

108-5174

Product Specification

AMPMODU MOD II, Housing Lock Connector

1. Scope:

This specification covers requirements for product performance and test methods of AMPMODU MOD II, housing lock connectors. The subject connector is a wire-to-board connector assembly, consisting of 2.54mm pitch, post header and receptacle housing, manufactured by AMP-Italy and female contacts.

2. Applicable Documents

The following documents form part of this specification to the extent specified herein.

- a. MIL-STD-202 Test Methods for Electronic and Electric Component Parts 114-5076 AMP Application Specification, Crimping of AMPMODU MOD II Receptacle Contacts

3. Material, Finish and Appearance:

3.1 Receptacle Contacts:

- a. Material: Phosphor Bronze
- b. Finish: 0.38µm min. gold-plating on contact area only, over 0.8µm min. nickel under-plate

3.2 Post Header:

3.2.1 Support Housing:

- a. Material: 10% Glass-filled Poly-buthylene Terephthalate (PBT)
- b. Color: Black
- c. Flammability Grade: UL94V-0

3.2.2 Post:

- a. Material: Brass
- b. Finish: 0.76µm min. thick gold-plating for contact area only and 0.38µm min. thick gold over 1.3µm min. nickel plating, and gold flash all over other area

3.3 Receptacle Housing:

- a. Material: Modified Polyphenylene Oxide (PPO), NORYL
- b. Color: Black
- c. Flammability Grade: UL94V-1

4. Product design feature, construction and dimensions

Product design feature, construction and dimensions shall be conforming to the applicable product drawing(s).


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		CHK	<i>[Signature]</i> 8-17-84			TOKYO, JAPAN		
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					J	A	108-5174	A1
A1	Revised RFA-1481	<i>[Signature]</i> 7-19-84		NAME Product Specification				
A	Revised per RFA-644	<i>[Signature]</i> 8-17-84		AMPMODU MOD II, Housing Lock Connector				
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5. Performance:

5.1 Rating:


- 5.1.1 Voltage Rating: 50V AC
- 5.1.2 Current Rating: 3 A max. per Contact (#22 AWG)
- 5.1.3 Temperature Rating: -40°C --- +85°C, (Operating temperature rising inclusive)
- 5.1.4 Applicable Wire Size: (#30--#22 AWG), 0.05mm<sup>2</sup> -- 0.3mm<sup>2</sup>
- 5.1.5 Insulation Diameter: (.025" -- .061"), 0.64mm -- 1.55mm

5.2 Performance Requirements and Test Methods:

The tested products shall meet the requirements specified in Fig. 1.

Test Items (Paragraph Number)	Performance Requirements	Test Methods
Confirmation of Products: (Para. 5.2.1)	Product shall meet the requirements of product drawings and Application Specification 114-5076.	Visually and tactually inspect for conformance of product with applicable product drawings and specifications. Check dimensions.
Insertion/Extraction Force of Connector: (Para. 5.2.2)	Insertion Force (Initial) 280g max.  Extraction Force (Initial) 25g min.	By using tensile testing machine, measure the force required to insert the separated connectors, or to extract the mated pair of connectors by operating the head to travel with the speed at a rate of 100mm a minute, without locking mechanism set in effect. Obtain the force per contact by dividing the measured value by the number of contacts
Termination Resistance: (Low Level) (Para. 5.2.3)	15mΩ max.	Measure termination resistance (low level) by applying test current of 50mA max. at open circuit voltage of 50mV to the test circuits specified in Fig. 5 and Fig. 6. Obtain termination resistance by calculation from the measured millivolt drop value.
Insulation Resistance (Para. 5.2.4)	5,000MΩ min. (Initial) 1,000MΩ min. (Final) After humidity testing	Measure insulation resistance in accordance with Test Condition B, Test Method 302 of MIL-STD-202 by applying test potential of 500V between the adjacent contacts and between the contacts and ground of unmated connector.

