AMP

QUALIFICATION TEST REPORT

CONTACT, TYPE VI

501-175 * Rev. A

I got this

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Product Specification: [redacted]
CTL No.: CTL5050-013-002
Date: May 13, 1992
Classification: Unrestricted
Prepared By: Terrance M. Shingara
Per EC: 0990-0062-94

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Corporate Test Laboratory Harrisburg, Pennsylvania

Thank you for changing this

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(R5056TS1)

AMP

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CORPORATE TEST LABORATORY

Qualification Test Report
Type VI Contact

1. Introduction

1.1 Purpose

Testing was performed on AMP* Type VI Contact to determine its conformance to the requirements of AMP Product Specification 108-10038 Rev.0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Type VI Contact manufactured by the Interconnection Components & Assemblies Products Division of the Capital Goods Business Unit. The testing was performed between December 11, 1990 and February 26,1992.

1.3 Conclusion

The Type VI Contact meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-10038 Rev. 0.

* Trademark

1.4 Product Description

The Type VI contact is a .062 diameter size 16 contact. The contact base material is a copper alloy with either tin or gold over nickel plating. Contacts are designed to accept wire sizes AWG 14 thru AWG 28.

1.5 Test Samples

The test samples were randomly selected from normal current production lots, and the following part numbers were used for test: All samples were loaded in CPC Series 1 Connectors using the 23-37 arrangement.

Test Group	Quantity	Part Number	Description
1,2,4,5,6	402	66585-2	Sn Pin AWG 28
1,2,4,5,6	402	66586-2	Sn Socket AWG 28
4,5	222	66581-2	Sn Pin AWG 20
4,5	222	66582-2	Sn Socket AWG 20
2,4,5,6	312	66577-2	Sn Pin AWG 14
2,4,5,6	312	66578-2	Sn Socket AWG 14
2,3,4,5	312	66585-4	Au Pin AWG 28
2,3,4,5	312	66586-4	Au Socket AWG 28
4,5	222	66581-4	Au Pin AWG 20
4,5	222	66582-4	Au Socket AWG 20
1,2,3,4,5	582	66577-4	Au Pin AWG 14
1,2,3,4,5	582	66578-4	Au Socket AWG 14

1.6 Qualification Test Sequence

	Test Groups					
Test or Examination	1	2	3	4	5	6
Examination of Product	1,8	1,5	1,5	1,5	1	1,5
Termination Resistance	3,7	2,4	2,4	2,4	2,4	2,4
T-Rise vs. Current						3
Current Cycling					3	
Contact Engaging Force	2					
Contact Separating Force	5					
Crimp Tensile					5	
Durability	4					
Thermal Shock	6					
Humidity-Temperature Cycling				3		
Mixed Flowing Gas			3			
Temperature Life		3				

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 current production lots. They were inspected and accepted by the Product Assurance Department of the Capital Goods Business Unit Group.

2.2 Termination Resistance, Dry Circuit - Groups 1,2,3,4,5,6

All termination resistance measurements, taken at 100 milliamperes dc. and 50 millivolts open circuit voltage, were less than 32 milliohms.

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	30	Initial AWG 14	1.83	2.13	1.96
	30	Initial AWG 28	3.49	5.29	4.24
	30	Final AWG 14	2.13	3.03	2.48
	30	Final AWG 28	5.09	8.29	6.80
2	60	Initial AWG 14	1.83	3.03	2.25
	60	Initial AWG 28	2.29	5.79	4.01
	60	Final AWG 14	1.93	10.43	3.70
	60	Final AWG 28	2.29	10.19	5.72
3	45	Initial AWG 14	1.91	2.17	1.98
	45	Initial AWG 28	2.40	3.93	3.03
	45	Final AWG 14	1.95	2.45	2.10
	45	Final AWG 28	2.56	3.75	3.06
4	30	Initial AWG 14	2.03	2.83	2.42
	30	Initial AWG 28	2.89	6.29	4.00
	30	Final AWG 14	2.33	26.73	7.43
	30	Final AWG 28	3.69	7.29	5.04
5	20	Initial AWG 14	1.83	2.43	2.01
	30	Initial AWG 20	1.52	2.22	1.77
	30	Initial AWG 28	2.39	5.39	3.75
	20	Final AWG 14	1.86	2.68	2.23
	30	Final AWG 20	0.74	1.89	1.25
	30	Final AWG 28	2.78	20.63	5.09
6	30	Initial AWG 14	1.53	2.23	1.99
	30	Initial AWG 20	1.32	2.12	1.64
	30	Initial AWG 28	1.99	3.79	2.99
	30	Final AWG 14	1.84	2.88	2.18
	30	Final AWG 20	0.84	1.83	1.27
	30	Final AWG 28	1.29	6.19	4.35

All values in milliohms

2.3 Temperature Rise vs. Current - Group 6

All samples had a temperature rise of less than 30°C above ambient when a specified current of 1.8 amperes dc was applied.

