
AMPMODU* MOD I Interconnection System

1. SCOPE

This specification covers performance and test requirements for the AMPMODU MOD I Interconnection System, manufactured by TE AMP Italia.

When tests or inspections are performed on the subject product line, this document must always be used together with the applicable product drawings.

2. DESCRIPTION

This system provides wire-to-board termination at 3.96 mm [.156 in.] pitch using the 0.79 x 1.57 mm [.031 x .062 in.] post technology. It is composed of:

2.1. Crimped Receptacle Connector

Single row, having standard and high pressure contacts for discrete wires covering a range of 17 to 26 AWG

2.2. Header Assembly

Single row, shrouded and unshrouded, having straight or right angle post contacts inserted into an insulated header which is directly mounted on a printed circuit board.

3. APPLICABLE DOCUMENTS

Applicable portion of the following documents form a part of the specification, to the extent indicated herein.

In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence.

- IEC 512-2: Electromechanical Components for Electronic Equipment: Basic Testing Procedures and Measuring Methods
- IEC 130-1: Connectors for Frequencies below 3 MHz, General Requirements, and Measuring Methods
- IEC 68-2: Basic Environmental Testing Procedures for Electronic Equipment and Components
- Application Specification:114-20040 – AMPMODU MOD I Interconnection System

4. REQUIREMENTS

4.1. Design and Construction

All components of this product line shall be of design, construction and physical dimensions specified in the applicable product drawings.

4.2. Materials

- Receptacle: Copper alloy, pre-gold plated (0.38 and 1.27 μm thk.) over nickel or pre-tin plated (0.76 μm thk.)
- Post Contacts: Copper alloy, gold-plated (0.38 and 1.27 μm thk. duplex plating) over nickel or tin plated (2.0 μm thk. min.)
- Receptacle and Header Housing: Glass Reinforced polycarbonate, UL94 V-1 or polyamide 6/6 (NYLON) UL94 HB

4.3. Ratings

Current:	5.0 amperes max per contact 3.0 amperes max per contact (for 26÷22 AWG rec. contact)
Operating Temperature:	-40°C to +105°C
Climatic Category (IEC):	40/105/21
Max Operating Voltage:	40 VAC 60 VDC

For applications at higher voltages, contact TE engineering.

5. PERFORMANCE AND TEST DESCRIPTION

TEST DESCRIPTION	TEST PROCEDURE	REQUIREMENTS															
Examination of product	Visual, dimensional, and functional check	Shall be in accordance with the relevant product drawings															
Total connection resistance, low level, (dry circuit)	According to IEC 512-2, test 2a. Subject mated contacts assembled in housing to 20 mV max (open circuit) at 20 mA and measured as indicated in Figure 1. Calculate the termination resistance, subtracting the resistance of the wire.	15 mΩ max.															
Crimp resistance, low level, (Dry Circuit)	According to IEC 512-2, test 2a. Subject mated contacts to 20 mVnmax (open circuit) at 20 mA and measure as indicated in Figure 2. Calculate the crimp resistance, subtracting the resistance of the wire.	4 mΩ max.															
Insulation resistance	According to IEC 512-2, test 3a. Test between adjacent or opposite contacts of mated connectors by applying 500 Vdc for 1 minute.	Initial: 5000 mΩ min. Final: 1000 mΩ min.															
Dielectric withstanding voltage	According to 512-2, test 4a Test between adjacent or opposite contacts of mated connectors by applying 1200 V rms for 1 minute.	No breakdown or flashover															
Engaging force	According to IEC 512-7, test 13b a.) <u>With Gage</u> -- Measure force to engage a steel gage size 1, as indicated in Figure 3. b.) <u>With posts</u> – Measure force necessary to mate male and female connector assemblies with disconnected locking device, using a suitable machine. Be sure to calculate force per contact.	Standard Pair: 2.5N max. High Pair: 6.0N max. Standard Pair: 3.0 N max. High Pair: 10.0N max.															
Separating force	According to IEC 512-7, test 13b. Measure the force required to separate using a steel gage size 2, as indicated in Figure 3.	Initial values: Std Pr.: 0.6N min. High Pr.: 0.8N min. After durability: Std. Pr.: 0.5N min High Pr.: 0.7N min.															
Durability	According to IEC 512-5, test 9a. Mate and unmate male and female connector assemblies using a suitable machine. <u>Number of Cycles:</u> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Type</th> <th>Plating</th> <th>Cycles</th> </tr> </thead> <tbody> <tr> <td>Std. Pr.</td> <td>0.38 μm gold</td> <td>100</td> </tr> <tr> <td>Std. Pr.</td> <td>1.27 μm gold</td> <td>200</td> </tr> <tr> <td>High Pr.</td> <td>0.76 μm tin</td> <td>25</td> </tr> <tr> <td>Std. Pr.</td> <td>0.76 μm tin</td> <td>10</td> </tr> </tbody> </table>	Type	Plating	Cycles	Std. Pr.	0.38 μm gold	100	Std. Pr.	1.27 μm gold	200	High Pr.	0.76 μm tin	25	Std. Pr.	0.76 μm tin	10	No physical damage. Shall meet the requirements of subsequent tests listed in Paragraph 6.
Type	Plating	Cycles															
Std. Pr.	0.38 μm gold	100															
Std. Pr.	1.27 μm gold	200															
High Pr.	0.76 μm tin	25															
Std. Pr.	0.76 μm tin	10															
Crimp tensile	According to IEC 512-8a, test 16d. Determine crimp tensile, by applying an axial load to wire at a rate of 25 mm/min.	75% min. of tensile strength of wire.															
Contact retention	Crimp-on, snap-in contact only. According to IEC 512-8, test 15a. Apply an axial load to crimped contacts inserted in housing..	30N Min															
Locking device retention	To be performed on plastic housings without contacts applying an axial load to mated connector housings.	5N typical															

