75 Ohm Miniature BNC RF Connector Series

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics 75 Ohm Miniature BNC RF Connector Series to determine their conformance to the requirements of Product Specification 108-2159 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the 75 Ohm Miniature BNC RF Connector Series. Testing was performed at the Engineering Assurance Product Test Laboratory between 02Apr04 and 30Jul04. The test file number for this testing is CTL B046739-008. This documentation is on file at and available from the Engineering Assurance Product Test Laboratory. Additional VSWR testing was performed at the EME Test Laboratory between 22Mar06 and 04Apr06. The test file number for this testing is EMEK228-003. This documentation is on file at and available from the EME Test Laboratory.

1.3. Conclusion

The 75 Ohm Miniature BNC RF Connector Series listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-2159 Revision A.

1.4. Product Description

75 Ohm Miniature BNC RF Connector Series consists of cable applied plugs and jacks as well as printed circuit board applied jacks.

1.5. Test Specimens

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

Test Group	Quantity	Part Number	Description
1,2,3,4,5,6	5 each	1274584-1	Mini BNC right angle bulkhead PCB jack
1,2,3,4,5	5 each	1274563-1	Mini BNC straight cable plug
6	1	1274563-1	Mini BNC straight cable plug
6	1	1274566-1	Mini BNC right angle cable plug
6	5	1274571-1	Mini BNC vertical PCB jack
6	5	1274572-1	Mini BNC right angle PCB jack
6	4	1274663-2	Mini BNC PCB stacked jack
7	5	1274563-1	Mini BNC straight cable plug

Figure 1

* Trademark
| Indicates change

1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

- Temperature: 15 to 35˚C
- Relative Humidity: 25 to 75%

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Initial examination of product	1	1,5	1,9	1	1	1	1
Low level contact resistance	3,5	2,4,7	4,6,13	2,4	2,4		
Voltage standing wave ratio						2	
Insulation resistance			2,7,11				
Withstanding voltage			3,8,12				
Vibration, random		3					
Mechanical shock		6					
Durability	4						
Mating force	2						
Unmating force	6						
Termination tensile strength							2
Thermal shock			5				
Humidity, steady state			10				
Temperature life				3			
Mixed flowing gas					3(c)		
Final examination of product	7	8	14	5	5	3	3

NOTE
(a) See paragraph 1.5.
(b) Numbers indicate sequence in which tests are performed.
(c) Precondition specimens with 10 durability cycles.

Figure 2

2. SUMMARY OF TESTING

2.1. Initial Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by CC&CE 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 Groups 1, 2, 3, 4 and 5

All low level contact resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than 6 milliohms for center contact and 2.5 milliohms for ground path. Measurements do not include wire bulk resistance. Bulk resistance values of 40.91 and 5.40 milliohms were subtracted from the center contact and ground path measurements, respectively.

2.3. Voltage Standing Wave Ratio - Test Group 6

A. Single Position Connectors

All voltage standing wave ratio measurements were less than: 1.11 maximum up to 500 MHz (any combination); 1.17 maximum up to 1 GHz (any combination); 1.40 maximum up to 2 GHz (any jack with straight plug); and 1.80 maximum up to 2 GHz (any jack with right angle plug).

B. Two Position Jack Connector

All voltage standing wave ratio measurements were less than: 1.13 maximum up to 500 MHz (any combination); 1.30 maximum up to 1 GHz (any combination); 1.52 maximum up to 2 GHz (with straight plug); and 1.80 maximum up to 2 GHz (with right angle plug).

2.4. Insulation Resistance - Test Group 3

All insulation resistance measurements were greater than 1000 megohms.

2.5. Withstanding Voltage - Test Group 3

No dielectric breakdown or flashover occurred.

2.6. Vibration - Test Group 2

No discontinuities were detected during vibration testing. Following vibration testing, no cracks, breaks, or loose parts on the specimens were visible.

2.7. Mechanical Shock - Test Group 2

No discontinuities were detected during mechanical shock testing. Following mechanical shock testing, no cracks, breaks, or loose parts on the specimens were visible.

2.8. Durability - Test Group 1

No physical damage occurred as a result of mating and unmating the specimens 500 times.

2.9. Mating Force - Test Group 1

All mating force measurements were less than 31 N [7 lbf].

2.10. Unmating Force - Test Group 1

All unmating force measurements were greater than 4 N [1 lbf].

2.11. Termination Tensile Strength - Test Group 7

All termination tensile strength measurements were less than 89 N [20 lbf].

2.12. Thermal Shock - Test Group 3

No evidence of physical damage was visible as a result of thermal shock testing.

2.13. Humidity, Steady State - Test Group 3

No evidence of physical damage was visible as a result of exposure to steady state humidity.

2.14. Temperature Life - Test Group 4

No evidence of physical damage was visible as a result of temperature life testing.

