AMP

QUALIFICATION TEST REPORT

CONNECTOR, AMPOWER* WAVE CRIMP
wire tap with .250 FASTON* Tab

501-199 Rev. A

Product Specification: 108-1387, Rev. A
CTL No.: CTL9983-061
CTL9983-065
Date: February 16, 1993
Classification: Unrestricted
Prepared By: Terrance M. Shingara
Revised per ECN: EC93031202

*Trademark

Corporate Test Laboratory Harrisburg, Pennsylvania

Table of Contents

AMP INCORPORATED
HARRISBURG, PENNSYLVANIA 17105 PHONE: 717-564-0100 TWX: 510-657-4110
CORPORATE TEST LABORATORY

Qualification Test Report
AMPOWER Wave Crimp
wire tap with .250 FASTON tab.

1. Introduction

1.1 Purpose

Testing was performed on AMP's AMPOWER Wave Crimp wire tap with FASTON tab to determine if it meets the requirements of AMP Product Specification 108-1387, Rev. A.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the AMPOWER Wave Crimp wire tap with FASTON tab, manufactured by the Advanced Development Laboratory, Phoenix, Arizona. The testing was performed between September 9, 1992 and February 12, 1993.

1.3 Conclusion

The AMPOWER Wave Crimp wire tap with FASTON tab meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1387, Rev. A.

1.4 Product Description

The AMPOWER Wave Crimp wire tap with .250 FASTON tabs can be applied anywhere along the length of 1 inch wide insulated single or dual conductor flat copper cable having conductor thickness of .010 or .020. This tap provides 2 electrically independent NEMA/UL standard .250 tabs in an insulated housing. The contacts are made from a copper alloy, which is silver plated. The housing is a black glass filled PBT Polyester (UL94V-0).

1.5 Test Samples

The test samples were randomly selected from current production, and the following part numbers were used for test:

Group	Quantity	Part Number	Description
1,2,3	16 ea.	765273-2	Tap transition
1,2,3	16 ea.	765194-2	Tap insert
1,2,3	16 ea.	765295-1	Housing bottom
1,2,3	16 ea.	765296-1	Housing top
1,2,3	32 ea.	520963-2	Ultra-Pod FASTON receptacle
1,2,3	32 ea.	520974-2	Ultra-Pod FASTON receptacle
1,2,3	16 ea.	1-765210-1	0.010 mil Cable
1,2,3	16 ea.	1-765210-2	0.020 mil Cable

1.6 Qualification Test Sequence

Test or Examination	Test Groups		
	1	2	3
Examination of Product	1,6	1,11	1,9
Termination Resistance, Dry Circuit	2,5	2,8	
Dielectric Withstanding Voltage			3,7
Insulation Resistance			2,6
T-Rise vs. Current		3,9	
Vibration	3	7	
Physical Shock	4		
Locking Mechanism Strength			8
Unmating Force		10	
Thermal Shock			4
Humidity-Temperature Cycling		5	5
Mixed Flowing Gas		4	
Temperature Life		6	

The numbers indicate sequence in which tests were performed.

2. Summary of Testing

2.1 Examination of Product - All Groups

All samples submitted for testing were selected from normal production lots. They were inspected and accepted by the Product Assurance Department of the Strategic Products Center, Phoenix, Arizona.

2.2 Termination Resistance, Dry Circuit - Groups 1,2

All termination resistance measurements, taken at 100 milliamperes dc. and 50 millivolts open circuit voltage, were less than the specification requirement of 1.0 milliohms initial and 2.0 milliohms after testing.

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	32	Initial	0.389	0.777	0.565
		After Mechanical	0.387	0.819	0.594
2	32	Initial	0.425	0.792	0.562
		After Current Ver.	0.418	.0998	0.688

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 3

There was no dielectric breakdown or flashover between the two cables or between the cables and conductive foil wrapped around the plastic housing, when a test voltage of 1500 Vac was applied for one minute.

2.4 Insulation Resistance - Group 3

All insulation resistance measurements were greater than the specification requirement of 5000 megohms for the initial measurement and 1000 megohms for measurement taken after test.

2.5 Temperature Rise vs. Current - Group 2

All samples had a temperature rise of less than 30°C above ambient, when a specified current of 9.75 amperes was applied to a terminated, 10 mil cable with a Ultra-Pod FASTON receptacle terminated with 18 AWG wire and 25 amperes was applied to a terminated, 20 mil cable with a Ultra-Pod FASTON receptacle terminated with 12 AWG wire.

2.6 Vibration - Groups 1,2

Following vibration, there were no cracks, breaks, or loose parts on the connector assemblies.

2.7 Physical Shock - Group 1

Following physical shock, there were no cracks, breaks, or loose parts on the connector assemblies.

2.8 Locking Mechanism Strength - Group 3

Taps mated with FASTON receptacles suffered neither housing failure nor mating failure when subjected to a total delamination load of 12 pounds, applied to the wire tap pair.

2.9 Unmating Force - Group 2

All unmating force measurements were greater than 3.0 pounds.

2.10 Thermal Shock - Group 3

There was no evidence of physical damage to the contacts, FASTON receptacles, or the cables, as a result of thermal shock.

2.11 Humidity-Temperature Cycling - Groups 2,3

There was no evidence of physical damage to the contacts, FASTON receptacles, or the cables, as a result of exposure to humidity-temperature cycling.

