Ultraminiature Coax Connector (UMCC) and Cable Assemblies

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics Ultraminiature Coax Connector (UMCC) and Cable Assemblies to determine their conformance to the requirements of Product Specification 108-2231 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Tyco Electronics UMCC and Cable Assemblies. Testing was performed at the Electronics Testing Center, Taiwan between 25Dec02 and 21Nov05. The test file numbers for this testing are ET91T-12-071-B01 and ET94T-10-078-E00. This documentation is on file at and available from the Electronics Testing Center, Taiwan.

1.3. Conclusion

The Tyco Electronics UMCC and Cable Assemblies listed in paragraph 1.4., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-2231 Revision A.

1.4. Test Specimens

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

Part Number	Description
1566230-1	Tyco Electronics Style A Ultraminiature coax connector
1775146-1	Tyco Electronics Style B Ultraminiature coax connector
Various	Tyco Electronics Style I RF connector plug cable assembly
Various	Tyco Electronics Style III RF connector plug cable assembly

Figure 1

1.5. Environmental Conditions

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

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

1.6. Qualification Test Sequence

Test or Examination	Test Group (a)									
	1	2	3	4	5	6	7A	7B	8	9
	Sample Group (b)									
	C,E	C,E	C,E	C	C,E	C,F	C,E	C,E	C,E	C,E
	Test Sequence (c)									
Examination of product	1,5	1,5	1,5	1,3	1,4	1,3	1,3	1,3	1,3	1,3
Low level contact resistance	2,4		2		3					
Voltage standing wave ratio									2	
Insulation resistance		2,4	3							
Withstanding voltage			4							
Vibration, random							2			
Mechanical shock								2		
Repetitive operation	3									
Female contact holding force				2						
Three axis unmating force										2
Thermal shock					2					
Humidity, steady state		3								
Salt spray						2				

NOTE *(a) See paragraph 1.4.*
(b) Numbers indicate sequence in which tests are performed.

Figure 2

2. SUMMARY OF TESTING

2.1. Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by 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 and 5

All low level contact resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than 15 milliohms.

2.3. Voltage Standing Wave Ratio - Test Group 8

All voltage standing wave ratio measurements were 1.3 to 1 from 0.5 to 3 GHz and 1.4 to 1 from 3 to 6 GHz.

2.4. Insulation Resistance - Test Group 2

All insulation resistance measurements were greater than 1000 megohms initially and 500 megohms after testing.

2.5. Withstanding Voltage - Test Group 3

No dielectric breakdown or flashover occurred.

2.6. Vibration, Random - Test Group 7

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 7

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. Repetitive Operation - Test Group 1

No physical damage occurred as a result of manually inserting and disengaging the specimens 30 times.

2.9. Female Contact Holding Force - Test Group 4

All female contact holding force measurements were greater than 0.15 N.

| 2.10. Three Axis Unmating Force

| All three axis unmating force measurements were greater than 2 N in the upward and downward
| directions, and greater than 4 N in the horizontal direction.

| 2.11. Thermal Shock - Test Group 5

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

| 2.12. Humidity, Steady State - Test Group 2

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

| 2.13. Salt Spray - Test Group 6

No evidence of physical damage was visible as a result of exposure to a salt concentrated atmosphere.

3. TEST METHODS

3.1. 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. The test current was maintained at 100 milliamperes maximum with a 20 millivolt maximum open circuit voltage.

3.3. Voltage Standing Wave Ratio

Voltage standing wave ratio SWR was measured on unmated specimens using a network analyzer. The sweep range was 0.5 to 6 GHz.

3.4. Insulation Resistance

Insulation resistance was measured between the ground contact and signal pin of mated specimens. A test voltage of 100 volts DC was applied for 1 minute before the resistance was measured.

Figure 3

3.5. Withstanding Voltage

A test potential of 200 volts AC was applied between the ground contact and signal pin of mated 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 10 to 100 to 10 Hz. The root-mean square amplitude of the excitation was 6 GRMS. Seven sweeps in each of 3 mutually perpendicular planes, 35 minutes per axis. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

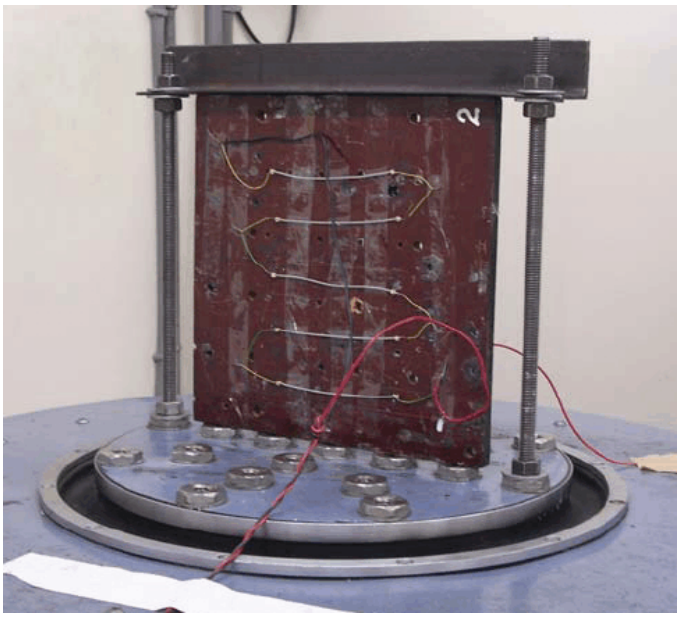


Figure 4

3.7. Mechanical Shock, Half-sine

Mated specimens were subjected to a mechanical shock test having a half-sine waveform of 75 gravity units (g peak) and a duration of 11 milliseconds. Six cycles in each direction were applied along the 3 mutually perpendicular planes. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

Figure 5

3.8. Repetitive Operation

Specimens were manually inserted and disengaged 30 times.

