

0.8 mm CHAMP* Single or Stackable Receptacle and Cable Mounted Plug

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics 0.8 mm CHAMP* Receptacle and Cable Mounted Plugs to determine their conformance to the requirements of Product Specification 108-1471-1 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the 0.8 mm CHAMP Connector. Testing was performed at the Engineering Assurance Test Laboratory between 25Apr01 and 25May01. The test file number for this testing is CTL 2194-003A. This documentation is on file at and available from the Engineering Assurance Test Laboratory.

1.3. Conclusion

The .8 mm CHAMP Connector listed in paragraph 1.5, conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-1471-1 Revision A.

1.4. Product Description

PC board connectors are comprised of phosphor bronze base material with 30 microinches of gold on the mating end, and tin-lead on the solder tails, all over nickel. Cable connectors are comprised of phosphor bronze base material with 30 microinches of gold plating on the mating end, and tin-lead on the insulation displacement contacts, all over nickel. The housings on the PC board and cable connectors are black thermoplastic, UL94V-0 rated. The shell is carbon steel with nickel over copper plating.

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
1,2,3,4,5	5 each	796055-1	68 position receptacle using PCB PN 60-469253-1
1,2,3,4,5	5 each	787775-1	68 position plug kit using cable PN 636218-1

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(b)	2(b)	3(b)	4(c)	5
	Test Sequence (d)				
Initial examination of product	1	1	1	1	1
Low level contact resistance	3,7	2,4	2,4		
Insulation resistance				2,6	
Withstanding voltage				3,7	
Solderability, dip test					2
Vibration	5				
Mechanical shock	6				
Durability	4				
Mating force	2				
Unmating force	8				
Housing lock strength		5			
Thermal shock				4	
Humidity-temperature cycling				5	
Temperature life		3(e)			
Mixed flowing gas			3(e)		
Final examination of product	9	6	5	8	3

- NOTE**
- (a) See paragraph 1.5.
 - (b) Specimens for these test groups shall be mated and terminated.
 - (c) Specimens for this test group shall be mated but unterminated.
 - (d) Numbers indicate sequence in which tests are performed.
 - (e) Precondition specimens with 10 cycles durability.

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. Where specified, 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 termination resistance measurements taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than 10 milliohms change in resistance (ΔR) after testing.

Test Group	Number of Data Points	Condition	Termination Resistance		
			Min	Max	Mean
1	30	Initial	99.740	108.570	104.156
		After mechanical	99.792	109.600	104.648
		ΔR	-0.792	5.500	0.492
2	30	Initial	98.330	109.140	103.527
		After temperature life	98.020	109.370	103.006
		ΔR	-1.740	1.480	-0.521
3	30	Initial	97.640	108.340	102.669
		After mixed flowing gas	97.370	109.000	102.649
		ΔR	-1.570	1.370	-0.020

NOTE All values in milliohms.

Figure 3

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. Leakage current did not exceed 0.5 milliamperes.

2.5. Solderability, Dip Test - Test Group 5

All contact leads and brackets had a minimum of 95% solder coverage in the solderable area.

2.6. 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.

2.7. 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 for 500 cycles.

2.9. Mating Force - Test Group 1

All mating force measurements were less than 44 N [9.89 lb] for 68 position specimens.

2.10. Unmating Force - Test Group 1

All unmating force measurements were greater than 6.2 N [1.39 lb] for 68 position specimens.

2.11. Housing Lock Strength - Test Group 2

All housing lock strength measurements were greater than 125 N [28.1 lb].

2.12. Thermal Shock - Test Group 4

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

2.13. Humidity-Temperature Cycling - Test Group 4

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

2.14. Temperature Life - Test Group 2

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

2.15. 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.

