CONNECTOR, EUROLATCH® CABLE RECEPTACLE

1.0 Introduction

1.1 Purpose

Testing was performed on the AMP® EUROLATCH® ribbon cable receptacle connector to determine its conformance to the level 2 performance requirements of DIN 41 612, Part 5; dated October 1987. Connectors were subjected to the Group AP sequence only.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the EUROLATCH® receptacle product manufactured by the Portable Solutions Unit of the Personal Computer Business Group. The testing was performed between June, 1996 and October, 1996.

1.3 Conclusion

The EUROLATCH® Cable Receptacle product meets the electrical, mechanical, and environmental performance requirements of DIN 41 612, Part 5, Level 2, for Group AP, with the noted exceptions.

NOTE 1: The connectors were subjected to a maximum 500 VAC dielectric potential due to voltage limitations of the ribbon cable. (Level 2 requirement from DIN 41 612 is 1000 VAC)

NOTE 2: The connectors were subjected to a maximum temperature environment of 105°C due to temperature limitations of the ribbon cable. (Level 2 requirement from Din 41 612 is 125°C)

1.4 Product Description

The product tested was the AMP® EUROLATCH®, 64 conductor ribbon cable receptacle connector, which is a two piece, 0.100 ℄, 3 row, 64 position, (2 row loaded) connector for cable to board applications. The EUROLATCH® receptacle connector contacts were plated with 30 micro inches of gold in the contact area and bright tin-lead in the cable termination area. The mating pin header was an AMP® Eurocard type R connector containing contacts plated with 3-5 micro inches of gold over 30 micro inches of Palladium-nickel in the contact area. All contacts had 50 micro inches of nickel under plating. A total of 4 connector pairs were tested.

1.5 Test Samples

The test samples were randomly selected from normal current production lots, and the connectors used for testing contained the following part numbers:

Test Group	Quantity	Part Numbers	Description
AP	4	746603-1	EUROLATCH® Rcpt. Assembly
AP	4	650470-5	Eurocard Pin Assembly

1.6 Qualification Test Sequence

Test or Examination	Test Group AP
Examination of Product	1,23
Connector Polarization	2
Termination Resistance, Dry Circuit	3,19
Insulation Resistance	4,11,20
Dielectric Withstanding Voltage	5,8,12,21
Contact Separating Force	6
Total Insertion & Withdrawal Forces	7,22
Vibration	9
Thermal Shock	10
Humidity-Temperature Cycling	15,18
Dry Heat	13
Insulation Resistance During Dry Heat	14
Dielectric W\Standing Voltage @ Part. Vacuum	17
Cold Shock	16

The numbers indicate the sequence in which tests were performed.

2.0. Results of Testing

2.1 Examination of Product - Group AP

All samples submitted for testing were selected from normal current production lots. They were inspected and accepted by the Product Assurance Department of the Personal Computer Business Group.

2.2 Connector Polarization - Group AP

All samples met the polarization check.

2.3 Termination Resistance, Dry Circuit - Group AP

All termination resistance measurements, taken at 100 milliamperes DC and 20 millivolts open circuit voltage were less than 20 milliohms.

Test Group	No. of* Samples	Test Condition	Values in Milliohms Min	Max	Mean
AP	256	Initial Reading	4.84	7.54	5.20
	256	Final Reading	5.04	19.66	6.08

*Exceeds minimum requirement of 6 contacts per connector.

2.4 Insulation Resistance - Group AP

All insulation resistance measurements were greater than $1x10^{12}$ ohms initially, finally and at all intermediate measurement intervals.

2.5 Dielectric Withstanding Voltage - Group AP

No dielectric breakdown or flashover occurred when a test voltage of 500 volts AC was applied between adjacent contacts.

2.6 Contact Separating Force - Group AP

All contact separating forces were greater than 0.15 Newtons (0.54 ounces) per contact.

2.7 Total Insertion Force & Withdrawal Forces - Group AP

The total connector insertion and withdrawal forces were less than 60 Newtons (13.5 lb.).

2.8 Vibration - Group AP

Contact resistance, of the monitored contacts, did not exceed 40 milliohms during the vibration exposure. Following vibration, there was no visual evidence of cracks, breaks, or other physical damage to any of the connector assemblies.