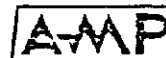
Fig. 1 (To be continued)

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Test Items (Paragraph Number)	Performance Requirements	Test Methods
Dielectric Strength: (Para. 5.2.5)	Connector shall withstand the test potential of 750V AC for 1 minute, without showing evidence of abnormalities.	Measure dielectric strength in accordance with Test Method 301 of MIL-STD-202 by applying test potential to increase at a rate of 500V a second until the specified extreme is reached. After reaching the extreme, hold the potential for 1 minute, and inspect if any abnormalities such as insulation breakdown or flashover takes place.
Contact Insertion/ Extraction Force (Para. 5.2.6)	Insertion Force: (Initial) 285 g max. Extraction Force: (Initial) 25 g min.	Measure the force required to insert the contact by using Gage "A" specified in Fig. 4, and that required to extract contact by using Gage "B" specified in Fig. 4. Operate the head to travel with the speed at a rate of 100 mm a minute.
Thermal Shock: (Para. 5.2.7)	After exposing under the thermal test conditioning, no physical damages shall be present, and the requirements for termination resistance shall be met.	Expose terminated and mated pair of connectors in accordance with Test Condition "A", Test Method 107D of MIL-STD-202, under 5 cycles of temperature changes between -55°C and +85°C reciprocatingly.
Durability: (Para. 5.2.8)	After undergoing test conditioning, requirements for termination resistance and extraction force, shall be met.	Repeat insertion and extraction of connectors for 100 cycles, by operating the head of tensile testing machine along the axial direction of the connectors with the speed at a rate of 100mm a minute.
Vibration: (Para. 5.2.9)	No electrical discontinuity greater than 1 microsecond shall take place in the tested circuit. After undergoing test conditioning, no physical damages shall be present.	Test in accordance with Test Condition B, Test Method 204C of MIL-STD-202, by applying vibratile test condition after having all the contacts series wired, and applying test current of 100mA flowing through the circuit. Vibration shall be such that the frequencies are changing between 10-2,000Hz with the peak intensity of 15G's, reciprocatingly. During vibration, the circuit shall be monitored for discontinuity taking place in the circuit, by using appropriate measuring apparatus.
Humidity: (Para. 5.2.10)	After humidity test conditioning, the requirements for insulation resistance and termination resistance shall be met. And no physical damages shall be present.	Test in accordance with Test Method 106D of MIL-STD-202 by exposing under the test condition for 10 cycles.

(To be continued)

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Test Items (Paragraph Number)	Performance Requirements	Test Methods																												
Salt Spray: (Para. 5.2.11)	After salty spray test conditioning, requirements for termination resistance shall be met.	Expose the sample under 5% salt spray test condition for 48 hours in accordance with Test Method 101D of MIL-STD-202.																												
Sulfuric Acid Gas (Para. 5.2.12)	After sulfuric Acid gas test conditioning, requirements for termination resistance shall be met.	Expose mated pair of connectors under 10 $\pm$ 3 ppm sulfuric acid gas test concentration with relative humidity of 90% min. at room temperature for 48 hours.																												
Contact Retention Force: (Para. 5.2.13)	2.0 kg min.	Insert wire-crimped contact into the contact position in housing, and test on tensile testing machine by applying an axial pull-off load to the crimped wire with the speed at a rate of 100mm a minute. Measure the force required to dislodge the contact from the housing position.																												
Crimp Tensile Strength: (Para. 5.2.14)	Wire crimp shall withstand the pull-off load within the specified value. Crimped wire shall be not pulled out nor broken off.	Test by operating the head of tensile testing machine with the speed at a rate of 100mm a minute in the axial direction.																												
		<table border="1"> <thead> <tr> <th colspan="2">Wire Size</th> <th colspan="2">Tensile Strength(min.)</th> </tr> <tr> <th>mm</th> <th>(AWG)</th> <th>kg</th> <th>(lbs.)</th> </tr> </thead> <tbody> <tr> <td>0.3</td> <td>(#22)</td> <td>4.9</td> <td>(1.8)</td> </tr> <tr> <td>0.2</td> <td>(#24)</td> <td>3.1</td> <td>(6.8)</td> </tr> <tr> <td>0.14</td> <td>(#26)</td> <td>1.8</td> <td>(3.97)</td> </tr> <tr> <td>0.08</td> <td>(#28)</td> <td>1.2</td> <td>(2.65)</td> </tr> <tr> <td>0.05</td> <td>(#30)</td> <td>0.4</td> <td>(0.88)</td> </tr> </tbody> </table>	Wire Size		Tensile Strength(min.)		mm	(AWG)	kg	(lbs.)	0.3	(#22)	4.9	(1.8)	0.2	(#24)	3.1	(6.8)	0.14	(#26)	1.8	(3.97)	0.08	(#28)	1.2	(2.65)	0.05	(#30)	0.4	(0.88)
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Solderability: (Applicable to Post Header Only) (Para. 5.2.15)	More than 95% of the tested area shall appear with fresh and sufficiently effective, working coverage of solder.	After immersing the soldering area of post header into Flux (Alpha 100, GX-5, GX-7 etc.) for 5 - 10 seconds, dip into the melted solder (60% tin, 40% lead) which is controlled at 230 $\pm$ 5 $^{\circ}$ C, for 3 $\pm$ 0.5 seconds. Then, inspect visually the soldered area, with the use of magnifying glass.																												
Temperature Rising: (Para. 5.2.16)	40 $^{\circ}$ C max.	After having all the contacts series-wired, and mate the connectors, energize with the test current. Measure the temperature rising of the connector by probing on the points specified in Fig. 6 with the use of thermo-couple.																												

