SPECIFICATION

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SPEC. NO.: PS-52519-XXXXX-XXX **REVISION:** A

PRODUCT NAME: 0.5mm PITCH BACK FLIP FPC CONN.

SMT R/A D/C TYPE

PRODUCT NO: 52519 SERIES

PREPARED:	CHECKED:	APPROVED:
Tsai, Wang Kun	Liu, Yuan Huang	Wang, Chun Sheng
DATE: 2020/08/14	DATE: 2020/08/14	DATE: 2020/08/14

1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
1	ECN-1911180	NEW PROJECT SPEC FOR APD1080242	Tsai, Wang kun	2019.11.12
A	ECN-2008259	ADD FPC Holding Force Test Group	Tsai, Wang kun	2020.08.14

2 SCOPE

This specification covers performance, tests and quality requirements for 0.5 mm pitch Back Flip FFC/FPC Conn. SMT R/A D/C Type

3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

4 REQUIREMENTS

4.1 Design and Construction

4.1.1 Product shall be of design, construction and physical dimensions specified on applicable product drawing.
4.1.2 All materials conform to R.o.H.S. 2.0 and the standard depends on TQ-WI-140101.

4.2 Materials and Finish

4.2.1 Contact: High performance copper alloy (Phosphor Bronze)
Finish: (a) Contact Area: Refer to the drawing.
(b) Under plate: Refer to the drawing.
(c) Solder area: Refer to the drawing.
4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0
4.2.3 Actuator: Thermoplastic or Thermoplastic High Temp., UL94V-0
4.2.4 Fitting Nail: Copper Alloy, Finish: Refer to the drawing.

4.3 Ratings

4.3.1 Working voltage less than 36 volts AC（per pin）
4.3.2 Voltage: 50 Volts AC (per pin)
4.3.3 Current: DC 0.5 Amperes (per pin)
4.3.4 Operating Temperature : -40℃ to +85℃

5 Performance

5.1. Test Requirements and Procedures Summary

Item	Requirement	Standard
Examination of Product	Product shall meet requirements of applicable product drawing and specification.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Item	**Requirement**	**Standard**
Low Level Contact Resistance	100 m Ω Max.(initial)per contact 20 m Ω Max. Change allowed	Mate connectors, measure by dry circuit, 20mV Max., 10mA Max. (EIA-364-23)
Insulation Resistance	50 M Ω Min.	Unmated connectors, apply 500 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max.	200 VAC Min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors. (EIA-364-20)
Temperature rise	30℃ Max. Change allowed	Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25℃ (EIA-364-70 METHOD 1,CONDITION 1)

MECHANICAL		
Item	**Requirement**	**Standard**
Durability	10 cycles. Without notches of FPC	The sample should be mounted in the tester and fully mated and unmated the number of cycles specified at the rate of less than 10 cycles / minute. (EIA-364-09)
FPC Holding Force	0.2N/pin ×contacts pin + 2.0N MIN. (initial)	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute.
Terminal / Housing Retention Force	20 gf MIN.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.
Fitting Nail /Housing Retention Force	50 gf MIN.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the fitting nail assembled in the housing.
Vibration	1 μs Max.	The electrical load condition shall be DC 1 mA all contacts. Subject to a simple harmonic motion having amplitude of 0.76mm (1.52mm maximum total excursion) in frequency between the limits of 10 and 55 Hz. The entire frequency range, from 10 to 55 Hz and return to 10 Hz, shall be traversed in approximately 1 minute. This motion shall be applied for 2 hours in each of three mutually perpendicular directions. (EIA-364-28 Condition I)
Shock (Mechanical)	1 μs Max.	Subject mated connectors to 50 G's (peak value) half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks). The electrical load condition shall be DC 1mA for all contacts. (EIA-364-27, test condition A)

