AMP

QUALIFICATION TEST REPORT

AMP* MAG-MATE* Terminal,
Micro Series

501-52 Rev. 0

Product Specification:	108-2052 Rev. 0
CTL No.:	CTL1039-018
Date:	April 23, 1987
Classification:	Unrestricted
Distribution:	02

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CORPORATE TEST LABORATORY

Qualification Test Report on
MAG-MATE Terminal, Micro Series
P/N 63440-1 & 63441-1

1. Introduction

1.1 Purpose

Testing was conducted at the C&EP Group Laboratory to determine product performance when tested to the requirements of AMP Specification 108-2052, Rev. 0, dated August 3, 1987.

1.2 Scope

This report covers the electrical and mechanical performance of MAG-MATE Terminals, Micro Series, made by the Terminal Products Division of the Connector & Electronic Products Group. Testing was performed between April 8, 1985 and August 13, 1986.

1.3 Conclusion

AMP MAG-MATE Terminals, Micro Series, conform to the performance requirements of the product specification.

1.4 Product Description

The Micro Series MAG-MATE consists of precisely controlled terminating slots of "U" shaped stamped and formed terminals, which are pushed over wire. The terminal is designed to accept a range of magnet wire from 28 through 34 AWG in copper. The housing is Valox 420 and the terminal is tin plated brass.

1.5 Test Samples

Part Number	Wire Size	Wire Type	Description
63440-1	#28	Copper	Micro MAG-MATE, .110 FASTON Tab
63440-1	#29	Copper	Micro MAG-MATE, .110 FASTON Tab
63440-1	#30	Copper	Micro MAG-MATE, .110 FASTON Tab
63440-1	#31	Copper	Micro MAG-MATE, .110 FASTON Tab
63441-1	#32	Copper	Micro MAG-MATE, .110 FASTON Tab
63441-1	#33	Copper	Micro MAG-MATE, .110 FASTON Tab
63441-1	#34	Copper	Micro MAG-MATE, .110 FASTON Tab

Each test group consisted of 10 or more samples

Phelps Dodge Poly-Thermaleze copper magnet wire was used throughout the tests.

1.6 Qualification Test Sequence

	Test Group		
	1	2	3
Test or Examination	Test Sequence (a)		
Examination of Product	1	1	1
Termination Resistance, Dry Circuit	2,6	2,4	
Current Cycling		3	
Insertion Force			2
Extraction Force			3
Thermal Shock	3		
Humidity-Temperature Cycling	5		
Temperature Life	4		

(a) Numbers indicate order of testing.

2. Testing Summary

2.1 Examination of Product

Test samples were visually, dimensionally, and functionally examined per the applicable Quality Inspection Plan.

Test Results

Samples met the requirements of the Quality Inspection Plan.

2.2 Termination Resistance, Dry Circuit, Group 1

Dual terminated assemblies were attached to a four-terminal system, and the voltage drop from the top of the terminal to a point 1.50 inches along the magnet wire was measured. Terminals in Group 1 were subjected to 50 mv maximum circuit voltage and 100 ma maximum current flow.

Test Results

All samples passed the specification requirements. The maximum, minimum, and mean resistance of the terminal assemblies is listed below. Measurements were taken initially, and after 25 cycles of thermal shock exposure, after 33 days of temperature life exposure and after 10 cycles of humidity-temperature exposure. All values are in milliohms.

Group No.	Wire Size	Spec. Max.	Initial			After Thermal Shock		
			Max.	Min.	Mean	Max.	Min.	Mean
146-7	#28	15.0	10.64	10.45	10.58	10.72	10.57	10.65
146-5	#29	20.0	12.86	12.46	12.61	12.91	12.54	12.66
136-5	#30	24.0	15.79	14.30	14.87	15.81	14.27	14.88
428-1	#31	34.0	21.04	17.34	19.21	21.33	17.50	19.35
428-5	#32	37.0	23.90	20.94	22.32	23.90	20.94	22.39
428-20	#33	43.0	33.82	26.84	28.71	30.73	26.81	28.62
428-7	#34	48.0	40.22	34.70	37.50	40.37	34.68	37.63

Note: Wire size 30 samples were replaced with new parts after the thermal shock test. The testing on this size was done in two different time frames.

