SPECIFICATION

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SPEC. NO.: PS-52510-XXXXX-XXX **REVISION:** A

PRODUCT NAME: 1.0 mm Pitch ZIF R/A T/C FPC Connector

PRODUCT NO: 52510 series

PREPARED:	CHECKED:	APPROVED:
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DATE: **2022.02.17**	DATE: **2022.02.17**	DATE: **2022.02.17**

1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
1	ECN-002814	新制 SPEC	Lei,shanjun	2019/04/17
A	ECN-007053	結案發行正式版	Lei,shanjun	2022/02/17

2 SCOPE

This specification covers performance, tests and quality requirements for 1.0 mm Pitch ZIF R/A T/C FPC Connector . These connectors are used to hold graphic card in computer.
Aces's P/N ：52510 series.

3 APPLICABLE DOCUMENTS

EIA-364 **ELECTRONICS INDUSTRIES ASSOCIATION**

4 REQUIREMENTS

4.1 Design and Construction

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

4.2 Materials and Finish

4.2.1 Contact: High performance copper alloy (Phosphor Bronze)
Finish: Plating pls. See order information.
4.2.2 Housing: Thermoplastic High Temp., UL94V-0
4.2.3 Latch: Thermoplastic High Temp., UL94V-0
4.2.4 Fitting Nail: Copper Alloy, Plating pls. See order information

4.3 Ratings

4.3.1 Working voltage less than 36 volts (per pin)
4.3.2 Voltage: 125 Volts AC (per pin)
4.3.3 Current: 1 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	20 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	100 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: 2 mA max.	250 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, METHOD1,CONDITION1)

MECHANICAL		
Item	**Requirement**	**Standard**
Durability	10 cycles.	The sample should be mounted in the tester and fully mated and unmated the number of cycles specified at the rate of 25.4 ± 3mm/min. (EIA-364-09)
Contact Retention Force	0.5kgf Min.	Operation Speed： 25.4 ± 3 mm/minute. Measure the contact retention force with Tensile strength tester.
Actuator Insertion / Extraction Force	Refer to Refer to Actuator Insertion/Extraction Force	Mate applicable FPC insert and extract actuator at the speed of 25 ± 3 mm/min.

FPC Retention Force	Refer to FPC withdrawal force	Insert the actuator, pull the FPC at the speed rate of 25.4 ± 3 mm/min.
Fitting Nail /Housing Retention Force	0.10kgf 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 100 mA maximum for 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 100mA maximum 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 9 **(Lead Free)**	Pre Heat：150℃~180℃, 60~90sec. Heat：230℃ Min., 40sec Min. Peak Temp.：260℃Max, 10sec Max.
Thermal Shock	See Product Qualification and Test Sequence Group 3	Mate module and subject to follow condition for 5 cycles. 1 cycles: -40 +0/-3 ℃, 30 minutes +85 +3/-0 ℃, 30 minutes (EIA-364-32, test condition A)
Humidity	See Product Qualification and Test Sequence Group 3	Mated Connector 40℃, 90~95% RH, 96 hours. (EIA-364-31,Condition A, Method II)
Temperature life	See Product Qualification and Test Sequence Group 4	Subject mated connectors to temperature life at 85℃ for 96 hours. (EIA-364-17, Test condition A)

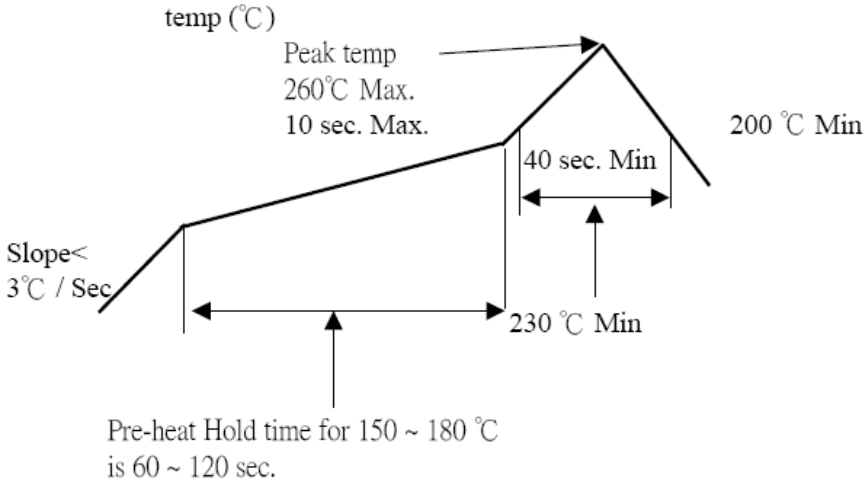
Solder ability	Solder able area shall have minimum of 95% solder coverage.	Subject connectors into solder bath, Temperature at 245 ±5℃, for 4-5 sec. (EIA-364-52)

