8 Position 0.64/2.8 mm Hybrid Unsealed Connector System

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics 8 Position 0.64/2.8 mm Hybrid Unsealed Connector System.

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.

Successful qualification testing on the subject product line was completed on 30Jul08. The Qualification Test Report number for this testing is 501-699. 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. Tyco Electronics Documents

- 501-657: Qualification Test Report (0.64 mm Generation Y Terminal)
- 501-699: Qualification Test Report (8 Position 0.64/2.8 mm Hybrid Unsealed Connector System)
- 502-1212: Engineering Report (Evaluation of .040/2.8 mm Contact Systems)

2.2. Industry Documents

- USCAR-2, Revision 4: Performance Specification for Automotive Electrical Connector Systems
- USCAR-25, May2003: Electrical Connector Assembly Ergonomic Design Criteria

2.3. Reference Document

108-2296: Product Specification (0.64 mm Generation Y Terminal)

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.

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3.3. Ratings

- Voltage: 120 volts AC; 14 volts DC
- Current: 7 amperes for 0.64 signal positions with 18 AWG wire; 20 amperes for 2.8 power positions with 12 AWG wire
- Temperature: -40 to 85˚C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental 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
Visual inspection.	USCAR-2, Section 5.1.8.4. No defects.	USCAR-2, Section 5.1.8.3.
Terminal-connector insertion.	30 N maximum for both 0.64 mm and 2.8 mm contacts.	USCAR-2, Section 5.4.1.3.A.
Terminal-connector extraction, primary latching.	30 N minimum for 0.64 mm contacts. 60 N minimum for 2.8 mm contacts.	USCAR-2, Section 5.4.1.3.B.
Terminal-connector extraction, secondary latching.	75 N minimum for 0.64 mm contacts. 90 N minimum for 2.8 mm contacts.	USCAR-2, Section 5.4.1.3.B.
Terminal-connector extraction, secondary latching after moisture conditioning.	60 N minimum for 0.64 mm contacts. 90 N minimum for 2.8 mm contacts.	USCAR-2, Section 5.4.1.3.B.
TPA, preset to lock.	15 N minimum without contacts. 60 N maximum with contacts.	USCAR-2, Section 5.4.5.3.A.
TPA, lock to preset.	USCAR-2, Section 5.4.5.4. 90 N maximum for 1st cycle. 18 N minimum after 1st cycle.	USCAR-2, Section 5.4.5.3.B.
TPA, preset to OFF (removal).	USCAR-2, Section 5.4.5.4. 25 N minimum.	USCAR-2, Section 5.4.5.3.B.
Connector-connector audible click.	USCAR-2, Section 5.4.7.4. 7 dB minimum above ambient.	USCAR-2, Section 5.4.7.3.
Connector-connector audible click after moisture conditioning.	USCAR-2, Section 5.4.7.4. 5 dB minimum above ambient.	USCAR-2, Section 5.4.7.3.
Connector-connector mating force.	USCAR-2, Section 5.4.2.3.A. 75 N maximum.	USCAR-25, Table 6.3.
Connector-connector unmating force, primary lock engaged.	USCAR-2, Section 5.4.2.4. 110 N minimum.	USCAR-2, Section 5.4.2.3.B.
Connector-connector unmating force, primary lock disengaged.	USCAR-2, Section 5.4.2.4. 75 N maximum.	USCAR-2, Section 5.4.2.3.B.

Figure 1 (continued)

