
QSL RF Connectors

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics QSL RF Connectors which includes cable applied plugs and printed circuit board applied jacks.

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 13Jan09. The Qualification Test Report number for this testing is 501-697. 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

- ! 114-5397: Application Specification (3 Port Stripline RF Connector)
- ! 114-5398: Application Specification (3 Port Stripline RF Connector)
- ! 408-10212: Instruction Sheet (QSL Connector Mated Pair VSWR Test Set-Up Procedure)
- ! 501-697: Qualification Test Report (QSL RF Connectors)

2.2. Industry Document

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

2.3. Reference Document

109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)

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: 270 volts AC rms maximum
- ! Temperature: -20 to 80°C
- ! Characteristic Impedance: 50 ohms
- ! Frequency Range: DC to 6 GHz

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 and Application Specifications 114-5397 and 114-5398.	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.
ELECTRICAL		
Low Level Contact Resistance (LLCR).	20 milliohms maximum. ΔR 8 milliohms maximum for contacts. ΔR 5 milliohms maximum for shields.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Voltage Standing Wave Ratio (VSWR).	1.30 maximum DC to 3 GHz. 1.45 maximum 3 to 6 GHz.	EIA-364-108. Measure VSWR between 100 MHz and 6 GHz, connectors only per Instruction Sheet 408-10212.
Insulation resistance.	100 megohms minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts of mated specimens.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 800 volts AC at sea level. Test between adjacent contacts of mated specimens.
Contact-to-contact isolation.	35 dB minimum.	Measure contact-to-contact isolation between 100 MHz and 6 GHz. All unused ports shall be terminated in 50 ohms.

Figure 1 (continued)

Test Description	Requirement	Procedure
MECHANICAL		
Random vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition Letter D. Subject mated specimens to 3.10 G's rms between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes. See Figure 4.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 4.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 500 cycles at a maximum rate of 500 cycles per hour.
Mating force.	30 N maximum for 3 port connector. 20 N maximum for 1 port connector.	EIA-364-13. Measure force necessary to engage coupling mechanism at a maximum rate of 12.7 mm per minute.
Unmating force.	30 N maximum. 8 N minimum.	EIA-364-13. Measure force necessary to disengage coupling mechanism at a maximum rate of 12.7 mm per minute.
Shear force.	60 N minimum.	EIA-364-8. Apply specified load from the front of the specimen at a rate of 25 ± 6 mm per minute.
Angled pull test.	No physical damage before disengagement for cable plugs without screw mounting hardware. No discontinuities of 1 microsecond or longer duration with 20 N maximum pull force for cable plugs with screw mounting hardware.	Direction of pull shall be 45 degrees at 8 reference directions (N, S, E, W, NW, NE, SW and SE).
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32. Subject unmated specimens to 5 cycles between -20 and 80°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.

Figure 1 (continued)

Test Description	Requirement	Procedure
Humidity, steady state.	See Note.	EIA-364-31, Method II, Test Condition C. Subject unmated specimens to 40°C and 90 to 95% RH for 504 hours.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 3, Test Time Condition D. Subject mated specimens to 85°C for 1000 hours.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA (4 gas). Subject mated specimens to environmental Class IIA for 7 days.

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 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)								
	1	2	3	4	5	6	7	8	9
	Test Sequence (b)								
Initial examination of product	1	1,5	1,7	1,5	1	1	1	1	1
LLCR	3,5	2,4,7		2,4,7	2,4	2,4			2,4
VSWR							2		
Insulation resistance			2,5,9						
Withstanding voltage			3,6,10						
Contact-to-contact isolation							3		
Random vibration		3							
Mechanical shock		6							
Durability	4								
Mating force	2								
Unmating force	6								
Shear force								2	
Angled pull test									3
Thermal shock			4	3					
Humidity, steady state			8	6					
Temperature life					3				
Mixed flowing gas						3(c)			
Final examination of product	7	8	11	8	5	5	4	3	5

NOTE

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition specimens with 10 durability cycles.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with Instruction Sheet 408-10212 and shall be selected at random from current production. All test groups shall each consist 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.