Table 1 (continued)

TEST DESCRIPTION	TEST PROCEDURE	REQUIREMENTS
Corrosion, salt spray	According to IEC 512-6, test 11f Subject mated connectors to salt spray with 5% NaCl concentration. Duration of the test: Gold and high pressure Tin plate 48 hrs. and for standard pr. Tin plate: 24 hrs.	Shall meet the requirements of subsequent tests listed in Paragraph 6.
Thermal shock	According to IEC 512-6 test 11d. Subject mated with connectors to 5 cycles between -40°C and +105°C . Lasting time to each temperature: 30 minutes.	No physical damage. Shall meet the requirements of subsequent tests listed in Paragraph 6.
Damp, heat, steady state	According to IEC 512-6, test 11c.. Subject mated connectors to specified duration of damp heat, at a temperature of: 40°C and 96% of relative humidity. Duration of test: Gold-plated product: 21 days. Tin-plated product: 1 day.	No physical damage. Shall meet the requirements of subsequent tests listed in Paragraph 6.
Solderability	Post contacts mated with the relevant printed circuit board. According to IEC 68-2-20 test Ta method 1. Solder bath at 235° C. Samples shall be previously aged at 155° C for 16 hours. (Ageing 3).	At least 95% of soldering area of tested post contacts shall have a fresh, smooth and uniform covering of solder.
Vibration	According to IEC 512-4, test 6d. Subject mated connectors to 10G, 10 to 500 Hz, with 100 mA current applied. Displacement: 1.5 mm (maximum total excursion) Sweep time: 15 min No of Cycles: 12 per axis.	No physical damages. No discontinuities greater than 1 microsecond.

Table 1 (end)

6. CONNECTOR TESTS AND SEQUENCES

TEST DESCRIPTION	Test Group and Sequence (**)			
	1	2	3	4
Examination of Product	1, 10	1, 10	1, 3	1, 7
Termination resistance	2, 9	4, 9		
Crimp Resistance †				
Insulation Resistance		2, 6		2, 5
Dielectric Withstanding Voltage		3, 7		3, 6
Engaging Force	3, 6			
Separating Force	4, 7			
Durability	5			
Crimp Tensile †				
Contact Retention †				
Locking Device Retention †				
Corrosion, Salt Spray	8			
Thermal Shock		5		
Damp Heat, Steady State				4
Solderability			2	
Vibration		8		

(**) Numbers indicate the sequence in which tests are performed

† Tests to be performed on separate samples (not in sequence)

Table 2

7. QUALIFICATION TEST

Qualification test shall be performed according to the test methods and requirements specified in Paragraph 5 and test sequence specified in Paragraph 6.

Samples shall be selected at random from current production. Each test group shall consist of four connectors.