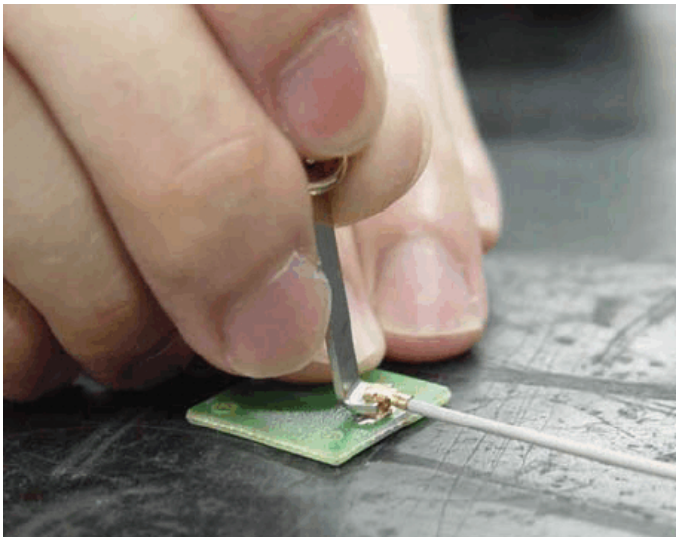


Figure 6

3.9. Female Contact Holding Force

The force required to remove female contacts was measured using a 0.475 mm gage pin held in a tensile/compression device with a free floating fixture and a rate of travel of 12.5 mm per minute.

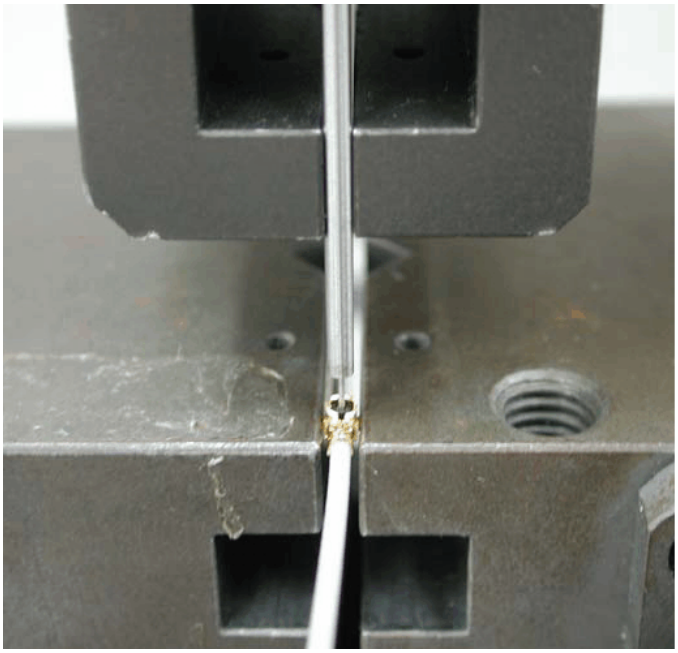
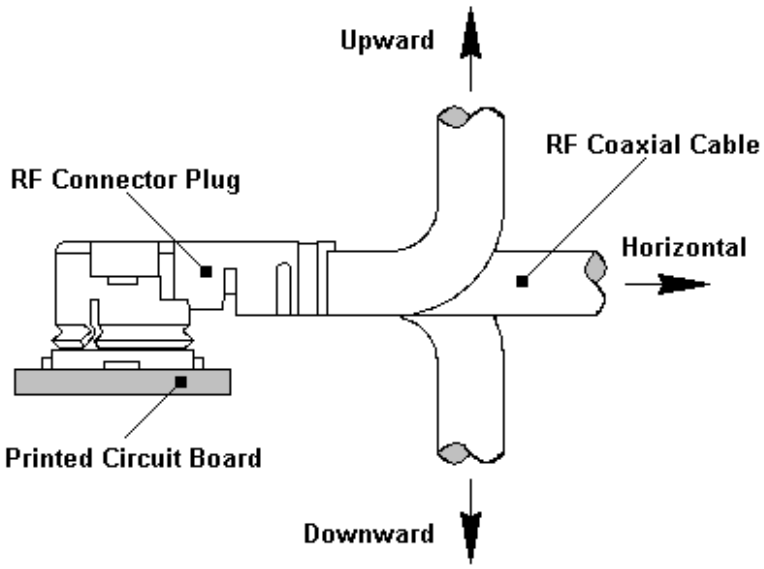


Figure 7

| 3.10. Three Axis Unmating Force

| The force required to unmate specimens from a printed circuit board was measured in the upward,
| downward and horizontal directions at a maximum rate of 12.7 mm per minute.



| Figure 8

| 3.11. Thermal Shock

Mated specimens were subjected to 5 cycles of thermal shock with each cycle consisting of -40˚C for 30 minutes; 25˚C for 5 minutes; 90˚C for 30 minutes; and 25˚C for 5 minutes.

| 3.12. Humidity, Steady State

Mated specimens were subjected to a relative humidity of 95% and a temperature of 40˚C for a period of 96 hours.

| 3.13. Salt Spray

Mated specimens were subjected to a 5% salt spray environment for 48 hours. The temperature of the box was maintained at 30˚C. The spray volume was 1 to 2 ml per hour.