



QUALIFICATION TEST REPORT

Commercial SMB Series Coaxial Jack
Printed Circuit Board Mounted

501-122

Rev. A

Product Specification: 108-12074, Rev. 0
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Prepared By: Terrance M. Shingara
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Corporate Test Laboratory Harrisburg, Pennsylvania

Table of Contents

1.	Introduction	Page 1
1. 1	Purpose	Page 1
1. 2	Scope	Page 1
1. 3	Conclusion	Page 1
1. 4	Product Description	Page 2
1. 5	Test Samples	Page 2
1. 6	Qualification Test Sequence	Page 2
2.	Summary of Testing	Page 3
2. 1	Examination of Product	Page 3
2. 2	Termination Resistance, Specified Current	Page 3
2. 3	Dielectric Withstanding Voltage	Page 3
2. 4	Insulation Resistance	Page 3
2. 5	Permeability	Page 3
2. 6	RF High Potential	Page 3
2. 7	Vibration	Page 4
2. 8	Physical Shock	Page 4
2. 9	Mating Force	Page 4
2.10	Unmating Force	Page 4
2.11	Durability	Page 4
2.12	Jack to Board Retention	Page 4
2.13	Resistance to Soldering Heat	Page 4
2.14	Thermal Shock	Page 4
2.15	Humidity-Temperature Cycling	Page 4
2.16	Mixed Flowing Gas	Page 4
2.17	Temperature Life	Page 5
3.	Test Methods	Page 5
3. 1	Examination of Product	Page 5
3. 2	Termination Resistance, Specified Current	Page 5
3. 3	Dielectric Withstanding Voltage	Page 5
3. 4	Insulation Resistance	Page 6
3. 5	Permeability	Page 6
3. 6	RF High Potential	Page 6
3. 7	Vibration	Page 6
3. 8	Physical Shock	Page 6
3. 9	Mating Force	Page 6
3.10	Unmating Force	Page 6
3.11	Durability	Page 7
3.12	Jack to Board Retention	Page 7
3.13	Resistance to Soldering Heat	Page 7
3.14	Thermal Shock	Page 7
3.15	Humidity-Temperature Cycling	Page 7
3.16	Mixed Flowing Gas	Page 7
3.17	Temperature Life	Page 7
4.	Validation	Page 8

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AMP

AMP INCORPORATED

HARRISBURG, PENNSYLVANIA 17105 PHONE: 717-564-0100 TWX: 510-657-4110

CORPORATE TEST LABORATORY

Qualification Test Report
Commercial SMB Series Coaxial Jack
Printed Circuit Board Mounted

1. Introduction

1.1 Purpose

Testing was performed on AMP* Commercial SMB Series Coaxial Jack to determine its conformance to the requirements of AMP Product Specification 108-12074, Rev. 0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Commercial SMB Series Coaxial Jack, manufactured by the Manufacturing Operations Division of the Capital Goods Business Sector. The testing was performed between April 15, 1990 and July 23, 1990.

1.3 Conclusion

The Commercial SMB Series Coaxial Jack meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-12074, Rev. 0.

* Trademark

1.4 Product Description

The Commercial SMB Series Coaxial PCB Jack consists of a center contact, captivated dielectric, and a one piece shell body. This jack is soldered to a printed circuit board, via four legs for the outer conductor and one leg centered within the other four legs for the center conductor (RF signal). The SMB Jack interface then protrudes above the printed circuit board plane, ready for connection to a coaxial signal carrier that has been terminated with a SMB plug, thereby delivering an RF signal to the printed circuit board.

1.5 Test Samples

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

Test Group	Quantity	Part Number	Description
1,2,3,4,5,6	30	221111-1	Vertical SMB Jack
1,2,3,4,5,6	30	228435-1	Rt Angle SMB Jack
1,2,3,4,5,6	30	228212-1	Vertical SMB Jack
1,2,3,4,5,6	60	228213-1	SMB Plug*

* For mating purposes only

1.6 Qualification Test Sequence

Test or Examination	Test Groups					
	1	2	3	4	5	6
Examination of Product	1,9	1,5	1,7	1,8	1	1
Termination Resistance, Specified Current	3,7	2,4	2,6			
Dielectric Withstanding Voltage				3,7		
Insulation Resistance				2,6		
Permeability			3			
RF High Potential			4			
Vibration	5					
Physical Shock	6					
Mating Force	2					
Unmating Force	8					
Durability	4					
Jack to Board Retention						2
Resistance to Soldering Heat					2	
Thermal Shock				4		
Humidity-Temperature Cycling				5		
Mixed Flowing Gas				5		
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 Sector.

2.2 Termination Resistance, Specified Current - Groups 1, 2, 3

All termination resistance measurements, taken at the specified current of 1.0 amperes dc, were less than the specification maximums.

Test Group	Type Samples	Condition	No. of Samples	Measured Maximum	Spec. Maximum
1	Center	Initial	15	2.6	6.0
	Outer		15	1.4	2.0
	Center	Final	15	3.1	8.0
	Outer		15	2.2	2.5
2	Center	Initial	15	4.0	6.0
	Outer		15	1.3	2.0
	Center	Final	15	5.4	8.0
	Outer		15	1.9	2.5
3	Center	Initial	15	4.2	6.0
	Outer		15	2.1	2.0
	Center	Final	15	-0.3	8.0
	Outer		15	1.0	2.5

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 4

No dielectric breakdown or flashover occurred, when a test voltage was applied between the center and outer contact.

2.4 Insulation Resistance - Group 4

All insulation resistance measurements were greater than 1000 megohms initially and 100 megohms after test.

2.5 Permeability - Group 3

All permeability measurements were less than 2.0 mu.

2.6 RF High Potential - Group 3

No evidence of physical damage to the jack was visible, as a result of RF High Potential testing.

