

PRODUCT SPECIFICATIONS

108-51074

Connector, FPC, 1mm, Gold-Plated

1.0 SCOPE

1.1 Contents

This specification covers performance, tests and quality requirements for the AMP* 1 mm FPC connector. This connector ranges in size from 4 to 30 positions. A single contact is produced with tails to provide right angle surface mount connections to a printed circuit board. An actuator provides ZIF action and the socket accepts FEC, FFC, or FPC. The 2 right angle versions of the socket mate with the exposed traces of the cable facing up or down. Housing can be equipped with solder hold down tabs for both right angle versions.

1.2 Qualification

When tests are performed on the subject product line, procedures specified in AMP 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

The applicable product descriptions and part numbers are as follow:

Part Number	Part Description
x-1735119-x	1mm FPC, Horizontal, Top Contact, Gold-plated
x-1735265-x	1mm FPC, Horizontal, Bottom Contact, Gold-plated

2.0 Applicable Documents

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence.

2.1 Specifications

- A. 109-1: General Requirements for Test Specifications
- B. 109 Series: Test Specifications as indicated in Figure 1. (Comply with MIL STD-202, MIL STD-134 and EIA RS-364)
- C. 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- D. 114-1072: Application Specification
- E. 501-51058: Qualification Test Report

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SPEC: 1mm Pitch FPC Connector, Gold Plated

108-51074

REV: 0

PRE: Yap Ket Wui

SPEC No:

EC No: INITIAL RELEASE

APP: Leong See Fan

PAGE: 1 of 10

3.0 Requirements

3.1 Design And Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Materials

- A. Actuator: Glass reinforced nylon (PPA), UL94 V-0 or glass reinforced PPS, UL94 V-0
- B. Board mount: Phosphor bronze, tin plating
- C. Contact: Phosphor bronze, Gold flash over nickel plating
- D. Housing: Glass reinforced polyester (LCP), UL94V-0

3.3 Ratings

- A. Voltage: 200 volts AC (rms)
- B. Current: Signal application only, 1 ampere maximum for single circuit
- C. Temperature: -40 to 85°C

3.4 Performance And Test Descriptions

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per AMP Specification 109-1.

3.5 Test Requirements And Procedures Summary

Para	Test Items	Requirements	Procedures
3.5.1	Confirmation of product	Product shall meet the requirements of the applicable product drawing.	Visually, dimensionally and functionally inspected per applicable quality inspection plan before test, visually only after test.
Electrical			
3.5.2	Contact / Termination Resistance (TR)	30 mΩ Max. (Initial)	Measurement shall be made between each contact and mating cables to close circuit current of 100mA Max. (See Figure 3.) EIA-364-23.
3.5.3	Insulation Resistance	1000 MΩ Min	Apply voltage 500V DC for 1 minute between adjacent contacts of mated connector. EIA-364-21.
3.5.4	Dielectric Strength	No creeping discharge, arching nor flashover shall occur. Current leakage: 0.5mA Max.	500V AC (rms) for 1 minute. Test between adjacent contacts of mated connector. EIA-364-20, Method A.

Figure 1 (to be continued)

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Mechanical			
3.5.5	Vibration (Low Frequency)	No electrical discontinuity greater than 1µsec. shall occur. TR: 50 mΩ Max. (Final)	Subject mated connectors for 2 hours in each of 3 mutually perpendicular planes, with 1mA DC applied current. Amplitude: 1.52 mm Peak to Peak. Frequency: 10-55-10Hz shall be traversed in 1 minute. (See Figure 4.) EIA-364-28, Cond. I
3.5.6	Physical Shock	No electrical discontinuity greater than 1µsec. shall occur. TR: 50 mΩ Max. (Final)	Subject mated connectors to following condition. 3 shocks shall be applied along 3 mutually perpendicular planes, with 1mA DC applied current. (See Figure 4.) Test Pulse: Halfsine shock Peak Value: 490m/s ² (50G) Duration: 11 millisecond Total: 18 shocks EIA-364-27, Cond. A
3.5.7	Contact Retention Force	100g (0.98N) Min.	Pull the contacts at speed rate of 25±3mm/min.
3.5.8	Solderability	Wet solder coverage 95% Min, must show no voids, pin holes.	Lead free solder: Sn/3.35Ag/0.65Cu Flux : Rosin 11~17%, IPA 80~90% Subject unmated connectors to the following pre-treatment conditions: 1) Storage at 150°C for 1 hour. 2) Leave sample at room temperature for 2 hours min.

