

1mm Pitch FFC Connector, SMT Process Type (Non-ZIF Type)

DESIGN OBJECTIVES

1.0 SCOPE

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of 1mm Pitch FFC Connector (Non-ZIF type).

The applicable product descriptions and part numbers are as follow:

Part Number	Part Description
X-84981-x	1mm FFC Connector, SMT, H
X-84982-x	1mm FFC Connector, SMT, V
X-1735042-x	1mm FFC Connector, SMT, V, w/Kapton Tape, w/emboss Tape
X-1735360-x	1mm FFC Connector, SMT, H, (Non-ZIF), Bottom Contact
X-1735669-x	1mm FFC Connector, Through Hole, High-Temp, V

Country of origin: Singapore

Production location: 26 Ang Mo Kio Industrial Park 2, Singapore 569507

UL File No.: E28476

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. 501-51042 Qualification Test Report on 1mm FFC Connector, SMT Type, Non-ZIF Type, Vertical & Horizontal

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. Solder Peg: Brass, 1 μm min thk Tin over Nickel underplate
- B. Receptacle Contact: Phosphor bronze, 1 μm min thk Tin over Nickel underplate
- C. Receptacle Housing:
SMT version: Hi-Temp Glass-filled Nylon, UL94V-0, Beige colour

3.3 Ratings

- A. Voltage Rating: 125V AC
- B. Current Rating: 1.0A
- C. Operating & Storage Temperature Rating: -20°C to $+85^{\circ}\text{C}$

3.4 Performance And Test Descriptions

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig 1.

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 m Ω Max. (Initial)	Measurement shall be made between each contact and mating cables to close circuit current of 10mA Max.
3.5.3	Insulation Resistance	1000 M Ω Min	Apply voltage 500V DC for 1 minute between adjacent contacts of mated connector.
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.

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
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. Test Pulse: Halfsine shock Peak Value: 490m/s ² (50G) Duration: 11 millisecond Total: 18 shocks
3.5.7	Solderability	Wet solder coverage 90% Min, must show no voids, pin holes.	Dip soldertail into flux followed by lead free solder bath at 245±5°C for a time duration of 5±1s
3.5.8	Resistance To Soldering Heat for SMT Type	No physical damage shall occur. Electrical characteristics shall be satisfied.	PCB thickness: 1.6mm Subject connectors to the following pre-condition & reflow, 2 cycles. Pre-condition: 30°C, 70%RH, 192Hrs. Reflow: Refer to Figure 2. <u>Soldering Iron method:</u> Bit temperature: 350 ±10° C; Solder times: 3 ~ 4 sec
3.5.9	FFC Mating And Un-mating Force	Mating Force: Pos. x 2.5 N Max. (Initial & after 20x) Un-mating Force: Pos. x 0.2 N Min. (Initial & after 20x)	Operation speed: 25.4 mm/minute Measure the force required to mate and un-mate the connector.
3.5.10	Durability (Repeated Mating & Un-mating)	TR: 50 mΩ Max. (Final)	Operation speed: 10 cycle/ minute No. Of cycles: 20 cycles.

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)	Subject mated connectors to following condition, repeat for 5 cycles. <table border="1" style="margin: 10px auto;"> <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> 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.	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																
2	+25 ± 5°C	10																
3	+90 ± 5°C	30																
4	+25 ± 5°C	10																
3.5.13	Humidity, Steady State	Insulation resistance: 1000 MΩ Min. (Final). Dielectric strength: must meet 3.5.4	Subject mated connectors to 90~95% R.H., 40 ± 2°C for 96 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.															
3.5.14	Salt Spray	TR: 50 mΩ Max. (Final)	Subject mated connectors to: Salt concentration: 5 ± 1% Spray time: 48 hours Ambient temperature: 35 ± 2° C. 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.															

Fig 1 (to be continued)

3.5.15	Temperature Life (Heat Resistance)	TR: 50 mΩ Max. (Final)	Subject mate connectors to 85±2°C for 250 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 48 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.

Fig 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.

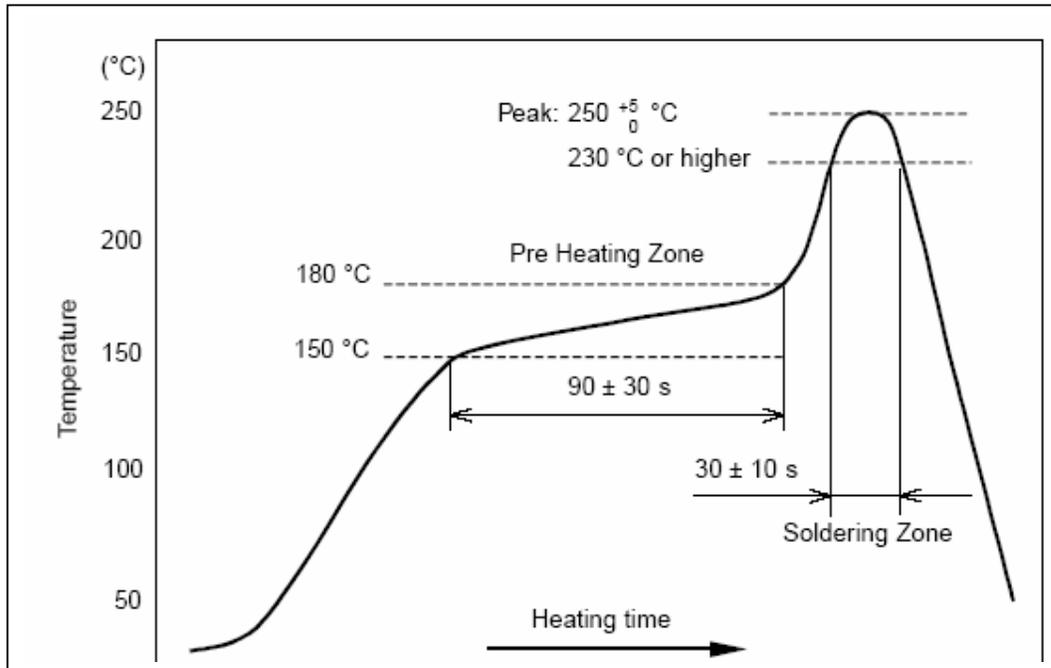


Figure 2: Temperature profile for evaluation of solder heat resistance (at solder joint)

5.0 PRODUCT QUALIFICATION TEST SEQUENCE

Test	Test Group									
	1	2	3	4	5	6	7	8	9	10
Confirmation of Product	1,7	1,8	1,6	1,5	1,3	1,5	1,5	1,5	1,3	1,3
Termination Resistance		2,7	2,5	2,4		2,4	2,4	2,4		
Insulation Resistance	2,5									
Dielectric Strength	3,6									
Vibration			3							
Physical Shock			4							
Solderability									2	
Resistance to Soldering Heat										2
FFC Mating Force		3,6								
FFC Un-mating Force		4								
Durability		5								
Temperature Rise Vs Current					2					
Thermal Shock (Temperature Cycling)				3						
Humidity (Steady State)	4									
Salt Spray							3			
Temperature Life						3				
Cold Resistance								3		

Figure 3