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

6 INFRARED REFLOW CONDITION

6.1. 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
	Test Sequence										
Examination of Product	1、3	1、8	1、7	1、6	1、4	1、3	1、3	1、3	1、4	1、5	1、3
Low Level Contact Resistance		2、11	2、10	2、9	2、5				3	2、6	
Insulation Resistance		3、10	3、9	3、8							
Dielectric Withstanding Voltage		4、9	4、8	4、7							
Temperature rise	2										
Durability		6									
Vibration										3	
Shock (Mechanical)										4	
Thermal Shock			5								
Humidity			6								
Temperature life				5							
Solder ability						2					
Contact Retention Force							2				
FPC Retention Force		5、7									
Fitting Nail /Housing Retention Force								2			
Resistance to Soldering Heat									2		
Actuator Insertion / Extraction Force											2
Sample Size	2	4	4	4	4	2	4	4	4	4	4

Actuator Insertion/ Withdrawal Force

Table shown below is a data of actuator insertion and withdrawal force when using a thickness of 0.3mm FPC.But, there's a case which actuator insertion and withdrawal force doesn't fulfill the data value shown below,because FPC specification affects the result of actuator insertion and withdrawal force.

NO. OF Ckt.	Insertion Force (Kgf, Max)			Extration Force (Kgf, Max)		
	1st	6th	30th	1st	6th	30th
3	2.80	2.60	2.60	3.70	3.30	3.30
4	2.90	2.70	2.70	3.80	3.40	3.40
5	3.00	2.80	2.80	3.90	3.50	3.50
6	3.10	2.90	2.90	4.00	3.60	3.60
7	3.20	3.00	3.00	4.10	3.70	3.70
8	3.30	3.10	3.10	4.20	3.80	3.80
9	3.40	3.20	3.20	4.30	3.90	3.90
10	3.50	3.30	3.30	4.40	4.00	4.00
11	3.60	3.40	3.40	4.50	4.10	4.10
12	3.70	3.50	3.50	4.60	4.20	4.20
13	3.80	3.60	3.60	4.70	4.30	4.30
14	3.90	3.70	3.70	4.80	4.40	4.40
15	4.00	3.80	3.80	4.90	4.50	4.50
16	4.10	3.90	3.90	5.00	4.60	4.60
17	4.20	4.00	4.00	5.10	4.70	4.70
18	4.30	4.10	4.10	5.20	4.80	4.80
19	4.40	4.20	4.20	5.30	4.90	4.90
20	4.50	4.30	4.30	5.40	5.00	5.00
21	4.60	4.40	4.40	5.50	5.10	5.10
22	4.70	4.50	4.50	5.60	5.20	5.20
23	4.80	4.60	4.60	5.70	5.30	5.30
24	4.90	4.70	4.70	5.80	5.40	5.40
25	5.00	4.80	4.80	5.90	5.50	5.50
26	5.10	4.90	4.90	6.00	5.60	5.60
27	5.20	5.00	5.00	6.10	5.70	5.70
28	5.30	5.10	5.10	6.20	5.80	5.80
29	5.40	5.20	5.20	6.30	5.90	5.90
30	5.50	5.30	5.30	6.40	6.00	6.00
31	5.60	5.40	5.40	6.50	6.10	6.10
32	5.70	5.50	5.50	6.60	6.20	6.20
33	5.80	5.60	5.60	6.70	6.30	6.30
34	5.90	5.70	5.70	6.80	6.40	6.40

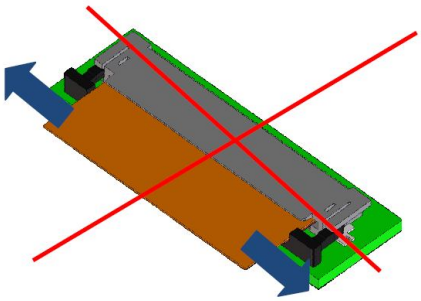
FPC WITHDRAWAL FORCE

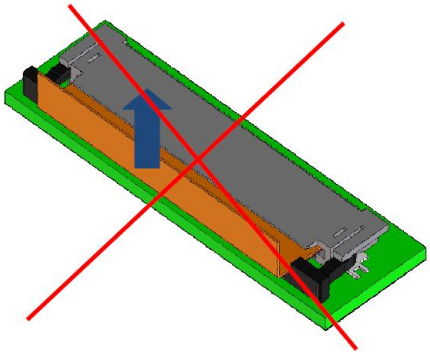
Table shown below is a data of FPC retention force when using a thickness of 0.3mm FPC. But, there's a case which FPC retention force doesn't fulfill the data value shown below, because FPC specification affects the result of FPC retention force.

