

Products pecification

1. Scope

This specification applies to the 0.5mm pitch FPC/FFC series connectors,specifying the product's performance indicators,test methods and testrequirements. (Applicable Product Model:FFC05050 series)

2. Connector Dimensions

Refer to the drawing.

3. Materials and Plating

- A. Housing : Thermoplastic Without Halogen, UL94V-0,Color: Nature;
- B. Cover : Thermoplastic Without Halogen, UL94V-0,Color: Black;
- C. Contact : Copper Alloy, Gold or Tin plating over Nickel under plating Overall.
- D. Peg : Copper Alloy, Tin Plating over Nickel under plating overall.

4. Applicable P.C.B. Layout

Refer to the drawing

5. Rating

Operating Voltage: 50V AC

Current Rating: 0.5A DC

Operating Temperature: -25℃~+85℃ (Including Terminal Temperature Rise)

6 TEST CONDITION

The test and measurement, unless otherwise specified, shall be carryout at a temperature of 15 to 35℃, Relative humidity of 25 to 85%,and atmospheric pressure of 86 to 106KPa. However, when any doubt arises on the judgment value under it, the test and measurement shall be carry out at a temperature of 20±2℃, relative humidity of 60 to 70%, and atmospheric pressure of 86 to 106KPa.

7. Performance

Test Item	Requirement	Test Condition
Examination of Product	Meets requirements of Product	Visual inspection.

Electrical Performance

Contact resistance	30mΩ Max.	Mate applicable FPC and measure by dry circuit 20mV Max,10mA
Insulation resistance	500mΩ Min.	[500]VAC for 1 minute Test between adjacent circuits of unmated connector.
Withstanding Voltage	No breakdown, flashover, or arcing	[500]VAC for 1 minute Test between adjacent circuits of unmated connector.

Mechanical Performance

Contact/Leg Retention Force	0.150kgf Min.		Apply axial pull out force at the rate of [25.4±3]mm/min on the terminal assembled in the housing
FPC/FFC Retention Force	Operation Speed:[25.4±3]mm/min Measure the force required to unmated connector.		0.030kgf/Pin Min.(PIN>= 13) 0.040kgf/ Min.(PIN<13)
Durability	Appearance	No damage	Operation Speed: (10) cycle-max./min Durability Cycles: 30 Cycles
	Contact resistance	100mΩ Max.	
Vibration	Appearance	No damage	Amplitude: 1.52mm Frequency: 10~55~10HZ 2 hours in X,Y,Z directions, total 6 cycles
	Contact resistance	100mΩ Max.	
	Discontinuity	1μs Max	
Mechanical Shock	Appearance	No damage	The connectors shall be soldered on the P.C. board. /Acceleration: 50G. Time: 11ms.(half sine wave). Cycle: 3 cycle for 3 axis total 9 cycle.
	Contact resistance	100mΩ Max.	
	Discontinuity	1μs Max	
Temperature Rising	Contact Resistance	30mΩ Max.	Mate applicable FPC and measure the temperature rise of contact when the maximum AC mated current is.
Solder ability	≥95% solder coverage, no voids, cold joints, etc.		Dwell time: 3±0.5 seconds Solder temperature: 245±5℃

Environmental & Other Performance

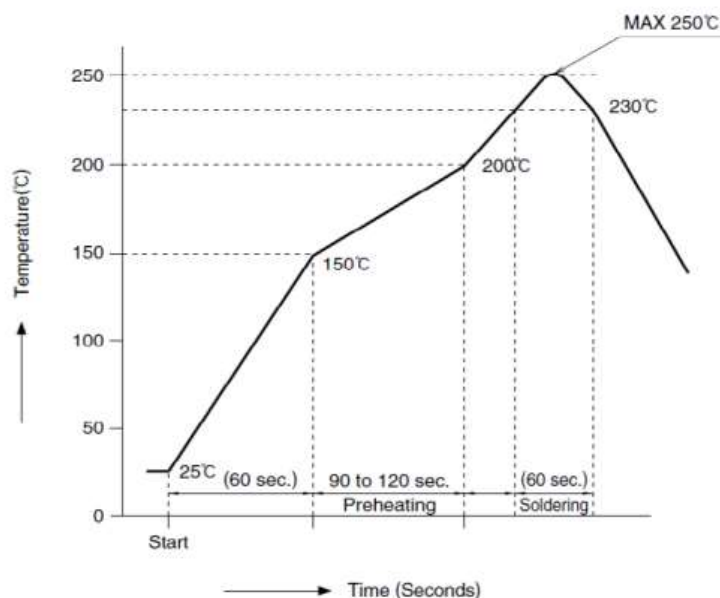
Resistance to Reflow Soldering Heat	Appearance	No damage	Pre Heat:150~180℃,90±30sec. Heat: 230℃ Min.,30±10sec Peak Temp.:250+0/-5℃, 10sec. Or less Duration: 3 cycles Refer to Fig.2
Thermal shock	Contact Resistance	100mΩ Max.	Mated connectors, 5 cycles: -55℃ for 30 min → +85℃ for 30 min
Humidity-Temp erature Cycle	Appearance	No damage	40 ± 2 °C in temperature and 90~95%RH for 96 hours.After testing connector shall be left alone for 1 to 2 hours in a room ambient.
Temperature life	Contact Resistance	100mΩ Max.	Mated connectors, 85℃ for 250 hours
Salt Spray	Appearance	No damage	Mated connectors, 35±2℃, 5±1% NaCl, 24 hours (or as customer required)
	Contact Resistance	100mΩ Max.	

