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**Receptacle, AMP-LATCH\* Ultra Novo, Flat Cable Round  
Conductor**

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**1. INTRODUCTION**

## 1.1. Purpose

Testing was performed on AMP-LATCH\* Ultra Novo Receptacle to determine its conformance to the requirements of Product Specification 108-1740 Rev. D.

## 1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Ultra Novo Receptacle. Testing was performed at the Americas Regional Laboratory between 28Aug97 and 19Dec97.

## 1.3. Conclusion

The Ultra Novo Receptacle, listed in paragraph 1.5., met the electrical, mechanical, and environmental performance requirements of Product Specification 108-1740 Rev D.

## 1.4. Product Description

The Ultra Novo receptacles are designed to be crimped to 0.635 mm [.025 in] centerline ribbon cable (AWG 30 solid and stranded). The complete assembly mates to an 0.635 mm [.025 in] square posts on 2.54 mm [.100 in] centerline with equivalent post length of 5.33 mm [.210 in]. The contact is a copper alloy with a thermoplastic (UL94V-O) housing.

## 1.5. Test Samples

The test samples were representative of normal production lots, and the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
1,2,3,4	5 each	120613-1	Ultra Novo Receptacle, Dual Row 40 Position, 30 AWG Solid
1,2,4	5 each	120613-2	Ultra Novo Receptacle, Dual Row 40 Position, 30 AWG Stranded

## 1.6. Environmental Conditions

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

- Temperature: 15 to 35°C
- Relative Humidity: 20 to 80%

1.7. Qualification Test Sequence

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

**NOTE** (a) The numbers indicate sequence in which tests were performed.  
 (b) Precondition with 10 cycles of durability.

**2. SUMMARY OF TESTING**

2.1. Examination of Product - All Groups

All samples submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by the Product Assurance Department of the Personal Computer Business Group. Where specified, samples were visually examined and no evidence of physical damage detrimental to product performance was observed.

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

All termination resistance measurements, taken at 100 milliamperes maximum and 50 millivolts open circuit voltage were less than 30 milliohms.

Test Group	Number of Data Points	Condition	Termination Resistance		
			Min	Max	Mean
Signal Contacts					
1	100	Initial	4.50	5.40	4.982
		After mechanical	4.53	5.80	5.000
2	100	Initial	3.99	5.02	4.671
		After temperature life	4.28	5.43	4.758
3	50	Initial	3.93	4.78	4.524
		After mixed flowing gas	4.13	6.84	4.641
Ground Contacts					
1	25	Initial	4.70	5.26	5.061
		After mechanical	4.61	5.18	4.982
2	25	Initial	4.17	4.77	4.581
		After temperature life	4.19	5.81	4.765
3	25	Initial	4.39	4.63	4.497
		After mixed flowing gas	4.12	5.23	4.600

**NOTE** All values in milliohms

2.3. Dielectric Withstanding Voltage - Group 4

No dielectric breakdown or flashover occurred.

2.4. Insulation Resistance - Group 4

All insulation resistance measurements were greater than 1000 megohms.

2.5. Vibration - Group 1

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

2.6. Physical Shock - Group 1

No discontinuities were detected during physical shock testing. Following physical shock testing, no cracks, breaks, or loose parts on the connector assemblies were visible.

2.7. Mating Force - Group 1

All mating force measurements were less than 340 g [12 oz] per contact.

2.8. Unmating Force - Group 1

All unmating force measurements were greater than 42.5 g [1.5 oz] per contact.

2.9. Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 75 times.

2.10. Thermal Shock - Group 4

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

2.11. Humidity-Temperature Cycling - Group 4

No evidence of physical damage was visible as a result of exposure to humidity-temperature cycling.

2.12. Mixed Flowing Gas - 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 - Group 2

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

**3. TEST METHODS**

3.1. Examination of Product

Where specified, samples were visually examined for evidence of physical damage detrimental to product performance.

3.2. Termination Resistance, Low Level

Termination resistance measurements at low level current were made using a 4 terminal measuring technique (Figure 1). The test current was maintained at 100 milliamperes maximum with a 50 millivolt open circuit voltage.

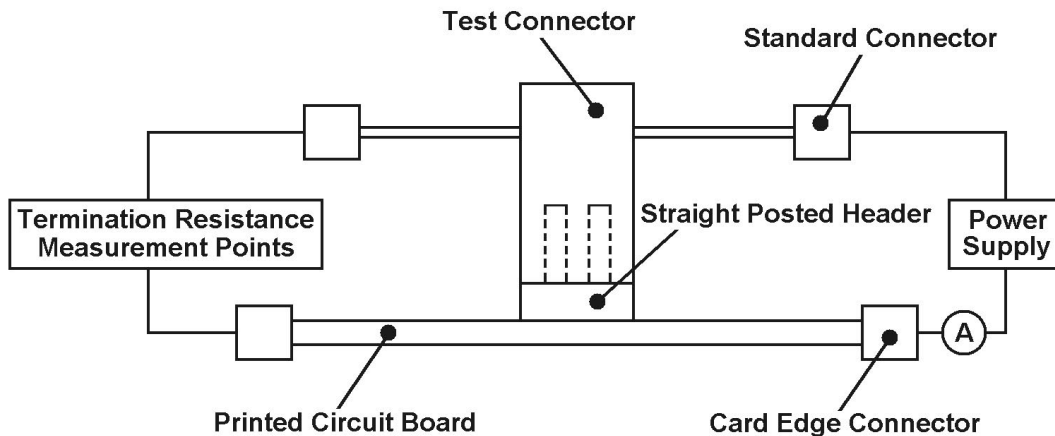


Figure 1  
Typical Termination Resistance Measurement Points

### 3.3. Dielectric Withstanding Voltage

A test potential of 200 volts DC was applied between the 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, using a test voltage of 500 volts DC. This voltage was applied for 2 minutes before the resistance was measured.

