

AMPMODU\* Mod.II Interconnection System,  
2.54 mm. [.100 in.] PITCH**1. SCOPE**

- 1.1 This specification covers performance and test requirements for the AMPMODU\* Mod.II interconnection system, manufactured by AMP Italy.
- 1.2 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 and board-to-board termination at 2.54 mm. [.100 in.] pitch using the 0.64x0.64 mm. [.025 sq. in.] post technology.

It is composed of :

**2.1 Crimped receptacle connector :**

Single and double row, having standard and high pressure contacts for discrete wires covering a range of 22 to 30 AWG.

**2.2 Board mounted receptacle connector assembly :**

Single and double row, horizontal and vertical mount, having standard or high pressure receptacle contacts inserted into an insulated housing which is directly mounted on a printed circuit board.

**2.3 Header assembly :**

Single and double row, 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 this 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.
- UNI 5085 : Corrosion test of protective metallic coatings (Kesternich Test)

Product Code: 5434

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| DR.<br>R. FABRIS | <i>Fabris R.</i>                            | 31 AUG 99      | DATE       | APVD<br>C. TARTARI | 31 AUG 99  |
|                  |                                             |                |            |                    | DATE       |

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**4. REQUIREMENTS****4.1 Design and construction :**

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

**4.2 Materials :**

- **Receptacle:** Copper alloy, pre-gold plated (0.38 or 0.76  $\mu\text{m}$  thk.) over Nickel or pre-tin plated (0.76  $\mu\text{m}$  thk.)
- **Post contact:** Copper alloy, gold plated (0.38 or 0.76  $\mu\text{m}$  thk. Duplex plating) over Nickel or tin plated (2.0  $\mu\text{m}$  thk. min.)
- **Receptacle housing:**  
Polyphenylene Oxide (Noryl), flammability rating UL 94V-1
- **Board mounted housing:**  
Glass-reinforced Polyester, flammability rating UL 94V-0
- **Header housing:**  
Glass-reinforced Polyester, flammability rating UL 94V-0

**4.3 Ratings :**

- A . **Current :** 3.0 A max per contact
- B . **Operating temperature :** -40°C to +80°C
- C . **Climatic category (IEC) :** 40/80/21
- D . **Max operating voltage :** 40 Vac or 60 Vdc  
For applications at higher voltage, please contact AMP.

**5. PERFORMANCE AND TEST DESCRIPTION**

This product line shall meet the electrical, mechanical and environmental performance requirements specified in following table.

| TEST DESCRIPTION                                     | TEST PROCEDURE                                                                                                                                                                                                                               | REQUIREMENTS                                               |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Examination of the 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.<br>Subject mated contacts assembled in housing to 20 mV max (Open circuit) at 20 mA and measure as indicated in fig.1a and 1b.<br>Calculate the termination resistance, subtracting the resistance of wire. | 15 m $\Omega$ max                                          |

