



The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity (TE) makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE may change these requirements based on the results of additional testing and evaluation. Contact TE Engineering for further details.

## **AMPMODU\*, MOD II INTERCONNECTION SYSTEM, 2.54mm [.100 in.] PITCH**

### **1. SCOPE**

- 1.1. This specification covers performance and test requirements for the AMPMODU\*, MOD II interconnection system, 2.54mm pitch (Italian range)
- 1.2. When tests or inspections are performed on the subject product line, this document should always be used together with the applicable product drawings.

### **2. DESCRIPTION**

This system provides wire to board and board to board termination at 2.54mm [.100 in] pitch using the 0.63x0.63mm [.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 (0.04mm<sup>2</sup> to 0.5mm<sup>2</sup>)

#### 2.2. Board mount 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.

#### 2.3. Header assembly:

Single or 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. Unless otherwise indicated the latest edition of the document applies.

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

#### 3.1. Industry Standard

- IEC 60512-2: Electrochemical components for electronic equipment:  
Basic testing procedures and measuring methods
- IEC 60130-1: Connectors for frequencies below 3MHz, general requirements and  
Measuring methods
- IEC 60068-2: Basic environmental testing procedures for electronic equipment and  
Components
- UNI 5085: Corrosion test of protective metallic coatings (Kesternich test)

## 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 contact: Copper alloy, pre-gold plated (0.38 or 0.76 $\mu$ m) over Nickel or pre-tin Plated (0.76 $\mu$ m) over Nickel
- Post contact: Copper alloy, gold plated (0.38 or 0.76 $\mu$ m Duplex plating) over Nickel or tin plated (2.0  $\mu$ m min.) over Nickel
- Receptacle housings: LCP, Flammability rating UL 94V-0
- Receptacle board mounted housings; LCP, Flammability rating UL 94V-0
- Shrouded header housings; PBT, Flammability rating UL 94V-0
- Pin housings single row: LCP, Flammability rating UL 94V-0
- Pin housings dual row: Polyphenylene Oxide (Noryl), Flammability rating UL 94V-1

### 4.3 Ratings:

- A. Current: 3A max per contact  
 B. Operating temperature: -40°C to +80°C  
 C. Climate category (IEC): 40/80/21  
 D. Max. Operating voltage: 40 Vac or Vdc  
 For application at higher voltage, please contact TE

## 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
Initial 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 60512-2-1 (test 2a). Subject mated contacts assembled in housing to 20mV max (Open circuit) at 20mA and measure as indicated in fig. 1a and 1b. Calculate the termination resistance, subtracting the resistance of wire.	15m $\Omega$ max.
Crimp resistance, low level (Dry circuit)	According to IEC 60512-2-1 (test 2a). Subject mated contacts to 20mV max (Open circuit) at 20mA and measure as indicated in fig. 2 Calculate the crimp resistance, subtracting the resistance of the wire.	7m $\Omega$ max.
Insulation resistance	According to IEC 60512-3-1 (test 3a). Two between adjacent or opposite contact of mated connectors by applying 500V dc for 1 min.	Initial : 5000m $\Omega$ min Final : 1000m $\Omega$ min

TEST DESCRIPTION	TEST PROCEDURE	REQUIREMENTS												
Dielectric Withstanding voltage	According to IEC 60512-4-1(test 4a) Test between adjacent or opposite contacts of mated connectors by applying 750V rms for 1 min.	No breakdown or flashover												
Engaging force	According to IEC 60512-13-2 (test 13b) a) <u>With gage</u> : measure force to engage a steel gage size 1, as indicated in Fig.3 b) <u>With posts</u> : measure force necessary to mate male and female connector assemblies with disconnected locking device, using a suitable machine Calculate force per contact.	Std Pr. : 1.8 N max High Pr. : 5.0 N max  Std Pr. : 2.0 N max High Pr. : 7.0 N max												
Separating force	According to IEC 60512-13-2 (test 13b) Measure force to separate using a steel gage size 2, as indicated in Fig 3.	Initial values: Std Pr. : 0.4 N min High Pr. : 0.6 N min  After durability : Std Pr. : 0.35 N min High Pr. : 0.5 N min												
Durability	According to IEC 60512-9-1 (test 9a). Mate and un-mate male and female connector assemblies using a suitable machine. Number of cycles: <table border="1" data-bbox="483 1066 1011 1272"> <thead> <tr> <th>Type</th> <th>Plating</th> <th>Cycles</th> </tr> </thead> <tbody> <tr> <td>Std. Pr.</td> <td>0.38µm gold</td> <td>100</td> </tr> <tr> <td>Std. Pr.</td> <td>0.76µm gold</td> <td>200</td> </tr> <tr> <td>High Pr.</td> <td>0.76µm tin</td> <td>25</td> </tr> </tbody> </table>	Type	Plating	Cycles	Std. Pr.	0.38µm gold	100	Std. Pr.	0.76µm gold	200	High Pr.	0.76µm tin	25	No physical damage. Shall meet the requirements of subsequent tests listed in para 6
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 60512-16-4 (test 16d). Determine crimp tensile, by applying an axial load to wire , at a rate of 25mm/min.	75% min. of tensile strength of wire.												
Contact retention	Crimp-on snap-in contact only. According to IEC 60512-15-1 (test 15a). 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.												
Vibration	According to IEC 60512-6-4(test 6d). Subject mated connectors to 10G, 10 to 500 Hz with 100mA current applied. Displacement: 1.5mm (max tot exc) Sweep time: 15 min. No of cycles: 12 per axis.	No physical damage. No discontinuities greater than 1 microsecond.												