2.9 Thermal Shock - Group AP

No evidence of physical damage to either the contacts or the connectors was visible as a result of thermal shock.

2.10 Humidity-Temperature Cycling - Group AP

No evidence of physical damage to either the contacts or the connectors was visible as a result of exposure to humidity-temperature cycling.

2.11 Insulation Resistance During Dry Heat - Group AP

There was no evidence of physical damage to either the contacts or the connectors as a result of exposure to an elevated temperature of 105°C. All IR measurements were greater than the required $1x10^{11}$ ohms.

2.12 Dielectric Withstanding Voltage At Partial Vacuum - Group AP

There were no dielectric breakdown failures to any adjacent contacts after applying 300 volts ac for 1 minute while at a partial vacuum of 300 millibars (simulated 30,000 foot altitude).

2.13 Cold Shock - Group AP

There was no evidence of physical damage to the contacts or connectors after exposure to a -55°C cold shock.

3.0 Test Methods

3.1 Examination of Product

Product drawings and inspection plans were used to examine the samples. They were examined visually and functionally.

3.2 Connector Polarization

All samples were checked for a polarization feature which would prevent the connector halves from being physically mated when improperly oriented.

3.3 Termination Resistance, Dry Circuit

Termination resistance measurements at low level current were made using a four terminal measuring configuration. The test current was maintained at 100 milliamperes DC with an open circuit voltage of 20 millivolts DC. For each measurement, 2 of the current and voltage probes were attached at the point where the solder tail of the Eurocard connectors was soldered to the printed circuit board. The other 2 probes were attached to opposite ends of a single conductor of the ribbon cable which was terminated to the Insulation Displacement Contact of the EUROLATCH® connector.

3.4 Insulation Resistance

Insulation resistance was measured between adjacent contacts, using a test voltage of 100 volts DC. This voltage was applied for one minute before the resistance was measured.

3.5 Dielectric Withstanding Voltage

A test potential of 500 volts AC was applied between the adjacent contacts. This potential was applied for one minute and then returned to zero.

3.6 Contact Separating Force

Separating forces were acquired by preconditioned each receptacle contact by inserting a maximum size gage pin of 0.024 x 0.039 inches, 3 times. A minimum size gage pin of 0.022 x 0.039 inches was then inserted and withdrawn 3 times while measuring the peak force required to withdraw or separate it from the contact being tested.

3.7 Total Insertion and Withdrawal Force

A test sample consisted of a plug and receptacle with all contacts installed. Samples were mounted in test fixtures in a manner similar to normal service. The samples were aligned and brought to a position where mechanical mating just began. Force measurements were taken while samples were mated and unmated at a rate of 1 inch/minute.

3.8 Vibration, Sine

Mated connectors were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.35mm, double amplitude or 6g's peak, whichever was less. The vibration frequency was varied (logarithmically/uniformly) between the limits of 10 and 500 Hz and returned to 10 Hz in 11.3 minutes. This cycle was performed 10 times in each of three mutually perpendicular planes, for a total vibration time of 5.7 hours. Six contact pairs on each connector were monitored for any increase in contact resistance which exceeded 40 milliohms.

3.9 Thermal Shock

Mated connectors were subjected to 5 cycles of temperature extremes with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -55 and 105°C, with transition between extremes of less than one minute.

3.10 Humidity-Temperature Cycling

Mated connectors were exposed to a total of 6 cycles of humidity-temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 40°C (9 hrs.) and 25°C (9 hrs.) with 3 hour transition times, while the relative humidity was held at 95%.

3.11 Insulation Resistance During Dry Heat

Mated connectors were subjected to a temperature of 105°C for 16 hours. IR was measured on three adjacent contact pairs of each connector. These measurements were made while at ambient, initially and immediately after removal from the oven.

3.12 Dielectric Withstanding Voltage At Partial Vacuum

Samples were placed in an altitude chamber with 3 adjacent contact pairs on each sample wired to test dielectric withstanding voltage. A test voltage of 300 volts AC was applied for 1 minute to each adjacent pair at a time while the chamber was maintained at a simulated altitude of 30,000 feet.

3.13 Cold Shock

Samples were placed in a test chamber environment of -55°C for a period of 2 hours. After removal the samples were inspected for any evidence of physical damage.

4.0 Validation

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