| TEST DESCRIPTION                             | TEST PROCEDURE                                                                                                                                                                                                                                                                                                                | REQUIREMENTS                                                                                                                          |             |        |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------|--------|
| Crimp resistance, low level<br>(Dry Circuit) | According to IEC 512-2, test 2a.<br>Subject mated contacts to 20 mV max (Open circuit) at 20 mA and measure as indicated in fig.2.<br>Calculate the crimp resistance, subtracting the resistance of wire.                                                                                                                     | 7 mΩ max                                                                                                                              |             |        |
| Insulation resistance                        | According to IEC 512-2, test 3a.<br>Test between adjacent or opposite contacts of mated connectors by applying 500 V dc for 1 min.                                                                                                                                                                                            | Initial : 5000 mΩ min<br>Final : 1000 mΩ min                                                                                          |             |        |
| Dielectric withstanding voltage              | According to IEC 512-2, test 4a.<br>Test between adjacent or opposite contacts of mated connectors by applying 750 V rms for 1 min.                                                                                                                                                                                           | No breakdown or flashover                                                                                                             |             |        |
| Engaging force                               | According to IEC 512-7, test 13b.<br>a) <u>With gage</u> : measure force to engage a steel gage size 1, as indicated in Fig.3<br>b) <u>With posts</u> : measure force necessary to mate male and female connector assemblies, with disconnected locking device, using a suitable machine.<br><br>Calculate force per contact. | Std Pr. : 1.8 N max<br>High Pr. : 5.0 N max<br><br>Std Pr. : 2.0 N max<br>High Pr. : 7.0 N max                                        |             |        |
| Separating force                             | According to IEC 512-7, test 13b.<br>Measure force to separate using a steel gage size 2, as indicated in Fig.3.                                                                                                                                                                                                              | Initial values :<br>Std Pr. : 0.4 N min<br>High Pr. : 0.6 N min<br>After durability :<br>Std Pr. : 0.35 N min<br>High Pr. : 0.5 N min |             |        |
| Durability                                   | According to IEC 512-5, test 9a.<br>Mate and unmate male and female connector assemblies using a suitable machine.                                                                                                                                                                                                            | No physical damage.<br>Shall meet the requirements of subsequent tests listed in para 6.                                              |             |        |
|                                              | Number of cycles :                                                                                                                                                                                                                                                                                                            |                                                                                                                                       |             |        |
|                                              | Type                                                                                                                                                                                                                                                                                                                          |                                                                                                                                       | Plating     | Cycles |
|                                              | Std. Pr.                                                                                                                                                                                                                                                                                                                      |                                                                                                                                       | 0.38μm gold | 100    |
|                                              | Std. Pr.                                                                                                                                                                                                                                                                                                                      | 0.76μm gold                                                                                                                           | 200         |        |
|                                              | High Pr.                                                                                                                                                                                                                                                                                                                      | 0.76μm tin                                                                                                                            | 25          |        |
| Crimp tensile                                | According to IEC 512-8A, test 16d.<br>Determine crimp tensile, by applying an axial load to wire, at a rate of 25 mm/min.                                                                                                                                                                                                     | 75% min. of tensile strength of wire.                                                                                                 |             |        |

| TEST DESCRIPTION             | TEST PROCEDURE                                                                                                                                                                                                 | REQUIREMENTS                                                                                                      |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Contact retention            | Crimp-on, snap-in contact only.<br>According to IEC 512-8, test 15a.<br>Apply an axial load to crimped contacts inserted in housing.                                                                           | 30 N min.                                                                                                         |
| Locking device retention     | To be performed on plastic housings without contacts applying an axial load to mated connector housings.                                                                                                       | 5 N min.                                                                                                          |
| Corrosion, salt spray        | According to IEC 512-6, test 11f.<br>Subject mated connectors to 48 hrs of salt spray, with 5% of NaCl concentration.                                                                                          | Shall meet the requirements of subsequent tests listed in para 6.                                                 |
| Corrosion, Kesternich test   | Subject mated and unmated connectors to the Kesternich test, acc. to UNI 5085.<br>Duration of test : 8 h                                                                                                       | Shall meet the requirements of subsequent tests listed in para 6.                                                 |
| Thermal shock                | According to IEC 512-6, test 11d.<br>Subject mated connectors to 5 cycles between -40°C and +80°C.<br>Lasting time to each temperature : 30 min.                                                               | No physical damage.<br>Shall meet the requirements of subsequent tests listed in para 6.                          |
| Damp heat, steady state      | According to IEC 512-6, test 11c.<br>Subject mated connectors to 21 days of damp heat, at a temperature of 40°C, and 96% of relative humidity.                                                                 | No physical damage.<br>Shall meet the requirements of subsequent tests listed in para 6.                          |
| Temperature/Humidity cycling | According to IEC 68-2-38, test Z/AD.<br>Subject mated connectors to 10 temperature/humidity cycles.<br>Duration of each cycle : 24 h                                                                           | No physical damage.<br>Shall meet the requirements of subsequent tests listed in para 6.                          |
| Solderability                | Post contacts mated with relevant printed circuit board.<br>According to IEC 68-2-20 test Ta, method 1 : solder bath at 235°C.<br>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 coverage of solder. |
| Vibration                    | According to IEC 512-4, test 6d.<br>Subject mated connectors to 10G, 10 to 500 Hz, with 100 mA current applied.<br>Displacement: 1.5 mm. (max tot exc)<br>Sweep time : 15 min.<br>No. of cycles : 12 per axis. | No physical damage.<br>No discontinuities greater than 1 microsecond.                                             |

