, with or without tin-plating.

5. Product Design Feature, Construction and Dimensions:

5.1 Product design feature, construction and dimensions shall be conforming to applicable customer product drawing(s). Receptacle contact has a locking mechanism with which it can retain secure mating with counterpart tab contact after being encapsulated in connector housing cavity. To release locking condition of mated connector, separating it by pulling connector housing is just enough to achieve. Locking mechanism has a function to be unlocked when pulled by connector housing.

5.2 Housing:

Product design feature, construction and dimensions shall be conforming to applicable customer product drawing(s). Housing is featured with small locking detents in the cavity that fit on between the contact rollings and securely lock contacts in the cavity.

6. Application Requirements:

6.1 Wire Range:

The wires of the following ranges shall be used for terminating contacts.

Wire \ Part Number	170324-X	170325-X	170326-X
Wire Size (mm ²)	0.22 - 0.53	0.51 - 1.38	0.76 - 2.09
Insulation Diameter (mm)	1.5 - 2.7	1.9 - 3.4	2.2 - 3.4
Wire \ Part Number	170327-X	170328-X	170329-X
Wire Size (mm ²)	0.31 - 0.89	0.76 - 2.09	1.75 - 5.4
Insulation Diameter (mm)	1.5 - 3.1	2.2 - 3.4	3.0 - 5.1

6.2 Temperature Rating:


Temperature rating of the product is within the range of -40°C and +105°C.

7. Performance Requirements and Test Methods:

7.1 Summary of Performance Requirements and Test Methods:

Test Item (Paragraph Number)	Specified Requirements	Test Methods
Appearance Confirmation of Products (Para. 7.1.1)	The products shall show no evidence of cracks, breakage, damage, rattling of parts, loose of parts, rust and fusion that are defective and detrimental to connector functions.	Visually and tactually inspect the appearance of product in accordance with AMP inspection plan applicable to the products.

Table 3 (To Be Continued)

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7.1 Summary of Performance Requirements and Test Methods (Continued):

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Test Items (Paragraph Number)	Specified Requirements		Test Methods
Crimp Tensile Strength (Para. 7.1.2)	Wire	Size	Tensile Strength
	mm ²	(AWG)	(kg) (Min.)
	0.2	#24	2.0
	0.3	#22	5.0
	0.5	#20	8.0
	0.75	#18	12.0
	1.25	#16	21.0
	2.0	#14	25.0
3.0	#12	42.0	
5.0	#10	50.0	Prepare samples by crimping on the wire specified in Table 6. Fasten the sample on the head of tensile testing machine, and apply an axial pull-off load to the sample by operating the head to travel with the speed at a rate of 100mm a minute, and measure the force required to pull-off the wire from the wire crimp. For this test, insulation crimp is omitted.
Contact Retention Force (Para. 7.1.3)	5.0 kg minimum for 187 series and 7.0 kg minimum for 250 series.		A sample connector assembly loaded with the wire-crimped contacts is fastened on the head of tensile testing machine, and apply an axial pull-off load to the crimped wire, and measure the force required to dislodge the contact from the loaded connector position. For this test, the wires greater than 0.75mm ² , (#18 AWG) shall be used.
Contact Locking Strength (Para. 7.1.4)	6.0 kg minimum (initial) "187" Series		A sample connector which is loaded with contacts crimped on approximately 100mm long, 1.25mm ² or greater size wires is mated with counterpart tab contacts with locking mechanism set in effect. Such assembled sample is tested by securing tab side on tensile testing machine and apply an axial pull-off load to the crimped wire by operating the head to travel with the speed at a rate of 100mm a minute, and measure the force required to disengage or to break the locking mechanism.
	5.0 kg minimum (final) "187" Series		
Connector Insertion and Extraction Force (Para. 7.1.5)	Insertion Force 8.0 kg maximum		Connector insertion/extraction force is tested by using tensile testing machine. The sample connector and tab assembly are secured respectively on the machine so that they are made to mate and to unmate as the head is operated at a rate of 100 mm a minute. For the extraction force test, the locking mechanism is not set in effect.
	Extraction Force 3.0 kg minimum		