ENVIRONMENTAL

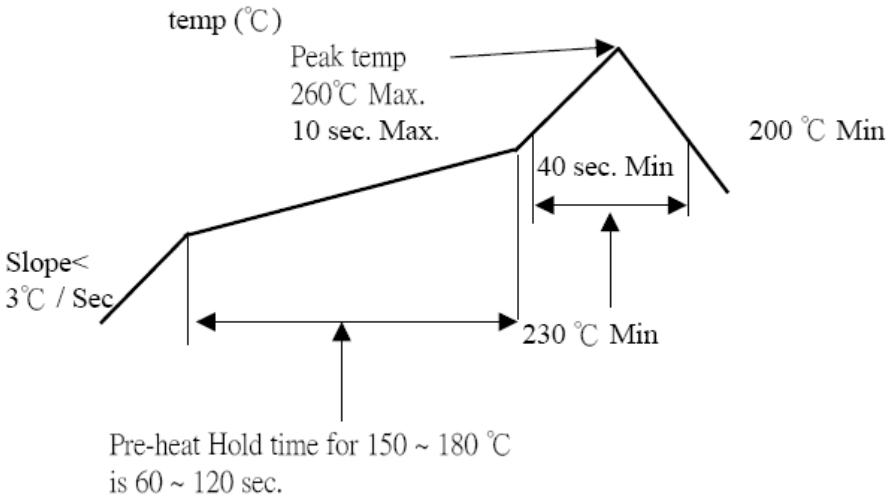
Item	Requirement	Standard
Resistance to **Reflow** Soldering Heat	See Product Qualification and Test Sequence Group 10 **(Lead Free)** No deformation of components affecting performance.	Pre Heat：150℃~180℃, 60~120sec. Heat：230℃ Min., 40sec Min. Peak Temp.：260℃Max, 10sec Max. Cycles：2
Hand Soldering Temperature Resistance	Appearance: No damage	Temp: 350 ±10℃, 5 sec
Thermal Shock	See Product Qualification and Test Sequence Group 4	Mate module and subject to follow condition for 5 cycles. 1 cycles: -55 ±3℃, 30 minutes 85 ±2℃, 30 minutes (EIA-364-32, test condition I)
Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40 ±2℃, 90~95% RH, 96 hours. (EIA-364-31,Condition A, Method II)
Heat Resistance	See Product Qualification and Test Sequence Group 5	Mated connectors to temperature life at 85 ±2℃ for 96 hours. (EIA-364-17, Test condition A)
Cold Resistance	See Product Qualification and Test Sequence Group 6	Mated connectors to temperature life at -40 ±3℃ for 96 hours. (EIA-364-59A)
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group 7	Subject mated/unmated connectors to 5% salt-solution concentration, 35℃ (I) Gold flash for 8 hours (II) Gold plating 3u" for 48 hours. (III) Gold plating ≧ 5 u" for 96 hours. (EIA-364-26)
Solder ability	Tin plating: Solder able area shall have minimum of 95% solder coverage. Gold plating: Solder able area shall have minimum of 75% solder coverage.	And then into solder bath, Temperature at 245 ±5℃, for 4-5 sec. (EIA-364-52)
SO_2 Gas	See Product Qualification and Test Sequence Group 12.	Mate applicable FPC and expose to 50 ±5ppm SO_2 gas at 40 ±2℃ for 24 hours.
NH_3 Gas	See Product Qualification and Test Sequence Group 13.	Mate applicable FPC and expose to 28% NH_3 gas for 40 minutes.

Note. Flowing Mixed Gas shell be conduct by customer request.

6 INFRARED REFLOW CONDITION

Lead-free Process

TEMPERATURE CONDITION GRAPH
(TEMPERATURE ON BOARD PATTERN SIDE)



