FASTON* Receptacle, Printed Circuit Board Mounted

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Printed Circuit Board (PCB) mounted AMP* FASTON* Receptacle to determine its conformance to the requirements of AMP Product Specification 108-1706 Revision O.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the PCB mounted FASTON receptacle. Testing was performed at the Americas Regional Laboratory between 12Feb98 and 28Apr98. The test file number for this testing is CTL 1103-000-014A1. This documentation is on file at and available from the Americas Regional Laboratory.

1.3. Conclusion

The PCB mounted FASTON receptacle, listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1706 Revision O.

1.4. Product Description

The PCB mounted FASTON receptacle is designed to accept a 205/250 Series FASTON tab. These contacts are designed with a cantilevered floor or triangular cutout in the mating rolls to provide low insertion forces. In addition, the mating rolls allow maximum compliance toward the mating tab. The stabilizer supports the contact after insertion into the PC board.

1.5. Test Samples

The test samples were representative of normal production lots. Samples identified with the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
1,2,3	30 each	63968-1	PCB mounted FASTON receptacle
1,2,3	3 ea	60-469388	Test board, 2 ounce copper, .250 inch wide trace, top and bottom paralleled via plated through holes

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%

* Trademark
I Indicates change

LOC B

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Examination of product	1,9	1,9	1,3
Termination resistance	3,7	2,7	
Temperature rise vs current		3,8	
Solderability			2
Vibration	5	6(c)	
Mechanical shock	6		
Durability	4		
Mating force	2		
Unmating force	8		
Humidity-temperature cycling		4(d)	
Temperature life		5	

NOTE

(a) See paragraph 1.5.
(b) Numbers indicate sequence in which tests are performed.
(c) Discontinuities shall not be measured. Energize at 18 °C level for 100% loadings per AMP Specification 109-151.
(d) Precondition samples with 3 cycles durability.

Figure 2

2. SUMMARY OF TESTING

2.1. Examination of Product - All Test Groups

All samples submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by Product Assurance. Where specified, samples were visually examined 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 were less than 1.0 milliohm.

Test Group	Number of Data Points	Condition	Termination Resistance		
			Min	Max	Mean
1	30	Initial	0.48	0.56	0.518
		After mechanical	0.53	0.77	0.599
2	30	Initial	0.47	0.52	0.493
		After current verification	0.53	0.81	0.651

NOTE *All values in milliohms.*

Figure 3

2.3. Temperature Rise vs Current - Test Group 2

All samples had a temperature rise of less than 30°C above ambient when tested using a baseline rated current of 22.9 amperes.

2.4. Solderability - Test Group 3

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

2.5. Vibration, Sinusoidal - Test Groups 1 and 2

No discontinuities were detected during vibration testing (Test Group 1 only). Following vibration testing, no cracks, breaks, or loose parts on the samples were visible.

2.6. 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 samples were visible.

2.7. Durability - Test Group 1

No physical damage occurred as a result of mating and unmating the samples 6 times.

2.8. Mating force - Test Group 1

All mating force measurements were less than 12.25 pounds.

2.9. Unmating Force - Test Group 1

All unmating force measurements were greater than 4 pounds.

2.10. Humidity-temperature Cycling - Test Group 2

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

2.11. Temperature Life - Test 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

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

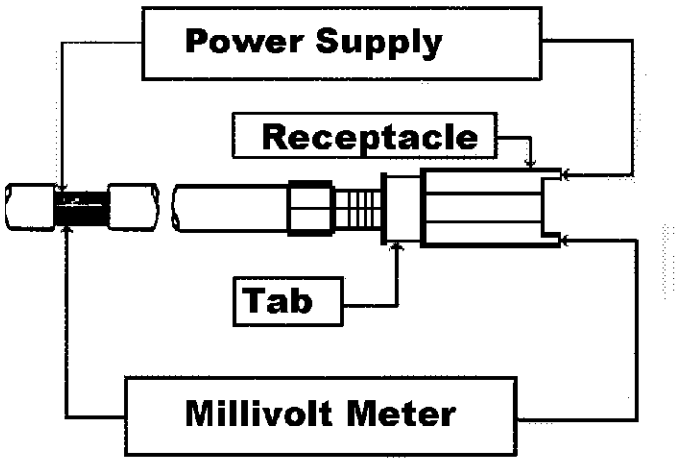

Figure 4
Typical Termination Resistance Measurement Points

3.3. Temperature Rise vs Current

Temperature rise curves were produced by measuring individual contact temperatures at 5 different current levels. These measurements were plotted to produce a temperature rise vs current curve. Thermocouples were attached to individual contacts to measure their temperatures. The ambient temperature was then subtracted from this measured temperature to find the temperature rise. When the temperature rise of 3 consecutive readings taken at 5 minute intervals did not differ by more than 1°C, the temperature measurement was recorded.

3.4. Solderability

Connector assembly contact solder tails were subjected to a solderability test. The soldertails were immersed in a mildly activated 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 1 inch per second, held for 3 to 5 seconds, then withdrawn. After cleaning in isopropyl alcohol, the samples 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 ± 5°C.

3.5. Vibration, Sinusoidal

Mated samples were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude. The vibration frequency was varied uniformly between the limits of 10 and 55 Hz and returned to 10 Hz in 1 minute. This cycle was performed 120 times in each of 3 mutually perpendicular planes for a total vibration time of 6 hours. Samples for Test Group 1 were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC. Samples for Test Group 2 were energized with 15.69 amperes.

3.6. Mechanical Shock, Half-sine

Mated samples 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. Samples were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.7. Durability

Samples were mated and unmated 6 times at a maximum rate of 600 cycles per hour.

3.8. Mating Force

The force required to mate individual samples was measured using a tensile/compression device with the rate of travel at 0.5 inch per minute and a free floating fixture.

3.9. Unmating Force

The force required to unmate individual samples was measured using a tensile/compression device with the rate of travel at 0.5 inch per minute and a free floating fixture.

3.10. Humidity-temperature Cycling

Mated samples 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 5). Samples were preconditioned with 3 cycles of durability.

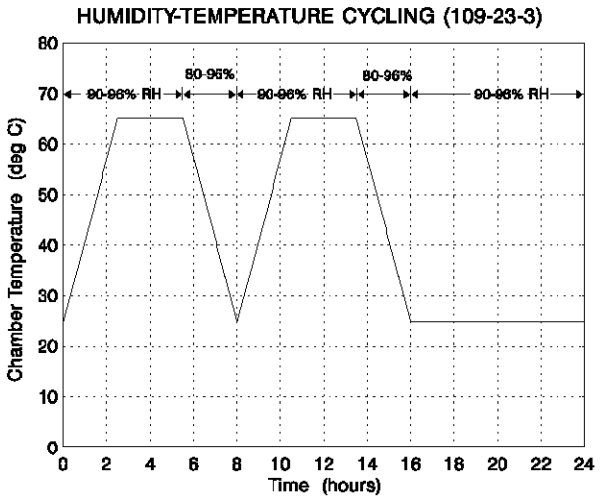

Figure 5
Typical Humidity-Temperature Cycling Profile

3.11. Temperature Life

Mated samples were exposed to a temperature of 105°C for 500 hours.