Metrimate Signal Connector

1. INTRODUCTION

1.1. Purpose

Testing was performed on Tyco Electronics Metrimate Signal Connector to determine its conformance to the requirements of Product Specification 108-10033, Revision E.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Metrimate Signal Connector manufactured by the Interconnection Components Division. Testing was performed between 06Jun88 and 26Jul88. The test file number for this testing is CTL5019-001-005. This documentation is on file at and available from the Harrisburg Electrical Components Test Laboratory.

1.3. Conclusion

The Metrimate Signal Connectors met the electrical and mechanical performance requirements of Product Specification 108-10033, Revision E.

1.4. Product Description

The Metrimate Signal Connector is a true metric specification connector designed for panel, free-hanging or PCB application. Housings are made from UL rated 94V-0 thermoplastic and are designed to accept Tyco Electronics precision formed, size 16 one-piece Type VI or two-piece Type III+ contacts, as well as screw-machined Type II contacts. In addition, these Multimate housings will accept Tyco Electronics subminiature coaxial contacts and fiber optic ferrules. Connectors are available in 4, 6, 9, 12, 18, 24, 36 and 64 position panel mount and 1, 3, 6, 10, and 16 position free-hanging and PCB mount.

1.5. Test Samples

Samples were taken randomly from current production. The following samples were used:

Test Group	Quantity	Part Number	Description
1,2,3,4,5	5 each	207019-1	36 position plug connector
1,2,3,4,5	5 each	207020-1	36 position receptacle connector
1,2,3,4,5	5 each	207015-1	4 position plug connector
1,2,3,4,5	5 each	207016-1	4 position receptacle connector

Figure 1

* Trademark
| Indicates change

1.6. Qualification Test Sequence

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Examination of product	1	1	1	1	1
Insulation resistance		4			
Dielectric withstanding voltage		5			
Vibration	3				
Physical shock	4				
Durability	2				
Contact retention			2		
Mating force	5				
Unmating force	6				
Housing panel retention					2
Housing locking strength				2	
Thermal shock		2			
Humidity, steady state		3			

NOTE *(a) See paragraph 1.5.*
(b) Numbers indicate sequence in which tests are performed.

Figure 2

2. SUMMARY OF TESTING

2.1. Examination of Product - Groups 1, 2, 3, 4 and 5

All samples submitted for testing were selected from normal production lots. They were inspected and accepted by the Product Assurance Department of the Automachine Systems Group.

2.2. Insulation Resistance - Group 2

All insulation resistance measurements were greater than the 100 megohms.

2.3. Dielectric Withstanding Voltage - Group 2

No dielectric breakdown or flashover occurred.

2.4. Vibration - Group 1

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

2.5. Physical Shock - Group 1

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

2.6. Durability - Group 1

No evidence of physical damage was visible as a result of manually mating and unmating the samples 250 times.

2.7. Contact Retention - Group 3

There was no evidence of physical damage or unseating of the contacts.

2.8. Mating Force - Group 1

All mating force measurements were less than 1.125 pounds per contact.

2.9. Unmating Force - Group 1

All unmating force measurements were greater than 1.0 ounce per contact.

2.10. Housing Panel Retention - Group 5

All housing panel retention measurements were greater than 50 pounds for 4 position samples and greater than 80 pounds for 36 position samples.

2.11. Housing Lock Strength - Group 4

All housing lock strength measurements were greater than 10 pounds.

2.12. Thermal Shock - Group 2

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

2.13. Humidity, Steady State - Group 2

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

3. TEST METHODS

3.1. Examination of Product

Product drawings and inspection plans were used to examine the samples visually, dimensionally and functionally.

3.2. Insulation Resistance

Insulation resistance was measured between adjacent pairs of contacts. A test voltage of 500 volts DC was applied for 1 minute before the resistance was measured.

3.3. Dielectric Withstanding Voltage

A test potential of 2000 volts AC was applied between adjacent pairs of contacts for 1 minute and then returned to zero.

3.4. Vibration

Mated samples were subjected to vibration having sinusoidal motion. The amplitude was 0.06 inch, double amplitude or 15 gravity units peak, whichever was less. The vibration frequency was varied between the limits of 5 and 500 Hz and returned to 5 Hz in 15 minutes. This cycle was performed 12 times in each of 3 mutually perpendicular planes.

3.5. Physical Shock

Mated samples were physically shocked having a half-sine waveform of 50 gravity units and a duration of 11 milliseconds. Six shocks in each direction were applied along the 3 mutually perpendicular planes for a total of 18 shocks.

3.6. Durability

Samples were manually mated and unmated 250 times.

3.7. Contact Retention

After inserting and removing the contacts from their housing 5 times, an axial load of 10 pounds was applied to each contact in an axial direction to in an attempt to remove the contacts.

3.8. Mating Force

The force required to mate loaded samples was measured using a tensile/compression device with a free floating fixture and a rate of travel of 1 inch per minute.

3.9. Unmating Force

The force required to unmate loaded samples with locking latches removed was measured using a tensile/compression device with a free floating fixture and a rate of travel of 1 inch per minute.

3.10. Housing Panel Retention

Empty samples were mounted rigidly into test panels, an axial load of 50 pounds for 4 position samples and 80 pounds for 36 position samples was applied to each end of the sample and held for 1 minute.

3.11. Housing Locking Strength

An axial load of 10.0 pounds was applied to mated samples in a direction normal to the plane of the cable entrance.

3.12. Thermal Shock

Unmated samples were subjected to 10 cycles of thermal shock with each cycle consisting of 30 minute dwells at -55 and 105°C with 2 minute transition between temperatures.

3.13. Humidity, Steady State

Mated samples were subjected to a relative humidity of 90 to 95% and a temperature of 40°C for 10 days.