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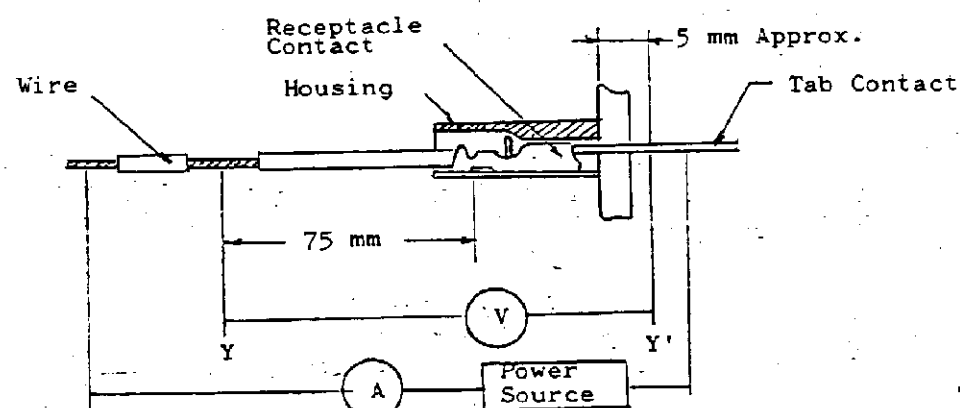
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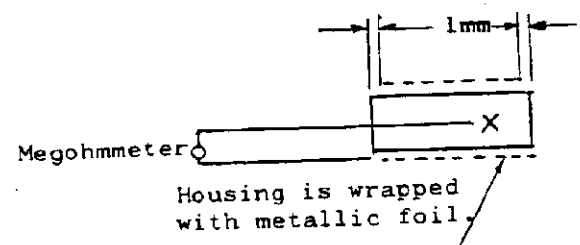
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7.1 Summary of Performance Requirements and Test Methods (Continued):

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Test Item (Paragraph Number)	Specified Requirements	Test Methods
Termination Resistance (Para. 7.1.6)	3.0 mΩ maximum: (Initial) 6.0 mΩ maximum: (Final)	Contact-loaded and mated connector is tested by applying test current of 1A (DC) through the test circuit in Fig. 1, and after temperature rising becomes stabilized, measure the millivolt drop between the probing points 75mm next to the wire crimp. Termination resistance is calculated after the resistance of 75mm long wire used for termination.  <p style="text-align: center;">Fig. 1</p>

Insulation Resistance (Para. 7.1.7)	1,000MΩ minimum	Insulation resistance is measured in accordance with Test Condition B (500V DC $\pm 10\%$), Test Method 302 of MIL-STD-202, by applying test potential between the adjacent contacts and between the contacts and ground. Insulation megohmmeter is used for measurement.  <p style="text-align: center;">Fig. 2</p>
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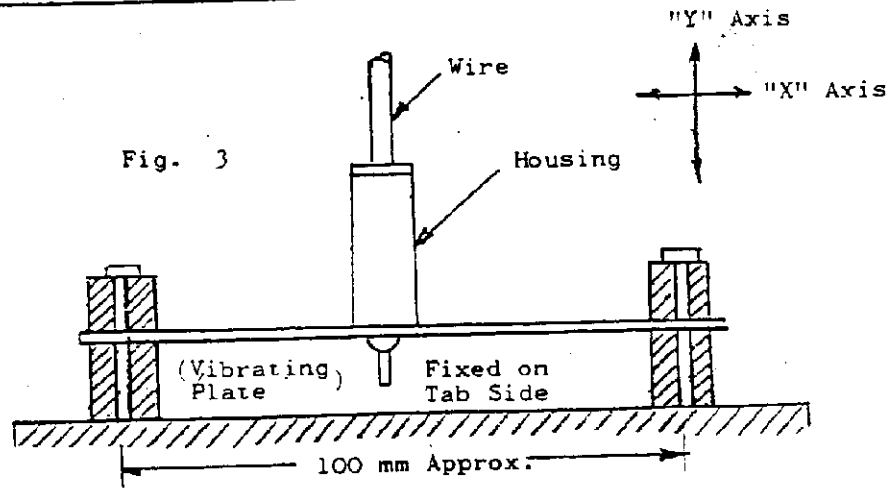
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7.1 Summary of Performance Requirements and Test Methods (Continued):

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Test Item (Paragraph Number)	Specified Requirements	Test Methods
Dielectric Strength (Para. 7.1.8)	No abnormalities shall be present after applying test potential of 2,000V AC for 1 minute.	Dielectric strength is measured in accordance with Test Method 301 of MIL-STD-202 by applying test potential of 2,000V AC (RMS) between the points as shown in Fig. 2, and observe if insulation breakdown or flashover takes place during the loaded test duration for 1 minute.
Temperature Rising (Para. 7.1.9)	30°C maximum	Contact-loaded and mated connector is tested by applying test current shown in Table 6. Measurement is done by using thermocouple attached to wire crimp, after temperature rising of connector becomes stabilized.
Low Frequency Vibration (Para. 7.1.10)	No electrical discontinuity greater than 1 microsecond shall take place during vibration. Termination resistance after the test conditioning, shall be 6mΩ maximum.	Low frequency vibration test is performed in accordance with Test Method 202 of MIL-STD-202 by applying test vibration by the vibration testing machine arranged as shown in Fig. 3, where contact-loaded and wired connector is fastened on the vibration table which is operated to produce the following test conditions: Frequency: 10-55-10Hz. to reciprocate one cycle a minute; Amplitude: 1.5mm both sides, Duration: 2 hours each for "X" and "Y" axes.