2.7 Vibration - Group 1

No discontinuities between the plug and jack were detected during vibration. Following vibration, no cracks, breaks, or loose parts on the jack assemblies were visible.

2.8 Physical Shock - Group 2

No discontinuities between the plug and jack were detected during physical shock. Following physical shock testing, no cracks, breaks, or loose parts on the jack assemblies were visible.

2.9 Mating Force - Group 1

All mating force measurements were less than 14 pounds.

2.10 Unmating Force - Group 1

All unmating force measurements were between 2 and 14 pounds.

2.11 Durability - Group 1

No physical damage occurred to the plugs or jacks, as a result of mating and unmating 500 times.

2.12 Jack to Board Retention - Group 6

No discontinuities between the plug and jack were detected. Following retention testing, no cracks, breaks, or loose parts on the jack assemblies were visible.

2.13 Resistance to Soldering Heat - Group 5

No evidence of physical damage to the plugs or jacks was visible, as a result of soldering heat.

2.14 Thermal Shock - Group 4

No evidence of physical damage to the plugs or jacks was visible, as a result of thermal shock.

2.15 Humidity-Temperature Cycling - Group 4

No evidence of physical damage to the plugs or jacks was visible, as a result of exposure to humidity-temperature cycling.

2.16 Mixed Flowing Gas - Group 1

No evidence of physical damage to the plugs or jacks was visible, as a result of exposure to the pollutants of mixed flowing gas.

2.17 Temperature Life - Group 2

No evidence of physical damage to the plugs or jacks 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, Specified Current

Termination resistance measurements taken at the specified current of 1.0 amperes dc were made, using a four terminal measuring technique (Figure 1).

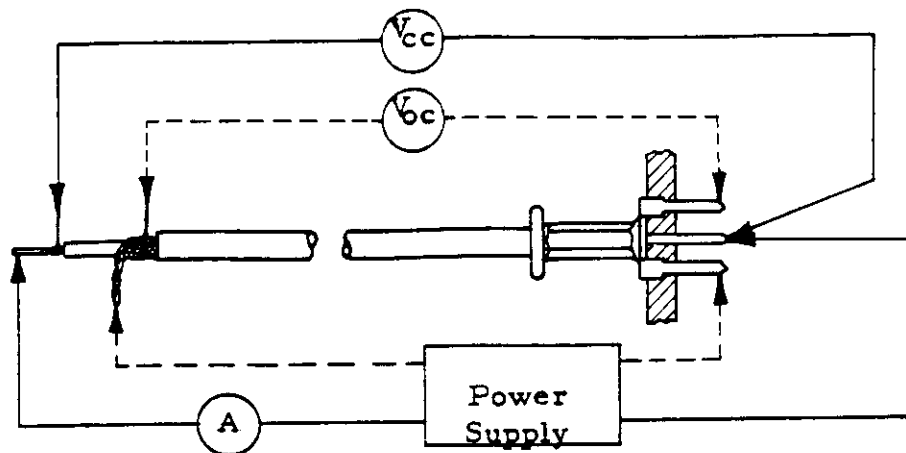


Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1000 vac was applied between the center and outer contacts. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation resistance was measured between the center and outer contact, using a test voltage of 500 volts dc. This voltage was applied for two minutes before the resistance was measured.

3.5 Permeability

Magnetic permeability was checked, using a 2.0 micro mu magnet.

3.6 RF High Potential

A test potential of 700 V 5.0 mhz was instantaneously applied between the center and outer contacts. This voltage was maintained for one minute.

3.7 Vibration, Sine

Mated connectors 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 2000 Hz and returned to 10 Hz in 20 minutes. This cycle was performed 12 times in each of three mutually perpendicular planes, for a total vibration time of 12 hours. Connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.8 Physical Shock

Mated connectors were subjected to a physical shock test, having a sawtooth waveform of 75 gravity units (g peak) and a duration of 6 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.

3.9 Mating Force

The force required to mate individual plug and jacks were measured, using a free floating fixture with the rate of travel at 0.5 inch/minute.

3.10 Unmating Force

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

3.11 Durability

Connectors were mated and unmated 500 times at a rate not exceeding 12 per minute.

3.12 Jack to Board Retention

Jacks were mounted on a printed circuit board, and an axial load was applied to the jack in a direction to remove the jack for the test board. The load was 30 pounds.

3.13 Resistance to Soldering Heat

Jacks were mounted on a printed circuit board and immersed, so that the bottom of the test board rested on molten solder. The temperature of the solder was 260°C, and the duration of the immersion was 30 seconds.

3.14 Thermal Shock

Mated connectors were subjected to five cycles of temperature extremes, with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -65°C and 85°C. The transition between temperatures was less than one minute.

3.15 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%.

3.16 Mixed Flowing Gas, Class II

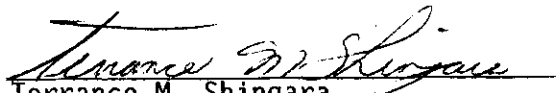
Mated connectors were exposed for 20 days to an mixed flowing gas Class II exposure. Class II exposure is defined as a temperature of 30°C and a relative humidity of 70%, with the pollutants of Cl₂ at 10 ppb, NO₂ at 200 ppb, and H₂S at 10 ppb.

3.17 Temperature Life

Mated connectors were exposed to a temperature of 125°C for 96 hours.


4. Validation

Prepared by:



Terrance M. Shingara 8/6/90
Test Engineer
Design Assurance Testing
Corporate Test Laboratory

Reviewed by:



Richard A. Groft 08/06/90
Supervisor
Design Assurance Testing
Corporate Test Laboratory

Approved by:



Edward Gill 8/8/90
Manager
Engineering & Design Assurance
Capital Goods Business Sector