7 PRODUCT QUALIFICATION AND TEST SEQUENCE

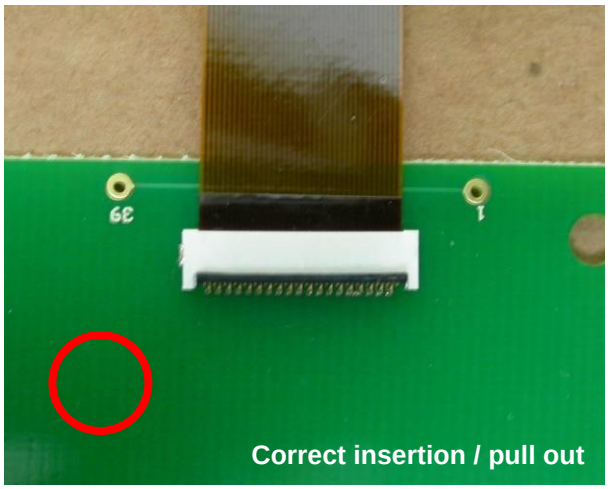
Test or Examination	Test Group													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Test Sequence													
Examination of Product				1、7	1、6	1、6	1、4			1	1	1、4	1、4	
Low Level Contact Resistance		1、3	1、4	2、10	2、9	2、9	2、5			3		2、5	2、5	
Insulation Resistance				3、9	3、8	3、8								
Dielectric Withstanding Voltage				4、8	4、7	4、7								
Temperature rise	1													
Durability		2												
Vibration			2											
Shock (Mechanical)			3											
Thermal Shock				5										
Humidity				6										
Heat Resistance					5									
Cold Resistance						5								
Salt Spray(Only For Gold Plating)							3							
Solder ability								1						
FPC Holding Force														1
Terminal / Housing Retention Force									1					
Fitting Nail/Housing Retention Force									2					
Resistance to Soldering Heat										2				
Hand Soldering Temperature Resistance											2			
SO_2 Gas												3		
NH_3 Gas													3	
Sample Size	2	4	4	4	4	4	4	2	4	4	4	4	4	4

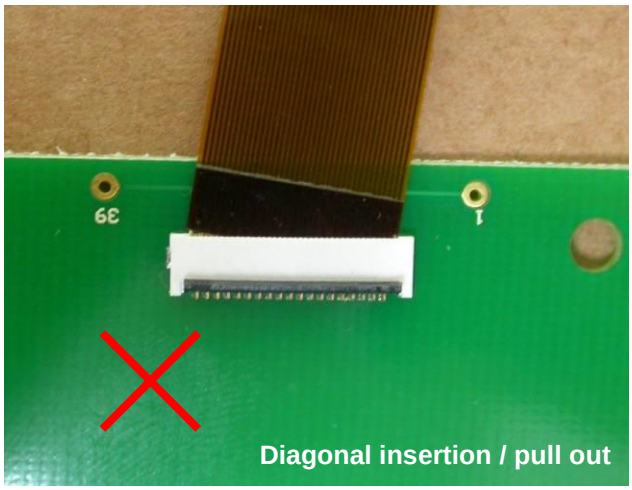
8 Connector Operation

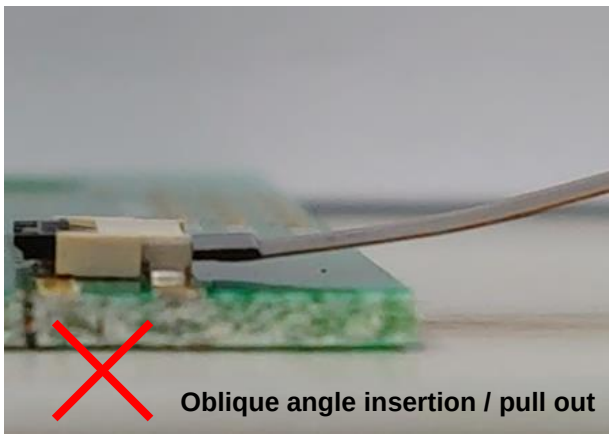
Exercise care when handling connectors. Follow recommendations given below.

A. Please open and close the actuator with the connector is mounted on the P.C.Board, and the FPC inserted. The actuator might not come off from the opening and shutting of the actuator in the state that FPC is not inserted and do not do, please.

B. FPC Correct insertion/ pull out verification
A visual comparison of the edge of the housing opening and the FPC pattern boundary will prevent diagonal insertion/pull out and partial insertion/pull out errors.

