.100 Inch Centerline Crimp-Snap Connectors

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics .100 Inch Centerline Crimp-Snap Connectors to | determine their conformance to the requirements of Product Specification 108-1328 Revision B.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the .100 Inch Centerline Crimp-Snap Connectors. Testing was performed at the Engineering Assurance Product Testing Laboratory between July and November 1995. Additional Testing was completed on 10Jul09. The test file numbers for this testing are ACL1443-003, ACL1443-004, ACL1443-005 and | EA20090472T. Additional testing on alternative platings was performed between 24May10 and 27Jul10. | The test file number for this additional testing is EA20100456T. This documentation is on file at and available from the Engineering Assurance Product Testing Laboratory.

1.3. Conclusion

The .100 Inch Centerline Crimp-Snap Connectors listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-1328 Revision | B.

1.4. Product Description

The .100 Inch Centerline Crimp-Snap Connectors are wire-to-board connections consisting of crimp-snap contacts seated in a housing that mates to .025 inch square post headers on .100 inch centerline and is designed to be terminated to 22 to 26 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:

| A. Test reports ACL1443-003, ACL1443-004, ACL1443-005 and EA20090472T

Test Group	Quantity	Part Number	Description
1	10	1-770602-0	CST-100, 10 position housing
	10	1-641215-0	MTA-100, 10 position .025 inch Au header assembly
1,2,3	260	770601-1	CST-100 Sn contacts with 22 AWG wire
2,3,4	16	2-770602-0	CST-100, 20 position housing
2	60	770601-1	CST-100 Sn contacts with 26 AWG wire
	6	2-640456-0	MTA-100, 20 position .025 inch Sn header assembly
4	100	770601-2	CST-100 Au contacts with 22 AWG wire
	5	2-641215-0	MTA-100, 20 position .025 inch Au header assembly
5	10	1-640456-0	MTA-100, 10 position .025 inch Sn header assembly
6	25	1375819-1	CST 100 II contact with 22 AWG wire
	25	1375819-1	CST 100 II contact with 24 AWG wire
	25	1375819-1	CST 100 II contact with 26 AWG wire

Figure 1 (continued)

* Trademark
| Indicates change

B. Test report EA20100456T

Test Group	Quantity	Part Number	Description
1,4	6 each	770601-2	30 µin Au plated contact mated to 30 µin Au plated header
	6 each	770601-2	30 µin Au plated contact mated to 30 µin PdNi plated header
	6 each	770601-2	30 µin PdNi plated contact mated to 30 µin Au plated header
	6 each	770601-2	30 µin PdNi plated contact mated to 30 µin PdNi plated header

NOTE *Each test assembly consists of a 6 position housing part number 1375820-6 loaded with the specified contacts and mated to the described 6 position header.*

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 80%

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Examination of product	1,9	1,9	1,7	1,5	1,3	1,3
Termination resistance	3,7	2,7		2,4		
Insulation resistance			2,5			
Dielectric withstanding voltage			3,6			
Temperature rise vs current		3,8				
Solderability					2	
Sinusoidal vibration	5	6(c)				
Physical shock	6					
Durability	4					
Mating force	2					
Unmating force	8					
Crimp tensile						2
Thermal shock			4			
Humidity/temperature cycling		4(d)				
Temperature life		5				
Mixed flowing gas				3		

NOTE
(a) See paragraph 1.5.
(b) Numbers indicate sequence in which tests are performed.
(c) Discontinuities shall not be measured. Energize at 18 ℃ level for 100% loadings per Test Specification 109-151.
(d) Precondition specimens with 10 cycles durability.

Figure 2

2. SUMMARY OF TESTING

2.1. Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. Specimens were inspected and accepted by the Product Assurance Department of the Commercial Products Business Unit. No evidence of physical damage detrimental to product performance was observed.

2.2. Termination Resistance - Test Groups 1, 2 and 4

A. Test Reports ACL1443-003, ACL1443-004, ACL1443-005 and EA20090472T.

All contact termination resistance measurements, taken at 100 milliamperes DC maximum and 50 millivolts DC maximum open circuit voltage were less than 6 milliohms initially and 10 milliohms after testing.

Test Group	Number of Data Points	Condition	Termination Resistance		
			Min	Max	Mean
1	100	Initial	2.81	3.54	3.07
		After mechanical	2.64	9.82	4.19
2	60	Initial	2.68	3.34	2.99
		After vibration	3.12	8.52	4.52
4	97	Initial	3.35	5.67	4.22
		After mixed flowing gas	3.29	9.22	4.83

NOTE *All values in milliohms.*

Figure 3

B. Test Report EA20100456T

All contact termination resistance measurements, taken at 100 milliamperes DC maximum and 20 millivolts DC maximum open circuit voltage were less than 10 milliohms after testing.

