Industrial Circular USB Connector System

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics Industrial Circular Universal Serial Bus (USB) Connector System. This rugged connector series is designed to meet USB requirements for use in harsh environments and features a quick-connect bayonet coupling | mechanism per IEC 61076-3-106, Variant 01.

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 17Sep08, additional | testing was completed on 25Jul09. The Qualification Test Report number for this testing is 501-690. 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 Document

501-690: Qualification Test Report (Industrial Circular USB Connector System)

2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- IEC 60529: Degrees of Protection Provided by Enclosures (IP Code)
- | IEC 61076-3: Connectors for Electronic Equipment - Part 3: Rectangular Connectors - Sectional | Specification

2.3. Reference Documents

- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- | Universal Serial Bus Specification 2.0, April 27, 2000

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

- Voltage: 30 volts AC
- Current: Signal application only, 1.5 amperes maximum at 25˚C
- Temperature:
  - Standard assembly: -40 to 85˚C
  - BLUETOOTH assembly: 0 to 75˚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
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
MECHANICAL		
Durability.	See Note.	EIA-364-9. Manually mate and unmate specimens for 50 cycles at a maximum rate of 300 cycles per hour.
ENVIRONMENTAL		
Sealing, immersion.	No ingress of water. See Note.	IEC-60529, IPX7. Submerge specimens to a depth of 1 meter in a mixture of water and Tinapal for 30 minutes.
Sealing, dust.	No ingress of dust. See Note.	IEC-60529, IP6X. Subject specimens to a dust laden atmosphere with a maximum depression of 2 kPa for 8 hours.

NOTE *Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.*

Figure 1

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3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Initial examination of product	1	1	1	1
Durability	2	2	2	2
Sealing, immersion	3		3	
Sealing, dust		3		3
Final examination of product	4	4	4	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 shall consist of a minimum of 5 specimens.

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.