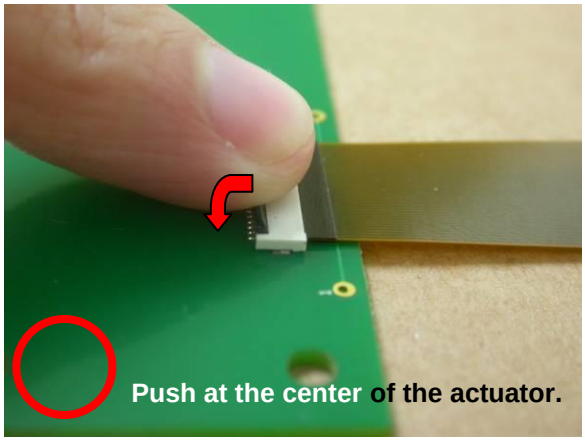


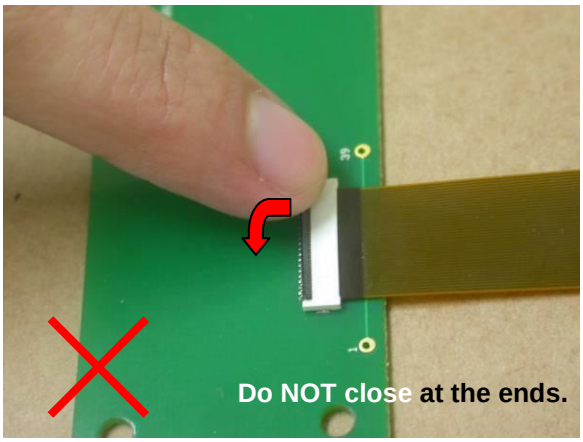




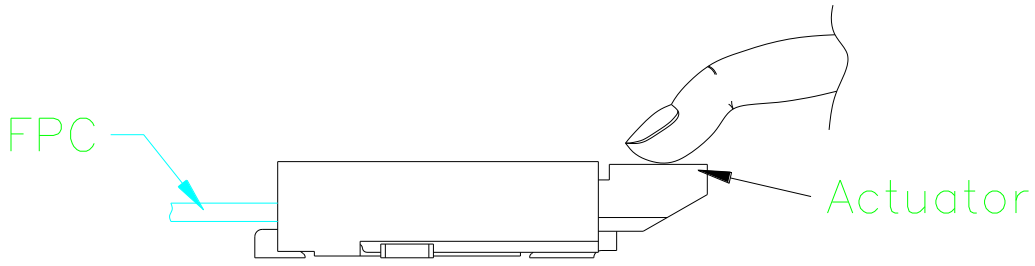
C. Locking

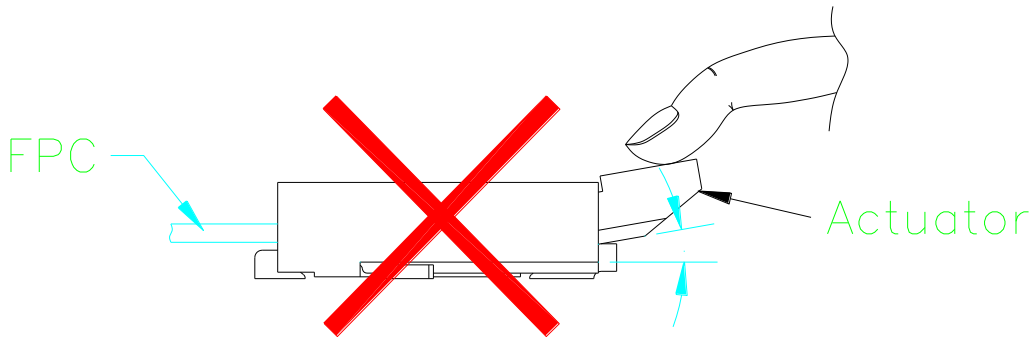
After FPC/FFC insertion, rotate the actuator down to a full stop, pushing it at the center.





