Shielded Top Entry Compliant Pin Modular Jack

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics Shielded Top Entry Compliant Pin Modular Jack to determine its conformance to the requirements of Product Specification 108-1163-6 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Shielded Top Entry Compliant Pin Modular Jack. Testing was performed at the Engineering Assurance Product Test Laboratory between 03Sep01 and 28Oct01. The test file number for this testing is CTL 2240-001. This documentation is on file at and available from the Engineering Assurance Product Test Laboratory.

1.3. Conclusion

The Shielded Top Entry Compliant Pin Modular Jack listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-1163-6 Revision A.

1.4. 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
1,2,3,4,5,6	10 each	1116202-1	8 position jack
	10 each	5-554739-3	8 position plug

Figure 1

1.5. Environmental Conditions

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

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

* Trademark
I Indicates change

LOC B

1.6. Qualification Test Sequence

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Initial examination of product	1	1	1	1	1	1
Low level contact resistance	3,7	2,4	2,4			
Insulation resistance				2,6		
Withstanding voltage				3,7		
Crosstalk						2
Attenuation						3
Return Loss						4
Vibration	5					
Mechanical shock	6					
Durability	4					
Mating force	2					
Unmating force	8					
Plug retention in jack					3	
Pull					2	
Jack retention to printed circuit board	9					
Thermal shock				4		
Humidity-temperature cycling				5		
Temperature life		3(c)				
Mixed flowing gas			3(c)			
Final examination of product	10	5	5	8	4	5

NOTE
(a) See paragraph 1.5.
(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, 2 and 3

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 30 milliohms after testing.

2.3. Insulation Resistance - Test Group 4

All insulation resistance measurements were greater than 500 megohms.

2.4. Withstanding Voltage - Test Group 4

No dielectric breakdown or flashover occurred.

2.5. Crosstalk - Test Group 6

All specimens met the requirements specified in Figure 3.

Category 5, 100 Ohm Twisted Pair

Frequency (MHz)	NEXT Loss (dB)	Attenuation (dB)	Return Loss (dB)
1.00	65	0.1	23
4.00	65	0.1	23
8.00	62	0.1	23
10.00	60	0.1	23
16.00	56	0.2	23
20.00	54	0.2	23
25.00	52	0.2	14
31.25	50	0.2	14
62.50	44	0.3	14
100.00	40	0.4	14

NOTE *See EIA/TIA 568-A, Oct. 1995*

Figure 3

2.6. Attenuation - Test Group 6

All specimens met the requirements specified in Figure 3.

2.7. Return Loss - Test Group 6

All specimens met the requirements specified in Figure 3.

2.8. 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.

2.9. 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.

2.10. Durability - Test Group 1

No physical damage occurred as a result of mating and unmating the specimens 750 times.

2.11. Mating Force - Test Group 1

All mating force measurements were less than 35.59 N [8 lbf].

2.12. Unmating Force - Test Group 1

All unmating force measurements were less than 35.59 N [8 lbf].

2.13. Plug Retention In Jack - Test Group 5

Plug did not dislodge from the jack when an axial load was applied.

2.14. Pull - Test Group 5

Plug remained mated when an axial load was applied.

2.15. Jack Retention to Printed Circuit Board - Test Group 1

Jack did not dislodge from the printed circuit board when a perpendicular load was applied.

2.16. Thermal Shock - Test Group 4

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

2.17. Humidity-temperature Cycling - Test Group 4

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

2.18. Temperature Life - Test Group 2

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

2.19. Mixed Flowing Gas - Test Group 3

No evidence of physical damage was visible as a result of exposure to the pollutants of mixed flowing gas.

2.20. 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 (Figure 4). The test current was maintained at 100 milliamperes maximum with a 20 millivolt maximum open circuit voltage.

