0.64 mm USCAR Contact System

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics 0.64 mm USCAR Contact System to determine its conformance to the requirements of Product Specification 108-2220 Revision A.

1.2. Scope

This report covers the electrical and mechanical performance of the 0.64 mm USCAR Contact System. Testing was performed at the Americas Global Automotive Division Product Reliability Center between March 2000 and January 2005. The test file numbers for this testing are 19990078ACL, 20000089ACL, 20000319ACL, 20010066ACL, 20010067ACL and 20050048ACS. This documentation is on file at and available from the Americas Global Automotive Division Product Reliability Center .

1.3. Conclusion

The 0.64 mm USCAR Contact System listed in paragraph 1.5., conformed to the electrical and mechanical performance requirements of Product Specification 108-2220 Revision A.

1.4. Product Description

The 0.64 mm USCAR contact system is comprised of either a 0.64 mm square male terminal or a 0.64 mm thick by 0.80 mm wide male terminal which mates to a trapezoidal female socket terminal.

1.5. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the following part numbers were used for test:

Quantity	Part Number	Description
435	97-4801-031-011	0.64 mm contact system, various crimp heights
60	1326028-1	0.64 mm female receptacles
30	1326028-1	0.64 mm female receptacles
64	638323-1	0.64 mm unsealed header assembly
64	638393-5	0.64 mm unsealed plug assembly
645	638551-1	0.64 mm tin terminal
60	638551-3	0.64 mm tin receptacles
60	638552-3	0.64 mm pin blade

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%

* Trademark
| Indicates change

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Examination of product	1,8	1,4	1,3	1,3
Low level contact resistance	3,6			
Temperature rise vs current	4,7			
Current cycling	5			
Durability	2			
Engaging force		2		
Separating force		3		
Terminal bend crimp			2	
Termination tensile strength				2

NOTE *(a) See paragraph 1.5.*
(b) Numbers indicate sequence in which tests are performed.

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. 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 Group 1

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

2.3. Temperature Rise vs Current - Test Group 1

All specimens had a temperature rise of less than 20˚C above ambient when tested using the specified current and the correct derating factor value based on the specimens wiring configuration.

2.4. Current Cycling - Test Group 1

Specimens did not exceed 55˚C temperature rise and 4 milliohms maximum with 7.7 amperes applied on 18 AWG specimens, or 4 milliohms maximum with 6.8 amperes applied on 20 AWG specimens.

2.5. Durability - Test Group 1

No physical damage occurred as a result of manually mating and unmating the specimens 10 times.

2.6. Engaging Force - Test Group 2

All engaging force measurements were less than 2.5 N for gold plated specimens and 5 N for tin plated specimens.

2.7. Separating Force - Test Group 2

All separating force measurements were greater than 0.5 N.

2.8. Terminal Bend Crimp - Test Group 3

No specimens fractured, or bent more than 30 degrees when subjected to a force of 12 N.

2.9. Termination Tensile Strength - Test Group 4

No specimens exceeded the crimp tensile values specified in Application Specification 114-13006.

3. TEST METHODS

3.1. 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. Temperature Rise vs Current

Specimens were 100% energized to achieve a 20˚C temperature rise starting at 6 amperes for 18 AWG wire and 5 amperes for 20 AWG wires. The current was increased in .5 ampere increments to 9.5 amperes for 18 AWG wire and 8.5 amperes for 20 AWG wire until a 20˚C temperature rise was achieved. The 20˚C temperature rise value for 18 AWG wire was reached at 9.188 amperes; and 8.5 amperes for 20 AWG wire.

3.4. Current Cycling

Testing consisted of 1008 cycles (hours) of current cycling, with each cycle having current ON for 45 minutes and current OFF for 15 minutes. The test current was 7.7 amperes for 18 AWG wire and 6.8 amperes for 20 AWG wire.

3.5. Durability

Specimens were manually mated and unmated 10 times.

3.6. Engaging Force

The force required to engage terminated specimens to a depth of 6.35 mm beyond the leading edge of the sleeve at a maximum rate of 50 ± 10 mm per minute was measured using a tensile/compression device with a free floating fixture.

3.7. Separating Force

The force required to separate terminated specimens from a depth of 6.35 mm beyond the leading edge of the sleeve at a maximum rate of 50 ± 10 mm per minute was measured using a tensile/compression device with a free floating fixture.

3.8. Terminal Bend Crimp

Specimens were held in a pin vise while a 12 N force was applied to the back of the wire crimp and held for 15 seconds. Specimens were then visually examined for bends, cracks and deformities.

3.9. Termination Tensile Strength

The force required to remove the wire from the crimp barrel at a maximum rate of $\leq$ 50 mm per minute was measured using a tensile/compression device with a free floating fixture.