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7.1 Summary of Performance Requirements and Test Methods (Continued):

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Test Item (Paragraph Number)	Specified Requirements	Test Methods										
Humidity (Para. 7.1.11)	Termination Resistance: 6.0mΩ max. Insulation Resistance: 100MΩ min. Dielectric Strength: No abnormalities such as insulation breakdown and flashover shall take place at 2,000V AC for 1 minute.	Humidity test is performed in accordance with Test Method 106 of MIL-STD-202 by exposing mated connector under the humidity atmosphere of 90-95% at 40°C for 96 hours in the test chamber. After test conditioning, connector shall be tested for termination resistance, insulation resistance and dielectric strength.										
Thermal Shock (Para. 7.1.12)	Termination Resistance: 6mΩ max.	Thermal shock is tested in accordance with Test Condition "A", Test Method 107 of MIL-STD-202, by exposing under the specified cycle of heat/cold temperature conditioning. After conditioning, termination resistance shall be measured. <table border="1" data-bbox="966 917 1528 1139"> <thead> <tr> <th>No.</th> <th>Test Condition</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>105 ±5°C for 30 minutes</td> </tr> <tr> <td>2</td> <td>Room Temperature for 5 minutes</td> </tr> <tr> <td>3</td> <td>-40 ±5°C, for 30 minutes</td> </tr> <tr> <td>4</td> <td>Room Temperature for 5 minutes</td> </tr> </tbody> </table>	No.	Test Condition	1	105 ±5°C for 30 minutes	2	Room Temperature for 5 minutes	3	-40 ±5°C, for 30 minutes	4	Room Temperature for 5 minutes
No.	Test Condition											
1	105 ±5°C for 30 minutes											
2	Room Temperature for 5 minutes											
3	-40 ±5°C, for 30 minutes											
4	Room Temperature for 5 minutes											
(Para. 7.1.13)	Termination Resistance: 6mΩ max.	Salt spray test is performed in accordance with Test Method 101 of MIL-STD-202 by exposing under the salt spray of 5% concentration for 96 hours. After exposure, termination resistance, and contact locking strength shall be measured.										


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7.2 Test Sequence:

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Test Item	Group	Para-graph Number	Test Sequence													
			I	II	III	IV	V		VI							
Appearance Confirmation of Product		7.1.1						1		1						
Crimp Tensile Strength		7.1.2	I													
Contact Retention Force		7.1.3		1												
Contact Locking Strength		7.1.4			1											
Connector Insertion Force		7.1.5						2								
Connector Extraction Force		7.1.5						3								
Termination Resistance		7.1.6								2	4	6	8	10		
Insulation Resistance		7.1.7						4	7							
Dielectric Strength		7.1.8						5	8							
Temperature Rising		7.1.9														
Vibration, Low Frequency		7.1.10								3						
Humidity		7.1.11						6			5					
Thermal Shock		7.1.12											7			
Salt Spray		7.1.13													9	

Table 4

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8. Quality Assurance Provisions:

8.1 Test Conditions:

Unless otherwise specified, all the tests shall be performed under any combination of the following test conditions.

Temperature	15 - - 35°C
Relative Humidity	45 - 75%
Atmospheric Pressure	650 - 800mmHg

8.2 Tests:

8.2.1 Test Specimens:

Samples to be employed for the tests shall be conforming to the applicable drawing(s), and prepared in accordance with AMP Application Specifications 114-5041 for 187 Series Positive Lock Receptacle, crimping of, and 114-5042 for 250 Series Positive Lock Receptacle, crimping of, by using wires specified in Table 6. Unless otherwise specified, no sample shall be reused.

8.2.2 Number of Specimens:


The number of specimens used for performance evaluation testing shall be more than 10 pieces per each specified sample group.

8.2.3 Applicable Wires and Test Current Intensity:

The wires of the following sizes and combination shall be used for termination, and the test current intensity shall be applied for testing thereof.