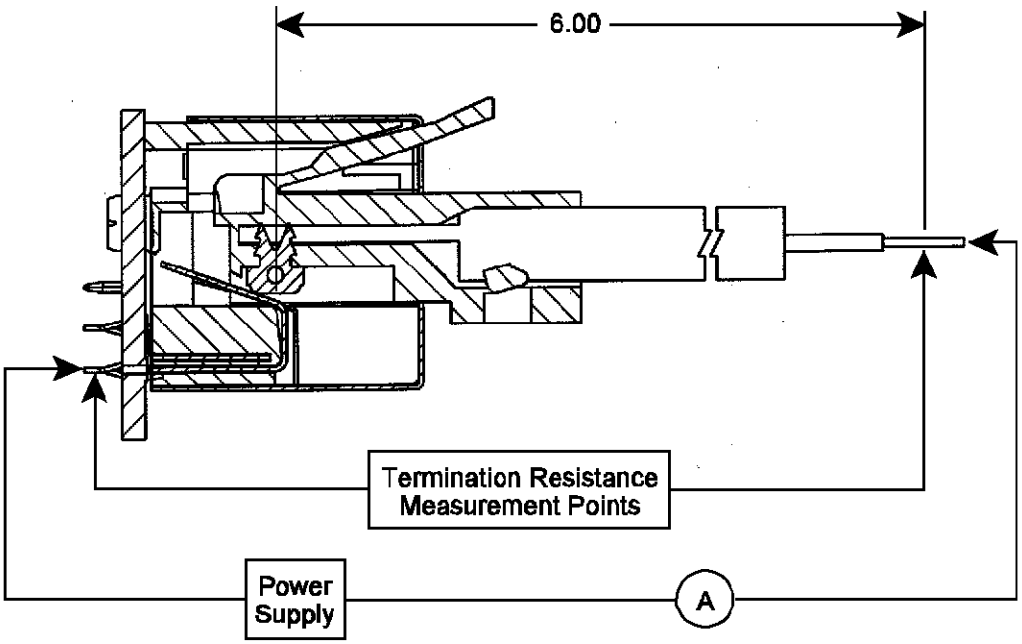

Figure 4
Low Level Contact Resistance Measurement Points

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. Crosstalk

Specimens were tested to the requirements of EIA-568A dated October 1995.

3.6. Attenuation

Specimens were tested to the requirements of EIA-568A dated October 1995.

3.7. Return Loss

Specimens were tested to the requirements of EIA-568A dated October 1995.

3.8. 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. 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.

3.9. Mechanical Shock, Half-sine

Mated specimens were subjected to a mechanical 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. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.10. Durability

Specimens were mated and unmated 750 times at a maximum rate of 600 cycles per hour.

3.11. 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 12.7 mm [.5 in] per minute.

3.12. 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 12.7 mm [.5 in] per minute.

3.13 Plug Retention In Jack

An axial load of 88.96 N [20 lbf] was applied to the plug housing at a rate of 12.7 mm [.5 in] per minute with the plug mated in an unmounted jack and the latch engaged.

3.14. Pull

An axial load of 75.62 N [17 lbf] was applied to the mated specimen at a rate of 12.7 mm [.5 in] per minute. The plug was then rotated 45 degrees from the cable axis.

3.15. Jack Retention To Printed Circuit Board

A minimum perpendicular load of 88.96 N [20 lbf] was applied to the jack mounted on a 1.57 mm [.062 in] thick printed circuit board at a rate of 50.8 mm [2 in] per minute.

3.16. Thermal Shock

Mated specimens were subjected to 5 cycles of thermal shock with each cycle consisting of 30 minute dwells at -40 and 85°C. The transition between temperatures was less than 1 minute.

3.17. 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 (Figure 5).

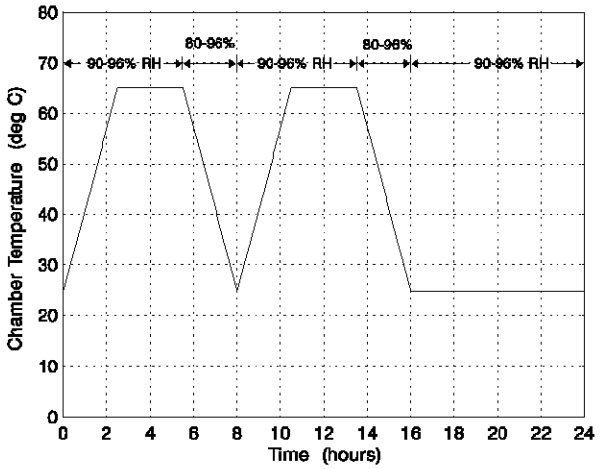

Figure 5
Typical Humidity-Temperature Cycling Profile

3.18. Temperature Life

Mated specimens were exposed to a temperature of 85°C for 500 hours. Specimens were preconditioned with 10 cycles of durability.

3.19. Mixed Flowing Gas, Class IIA

Mated specimens were exposed for 14 days to a mixed flowing gas Class IIA exposure. Class IIA exposure is defined as a temperature of 30°C and a relative humidity of 70% with the pollutants of Cl_2 at 10 ppb, NO_2 at 200 ppb, H_2S at 10 ppb and SO_2 at 100 ppb. Specimens were preconditioned with 10 cycles of durability.

3.20. Final Examination of Product

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