# 2 mm AMP-LATCH* Ribbon Cable Receptacle Connector

## 1. INTRODUCTION

### 1.1. Purpose

Testing was performed on AMP-LATCH* 2 mm Ribbon Cable Receptacle Connector to determine its conformance to the requirements of Product Specification 108-1372 Revision A.

### 1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the AMP-LATCH 2 mm Ribbon Cable Receptacle Connector. Testing was performed at the Engineering Assurance Product Test Laboratory between 28Mar94 and 22Jun94. The test file number for this testing is CTL 0767-012-002. This documentation is on file at and available from the Engineering Assurance Product Test Laboratory.

### 1.3. Conclusion

The AMP-LATCH 2 mm Ribbon Cable Receptacle Connector listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-1372 Revision A.

### 1.4. Product Description

The AMP-LATCH* 2 mm ribbon cable receptacle connector has insulation displacement contacts designed to be applied to 1 mm centerline, 28 AWG ribbon cable. Completed assemblies mate to 0.5 mm square or round posts on 2 mm centerlines.

### 1.5. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the following part numbers were used for test:

| Test Group | Quantity | Part Number | Description |
|---|---|---|---|
| 1,4 | 12 | 111626-2 | 14 position receptacle |
| 2,4,5 | 18 | 1-111626-1 | 50 position receptacle |
| 1,2,3,5 | 30 | 3-176264-9 | 50 position header |

Figure 1

### 1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

- Temperature: 15 to 35°C
- Relative Humidity: 25 to 75%



* Trademark
| Indicates change

1.7. Qualification Test Sequence

| Test or Examination | Test Group (a) | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| | Test Sequence (b) | | | | |
| Examination of product | 1,9 | 1,5 | 1,5 | 1,8 | 1,5 |
| Termination resistance, dry circuit | 3,7 | 2,4 | 2,4 | | 2,4 |
| Dielectric withstanding voltage | | | | 3,7 | |
| Insulation resistance | | | | 2,6 | |
| Vibration | 5 | | | | |
| Physical shock | 6 | | | | |
| Mating force | 2 | | | | |
| Unmating force | 8 | | | | |
| Durability | 4 | | | | |
| Thermal shock | | | | 4 | 3 |
| Humidity/temperature cycling | | | | 5 | |
| Mixed flowing gas | | | 3(c) | | |
| Temperature life | | 3(c) | | | |

**NOTE**

*(a) See paragraph 1.5.*
*(b) Numbers indicate sequence in which tests are performed.*
*(c) Precondition samples with 5 durability cycles.*

Figure 2

## 2. SUMMARY OF TESTING

2.1. Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. Specimens were inspected and accepted by the Product Assurance Department of the Capital Goods Business Unit.

2.2. Termination Resistance, Dry Circuit - Test Groups 1, 2, 3 and 5

All termination resistance measurements, taken at 100 milliamperes maximum and 50 millivolts maximum open circuit voltage were less than 25 milliohms.

| Test Group | Number of Data Points | Condition | Termination Resistance | | |
|---|---|---|---|---|---|
| | | | Min | Max | Mean |
| 1 | 84 | Initial | 3.13 | 5.92 | 3.746 |
| | | After mechanical | 2.60 | 8.14 | 3.749 |
| 2 | 125 | Initial | 2.96 | 6.05 | 3.559 |
| | | After temperature life | 2.89 | 6.71 | 3.729 |
| 3 | 100 | Initial | 2.60 | 3.93 | 3.046 |
| | | After mixed flowing gas | 2.71 | 4.67 | 3.279 |
| 5 | 100 | Initial | 2.88 | 5.85 | 3.542 |
| | | After thermal shock | 2.75 | 4.39 | 3.399 |

**NOTE** *All values in milliohms.*

Figure 3

2.3. Dielectric Withstanding Voltage - Test Group 4

No dielectric breakdown or flashover occurred.

2.4. Insulation Resistance - Test Group 4

All insulation resistance measurements were greater than 5000 megohms initially and 1000 megohms after humidity exposure.

2.5. Vibration - Test Group 1

No discontinuities were detected during vibration testing. Following vibration testing, no cracks, breaks, or loose parts on the specimens were visible.

2.6. Physical Shock - Test Group 1

No discontinuities were detected during mechanical shock testing. Following mechanical shock testing, no cracks, breaks, or loose parts on the specimens were visible.

2.7. Mating Force - Test Group 1

All mating force measurements were less than 1.67 N [6 ozf] maximum per contact.

2.8. Unmating Force - Test Group 1

| All unmating force measurements were greater than 0.14 N [0.5 ozf] minimum per contact.

2.9. Durability - Test Group 1

No physical damage occurred as a result of mating and unmating the specimens 150 times.

2.10. Thermal Shock - Test Groups 4 and 5

No evidence of physical damage was visible as a result of thermal shock testing.

