
0.64 mm USCAR Contact System

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) 0.64 mm USCAR contact system 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.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed in January of 2005. The Qualification Test Report number for this testing is 501-598. This documentation is on file at and available from Engineering Practices and Standards (EPS).

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. TE Documents

- 109-197: Test Specification (TE Test Specifications vs EIA and IEC Test Methods)
- 114-13006: Application Specification (0.64 mm Contact System)
- 501-598: Qualification Test Report (0.64 mm USCAR Contact System)

2.2. Industry Standard

SAE/USCAR-2 dated 8/97: Performance Standard For Automotive Electrical Connector Systems

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- Current: See Figure 4 for applicable current carrying capability
- Temperature: -40 to 125°C (USCAR temperature Class 3)
- Wire Range: See Application Specification 114-13006

3.4. Performance and Test Description

Product is designed to meet the electrical and mechanical performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Low level contact resistance.	20 milliohms maximum.	SAE/USCAR-2 dated 8/97, Section 6.3.2. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Temperature rise vs current.	20°C maximum temperature rise at specified current.	SAE/USCAR-2 dated 8/97, Section 6.3.3. Measure temperature rise vs current. See Figures 3, 5 and 6.
Current cycling.	Shall not exceed 55°C temperature rise and 4 milliohms maximum with 7.7 amperes applied on 18 AWG specimens. Shall not exceed 55°C temperature rise and 4 milliohms maximum with 6.8 amperes applied on 20 AWG specimens.	SAE/USCAR-2 dated 8/97, Section 6.3.4. Subject mated specimens to 1008 current cycles of 45 minutes ON and 15 minutes OFF at specified current levels. See Figure 3.
MECHANICAL		
Durability.	Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in Figure 2.	SAE/USCAR-2 dated 8/97. Manually mate and unmate specimens for 10 cycles.

Figure 1 (continued)

Test Description	Requirement	Procedure
Engaging force.	2.5 N maximum for gold plated specimens. 5 N maximum for tin plated specimens.	SAE/USCAR-2 dated 8/97, Section 6.2.1. Measure force necessary 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. See Figure 7.
Separating force.	0.5 N minimum.	SAE/USCAR-2 dated 8/97, Section 6.2.1. Measure force necessary 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. See Figure 7.
Terminal bend crimp.	SAE/USCAR-2 dated 8/97, Section 5.2.2.2. Specimen shall not fracture or bend more than 30 degrees when subjected to a force of 12 N at location 1. If the specimen does bend more than 30 degrees, it shall not tear when straightened to its original position.	SAE/USCAR-2 dated 8/97, Section 6.2.2. See Figure 10 of Section 6.2.2. of SAE/USCAR-2 dated 8/97.
Termination tensile strength.	See Application Specification 114-13006 crimp tensile values.	Measure crimp tensile (without insulation being crimped) at a maximum rate of ≤ 50 mm per minute.

Figure 1 (end)

3.6. Product Qualification and Requalification 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 4.1.A.
 (b) Numbers indicate sequence in which tests are performed.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test group 1 shall consist of 30 female sockets crimped to the appropriate wire size and 30 male terminals. Test group 2 shall consist of 30 female sockets and 30 male terminals. Test groups 3 and 4 shall each consist of 30 terminals crimped to each applicable wire size.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

