Series 120 Power Connector

1. INTRODUCTION

1.1. Purpose

Testing was performed on the TE Connectivity (TE) Series 120 Power Connector to determine its conformance to the requirements of Product Specification 108-2153 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Series 120 Power Connector. Testing was performed at Contech Research Incorporated, the test file number for this testing is 205725A. This documentation is on file at and available from Contech Research Incorporated. Testing was also performed at the Harrisburg Electrical Components Test Laboratory, the test file number for this testing are CTLH410-002, CTLB034992-001, CTLB034992-002, CTLB034992-004 and CTLB034992-005. This documentation is on file at and available from the Harrisburg Electrical Components Test Laboratory.

1.3. Conclusion

The Series 120 Power Connector listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-2153 Revision A.

1.4. Product Description

This power product is a two position hermaphroditic connector system. Contacts are available in stamped and formed and cold headed to accommodate 6 to 2 AWG wire.

1.5. Test Specimens

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

Part Number	Description
1445994-1	Gray Series 120 subassembly
1445994-2	Blue Series 120 subassembly
1445995-1	Contact, AMP Power Series 120, 2 AWG wire
1445995-1	Contact, AMP Power Series 120, 2 AWG wire, S400 crimp
1445995-1	Contact, AMP Power Series 120, 2 AWG wire, S500 crimp
1445996-1	Contact, AMP Power Series 120, 4 AWG wire
1445996-1	Contact, AMP Power Series 120, 4 AWG wire, S400 crimp
1445996-1	Contact, AMP Power Series 120, 4 AWG wire, S500 crimp
1445997-1	Contact, AMP Power Series 120, 6 AWG wire
1445997-1	Contact, AMP Power Series 120, 6 AWG wire, S400 crimp
1445997-1	Contact, AMP Power Series 120, 6 AWG wire, S500 crimp

Figure 1 (continued)

| Indicates Change

Part Number	Description
1445998-2	Kit, AMP Power Series 120, 2 AWG contacts
1445998-2	Kit, AMP Power Series 120, 4 AWG contacts
1445998-2	Kit, AMP Power Series 120, 6 AWG contacts
1604001-2	Subassembly, AMP Power Series 120, 4 AWG contacts
1604001-2	Subassembly, AMP Power Series 120, 6 AWG contacts
1604002-2	Subassembly, AMP Power Series 120, 2 AWG contacts

Figure 1 (end)

1.6. Environmental Conditions

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

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

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
LLCR (c)		2,8	2,5		
Withstanding voltage				2	
Temperature rise vs current					2
Sinusoidal vibration		5			
Mechanical shock		6			
Durability		3(d)	3(e)		
Mating/unmating force	2		4		
Contact retention, initial	3				
Humidity/temperature cycling		7			
Temperature life		4			
Final examination of product	4	9	6	3	3

NOTE

(a) See paragraph 1.5.
(b) Numbers indicate sequence in which tests are performed.
(c) Precondition with 1 durability cycle.
(d) 1000 cycles.
(e) 10000 cycles.

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 (C of C) was issued by Product Assurance. Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. LLCR - Test Groups 2, 3 and 5

All LLCR measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than 5 milliohms after testing.

2.3. Withstanding Voltage - Test Group 4

No dielectric breakdown or flashover occurred.

2.4. Temperature Rise vs Current - Test Group 5

All specimens had a temperature rise of 30°C above ambient when tested using a current of 120 amperes for 2 AWG wire, 100 amperes for 4 AWG wire and 70 amperes for 6 AWG wire.

2.5. Sinusoidal Vibration - Test Group 2

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

2.6. Mechanical Shock - Test Group 2

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. Durability - Test Groups 2 and 3

No physical damage occurred as a result of mating and unmating the specimens 1,000 times in test group 2 and 10,000 times in test group 3.

2.8. Mating/Unmating Force - Test Groups 1 and 3

All initial mating and unmating forces were less than 178 N [40 lbf] for double pole product and less than 67 N [15 lbf] for single pole product.

2.9. Contact Retention, Initial - Test Group 1

Initial contact retention measurements were greater than 445 N [100 lbf].

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.

2.12. Final Examination of Product - All Test Groups

Specimens were visually examined for evidence of physical damage detrimental to product performance.

3. TEST METHODS

3.1. Initial Examination of Product

A C of C was issued stating that all specimens in this test package were produced, inspected, and accepted as conforming to product drawing requirements, and were manufactured using the same core manufacturing processes and technologies as production parts.

3.2. LLCR

LLCR measurements 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. Withstanding Voltage

A test potential of 1365 volts AC was applied between adjacent contacts of mated specimens for 1 minute and then returned to zero.

3.4. Temperature Rise vs Current

Thermocouples were attached to the top side of the contact prior to insertion into the housings. There is a flat spot on the top side of the contact in front of the crimp just over the rounded portion of the contact. The thermocouples were attached towards the back of this flat spot behind where the TE symbol is stamped on the contact. A small hole was drilled and the thermocouple inserted, the metal was then peened back around the thermocouple. The thermocouple wire was taped to the specimen cable to act as a strain relief.

3.5. Sinusoidal Vibration

Mated specimens were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 1.5 mm [0.06 in], 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. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.6. Mechanical Shock

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.

3.7. Durability

Specimens were mated and unmated for the specified number of cycles at a maximum rate of 400 cycles per hour.

3.8. Mating/Unmating Force

The initial force required to mate and unmate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute.

3.9. Contact Retention

A minimum axial load of 600 N [135 lbf] was applied to each contact and held for 60 seconds. The force was applied in a direction to cause removal of the contacts from the housing.

3.10. 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.

3.11. Temperature Life

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

3.12. Final Examination of Product

Specimens were visually examined for evidence of physical damage detrimental to product performance.