TEST DESCRIPTION	TEST PROCEDURE	REQUIREMENTS
Corrosion, salt spray	According to IEC 60512-11-6 (test 11f). Subject mated connectors to 48 hours 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, according to UNI 5085 Duration of test : 8 hours	Shall meet the requirements of subsequent tests listed in para 6.
Thermal shock	According to IEC 60512-11-4(test 11d). Subject mated connectors to 5 cycles between -40°C to +80°C. Lasting time to each temperature : 30 min.	No physical damage. Shall meet the requirements of subsequent tests listed in para 6.
Damp heat, steady state	According to 60512-11-3 (test 11c). Subject mated connectors to 21 days of damp heat, at a temperature of 40°C and 96% of relative humidity	No physical damage. Shall meet the requirements of subsequent tests listed in para 6.
Temperature/Humidity cycling	According to IEC 60068-2-38, test Z/AD Subject mated connectors to 10 temperature/humidity cycles. Duration of each cycle : 24h	No physical damage. Shall meet the requirements of subsequent tests listed in para 6.
Solderability	Post contacts mated with relevant printed circuit boards. According to IEC 60068-2-20, test Ta, method 1: solder bath at 235°C Samples shall be previously aged by subjecting to Damp heat test with 85°C and 85% humidity for 4 days. (Simulates 2 years of Solderability)	At least 95% of soldering area of tested post contacts shall have a fresh, smooth and uniform coverage of solder.


**NOTE**

*Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in para 6.*

## 6. PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE

TEST OR EXAMINATION	TEST GROUP							
	1	2	3	4	5			
	TEST SEQUENCE							
Examination of 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, Kersternich test (b)	8							
Thermal shock		5						
Damp heat, steady state					4			
Temperature humidity cycling			4					
Solderability				2				
Vibration		8						



### NOTE

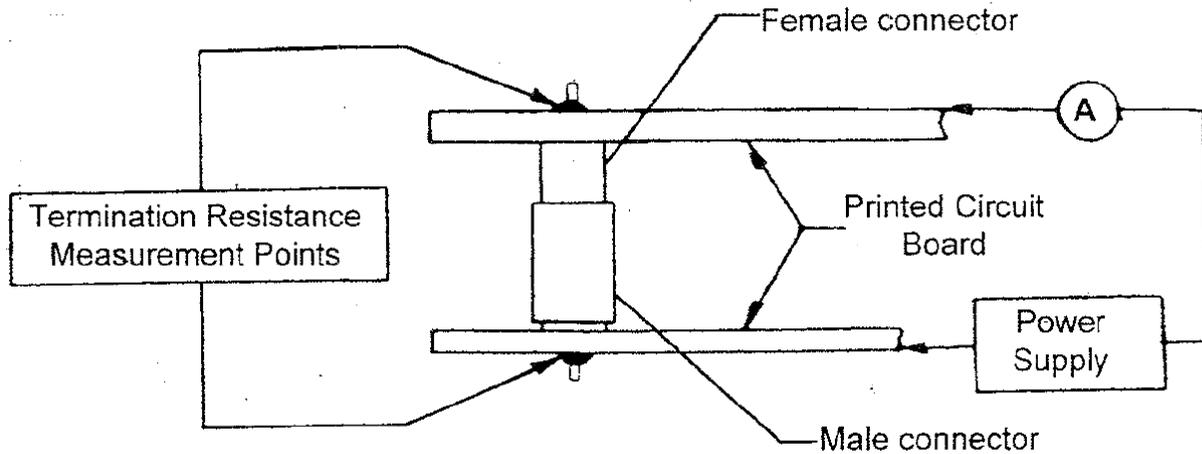
- (a) Tests to be performed on separate samples (not in sequence)
- (b) Alternative test methods

