Pivot II Connector, Two Pair

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics Two Pair Pivot II Connector to determine its conformance to the requirements of Product Specification 108-1657-2 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Two Pair Pivot II Connector. Testing was performed at the Global Automotive Division Product Reliability Center between Mar01 and Jul01. The test file numbers for this testing are 20000186ACL and 20010073ACL. This documentation is on file at and available from the Global Automotive Division Product Reliability Center.

1.3. Conclusion

The Two Pair Pivot II Connector listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-1657-2 Revision A.

1.4. Product Description

The Two Pair Pivot II Connector accepts two wires for each wire stuffer (pair) for power drop in a telecommunications circuit and is mounted on a customer provided .062 inch thick printed circuit board. Power from the printed circuit board is transferred to the connector module by means of solder posts which also serve as the mounting device for the module. Each wire stuffer module will accept solid copper wire 22 through 26 AWG with a maximum insulation diameter of .060 inch. Other wire sizes and types may be accommodated, but are subject to Tyco Electronics Engineering approval. Wire termination is accomplished simultaneously for each pair, no stripping of wire is required.

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	6 each	1339223-1	2 pair, Stanyl TE250F3 base and stuffer
	6 each	1339313-1	2 pair single entry Valox 420 SEO base and stuffer
	6 each	1339305-1	2 pair Valox 420 SEO base and clear Makrolon stuffer
	3 each	92-660837	Printed circuit board

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%

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Initial examination of product	1	1	1
Low level contact resistance	3,5,8	2,4,7,9	
Insulation resistance			2,6
Withstanding voltage			3,7
Temperature rise vs current		3,10	
Vibration, random	6	8	
Mechanical shock	7		
Durability	4		
Mating force	2		
Unmating force	9		
Thermal shock			4
Humidity-temperature cycling		5(c)	5
Temperature life		6	
Final examination of product	10	11	8

NOTE *(a) See paragraph 4.1.A.*
(b) Numbers indicate sequence in which tests are performed.
(c) Precondition specimens with 10 durability 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 was issued by Product Assurance. Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. Low Level Contact Resistance - Test Groups 1 and 2

All low level contact resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage had a change in resistance (ΔR) of less than 5 milliohms after testing.

2.3. Insulation Resistance - Test Group 3

All insulation resistance measurements were greater than 500 megohms.

2.4. Withstanding Voltage - Test Group 3

No dielectric breakdown or flashover occurred.

2.5 Temperature Rise vs Current - Test Group 2

All specimens had a temperature rise of less than 30°C above ambient when tested using a baseline rated current of 4.5 amperes and the correct derating factor value based on the specimens wiring configuration.

2.6. Vibration - Test Groups 1 and 2

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

2.7. 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.

2.8. Durability - Test Group 1

No physical damage occurred as a result of mating and unmating the specimens 50 times.

2.9. Mating Force - Test Group 1

All mating force measurements were less than 111.21 N [25 lbf].

2.10. Unmating Force - Test Group 1

All unmating force measurements were greater than 2.22 N [.5 lbf].

2.11. Thermal Shock - Test Group 4

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

2.12. Humidity-temperature Cycling - Test Group 2

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

2.13. Temperature Life - Test Group 2

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

2.14. 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

A Certificate of Conformance 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. Low Level Contact Resistance

Low level contact resistance 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. Insulation Resistance

Insulation resistance was measured between adjacent contacts of mated specimens. A test voltage of 500 volts DC was applied for 2 minutes before the resistance was measured.

3.4. Withstanding Voltage

A test potential of 1000 volts AC was applied between the adjacent contacts of mated specimens. This potential was applied for 1 minute and then returned to zero.

3.5. 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.

3.6. Vibration, Random

Mated specimens were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 10 and 500 Hz. The root-mean square amplitude of the excitation was 4.44 GRMS. This was performed for 1 hour in each of 3 mutually perpendicular planes for a total vibration time of 3 hours. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.7. 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.

3.8. Durability

Specimens were mated and unmated 50 times at a maximum rate of 600 cycles per hour.

3.9. 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 0.5 inch per minute.

3.10. 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 0.5 inch per minute.

3.11. Thermal Shock

Mated specimens were subjected to 5 cycles of thermal shock with each cycle consisting of 30 minute dwells at -40 and 80°C. The transition between temperatures was less than 1 minute.

3.12. 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.

3.13. Temperature Life

Mated specimens were exposed to a temperature of 80°C for 500 hours.

3.14. Final Examination of Product

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