Figure 1 (to be continued)

			<p>After pre-treatment, immerse soldertail into flux for 3 ~ 5 secs.</p> <p>Subject sample to the following conditions: Soldering Temperature: 240 ± 2°C Immersion depth: 0.2~0.25mm Immersion time: 3 secs</p>												
3.5.9	Resistance To Soldering Heat for SMT Type	No physical damage shall occur.	<p>Lead free solder: Sn/3.35Ag/0.65Cu Flux : Rosin 11~17%, IPA 80~90%</p> <p>PCB thickness: 1.6mm</p> <p><u>Pre-Treatment Conditions:</u> Leave for 168 hours in environment with 85° C, 85%RH.</p> <p><u>Reflow Soldering:</u></p> <table border="1"> <tr> <td>Peak Temperature</td> <td>240° C MAX</td> </tr> <tr> <td>Peak Time</td> <td>5s MAX</td> </tr> <tr> <td>At 220° C MIN</td> <td>20-40s</td> </tr> <tr> <td>Pre-heat Temperature</td> <td>150-190° C</td> </tr> <tr> <td>Pre-heat Time</td> <td>90-120s</td> </tr> <tr> <td>Cycles</td> <td>2</td> </tr> </table> <p><u>Soldering Iron method:</u> Bit temperature: 380 ±10° C; Solder times: 3 sec MIN.</p>	Peak Temperature	240° C MAX	Peak Time	5s MAX	At 220° C MIN	20-40s	Pre-heat Temperature	150-190° C	Pre-heat Time	90-120s	Cycles	2
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Peak Time	5s MAX														
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Cycles	2														
3.5.10	Durability (Repeated Mating & Un-mating)	TR: 50 mΩ Max. (Final)	<p>Manually mate and unmate samples for 30 cycles.</p> <p>EIA 364-9C</p>												

Figure 1 (to be continued)

Environmental

3.5.11	Temperature Rise Vs Current	30°C Max.	Mated condition, apply test current of 1A DC to the circuit, measure the temperature rise by thermocouple probing on soldered areas of contacts, after the temperature become stabilised.															
3.5.12	Thermal Shock (Temperature Cycling)	TR: 50 mΩ Max. (Final)	<p>Subject mated connectors to following condition, repeat for 10 cycles.</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55 ± 5°C</td> <td>30</td> </tr> <tr> <td>2</td> <td>+25 ± 5°C</td> <td>10</td> </tr> <tr> <td>3</td> <td>+90 ± 5°C</td> <td>30</td> </tr> <tr> <td>4</td> <td>+25 ± 5°C</td> <td>10</td> </tr> </tbody> </table> <p>Upon completion of the exposure period, test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.</p>	Step	Temperature	Time (min.)	1	-55 ± 5°C	30	2	+25 ± 5°C	10	3	+90 ± 5°C	30	4	+25 ± 5°C	10
Step	Temperature	Time (min.)																
1	-55 ± 5°C	30																
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3.5.13	Humidity, Steady State	<p>Insulation resistance: 1000 MΩ Min. (Final).</p> <p>Dielectric strength: must meet 3.5.4</p>	<p>Subject mated connectors to 90~95% R.H., 40 ± 2°C for 500 hours.</p> <p>Upon completion of the exposure period, test specimens shall be conditioned at ambient room conditions for 1 hour, after which the specified measurements shall be performed.</p>															
3.5.14	Salt Spray	TR: 50 mΩ Max. (Final)	<p>Subject mated connectors to:</p> <p>Salt concentration: 5 ± 1%</p> <p>Spray time: 48 hours</p> <p>Ambient temperature: 35 ± 2° C.</p> <p>Upon completion of the exposure period, test specimens shall be conditioned at ambient room conditions for 1 hour. The specified measurements shall be performed after salt deposits being removed.</p>															