2.12 Mixed Flowing Gas - Group 2

There was no evidence of physical damage to the contacts, FASTON receptacles, or the cables, as a result of exposure to the pollutants of mixed flowing gas.

2.13 Temperature Life - Group 2

There was no evidence of physical damage to the contacts, FASTON receptacles, or the connector, as a result of exposure to elevated temperature.

3. Test Methods

3.1 Examination of Product

The product drawings and inspection plans were used to examine the samples. They were examined visually and functionally.

3.2 Termination Resistance, Low Level

Termination resistance measurements at low level current were made, using a four terminal measuring technique (Figure 1). The test current was maintained at 100 milliamperes dc, with an open circuit voltage of 50 millivolts dc.

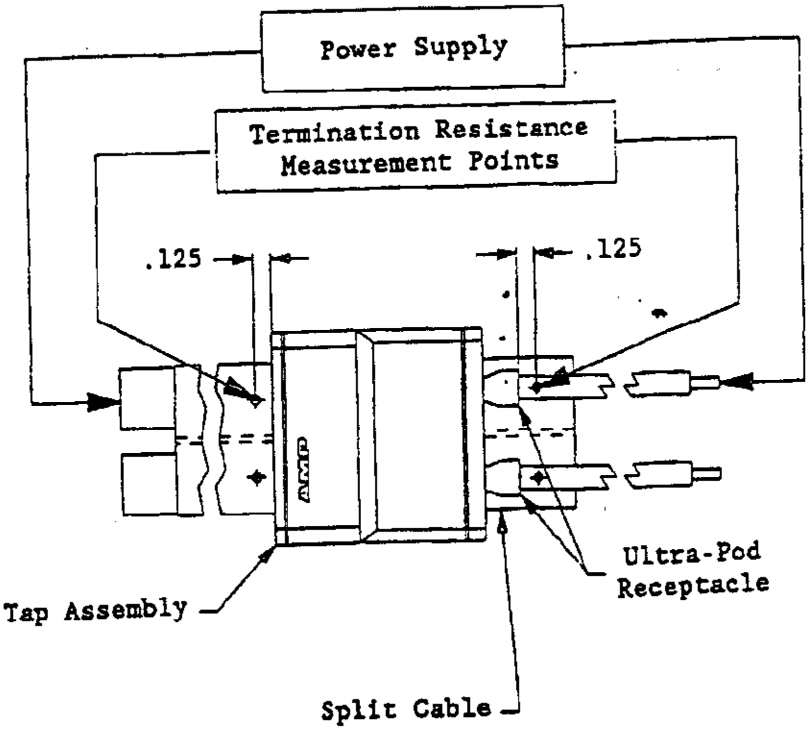

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1500 volts ac was applied between adjacent cables and between both conductors and conductive foil wrapped around the plastic housing. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation resistance was measured between adjacent cables and between both cables and the plastic housing, using a test voltage of 500 volts dc. This voltage was applied for two minutes, before the resistance was measured.

3.5 Temperature Rise vs. Specified Current

The connector temperature was measured, while energized at the specified current. Thermocouples were attached to the connectors to measure their temperatures. This temperature was then subtracted from the ambient temperature to find the temperature rise. When three readings at five minute intervals were the same, the readings were recorded.

3.6 Vibration, Sine

Connectors, mated with FASTON receptacles, were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude. The vibration frequency was varied logarithmically between the limits of 10 and 500 Hz and returned to 10 Hz in 15 minutes. This cycle was performed 12 times in each of three mutually perpendicular planes, for a total vibration time of nine hours. Connectors, in Group 2 were energized with with enough current to produce an approximate temperature increase of 18°C.

3.7 Physical Shock

Connectors, mated with FASTON receptacles, were subjected to a physical shock test, having a half-sine waveform of 50 gravity units (g peak) and a duration of 11 milliseconds. Three shocks in each direction were applied along the three mutually perpendicular planes, for a total of 18 shocks. The connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.8 Locking Mechanism Strength

A force of 12 pounds was applied between the wire attached to the FASTON receptacles and the AMPOWER cable. The connector body was maintained at a 90° angle to both wires.

3.9 Unmating Force

The force required to unmate individual FASTON receptacles was measured, using a free floating fixture with the rate of travel at 0.5 inch/minute.

3.10 Thermal Shock

Mated assemblies were subjected to 25 cycles of temperature extremes, with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -40°C and 105°C. The transition between temperatures was less than one minute.

3.11 Humidity-Temperature Cycling

Mated connectors were exposed to 10 cycles of humidity-temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25°C and 65°C twice, while the relative humidity was held at 95%.

3.12 Mixed Flowing Gas, Class III

Mated connectors were exposed for 20 days in the mixed flowing gas chamber. Class III exposure is defined as a temperature of 30°C and a relative humidity of 75%. Pollutants are Cl_2 at 20 ppb, NO_2 at 200 ppb, and H_2S at 100 ppb.

3.13 Temperature Life

Samples were subjected to 720 hours at an elevated temperature of 140°C.

4. Validation

Prepared by:

2/16/93

Terrance M. Shingara
Test Engineer
Design Assurance Testing
Corporate Test Laboratory

Reviewed by:

2/16/93

Richard A. Groft
Supervisor
Design Assurance Testing
Corporate Test Laboratory

Approved by:

3/17/93

Robert Grebe
Manager
Strategic Products Center, Phoenix Az.