### 3.5. Vibration, Random

Mated receptacles and headers were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 5 and 500 Hz. The power spectral density at 5 Hz was 0.000312 G<sup>2</sup>/Hz. The spectrum sloped up at 12 dB per octave to a PSD of 0.02 G<sup>2</sup>/Hz at 14 Hz. The spectrum was flat at 0.02 G<sup>2</sup>/Hz from 14 to 500 Hz. The root-mean square amplitude of the excitation was 3.13 GRMS. This was performed for 15 minutes in each of 3 mutually perpendicular planes for a total vibration time of 45 minutes. Receptacles and headers were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

### 3.6. Physical Shock

Mated receptacles and headers were subjected to a physical shock test having a half-sine waveform of 30 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. Receptacles and headers 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 receptacles and headers was measured using a tensile/compression device with the rate of travel at 12.7 mm [.5 in] per minute and a free floating fixture. The force per contact was calculated.

### 3.8. Unmating Force

The force required to unmate individual receptacles and headers was measured using a tensile/compression device with the rate of travel at 12.7 mm [.5 in] per minute and a free floating fixture. The force per contact was calculated.

### 3.9. Durability

Receptacles and headers were mated and unmated 75 times at a rate of 150 cycles per hour.

### 3.10. Thermal Shock

Unmated receptacles were subjected to 25 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

Unmated receptacles 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 (Figure 2).

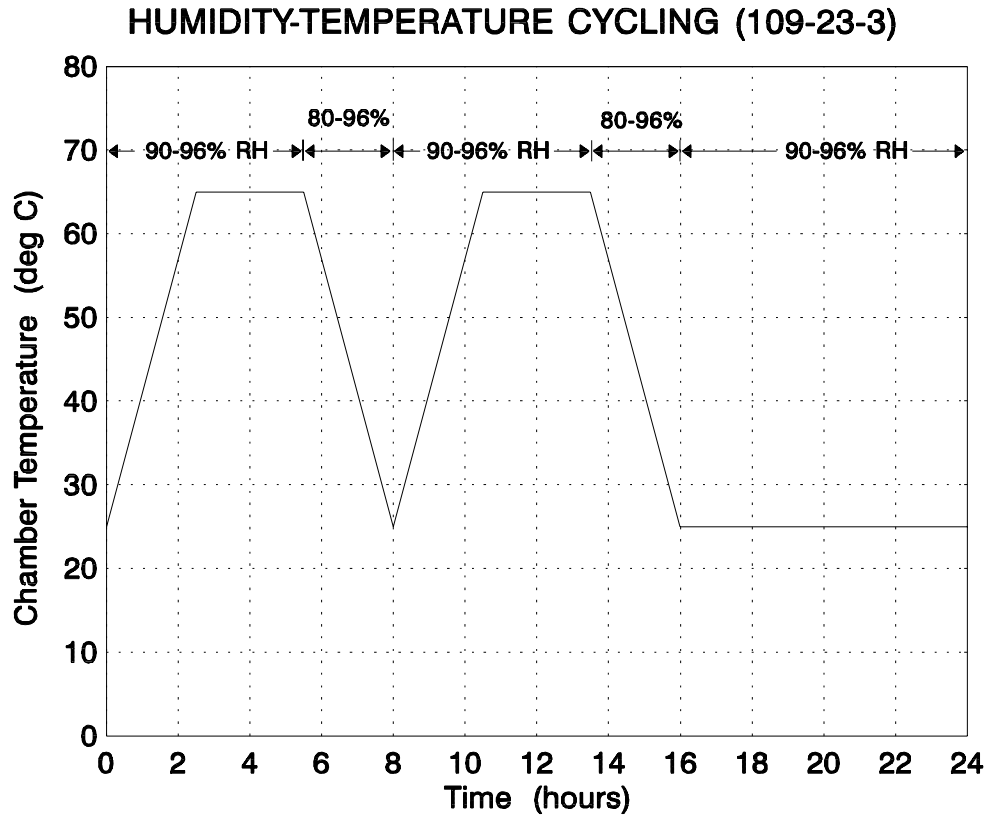


Figure 2  
Typical Humidity-Temperature Cycling Profile

3.12. Mixed Flowing Gas, Class III

Mated receptacles and headers 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<sub>2</sub> at 20 ppb, NO<sub>2</sub> at 200 ppb, and H<sub>2</sub>S at 100 ppb. Samples were preconditioned with 10 cycles of durability.

3.13. Temperature Life

Mated receptacles and headers were exposed to a temperature of 105°C for 500 hours. Samples were preconditioned with 10 cycles of durability.