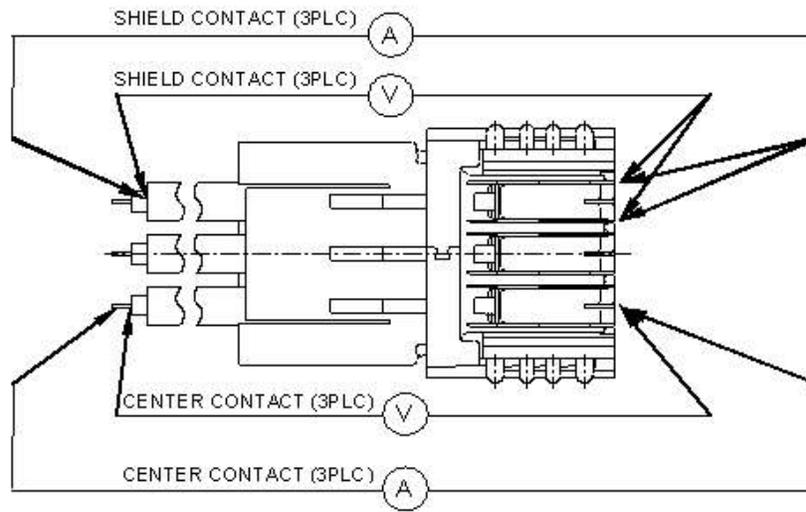


Figure 3
LLCR Measurement Points

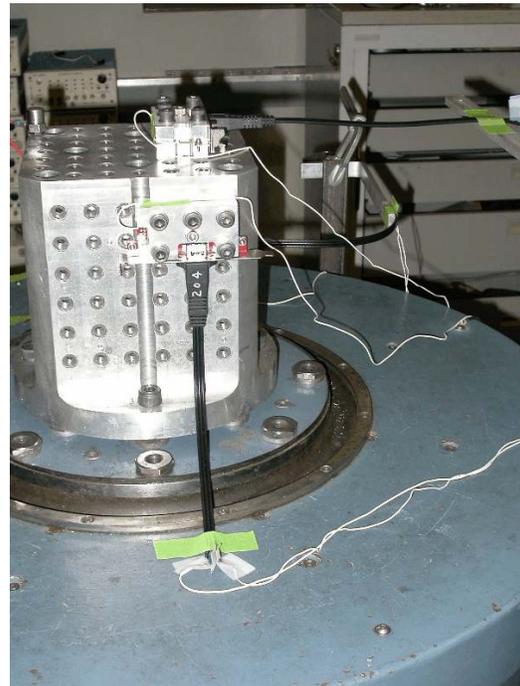
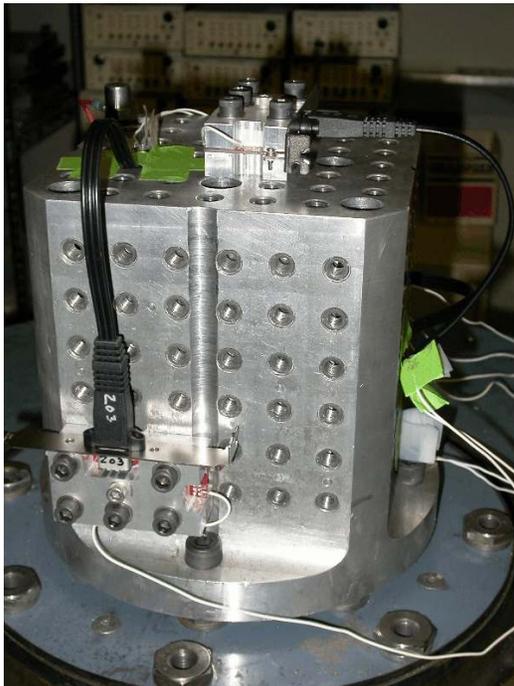


Figure 4
Vibration and Mechanical Shock Mounting Fixture