Test Description	Requirement	Procedure
Primary lock disengage.	USCAR-2, Section 5.4.2.4. 70 N maximum. 10 N minimum.	USCAR-2, Section 5.4.2.3.B.
Polarization feature effectiveness, mis-mated.	USCAR-2, Section 5.4.4.4. 220 N minimum, 2 minute hold.	USCAR-2, Section 5.4.4.3.
Connector drop.	USCAR-2, Section 5.4.8.4. No damage.	USCAR-2, Section 5.4.8.3.
Cavity damage susceptibility.	USCAR-2, Section 5.4.9.4. TPA shall not seat with 80 N minimum load applied.	USCAR-2, Section 5.4.9.3.
Extraction with primary and secondary latching.	75 N minimum for 0.64 mm contacts. 90 N minimum for 2.8 mm contacts.	USCAR-2, Section 5.4.1.3.B.
Header pin retention, unsoldered.	USCAR-2, Section 5.7.1.4. 15 N minimum for 0.64 mm contacts. 50 N minimum for 2.8 mm contacts.	USCAR-2, Section 5.7.1.3.
Connector cycling.	USCAR-2, Section 5.7.1.5. No damage.	USCAR-2, Section 5.7.1.4.
Dry circuit resistance.	USCAR-2, Section 5.3.1.4. 20 milliohms maximum for 0.64 mm contacts. 5 milliohms maximum for 2.8 mm contacts.	USCAR-2, Section 5.3.1.3.
Mechanical shock.	USCAR-2, Section 5.1.9.4. No contact pair resistance greater than 7 ohms for 1 microsecond or longer duration.	USCAR-2, Section 5.4.6. 35 G's half-sine shock pulses of 10 milliseconds duration, 10 shocks in each axis.
Vibration.	USCAR-2, Section 5.1.9.4. No contact pair resistance greater than 7 ohms for 1 microsecond or longer duration.	USCAR-2, Section 5.4.6. Profile per Figure 5.4.6.3.E.
Voltage drop.	USCAR-2, Section 5.3.2.4. 20 milliohms maximum for 0.64 mm contacts. 5 milliohms maximum for 2.8 mm contacts.	USCAR-2, Section 5.3.2.3.
Thermal shock.	USCAR-2, Section 5.1.9.4. No damage or failures.	USCAR-2, Section 5.6.1. Class 1.
Temperature/humidity cycling	No damage or failures.	USCAR-2, Section 5.6.2. Class 1.
High temperature exposure.	No damage or failures.	USCAR-2, Section 5.6.3. Class 1.

Figure 1 (continued)

Test Description	Requirement	Procedure
Terminal-terminal engaging force.	See Qualification Test Report 501-657 for 0.64 mm product. See Engineering Report 502-1212 for 2.8 mm product.	These tests were not performed as part of product qualification. Shown for reference only.
Terminal-terminal disengaging force.		
Terminal bend resistance.		
Maximum current rating.		
1008 hour current cycling.		

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)											
	1	2	3	4	5	6	7	8	9	10	11	12
	Test Sequence (b)											
Visual inspection	1,6	1,5	1,4	1,6	1,3	1,3	1,4	1,3	1,8	1,7	1,7	1,7
Terminal-connector insertion	2											
Terminal-connector extraction, primary latching	3											
Terminal-connector extraction, secondary latching	4											
Terminal-connector extraction, secondary latching moisture conditioned	5											
TPA, preset to lock		2										
TPA, lock to preset		3										
TPA, preset to OFF (removal)		4										
Connector-connector audible click			2									
Connector-connector audible click after moisture conditioning			3									
Connector-connector mating force				2								
Connector-connector unmating force, primary lock engaged				3								
Connector-connector unmating force, primary lock disengaged				4								
Primary lock disengage				5								
Polarization feature effectiveness, mis-mated					2							
Connector drop						2						
Cavity damage susceptibility							2					
Extraction with secondary latching							3					
Header pin retention, unsoldered								2				
Connector cycling									2	2	2	2
Dry circuit resistance									3,6	3,5	3,5	3,5
Mechanical shock									4			
Vibration									5			
Voltage drop									7	6	6	6
Thermal shock										4		
Temperature/humidity cycling											4	
High temperature exposure												4

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 4 plugs and 4 headers.
- Test group 2 shall consist of 40 plugs.
- Test group 3 shall consist of 20 plugs and 20 headers.
- Test group 4 shall consist of 40 plugs and 30 headers.
- Test group 5 shall consist of 3 plugs with Key A and 3 headers.
- Test group 6 shall consist of 5 plugs.
- Test group 7 shall consist of 10 plugs.
- Test group 8 shall consist of 4 headers (1 from each mold cavity).
- Test group 9 shall consist of 3 plugs and 3 headers.
- Test groups 10, 11 and 12 shall each consist of 12 plugs and 3 headers.

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.