1. Test Group 1

Specimen ID	Test Set 1 30 µin Au to 30 µin Au	
Condition	Initial	Final
Minimum	2.99	3.60
Maximum	8.50	7.62
Average	4.19	5.07
Standard Deviation	1.06	0.98
N	36	36

Specimen ID	Test Set 5 30 µin PdNi to 30 µin Au	
Condition	Initial	Final
Minimum	3.42	3.77
Maximum	6.37	7.38
Average	4.07	5.51
Standard Deviation	0.61	0.79
N	36	36

Specimen ID	Test Set 3 30 µin Au to 30 µin PdNi	
Condition	Initial	Final
Minimum	3.29	2.89
Maximum	5.35	7.83
Average	4.17	5.32
Standard Deviation	0.54	0.99
N	36	36

Specimen ID	Test Set 7 30 µin PdNi to 30 µin PdNi	
Condition	Initial	Final
Minimum	3.63	4.91
Maximum	7.28	8.69
Average	4.24	6.39
Standard Deviation	0.65	1.16
N	36	36

2. Test Group 4

Specimen ID	Test Set 2 30 µin Au to 30 µin Au	
Condition	Initial	Final
Minimum	3.14	3.29
Maximum	8.22	8.35
Average	4.77	5.41
Standard Deviation	1.15	1.29
N	36	36

Specimen ID	Test Set 6 30 µin PdNi to 30 µin Au	
Condition	Initial	Final
Minimum	3.33	3.38
Maximum	6.36	7.50
Average	4.06	4.38
Standard Deviation	0.58	0.94
N	36	36

Specimen ID	Test Set 4 30 µin Au to 30 µin PdNi	
Condition	Initial	Final
Minimum	3.28	3.56
Maximum	5.94	6.26
Average	4.42	4.76
Standard Deviation	0.77	0.79
N	36	36

Specimen ID	Test Set 8 30 µin PdNi to 30 µin PdNi	
Condition	Initial	Final
Minimum	3.62	3.73
Maximum	5.62	6.94
Average	4.31	4.42
Standard Deviation	0.47	0.62
N	36	36

Figure 4

2.3. Insulation Resistance - Test Group 3

All insulation resistance measurements were greater than 1000 megohms initial and 100 megohms final.

2.4. Dielectric 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 5.52 amperes DC.

2.6. Solderability - Test Group 5

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

2.7. Sinusoidal 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.

2.8. Physical Shock - Test Group 1

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

2.9. Durability - Test Group 1

No physical damage occurred as a result of manually mating and unmating the specimens 15 times.

2.10. Mating Force - Test Group 1

All mating force measurements were less than 2 pounds per contact.

2.11. Unmating Force - Test Group 1

All unmating force measurements were greater than .80 pound per contact.

2.12. Crimp Tensile - Test Group 6

All crimp tensile measurements were greater than 11 pounds for 22 AWG wire; 10 pounds for 24 AWG wire and 7 pounds for 26 AWG wire.

2.13. Thermal Shock - Test Group 3

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

2.14. Humidity/temperature Cycling - Test Group 2

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

2.15. Temperature Life - Test Group 2

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

2.16. Mixed Flowing Gas - Test Group 4

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

3. TEST METHODS

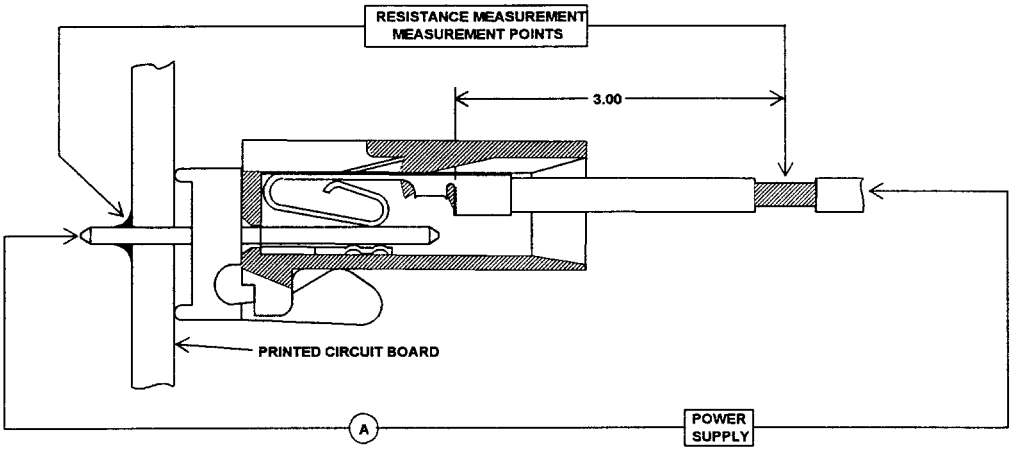
3.1. Examination of Product

Specimens were inspected and accepted by the Product Assurance Department of the Commercial Products Business Unit.

