CST-100 Type II .100 Inch Centerline Crimp-Snap Connectors

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics CST-100 Type II .100 Inch Centerline Crimp-Snap Connectors to determine their conformance to the requirements of Product Specification 108-1948 Revision B.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the CST-100 Type II .100 Inch Centerline Crimp-Snap Connectors. Testing was performed at the Global Automotive Division Product Reliability Center. The test file numbers for this testing are 20010153 ACL and 20010154 ACL. Additional Testing was completed on 10Jul09. The test file number for this testing is EA20090472T. This documentation is on file at and available from the Engineering Assurance Product Testing Laboratory.

1.3. Conclusion

The CST-100 Type II .100 Inch Centerline Crimp-Snap Connectors listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-1948 Revision A.

1.4. Product Description

The CST-100 Type II product is a wire-to-board connection 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:

Test Group	Quantity	Part Number	Description
1,2	6 each	2-1375820-8	CST-100 Type II 28 position assembly
3,4,5	5 each	2-1375820-8	CST-100 Type II 28 position assembly
5	5	1375820-3	CST-100 Type II 3 position assembly
		1-1375820-0	CST-100 Type II 10 position assembly
		1-1375820-8	CST-100 Type II 18 position assembly
		640456-3	3 position MTA friction lock header assembly
		1-640456-0	10 position MTA friction lock header assembly
		1-640456-8	18 position MTA friction lock header assembly
1,2	60 each	1375819-1	CST receptacle with 22 AWG wire
		1375819-1	CST receptacle with 26 AWG wire
3,4,5	100 each	1375819-1	CST receptacle

Figure 1 (continued)

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Test Group	Quantity	Part Number	Description
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 (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	6
	Test Sequence (b)					
Initial examination of product	1	1	1	1	1	1
Low level contact resistance	2,4,7	2,5,7,10				
Insulation resistance			2,5	3,7		
Withstanding voltage			3,6	4,8		
Temperature rise vs current		3,11				
Sinusoidal vibration	5	8(c)				
Mechanical shock	6	9				
Durability	3					
Mating force					2	
Unmating force					3	
Contact insertion force				2		
Contact extraction force				9		
Crimp tensile						2
Thermal shock			4	5		
Humidity/temperature cycling		4(d)				
Temperature life		6		6		
Final examination of product	8	12	7	10	4	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°C level for 100% loadings per Quality Specification 102-950.
(d) 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 were less than 6 milliohms initially and 10 milliohms after testing.

2.3. Insulation Resistance - Test Groups 3 and 4

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

2.4. Withstanding Voltage - Test Groups 3 and 4

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 specified current of 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 Groups 1 and 2

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

2.8. Durability - Test Group 1

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

2.9. Mating Force - Test Group 5

All mating force measurements were less than 8.9 N [2 lbf] per contact.

2.10. Unmating Force - Test Group 5

All unmating force measurements were greater than 3.6 N [.80 lbf] per contact.

2.11. Contact Insertion Force - Test Group 4

All contact insertion force measurements were less than 17.8 N [4 lbf] per contact.

2.12. Contact Extraction Force - Test Group 4

All contact extraction force measurements were greater than 23 N [5 lbf] per contact.

2.13. Crimp Tensile - Test Group 6

All crimp tensile measurements were greater than 48.9 N [11 lbf] for 22 AWG wire; 44.5 N [10 lbf] for 24 AWG wire and 31.1 N [7 lbf] for 26 AWG wire.

2.14. Thermal Shock - Test Groups 3 and 4

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

2.15. Humidity/temperature Cycling - Test Group 2

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

2.16. Temperature Life - Test Groups 2 and 4

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

2.17. 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. 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 adjacent contacts. 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. Sinusoidal Vibration

Mated specimens were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, 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.

3.7. 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.

3.8. Durability

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

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 12.7 mm [.5 in] per minute. The maximum average force per contact was calculated.

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 12.7 mm [.5 in] per minute. The minimum average force per contact was calculated.

3.11. Contact Insertion Force

The force required to insert contacts into plug cavities was measured using a tensile/compression device with a free floating fixture and a rate of travel of 25 mm [.984 in] per minute.

3.12. Contact Extraction Force

The force required to extract contacts from plug cavities was measured using a tensile/compression device with a free floating fixture and a rate of travel of 50 mm [1.986 in] per minute.

3.13. 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 25.4 mm [1 in] per minute.

3.14. Thermal Shock

Specimens were subjected to 10 cycles of thermal shock with each cycle consisting of 30 minute dwells at -55 and 105°C. The transition between temperatures was less than 1 minute.

3.15. Humidity/temperature Cycling

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. Specimens were preconditioned with 10 cycles of durability.

3.16. Temperature Life

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

3.17. Final Examination of Product

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