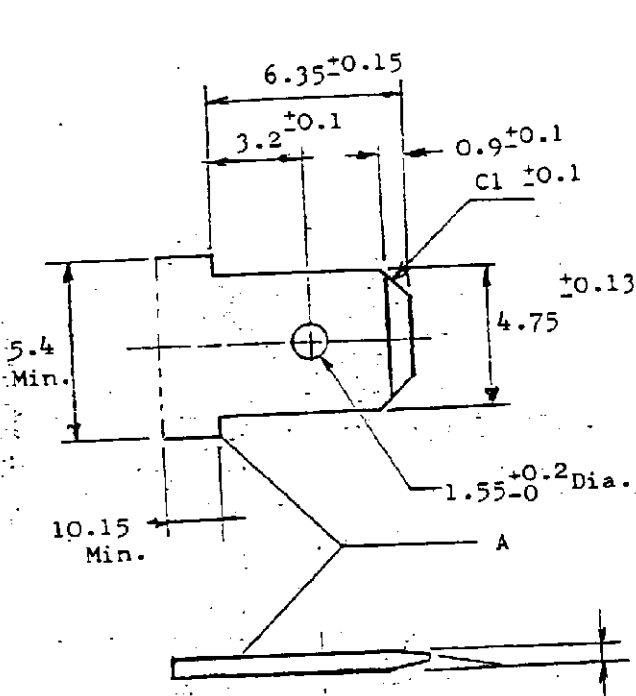
Wire mm ²	Size (AWG)	Wire Strand Composition			Specification of Wire	Test Current (A)	
		Calculated Cross Sectional Area	Number of Strands	(mm) Diameter			Insulation Diameter(mm)
0.2	(#24)	0.22mm ²	11	/ 0.16	1.5	UL - 1007	2.5
0.3	(#22)	0.31mm ²	12	/ 0.18	1.5	JCS - 246	3.0
0.5	(#20)	0.51mm ²	20	/ 0.18	2.2	JIS C 3406	5.0
0.75	(#18)	0.76mm ²	30	/ 0.18	2.8	JIS C 3316	7.0
1.25	(#16)	1.27mm ²	50	/ 0.18	3.1	JIS C 3316	12.0
2.0	(#14)	1.96mm ²	37	/ 0.26	3.4	JIS C 3316	15.0
3.0	(#12)	3.3mm ²	41	/ 0.32	4.1	JIS C 3406	20.0
5.0	(#10)	5.22mm ²	65	/ 0.32	4.6	JIS C 3406	25.0

Table 6

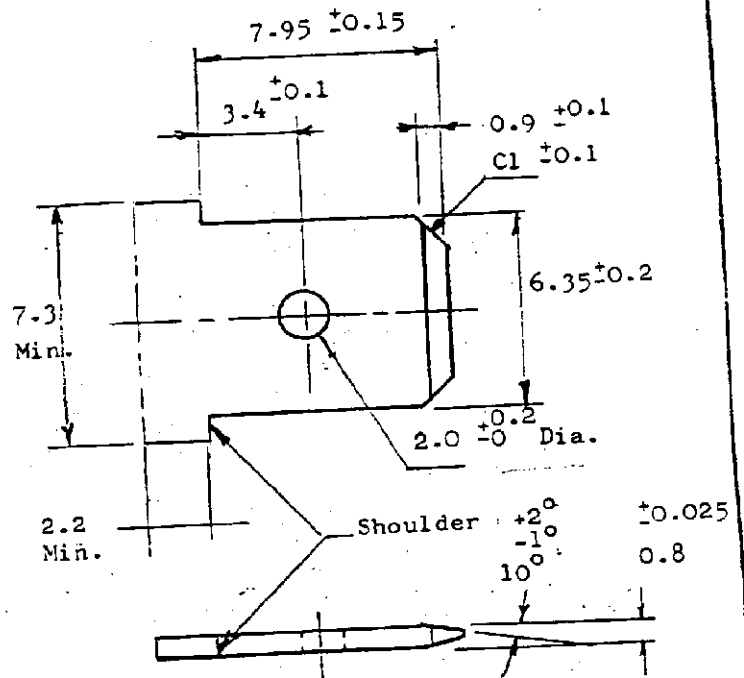
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8.2.4 Applicable Mating Tab Design:

Applicable mating tab shall be fabricated in accordance with the construction and dimensions shown in Fig. 4.



"187" Series Tab



"250" Series Tab

- (Note:)
1. Material of tab shall be 70% copper, 30% zinc, brass, conforming to C2600P-1/2H, of JIS H 3100.
 2. Tab contact shall be of plain brass.
 3. These tab designs are for fabricating tab contact for evaluation testing of receptacle contact. Refer to the following customer drawing for fabricating tab contact for production purposes.
- C81-25004: 3-Pos. Tab for Triac Application.

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