Figure 1 (to be continued)

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3.5.15	Temperature Life (Heat Resistance)	TR: 50 mΩ Max. (Final)	Subject mate connectors to 85±2°C for 500 hours. Upon completion of the exposure period, test specimens shall be conditioned at ambient room conditions for 1 hour, after which the specified measurements shall be performed.
3.5.16	Cold Resistance	TR: 50 mΩ Max. (Final)	Subject mated connectors to -25±3°C for 500 hours. Upon completion of the exposure period, test specimens shall be conditioned at ambient room conditions for 1 hour, after which the specified measurements shall be performed.
3.5.17	Hydrogen Sulfide Gas Exposure	TR: 50 mΩ Max. (Final)	Subject mated connectors to atmosphere of the following conditions: Temperature : 40 ± 2°C Relative humidity : 75% Density : 3 ± 1ppm Period : 96hours
3.5.18	Humidity-Heat Cycling Test	TR: 50 mΩ Max. (Final) IR: 500 MΩ Min Dielectric Withstanding Voltage: No breakdown nor flashover	Subject mated connectors to the temperature profile shown in Fig. 2. Total number of cycles: 40

Figure 1 (End)

4.0 Quality Assurance Provisions

4.1 Test Conditions

Unless otherwise specified, all the tests shall be performed in any combination of the following test conditions.

Temperature : 15 ~ 35° C

Relative Humidity : 25 ~ 85%

Atmosphere Pressure : 650 ~ 800 mm Hg

4.2 Test Specimens

4.2.1 The test specimens to be used for testing shall be confirming to the requirements of the applicable product drawing(s)

4.2.2 Unless otherwise specified, no sample shall be re-used.

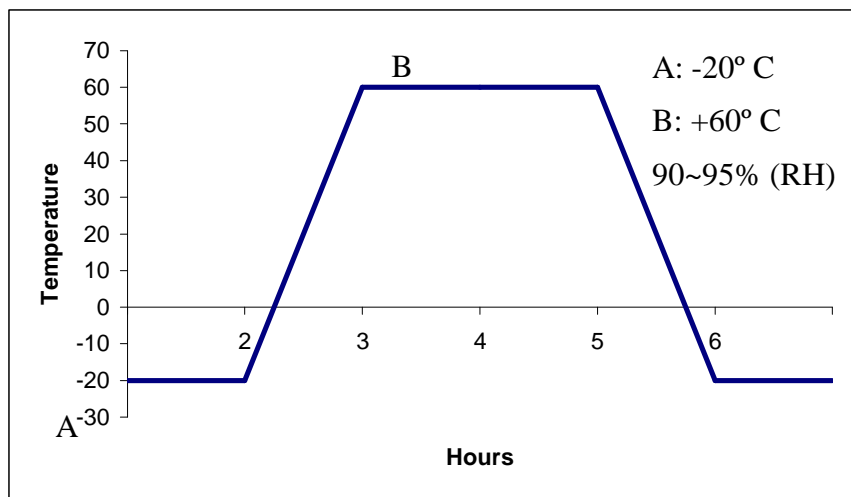


Figure. 2: Temperature Profile For Humidity-Heat Cycling Test

4.0 Quality Conformance Inspection

The applicable AMP quality inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