Group No.	Wire Size	Spec. Max.	Initial			After Temperature Life		
			Max.	Min.	Mean	Max.	Min.	Mean
146-7	#28	15.0	10.70	10.56	10.62	10.89	10.72	10.79
146-5	#29	20.0	12.82	12.46	12.58	13.12	12.63	12.77
266-1	#30	24.0	15.42	14.28	14.77	16.10	14.47	15.02
428-1	#31	34.0	21.33	17.50	19.35	21.56	17.72	19.57
428-5	#32	37.0	23.90	20.94	22.39	24.12	21.02	22.50
428-20	#33	43.0	30.73	26.81	28.62	35.98	26.49	29.37
428-7	#34	48.0	40.37	34.68	37.63	40.44	34.75	38.00

Note: Size 30 wire samples were exposed for 32 days at 118°C.

2.2 Continued

Group No.	Wire Size	Spec. Max.	Initial			After Humidity-Temperature		
			Max.	Min.	Mean	Max.	Min.	Mean
146-7	#28	15.0	10.80	10.64	10.71	10.81	10.66	10.72
146-5	#29	20.0	13.02	12.52	12.67	13.07	12.54	12.70
266-1	#30	24.0	16.55	14.47	15.04	19.11	14.43	15.37
428-1	#31	34.0	21.56	17.77	19.57	32.08	18.03	22.13
428-5	#32	37.0	24.12	21.02	22.50	24.13	21.02	22.51
428-20	#33	43.0	35.98	26.49	29.37	38.02	26.49	29.48
428-7	#34	48.0	40.44	34.75	38.00	40.95	34.75	38.02

2.3 Thermal Shock - Group 1

Terminal assemblies were subjected to 25 cycles of exposure to the listed extremes.

$125°C^{+5°}_{-0°}C$ for 30 Minutes Minimum

$-65°C^{-5°}_{+0°}C$ for 30 Minutes Minimum

Transition between extremes was less than 5 minutes.

Test Results

No physical damage occurred, and samples met the specification requirements for termination resistance.

2.4 Temperature Life - Group 1

Terminal assemblies were subjected to 33 days exposure to 118°C.

Test Results

Samples met the specification requirements for termination resistance at specified reading points.

2.5 Humidity-Temperature Cycling - Group 1

Terminal assemblies were subjected to ten 24-hour humidity-temperature cycles between 25°C and 65°C at a relative humidity of 95%. Samples were not subjected to cold shock nor to vibration during cycling.

Test Results

Samples met the specification requirements for termination resistance at specified reading points.

2.6 Current Cycling - Group 2

Terminal assemblies were subjected to 480 cycles. A cycle consists of 15 minutes current "ON" and 15 minutes current "OFF". The test current used is listed under termination resistance - specified current in paragraph 2.7. Measurements were taken initially, and after 480 cycles, except size 30 which was run for 576 cycles.

Test Results

All samples passed the specification requirements.

2.7 Termination Resistance, Specified Current - Group 2

Dual terminated assemblies were attached to a four-terminal system, and the voltage drop from the top of the terminal to a point 1.50 inches along the magnet wire was measured. Terminals were subjected to a specified current at a minimum open circuit voltage.

Test Results

All samples passed the specification requirements. The maximum, minimum, and average resistance of the terminal assemblies is listed below. All values are in milliohms.

Group No.	Wire Size (AWG)	Current (Amps)	Spec. Max.	Initial			After Cycling		
				Max.	Min.	Mean	Max.	Min.	Mean
146-8	#28	5.0	15.0	14.80	14.36	14.51	14.30	13.53	13.98
146-6	#29	4.5	20.0	18.17	17.40	17.87	17.94	17.19	17.57
266-4	#30	3.5	24.0	17.78	16.66	17.33	17.63	16.47	17.20
428-9	#31	2.0	34.0	22.01	19.22	20.52	22.00	19.27	20.56
428-13	#32	1.5	37.0	24.56	22.31	23.28	24.71	22.53	23.43
428-17	#33	1.0	43.0	31.02	28.41	29.48	30.81	28.07	29.23
428-15	#34	1.0	48.0	43.35	34.65	39.20	43.58	34.61	39.18

2.8 Insertion Force - Group 3

The force required to insert the terminal into a suitable housing cavity was measured at an insertion rate of 10.0 mm/min.

Test Results

All samples passed the specification requirements. The maximum, minimum and mean of the twenty samples are listed below.

Group Nos.	Insertion Force (Lbs.)			Spec.
	Max.	Min.	Mean	Max.
139-10-19	12.5	11.2	11.9	13.0

2.9 Extraction Force - Group 3

The force required to remove the terminal from the cavity was measured at a rate of 10.0 mm/min.

Test Results

All samples passed the specification requirements. The maximum, minimum and mean of the twenty samples are listed below.

Group Nos.	Extraction Force (Lbs.) Max.	Min.	Mean	Spec. Min.
139-10-19	6.4	4.0	5.3	3.75

3. Validation

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