2.11. Humidity/temperature Cycling - Test Group 4

No evidence of physical damage was visible as a result of humidity/temperature cycling.

2.12. Mixed Flowing Gas - Test Group 3

No evidence of physical damage was visible as a result of exposure to the pollutants of mixed flowing gas.

2.13. Temperature Life - Test Group 2

No evidence of physical damage was visible as a result of temperature life testing.

**3. TEST METHODS**

3.1. Examination of Product

Specimens were examined visually and functionally using product drawings and inspection plans.

3.2. Termination Resistance, Dry Circuit

Low level contact resistance measurements were made using a 4 terminal measuring technique (Figure 4). The test current was maintained at 100 milliamperes maximum with a 50 millivolt maximum open circuit voltage.

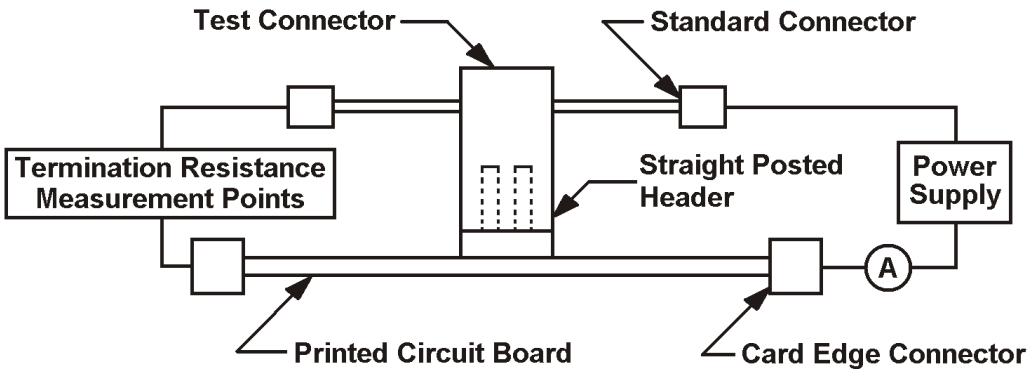


Figure 4
Termination Resistance & Temperature Measurement Points

3.3. Dielectric Withstanding Voltage

A test potential of 300 volts AC was applied between adjacent contacts. This potential was applied for 1 minute and then returned to zero.

3.4. Insulation Resistance

Insulation resistance was measured between adjacent contacts. A test voltage of 100 volts DC was applied for 2 minutes before the resistance was measured.

3.5. Vibration, Random

Mated specimens were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 50 and 2000 Hz. The power spectral density at 50 Hz was 0.01 $G^2$/Hz. The spectrum sloped up at 6 dB per octave to a PSD of 0.04 $G^2$/Hz at 100 Hz. The spectrum was flat at 0.04 $G^2$/Hz from 100 to 1000 Hz. The spectrum sloped down at 6 dB per octave to the upper bound frequency of 2000 Hz at which the PSD was 0.01 $G^2$/Hz. The root-mean square amplitude of the excitation was 23.91 GRMS. This was performed for 15 minutes in each of 3 mutually perpendicular planes for a total vibration time of 45 minutes. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes in the monitoring circuit.

3.6. Physical Shock, Sawtooth

Mated specimens were subjected to a mechanical shock test, having a sawtooth waveform of 50 gravity units (g peak) and a duration of 11 milliseconds. Three shocks in each direction were applied along the 3 mutually perpendicular planes, for a total of 18 shocks. Specimens were monitored for discontinuities of 1 microsecond or greater, using a current of 100 milliamperes DC.

3.7. Mating Force

The force required to mate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of 2.54 cm [1 in] per minute. The maximum average force per contact was calculated.

3.8. Unmating Force

The force required to unmate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of 2.54 cm [1 in] per minute. The minimum average force per contact was calculated.

3.9. Durability

Specimens were mated and unmated 150 times at a maximum rate of 150 cycles per hour.

3.10. Thermal Shock

Mated specimens were subjected to 5 cycles of thermal shock with each cycle consisting of 30 minute dwells at -65 and 105°C. The transition between temperatures was less than 1 minute.

3.11. Humidity/temperature Cycling

Mated specimens were exposed to 10 cycles of humidity/temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25 and 65°C twice while maintaining high humidity.

3.12. Mixed Flowing Gas, Class III

Mated specimens were exposed for 20 days to a mixed flowing gas Class III exposure. Class III exposure is defined as a temperature of 30°C and a relative humidity of 75% with the pollutants of $Cl_2$ at 20 ppb, $NO_2$ at 200 ppb and $H_2S$ at 100 ppb. Specimens were preconditioned with 5 cycles of durability.

3.13. Temperature Life

Mated specimens were exposed to a temperature of 105°C for 96 hours. Specimens were preconditioned with 5 cycles of durability.