Fig. (End)

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Fig. 2 Current Vs. Temperature Rise

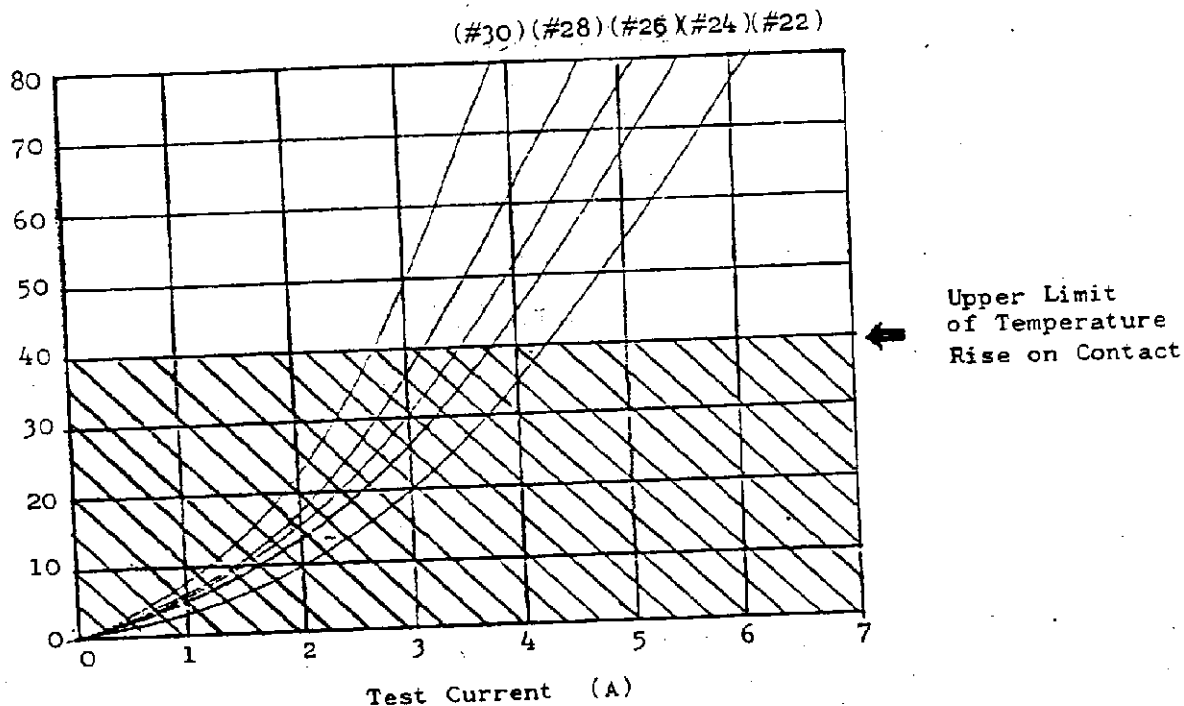


Fig. 2

Maximum allowable limit of temperature rising is determined by the confined operating temperature of gold-plated contact which is in the range  
 Maximum allowable temperature is obtained by the following formula, showing addition of the temperature rising resulted from the energized current over the ambient temperature where the connector is used.

$$\text{Max. Temperature} = \text{Temperature Rising} + \text{Ambient Temperature}$$

Allowable rate of temperature rising shall be within the curves shown in Fig. 2, prepared for each wire size to be applied for termination.

In any way, temperature rising shall not exceed 40°C, whichever wire size is used with appropriate selection of current intensity.