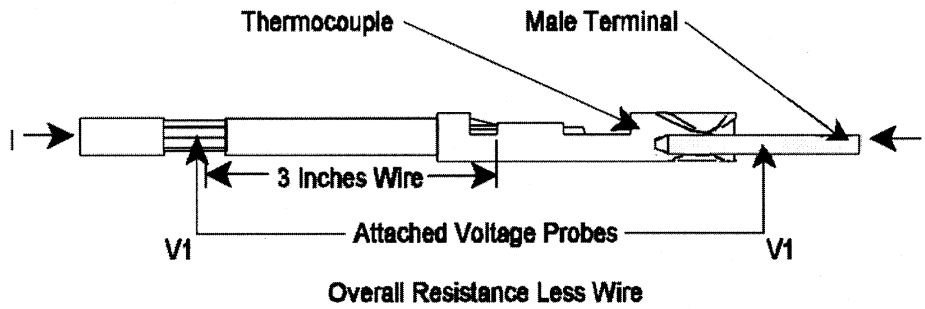


Figure 3
Low Level Contact Resistance and Temperature Rise vs Current

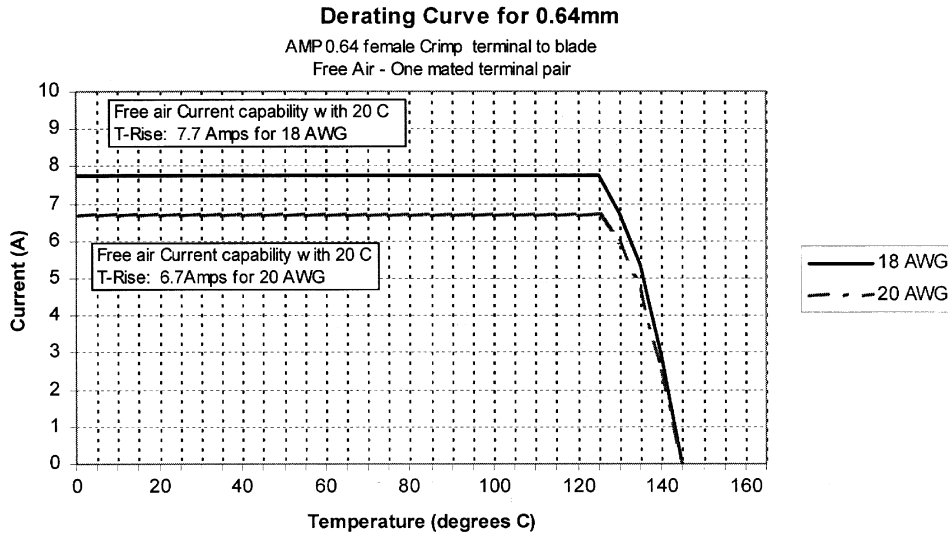


Figure 4
Derating Curve

Rated Current vs. Ambient Temperature Rating $P_{0.95} = 0.99$
 .64mm Contact on 18 AWG wire
 Wire-to-Wire Terminal System (Free-Hanging In Air)

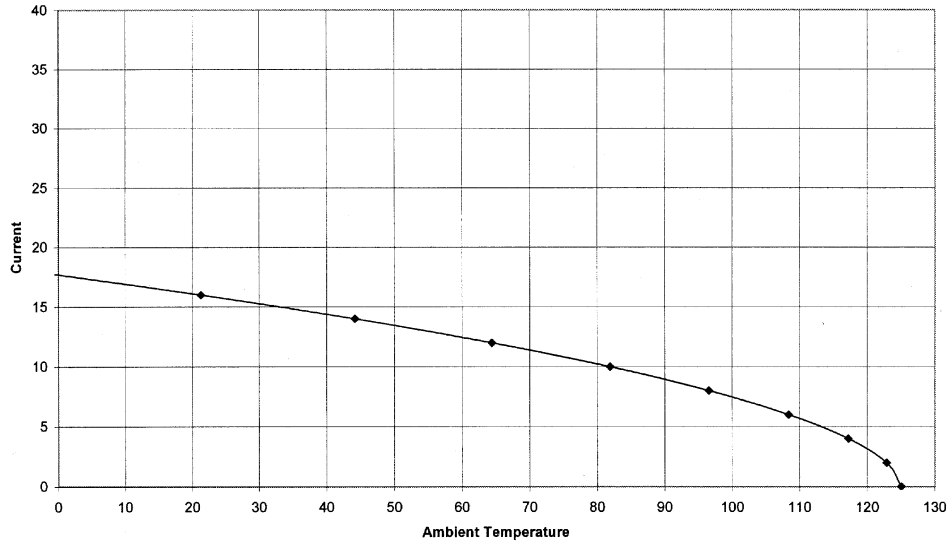


Figure 5
 Temperature Rise For 18 AWG

Rated Current vs. Ambient Temperature Rating $P_{0.95} = 0.99$
 0.64mm Contact on 20 AWG wire
 Wire-to-Wire Terminal System (Free-Hanging In Air)