## 7. QUALIFICATION TEST

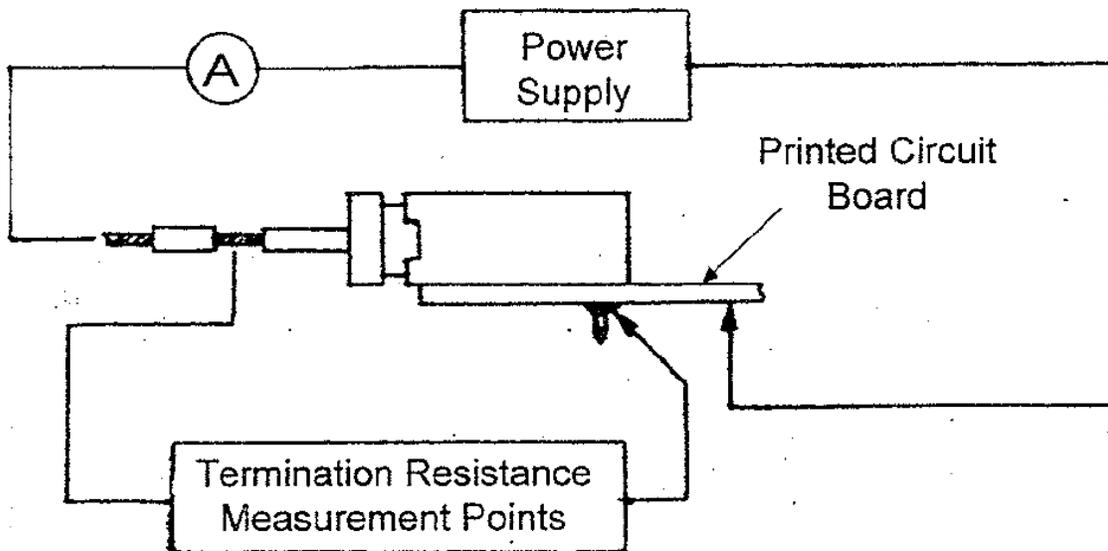
Qualification test shall be performed according to test methods and requirements specified in para 5 and test sequence specified in para 6.

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

FIG 1 – Termination resistance measurement set-up

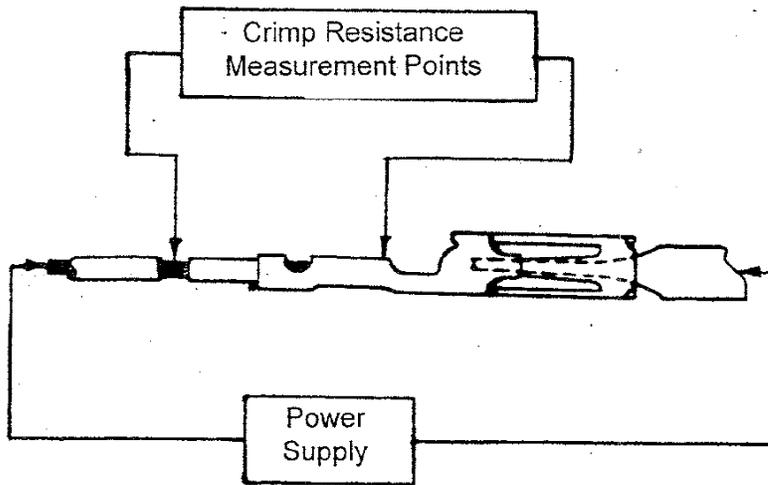
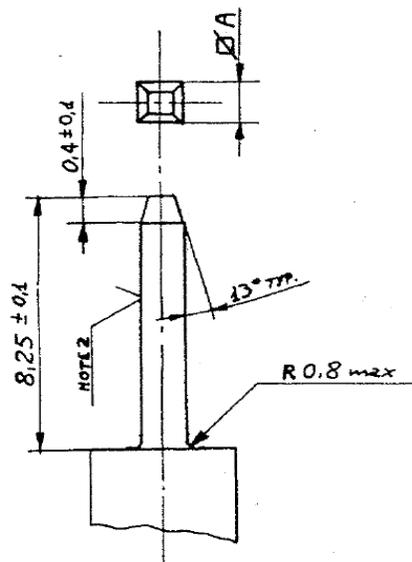


FIG 2 – Crimp Resistance measurement set-up


**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 $\begin{matrix} +0.0000 \\ -0.0025 \end{matrix}$	.0260 $\begin{matrix} +.0000 \\ -.0001 \end{matrix}$
2	0.6096 $\begin{matrix} +0.0025 \\ -0.0000 \end{matrix}$	.0240 $\begin{matrix} +.0001 \\ -.0000 \end{matrix}$

FIG. 3 - Engaging / Separating force gages