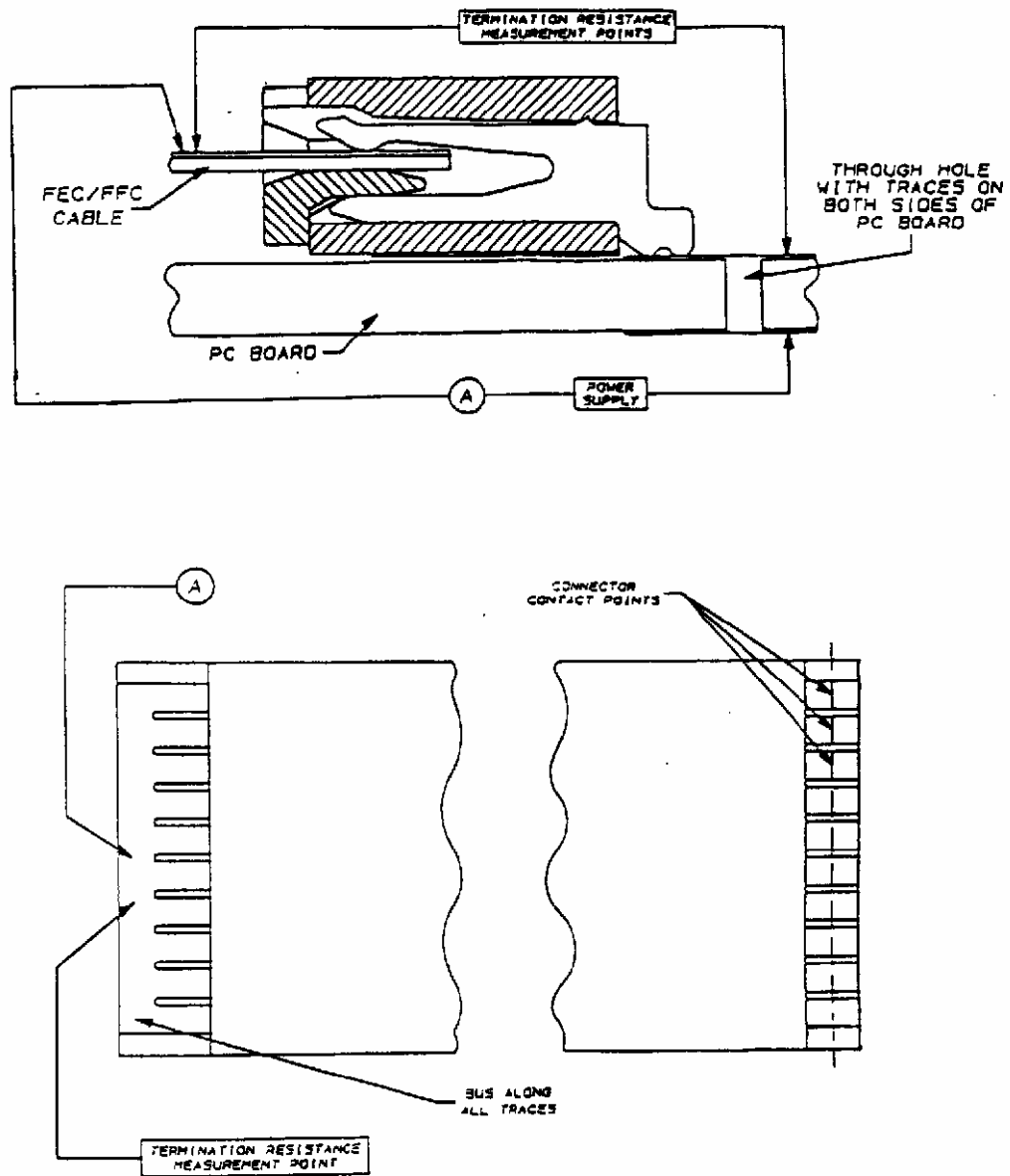


Figure 3: Termination Resistance Measurement Points

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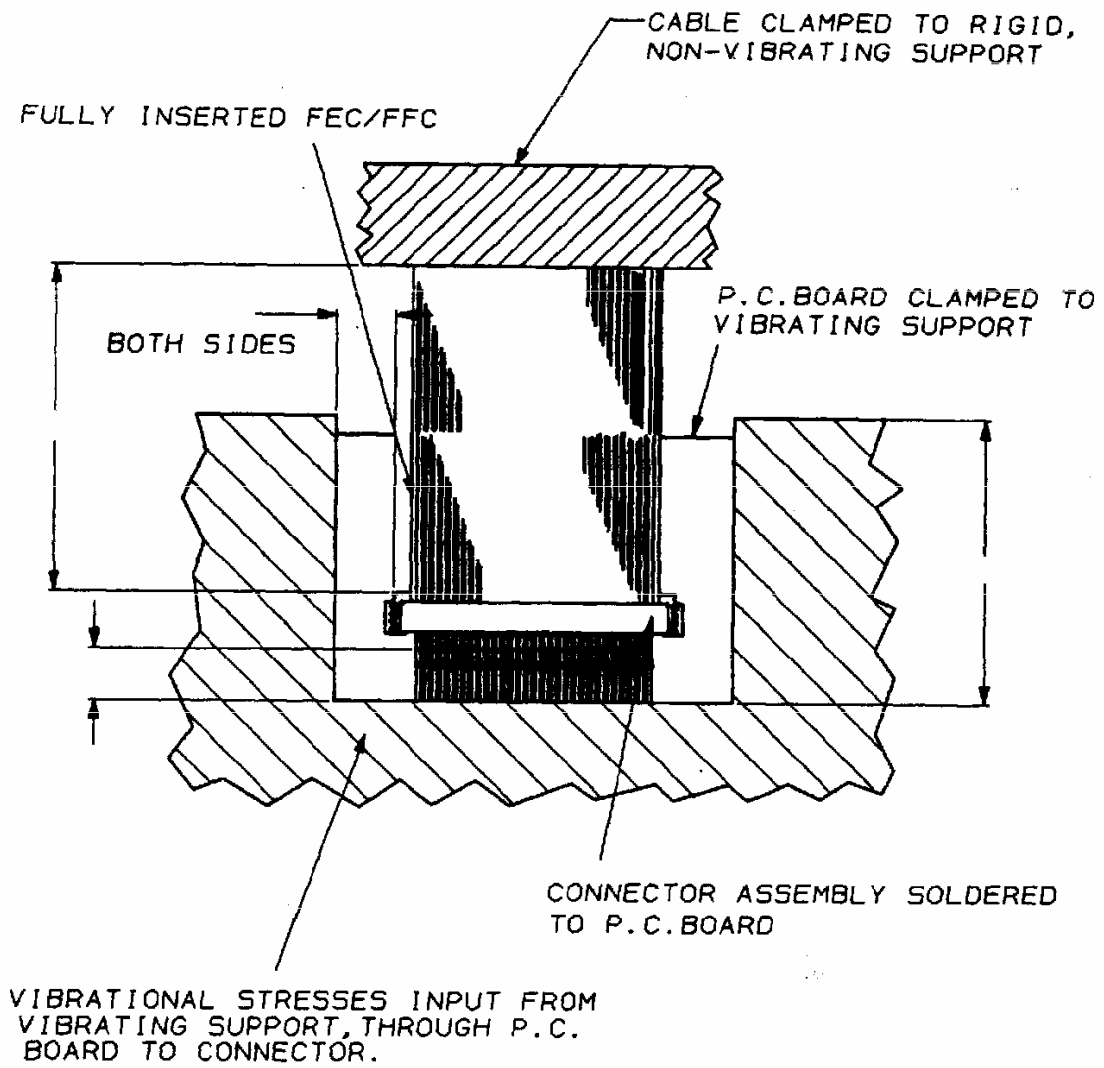


Figure 4.
Vibration And Mechanical Shock Mounting Fixture

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5.0 PRODUCT QUALIFICATION TEST SEQUENCE

Test	Test Group											
	1	2	3	4	5	6	7	8	9	10	11	12
Confirmation of Product	1,7	1,5	1,6	1,5	1,3	1,5	1,5	1,5	1,3	1,3	1,5	1,9
Termination Resistance		2,4	2,5	2,4		2,4	2,4	2,4			2,4	2,8
Insulation Resistance	2,5											3,6
Dielectric Strength	3,6											4,7
Vibration			3									
Physical Shock			4									
Contact Retention Force										2		
Solderability									2			
Resistance to Soldering Heat												
Durability		3										
Temperature Rise vs. Current					2							
Thermal Shock (Temperature Cycling)				3								
Humidity (Steady State)	4											
Salt Spray							3					
Temperature Life						3						
Cold Resistance								3				
Hydrogen Sulfide Gas Exposure											3	
Humidity-Heat Cycling Test												5

Figure 5

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