

PCB Mounted Circular Plastic Connector

1. INTRODUCTION

1.1. Purpose

Testing was performed on the AMP* Printed Circuit Board (PCB) mounted Circular Plastic Connector (CPC) to determine its conformance to the requirements of AMP Product Specification 108-10024-5 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the PCB mounted CPC. Testing was performed at the Americas Regional Laboratory between 02Feb00 and 29Feb00. The test file number for this testing is CTL 4993-015. This documentation is on file at and available from the Americas Regional Laboratory.

1.3. Conclusion

The PCB mounted CPC listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-10024-5 Revision A.

1.4. Product Description

The PCB mounted CPC is a removable contact design connector for use in electronic, electrical power and circuit control.

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
1,2,3	5 each	213588-1	Size 23-24 posted receptacle
1,3	5 each	206455-2	Size 23-63 posted receptacle
1,2	5 each	206837-1	Size 23-24 CPC plug
1	5	213588-1	Size 23-63 CPC plug
1,2	240 each	66100-7	Type III+ contact with 20 AWG wire
1	630	66108-8	Type III+ contact with 24 AWG wire

Figure 1

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 Group (a)		
	1	2	3
	Test Sequence (b)		
Initial examination of product	1	1	1
Dry circuit resistance	3,7	2,4	
Solderability			2
Vibration	5		
Mechanical shock	6		
Durability	4		
Mating torque	2		
Unmating torque	8		
Humidity-temperature cycling		3	
Final examination of product	9	5	3

NOTE (a) See paragraph 1.5.
 (b) Numbers indicate sequence in which tests are performed.

Figure 2

2. SUMMARY OF TESTING

2.1. Initial Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by the Product Assurance Department. Specimens were visually and dimensionally examined per the product drawing and no evidence of physical damage detrimental to product performance was observed.

2.2. Termination Resistance - Test Groups 1 and 2

All termination resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage had a change in resistance (ΔR) of less than 4 milliohms after testing.

Test Group	Number of Data Points	Condition	Termination Resistance		
			Min	Max	Mean
1 (23-24)	30	After mechanical	-0.16	+3.72	+1.358
1 (23-63)		After mechanical	-0.13	+1.29	+0.293
2 (23-24)		After humidity-temperature cycling	-0.34	+2.52	+0.666

NOTE All values in milliohms.

Figure 3

2.3. Solderability - Test Group 3

All contact leads had a minimum of 95% solder coverage.

2.4. 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.

2.5. Mechanical 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.

2.6. Durability - Test Group 1

No physical damage occurred as a result of mating and unmating the specimens 100 times.

2.7. Mating Torque - Test Group 1

All mating torque measurements were less than 2.26 N•m [20 in-lb].

2.8. Unmating Torque - Test Group 1

All unmating force measurements were less than 2.26 N•m [20 in-lb].

2.9. Humidity-temperature Cycling - Test Group 2

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

2.10. Final Examination of Product - All Test Groups

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

3. TEST METHODS**3.1. Initial Examination of Product**

Where specified, specimens were visually and dimensionally examined per the product drawing for evidence of physical damage detrimental to product performance.

3.2. Termination Resistance

Termination resistance measurements at low level current were made using a 4 terminal measuring technique. The test current was maintained at 100 milliamperes maximum with a 20 millivolt maximum open circuit voltage.

3.3. Solderability

Specimen contact solder tails were subjected to a solderability test. The soldertails were immersed in a nonactivated rosin flux for 5 to 10 seconds, allowed to drain for 10 to 60 seconds, then held over molten solder without contact for 2 seconds. The solder tails were then immersed in the molten solder at a rate of approximately 25.4 mm [1 in] per second, held for 3 to 5 seconds, then withdrawn. After cleaning in isopropyl alcohol, the specimens were visually examined for solder coverage. The solder used for testing was 60/40 tin lead composition and was maintained at a temperature of $245 \pm 5^{\circ}\text{C}$.

3.4. Vibration, Sinusoidal

Mated specimens were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 1.5 mm [0.06 in], double amplitude or 15 gravity units (g's peak). The vibration frequency was varied uniformly between the limits of 10 and 2000 Hz and returned to 10 Hz in 20 minutes. This cycle was performed 12 times in each of 3 mutually perpendicular planes for a total vibration time of 12 hours. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.5. Mechanical Shock, Half-sine

Mated specimens were subjected to a mechanical shock test having a half-sine 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.

3.6. Durability

Specimens were mated and unmated 100 times at a maximum rate of 600 cycles per hour.

3.7. Mating Torque

The force required to mate individual specimens was measured using a torque gage and suitable fixturing.

3.8. Unmating Torque

The force required to unmate individual specimens was measured using a torque gage and suitable fixturing.

3.9. Humidity-temperature Cycling

Mated/Unmated specimens were exposed to 10 cycles of humidity-temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25°C and 65°C twice while maintaining high humidity (Figure 4).

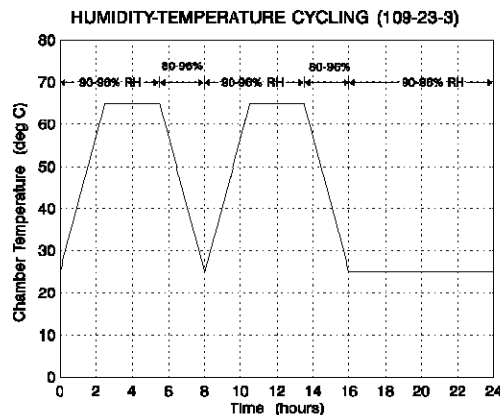


Figure 4
Typical Humidity-Temperature Cycling Profile

3.10. Final Examination of Product

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