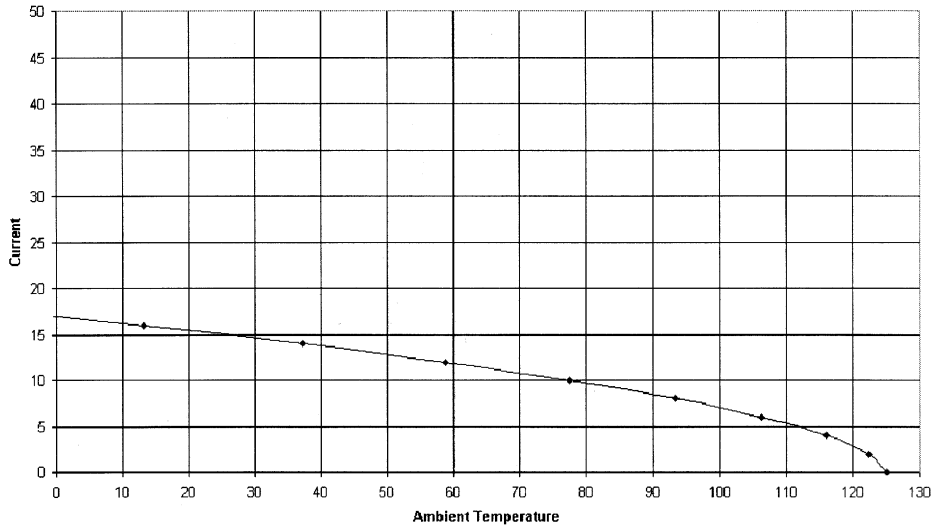


Figure 6
 Temperature Rise For 20 AWG

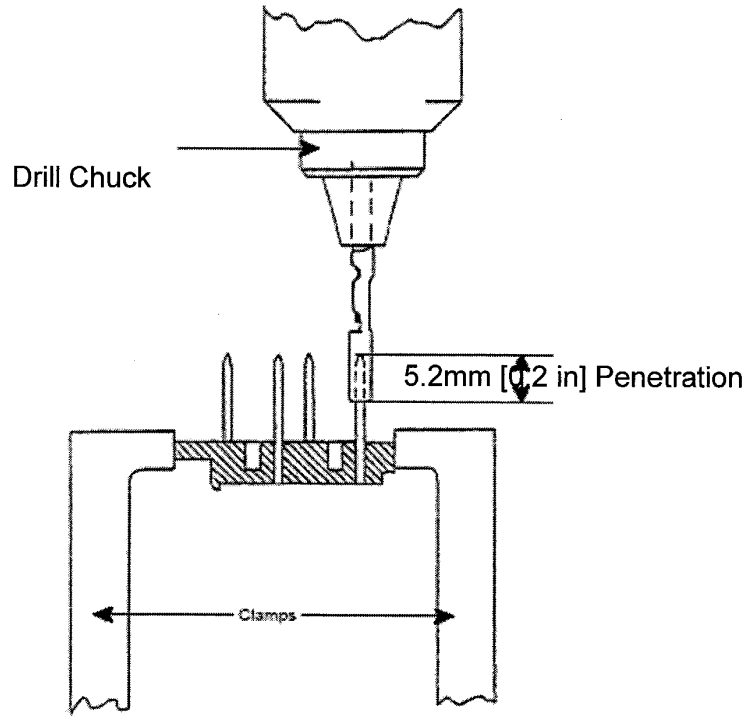


Figure 7
Engaging/Separating Force Setup

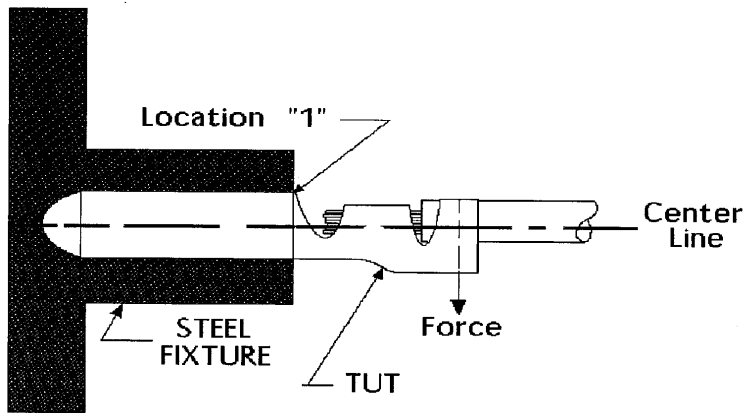


Figure 10 of Section 6.2.2. of SAE/USCAR-2 dated 8/97.
Terminal Bend Setup