**6. CONNECTOR TESTS AND SEQUENCES**

| TEST DESCRIPTION                | TEST GROUP AND SEQUENCE ( ** ) |      |     |     |     |
|---------------------------------|--------------------------------|------|-----|-----|-----|
|                                 | 1                              | 2    | 3   | 4   | 5   |
| Examination of the product      | 1,10                           | 1,10 | 1,7 | 1,3 | 1,7 |
| Termination resistance          | 2,9                            | 4,9  |     |     |     |
| Crimp resistance (a)            |                                |      |     |     |     |
| Insulation resistance           |                                | 2,6  | 2,5 |     | 2,5 |
| Dielectric withstanding voltage |                                | 3,7  | 3,6 |     | 3,6 |
| Engaging force                  | 3,6                            |      |     |     |     |
| Separating force                | 4,7                            |      |     |     |     |
| Durability                      | 5                              |      |     |     |     |
| Crimp tensile (a)               |                                |      |     |     |     |
| Contact retention (a)           |                                |      |     |     |     |
| Locking device retention (a)    |                                |      |     |     |     |
| Corrosion, salt spray (b)       | 8                              |      |     |     |     |
| Corrosion, Kesternich test (b)  | 8                              |      |     |     |     |
| Thermal shock                   |                                | 5    |     |     |     |
| Damp heat, steady state         |                                |      |     |     | 4   |
| Temperature/humidity cycling    |                                |      | 4   |     |     |
| Solderability                   |                                |      |     | 2   |     |
| Vibration                       |                                | 8    |     |     |     |

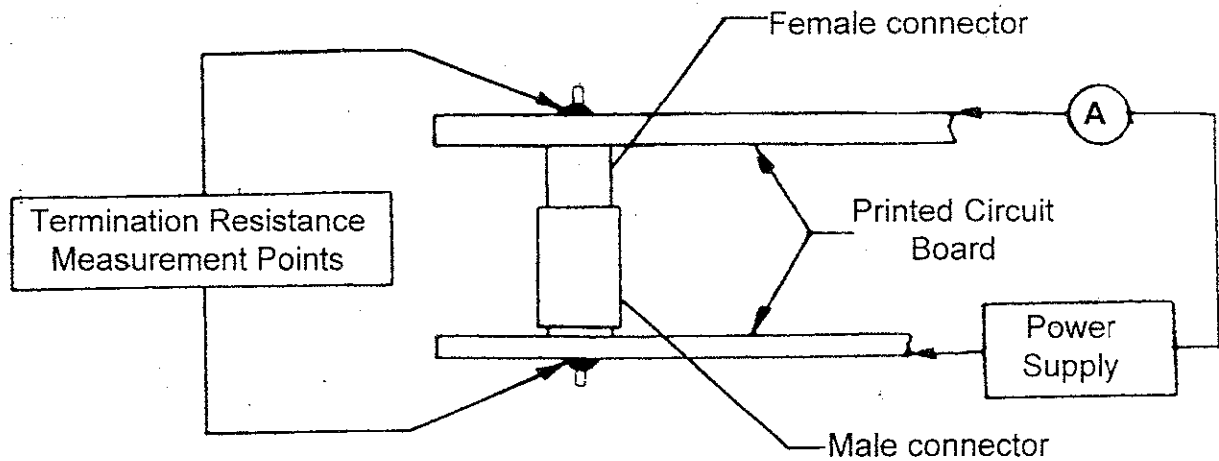
( \*\* ) Numbers indicated the sequence in which tests are performed  
( a ) Tests to be performed on separate samples (not in sequence)  
( b ) Alternative test methods

## 7. QUALIFICATION TEST

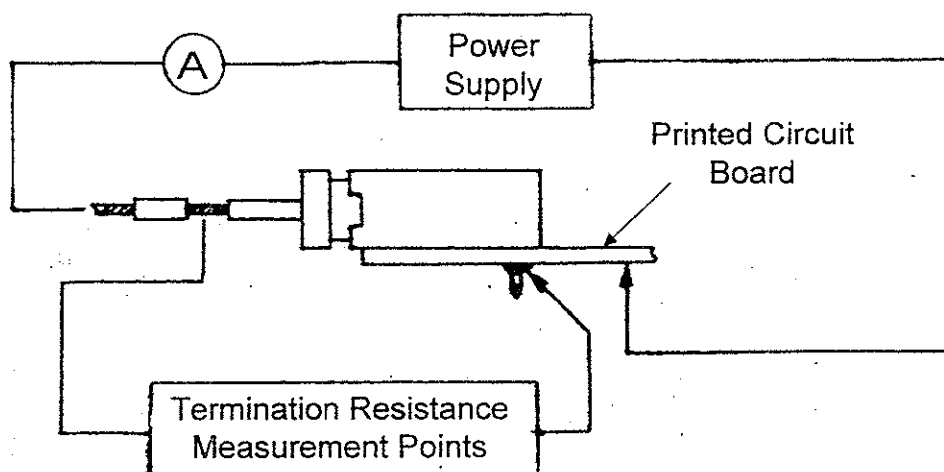
Qualification test shall be performed according to the test methods and requirements specified in para 5 and test sequence specified in para 6.