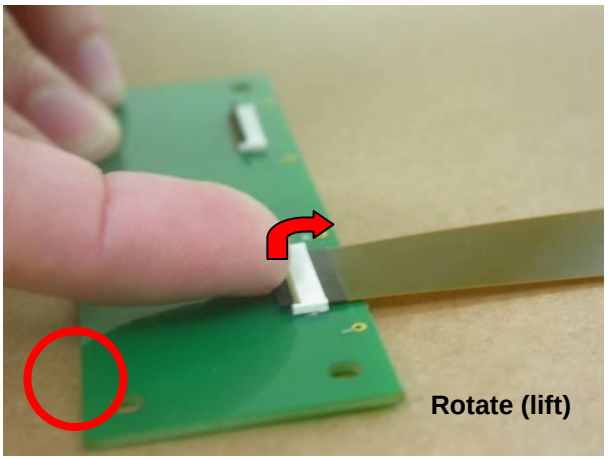
About the lock operation When you lock, it is recommended what the actuator does as a whole, and the actuator was shut surely.

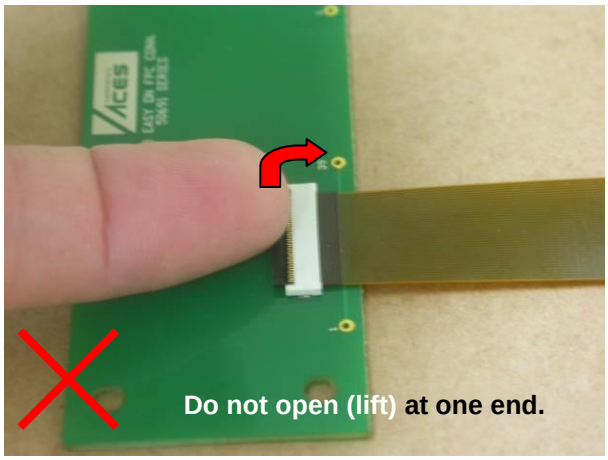




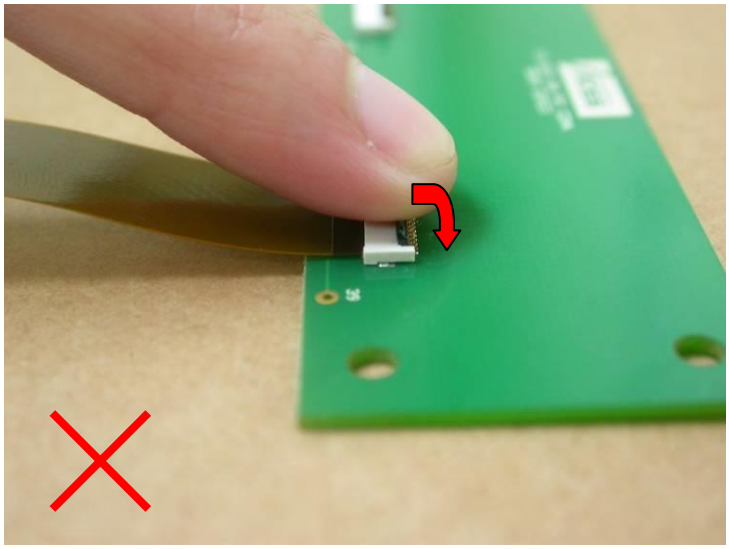
D. Lock release

Carefully rotate the actuator up to 90°, lifting it at the center.





- The actuator opens by rotating it in the direction OPPOSITE to the direction of the insertion of the FPC. DO NOT attempt to open it from the same side as the insertion of the FPC.



Precautions

E. This connector is small and thin and requires delicate and careful handling.

Be very careful not to apply any force to the FPC after inserting it.
Otherwise, the connector may become unlocked or the FPC may break.
Fix the FPC, in particular, when loads are applied to it continuously.
Design the FPC layout with care not to bend it sharply near the insertion opening.