2.4 Current Cycling - Group 5

No evidence of physical damage was visible to the test samples, after 500 cycles of cycling the current on and off at a minimum of 125% of specified current.

2.5 Contact Engaging Force - Group 1

All contact engaging forces were less than 22 ounces for gold plated contacts and 27 ounces for tin plated contacts.

2.6 Contact Separating Force - Group 1

All contact separating forces were greater than 1.5 ounces per contact.

2.7 Crimp Tensile - Group 5

All tensile values were greater than specification limits.

Wire Size	# of Samples	Limit	Min	Ave
AWG 14	40	50.0	52.4	67.7
AWG 20	60	17.0	28.4	32.3
AWG 28	60	2.5	4.3	6.8

all values in pounds

2.8 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 500 times for gold plated samples and 25 cycles for tin plated samples.

2.9 Thermal Shock - Group 1

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

2.10 Humidity-Temperature Cycling - Group 4

No evidence of physical damage to the contacts was visible as a result of exposure to humidity-temperature cycling.

2.11 Mixed Flowing Gas - Group 3

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

2.12 Temperature Life - Group 2

No evidence of physical damage to the contacts was visible as a result of exposure to an elevated temperature.

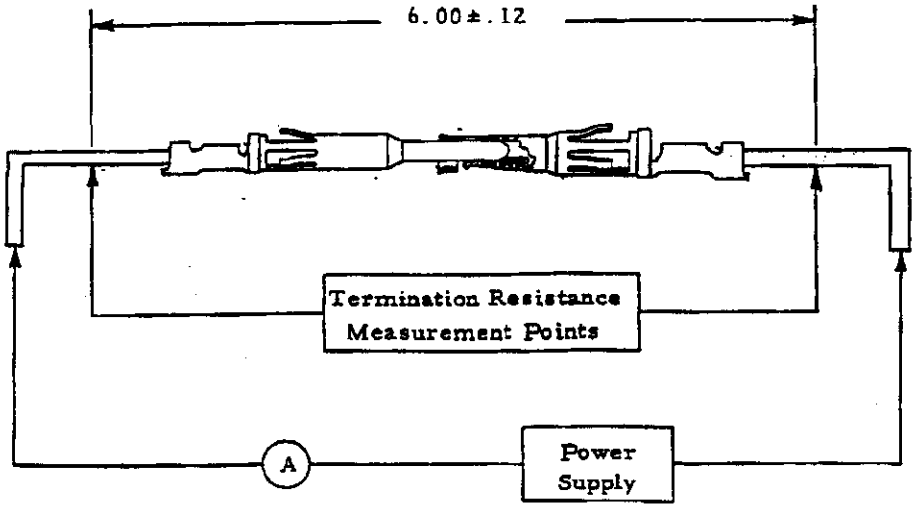
3. Test Methods

3.1 Examination of Product

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.



Note: Termination resistance equals millivolts divided by test current less resistance of 4.5 inches of wire.

Figure 1
Typical Termination Resistance Measurement Points

3.3 Temperature Rise vs Specified Current

Contact temperature was measured, while energized at the specified current. Thermocouples were attached to the contacts 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.

3.4 Current Cycling

The contacts were cycled on and off at 125% of the specified current. Testing consisted of 500 cycles, with each cycle having current on for 30 minutes and current off for 15 minutes.

3.5 Contact Engaging Force

Engaging forces were acquired by inserting a 0.0635 inch gage into the socket.

3.6 Contact Separating Force

After insertion a 0.0635 inch gage, Separating forces were acquired by withdrawing a 0.0615 inch gage from the socket.

3.7 Crimp Tensile

An axial load was applied to each sample at a crosshead rate of 1.0 inch per minute.

3.8 Durability

Contacts were mated and unmated the appropriate number of times at a rate not exceeding 300 per hour.

3.9 Thermal Shock

Mated contacts were subjected to 10 cycles of temperature extremes, with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -55°C and 105°C for gold plated contacts and -55°C and 90°C for tin plated contacts. the transition between temperatures was less than one minute.

3.10 Humidity-Temperature Cycling

After preconditioning the gold plated samples with 50 cycles of durability and the tin plated samples with 5 cycles of durability, mated contacts 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%.

3.11 Mixed Flowing Gas, Class II

After preconditioning the gold plated samples with 50 cycles of durability and the tin plated samples with 5 cycles of durability, mated contacts were exposed for 7 days to an mixed flowing gas Class II exposure. Class II 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, and H_2S at 10 ppb.

3.12 Temperature Life

After preconditioning the gold plated samples with 50 cycles of durability and the tin plated samples with 5 cycles of durability, mated contacts were exposed to a temperature of 105°C for 315 hours for gold plated contacts and 90°C for 1300 hours for tin plated contacts.

4. Validation

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