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5.3 Connector Test Items and Test Sequence:

Para- graph Number	Test Items	Sample Group Number						
		1	2	3	4	5	6	7
5.2.1	Confirmation of Product	1, 6, 9 12, 15	1, 6, 9 12					1, 3
5.2.2	Connector Insertion Force	2	2					
5.2.3	Termination Resistance (Low Level)	3, 7, 10, 13, 16	3, 7, 10, 13					
5.2.2	Connector Extraction Force	4	4					
5.2.4	Insulation Resistance			1, 4				
5.2.5	Dielectric Strength			2, 5				
5.2.6	Contact Insertion Force					1		
5.2.6	Contact Extraction Force					2		
5.2.7	Thermal Shock	8						
5.2.8	Durability	5	5					
5.2.9	Vibration	11						
5.2.10	Humidity		8	3				
5.2.11	Salt Spray		11					
5.2.12	Sulfuric Acid Gas	14						
5.2.13	Contact Retention Force		14					
5.2.14	Crimp Tensile Strength						1	
5.2.15	Solderability							2
5.2.16	Temperature Rising					1		

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Fig. 3

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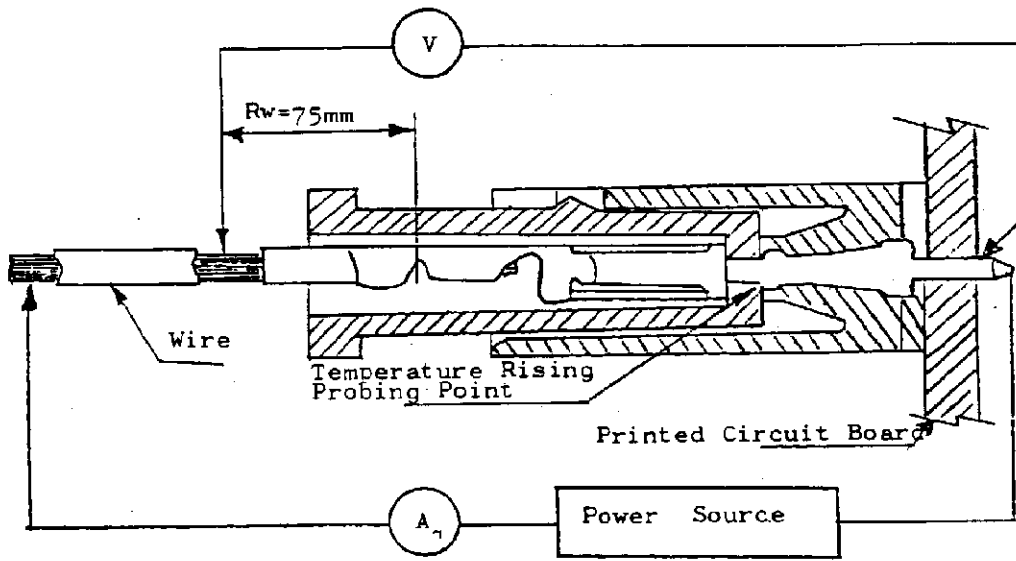


Fig. 5  
Termination Resistance Measuring Points (Vertical Mount Type)

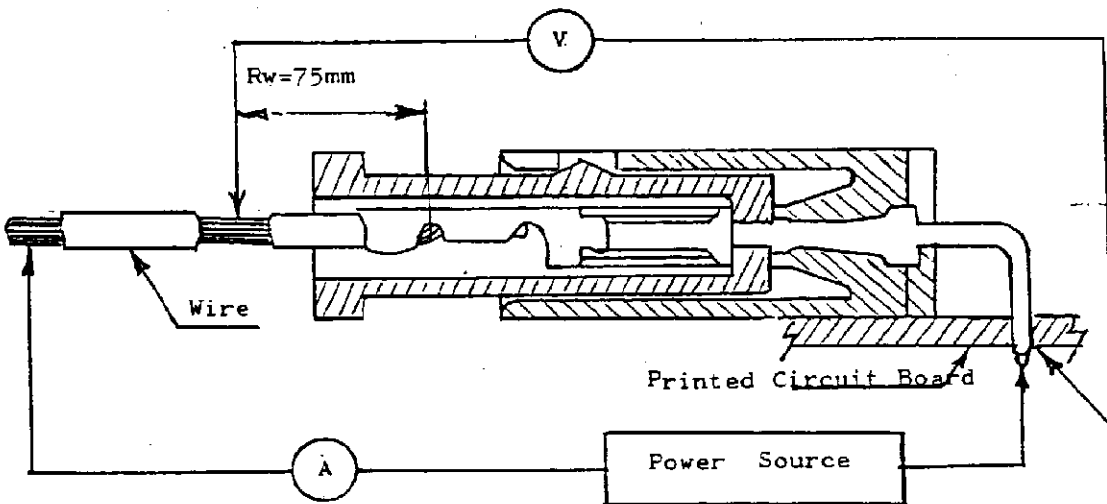


Fig. 6  
Termination Resistance Measuring Points (Horizontal Type)

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