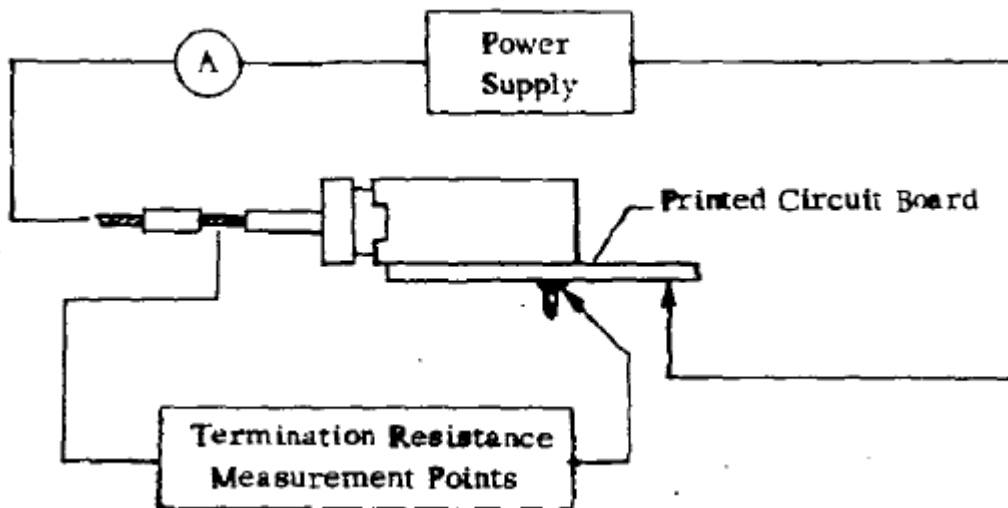


Figure 1 – Termination Resistance Measurement Set-Up

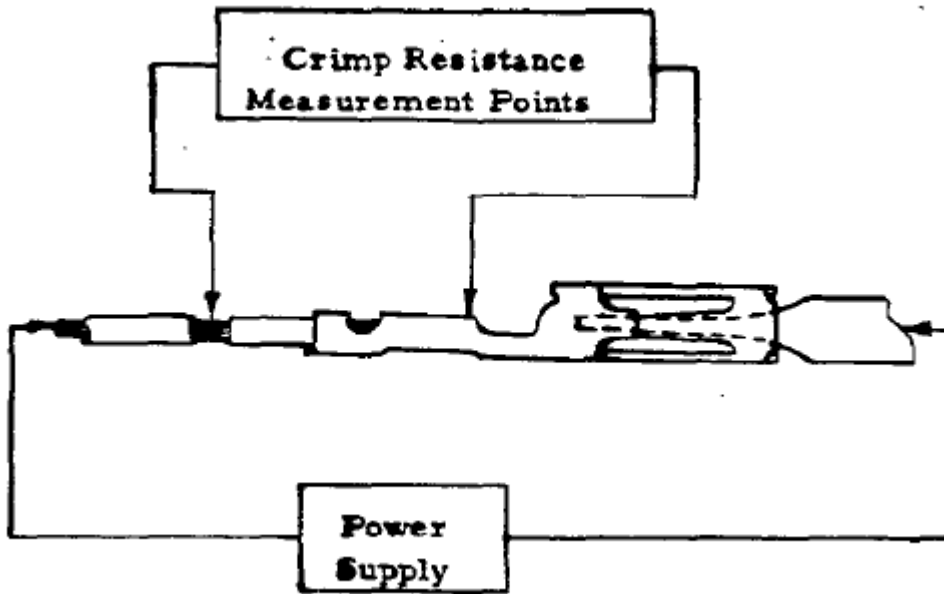
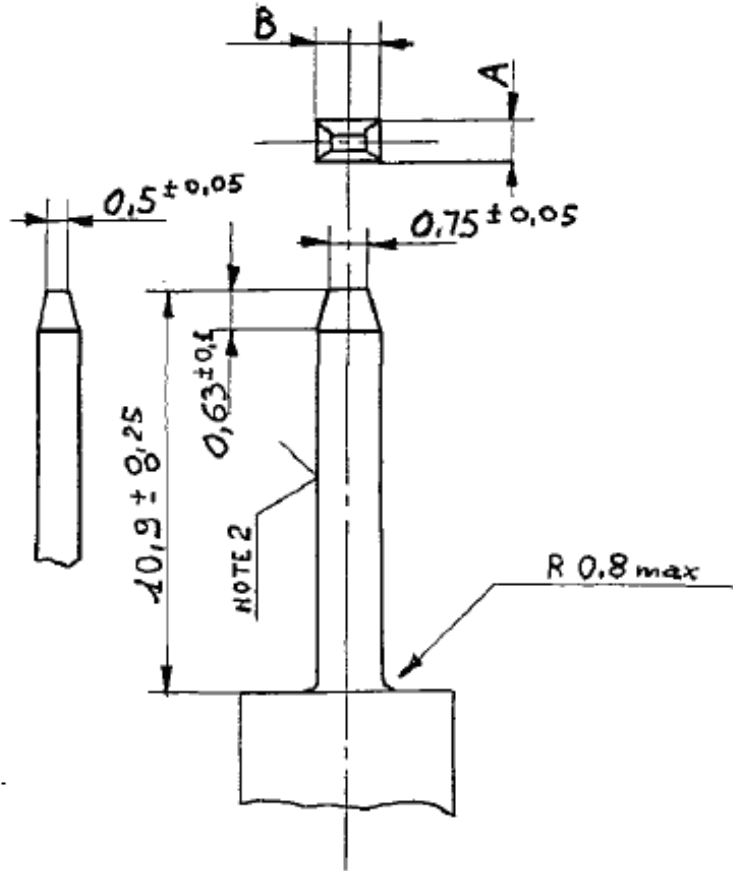


Figure 2 – Crimp Resistance Measurement Set-Up



NOTES:

1. **Material:** Stainless Steel, heat treated. Rockwell Hardness: 60-62 HRC.
2. **Surface Roughness:** $0,1 \mu\text{m Ra}$ on all sides.

Gage	A x B (millimeters)	A x B (inches)
1	$0,8128 +0,0000/- 0,0025 \times 1,5748 \pm 0,0762$	$.032 + .0000/- .0001 \times .062 \pm .003$
2	$0,762 +0,0025/0,0000 \times 1,5748 \pm 0,0762$	$.030 + .0001/- .0000 \times .062 \pm .003$

Figure 3