3.2. Termination Resistance

A. Test Reports ACL1443-003, ACL1443-004, ACL1443-005 and EA20090472T.

Termination resistance measurements were made using a 4 terminal measuring technique (Figure 5). The test current was maintained at 100 milliamperes DC maximum with a 50 millivolt DC maximum open circuit voltage.



NOTE *All wire resistance was subtracted from the measurements*

Figure 5
Termination Resistance Measurement Points

B. Test Report EA20100456T

All contact termination resistance measurements were made using a 4 terminal measuring technique. The test current was maintained at 100 milliamperes DC maximum with a 20 millivolt DC maximum open circuit voltage.

3.3. Insulation Resistance

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

3.4. Withstanding Voltage

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

3.5. Temperature Rise vs Current

Thermocouples were attached to individual contacts to measure their temperature while energized at 5.52 amperes DC. 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. Solderability

Specimen contact solder tails were immersed in a type R flux for 5 to 10 seconds, allowed to drain for 10 to 20 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 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 ± 5°C.

3.7. Sinusoidal Vibration

Mated specimens were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of .06 inch maximum total excursion. 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 for 2 hours in each of 3 mutually perpendicular planes. Specimens in test group 1 were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC. Specimens in test group 2 were energized at 3.5 amperes to produce an 18°C temperature rise, discontinuities were not measured.

3.8. Physical 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.

3.9. Durability

Specimens were manually mated and unmated 15 times at a maximum rate of 10 cycles per minute.

3.10. 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 .5 inch per minute. The force per contact was calculated.

3.11. 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 .5 inch per minute. The force per contact was calculated.

3.12. Crimp Tensile

The force required to pull the wire from the specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of 1 inch per minute.

3.13. Thermal Shock

Mated specimens were subjected to 10 cycles of thermal shock with each cycle consisting of 30 minute dwells at -55 and 105°C and 1 minute transition between temperatures.

3.14. Humidity/temperature Cycling

Mated specimens were exposed to 10 humidity/temperature cycles. Each cycle lasted 24 hours and consisted of cycling the temperature between 25 and 65°C twice while maintaining high humidity (Figure 6).

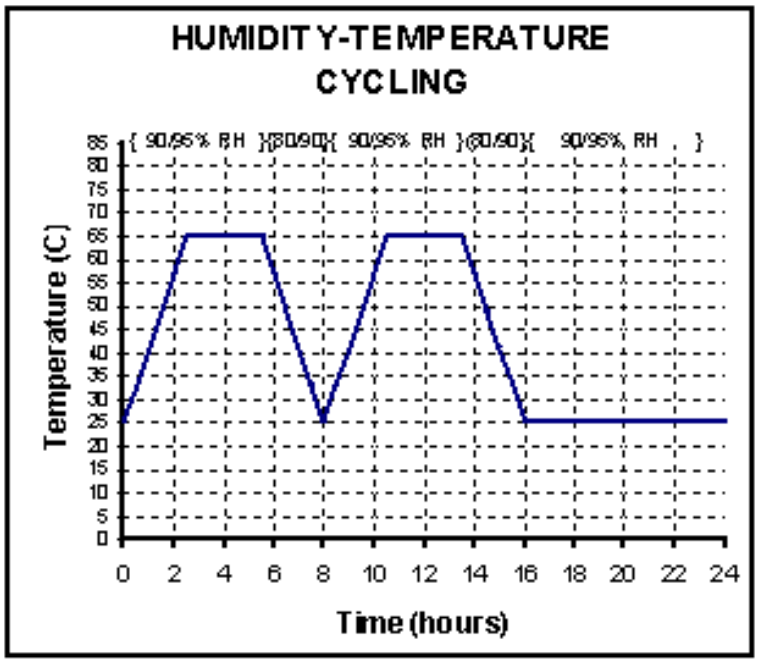


Figure 6
Humidity/Temperature Cycling Profile

3.15. Temperature Life

Mated specimens were exposed to a temperature of 105°C for 792 hours.

3.16. Mixed Flowing Gas, Class IIA

Mated specimens were exposed for 14 days to a mixed flowing gas Class II exposure. Class II 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 and H_2S at 10 ppb.