8. Test Sequence

Test Item	Test Group									
	1	2	3	4	5	6	7	8	9	10
	Test Sequence									
Examination of Product	1, 7	1, 9	1, 6	1, 5	1, 5	1, 5	1, 5	1, 3	1, 3	1, 3
Contact resistance		2, 8	2, 5	2, 4	2, 4	2, 4	2, 4			
Withstanding Voltage	3, 6									
Insulation resistance	2, 5									
Contact/ Peg Retention Force		3, 7								
FPC/FFC Retention Force		4, 6								
Durability		5								
Vibration			3							
Mechanical Shock			4							
Temperature Rising								2		
Solder ability										2
Resistance to Soldering Heat									2	
Thermal Shock				3						
Humidity Temperature Cycling	4				3					
Temperature Life						3				
Salt Spray Cycling							3			

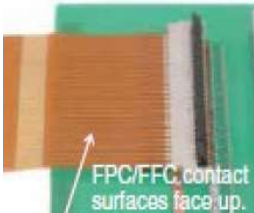
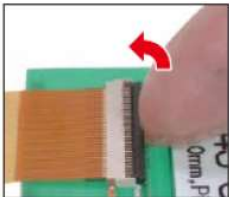
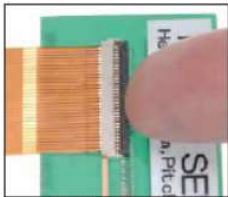
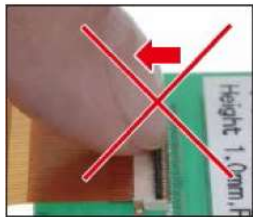
Note: Numbers indicate test sequence.

Refer to Fig.2: Resistance to Reflow Soldering Heat



7. Operation and Precautions

Exercise care when handling connectors. Follow recommendations given below.

Operation	Precautions
1. As delivered Delivered with the actuator open. There is no need to operate the actuator prior to inserting the FPC/ FFC. 	Do not close the actuator without the FPC/FPC inserted.
2. FPC/FFC insertion (The top and bottom contact specification) Insert the FPC/FFC with the conductive surfaces facing up or down. Align the FPC/FFC straight with the connector and insert it firmly all the way. 	- When inserting the FPC/FFC do not twist it. Insert straight. Improper insertion may cause deformation of the contacts and connection failures. - Be sure to insert the FPC/FFC when the actuator is fully open.
3. Locking After FPC/FFC insertion, rotate the actuator down to a full stop, pushing it at the center.  	- Do not operate the actuator by only one end. Open or close by pushing at the center. - Do not try to rotate the actuator past the fully open 90° position. This will damage the connector, preventing it from use. - Do not apply excessive force to the connector when the actuator is closed.  
4. FPC/FFC removal (Lock release) Carefully rotate the actuator up to 90°, lifting it at the center.  	- Do not operate the actuator from one end only. - The actuator opens only 90°. Do not attempt to open it past this angle or grasp it. - During the opening of the actuator do not press it toward the connector body. Rotate up at the center.  

8. Precautions at the Design Stage

- ◆ Route the FPC/FFC so that a direct pull force
- ◆ Make sure that there is enough space to insert/remove the FPC/FFC straight.
- ◆ Follow the recommendations given in this catalog in regard to mounting pattern, metal mask dimensions and FPC/FFC mating dimensions.
- ◆ Consult the manufacturer of the FPC/FFC for the details on the flexibility of the specific FPC/FFC.
- ◆ When designing the board lay-out and spaces in the device assure that there is enough clearances for the actuator to fully open/close.

9. Precautions when mounting connectors on the PCB

- ◆ Handling before mounting on PCB

Insertion of the FPC/FFC or operation of the actuator prior to mounting on the PCB is not recommended.

- ◆ PC board warpage

Minimize the warpage as much as possible. The connectors are straight within 0.1 mm max. Make sure that the mounting area flatness can accept the connector terminals without causing any failure of the solder joints.

- ◆ Forces on the board

- ◆ When braking the large PC board into individual boards exercise care not to damage the installed connectors.
- ◆ When attaching the boards or other components with the screws make sure that any stresses will not cause board deflections affecting the mounting areas of the connector.



- ◆ When hand soldering:

- * Do not perform hand soldering with the FPC inserted in the connector.
- * Do not apply excessive heat or touch the soldering iron anywhere other than the connector leads.
- * Do not use excessive amount of solder or flux compounds.

Operation of the actuator or contacts may be affected by excessive amounts of solder or flux compounds.