NO. OF Ckt.	Withdrawal Force (Kgf, Min.)	
	1st	10th
3	0.20	0.15
4	0.25	0.20
5	0.30	0.25
6	0.35	0.30
7	0.40	0.35
8	0.45	0.40
9	0.50	0.45
10	0.55	0.50
11	0.60	0.55
12	0.65	0.60
13	0.70	0.65
14	0.75	0.70
15	0.80	0.75
16	0.85	0.80
17	0.90	0.85
18	0.95	0.90
19	1.00	0.95
20	1.05	1.00
21	1.10	1.05
22	1.15	1.10
23	1.20	1.15
24	1.25	1.20
25	1.30	1.25
26	1.35	1.30
27	1.40	1.35
28	1.45	1.40
29	1.50	1.45
30	1.55	1.50
31	1.60	1.55
32	1.65	1.60
33	1.70	1.65
34	1.75	1.70

8.CONNECTOR USAGE:

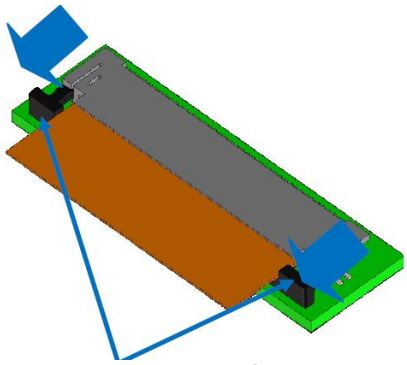
Please pay special attention not to have any pulling force/tension on the FPC when it is inserted into the connector.This can cause; the actuator to be unlocked, the actuator to come off, cut the traces on the FPC, and/or damage the FPC.Please be especially careful to avoid placing the FPC in a location where it will have a constant force applied on the FPC.If necessary, please fix the FPC directly on the chassis.Also, please avoid pulling the FPC vertically or twisting the FPC back and force horizontally while it is inserted in the connector.





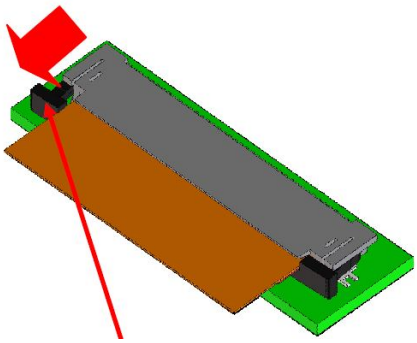
When locking the actuator, please push the actuator by applying a force to the both sides of actuator. Please do not apply a force to only one side of actuator because it may cause to damage the connector.

OK



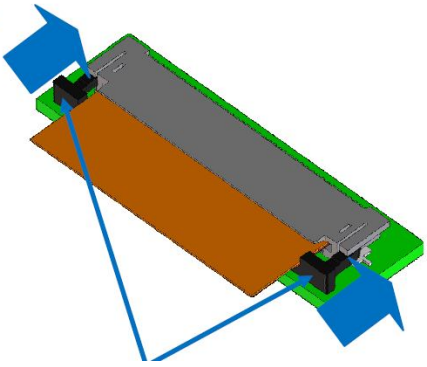
Withdrawing on both sides of actuator

No Good



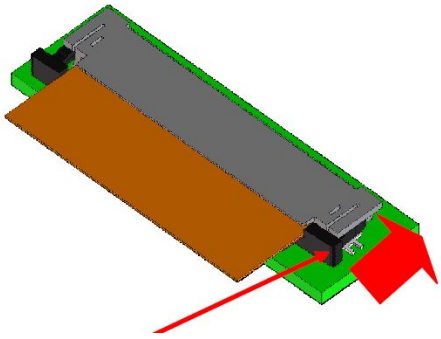
Withdrawing Pushing only one side of actuator

OK



Withdrawing on both sides of actuator

No Good



Withdrawing Pushing only one side of actuator