Samples shall be selected at random from current production.

Each test group shall consist of 4 connectors.



a) Board to board version



b) Wire to board version

**FIGURE 1 - Termination resistance measurement set-up**

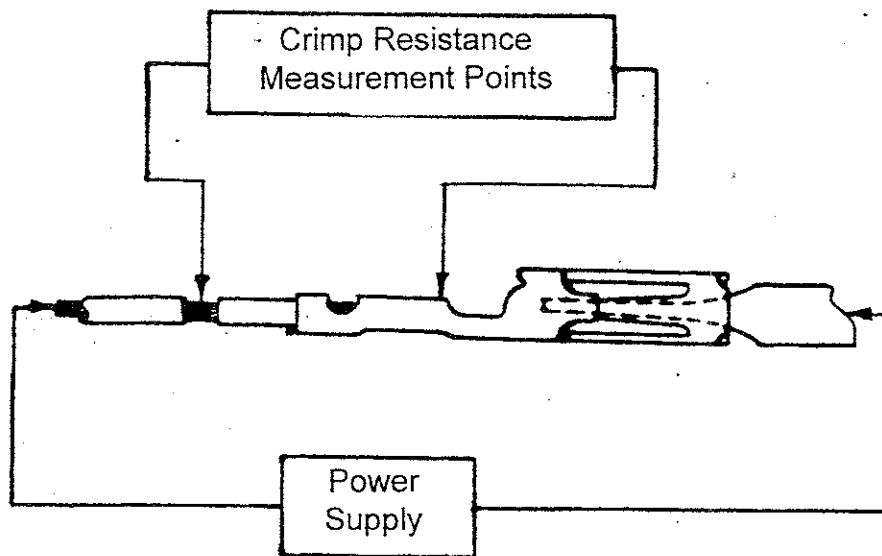
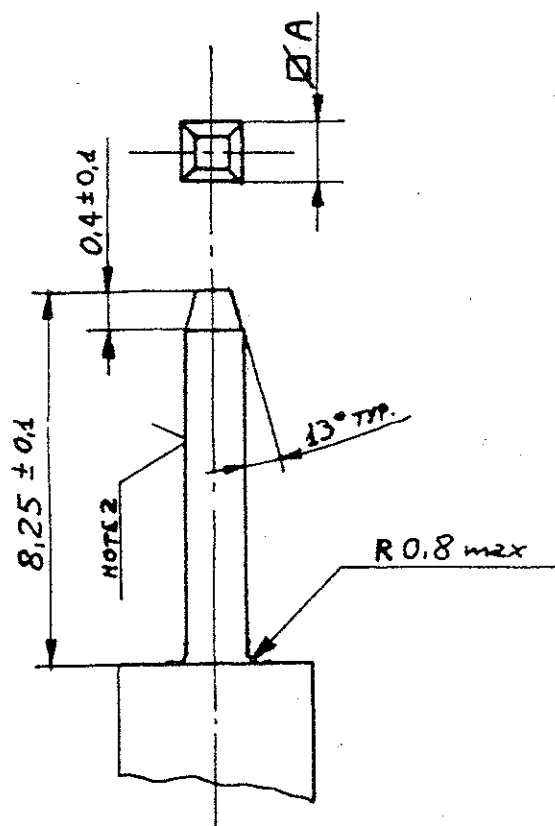


FIGURE 2 - Crimp resistance measurement set-up

**NOTES :**

1. Material : Stainless steel, heat treated ; Hardness : 60÷62 HRC
2. Surface roughness :  $0.1 \mu\text{m Ra}$  on all sides

| GAGE | A (mm)                       | A (inches)                  |
|------|------------------------------|-----------------------------|
| 1    | $0.6604^{+0.0000}_{-0.0025}$ | $.0260^{+0.0000}_{-0.0001}$ |
| 2    | $0.6096^{+0.0025}_{-0.0000}$ | $.0240^{+0.0001}_{-0.0000}$ |

FIG. 3 - Engaging / Separating force gages