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

3.2. Low Level Contact 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.

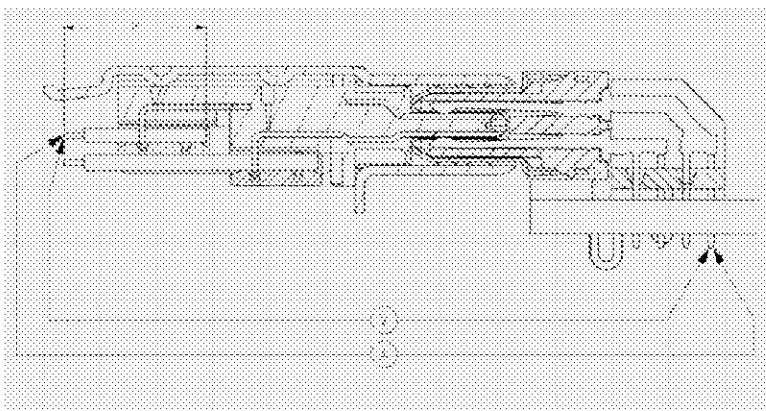


Figure 4
Typical Termination Resistance Measurement Points

3.3. Insulation Resistance

Insulation resistance was measured between adjacent contacts of mated but unterminated specimens. A test voltage of 100 volts DC was applied for 2 minutes before the resistance was measured.

3.4. Withstanding Voltage

A test potential of 250 volts AC was applied between the adjacent contacts of mated but unterminated specimens. The leakage current trip setting was 0.5 milliamperes. This potential was applied for 1 minute and then returned to zero.

3.5. Solderability, Dip Test

Connector assembly contact solder tails and brackets were subjected to a solderability test. The solder tails were immersed in a mildly activated rosin flux for 5 to 10 seconds and then allowed to drain for 5 to 20 seconds. The solder tails were then immersed in the molten solder at a rate of approximately 1 inch per minute, held for 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°C.

3.6. Vibration, Random

The parameters of this test condition are specified by a random vibration spectrum with excitation frequency bounds of 20 and 500 Hz. The spectrum remains flat at 0.05 G²/Hz from 20 Hz to the upper bound frequency of 500 Hz. The root-mean square amplitude of the excitation was 4.90 GRMS. The specimens were subjected to this test for 15 minutes in each of the 3 mutually perpendicular axes, for a total test time of 45 minutes per specimen. The test specimens were monitored for discontinuities of 1 microsecond or greater using an energizing current of 100 milliamperes.

3.7. Mechanical Shock, Half-sine

The parameters of this test condition are a half-sine waveform with an acceleration amplitude of 30 gravity units (g's peak) and a duration of 11 milliseconds. Three shocks in each direction were applied along the 3 mutually perpendicular axes of the test specimen, for a total of 18 shocks. The test specimens were monitored for discontinuities of 1 microsecond or greater using an energizing current of 100 milliamperes.

3.8. Durability

Specimens were mated and unmated for 500 cycles at a maximum rate of 500 cycles per hour.

3.9. Mating Force

The force required to mate individual specimens 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. Unmating Force

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

3.11. Housing Lock Strength

An axial load was applied to mated specimens in a manner which would cause the specimen locking latches to disengage.

3.12. Thermal Shock

Mated specimens were subjected to 5 cycles of thermal shock with each cycle consisting of 30 minute dwells at -55 and 85°C. The transition between temperatures was less than 1 minute.

3.13. 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).

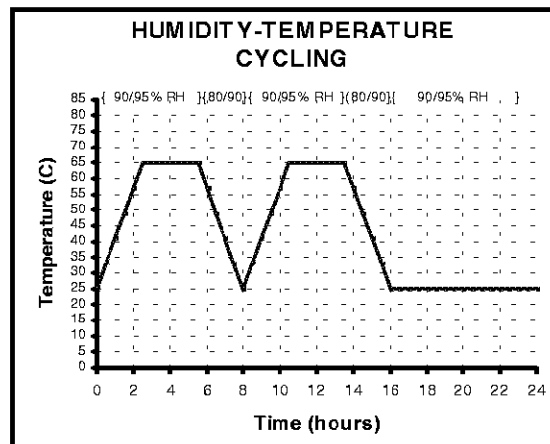


Figure 5
Typical Humidity-Temperature Cycling Profile

3.14. Temperature Life

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

3.15. 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 Cl₂ at 10 ppb, NO₂ at 200 ppb, H₂S at 10 ppb, and SO₂ at 100 ppb. Specimens were preconditioned with 10 cycles of durability.

3.16. Final Examination of Product

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