2.15. Mixed Flowing Gas - Test Group 5

No evidence of physical damage was visible as a result of exposure to the pollutants of mixed flowing gas.

2.16. Final Examination of Product - All Test Groups

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

3. TEST METHODS

3.1. Initial 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 at a test current of 100 milliamperes maximum and a 20 millivolt maximum open circuit voltage per Figure 3. Ten unterminated equal wire lengths were submitted by the requestor, in order to establish wire bulk subtraction factors for the center contact and the ground path. The averages of the 10 measurements were used as the subtraction factors. For the center contact, wire bulk for 11 ⅞ inches of wire and a value of 40.91 milliohms was subtracted. For the ground path, wire bulk for 11 ⅛ inches of wire and a value of 5.40 milliohms was subtracted.

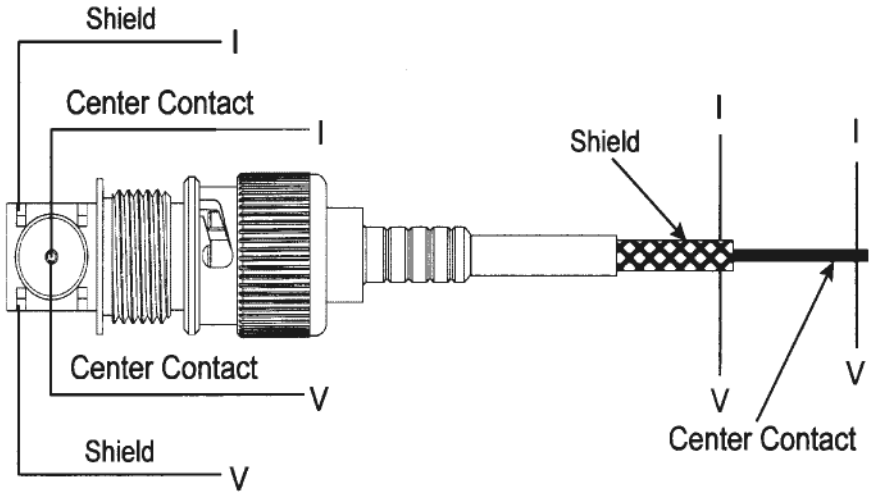

Figure 3
Low Level Contact Resistance Measurement Points

3.3. Voltage Standing Wave Ratio

VSWR was measured using an 8753D network analyzer. The sweep range was 0.045 to 2 GHz.

3.4. Insulation Resistance

Insulation resistance was measured between adjacent contacts of unmated specimens. A test voltage of 500 volts DC was applied for 2 minutes before the resistance was measured.

3.5. Withstanding Voltage

A test potential of 1000 volts AC was applied between the adjacent contacts of unmated specimens. This potential was applied for 1 minute and then returned to zero.

3.6. Vibration, Random

Mated specimens were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 20 and 500 Hz. The power spectral density at 5 Hz was 0.000312 G^2/Hz. The spectrum sloped up at 6 dB per octave to a PSD of 0.02 G^2/Hz at 14 Hz. The spectrum was flat at 0.02 G^2/Hz from 14 to 500 Hz. The root-mean square amplitude of the excitation was 3.10 GRMS. This was performed for 15 minutes in each of 3 mutually perpendicular planes for a total vibration time of 45 minutes. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.7. Mechanical Shock, Half-sine

Mated specimens were subjected to a mechanical shock test having a half-sine waveform of 30 gravity units (g peak) and a duration of 11 milliseconds. Three shocks in each direction were applied along the 3 mutually perpendicular planes for a total of 18 shocks. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.8. Durability

Specimens were mated and unmated 500 times at a maximum rate of 600 cycles per hour.

3.9. Mating Force

The force required to mate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute.

3.10. Unmating Force

The force required to unmate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute.

3.11. Termination Tensile Strength

The force required to pull the cable from the plug was measured using a tensile/compression device with a free floating fixture and a rate of travel of 25.4 mm [1 in] per minute.

3.12. Thermal Shock

Unmated specimens were subjected to 5 cycles of thermal shock with each cycle consisting of 30 minute dwells at -40 and 85˚C. The transition between temperatures was less than 1 minute.

3.13. Humidity, Steady State

Unmated specimens were exposed to 40˚C and 90 to 95% RH for 504 hours.

3.14. Temperature Life

Mated specimens were exposed to a temperature of 85˚C for 1000 hours.

3.15. Mixed Flowing Gas, Class IIA

Mated specimens were exposed for 20 days to a mixed flowing gas Class IIA exposure. Class IIA exposure is defined as a temperature of 30˚C and a relative humidity of 70% with the pollutants of Cl_2 at 10 ppb, NO_2 at 200 ppb, H_2S at 10 ppb and SO_2 at 100 ppb. Specimens were preconditioned with 10 cycles of durability.

3.16. Final Examination of Product

Specimens were visually examined for evidence of physical damage detrimental to product performance.