

# FFC / FPC Connectors

ZenShield®

Full EMI Shield








High temp. (105-125°C)



Robot ready

\* All EVAFLEX® series designed by **Mechanical Lock** and **Hold Down**

Click on each product information to jump to the web.

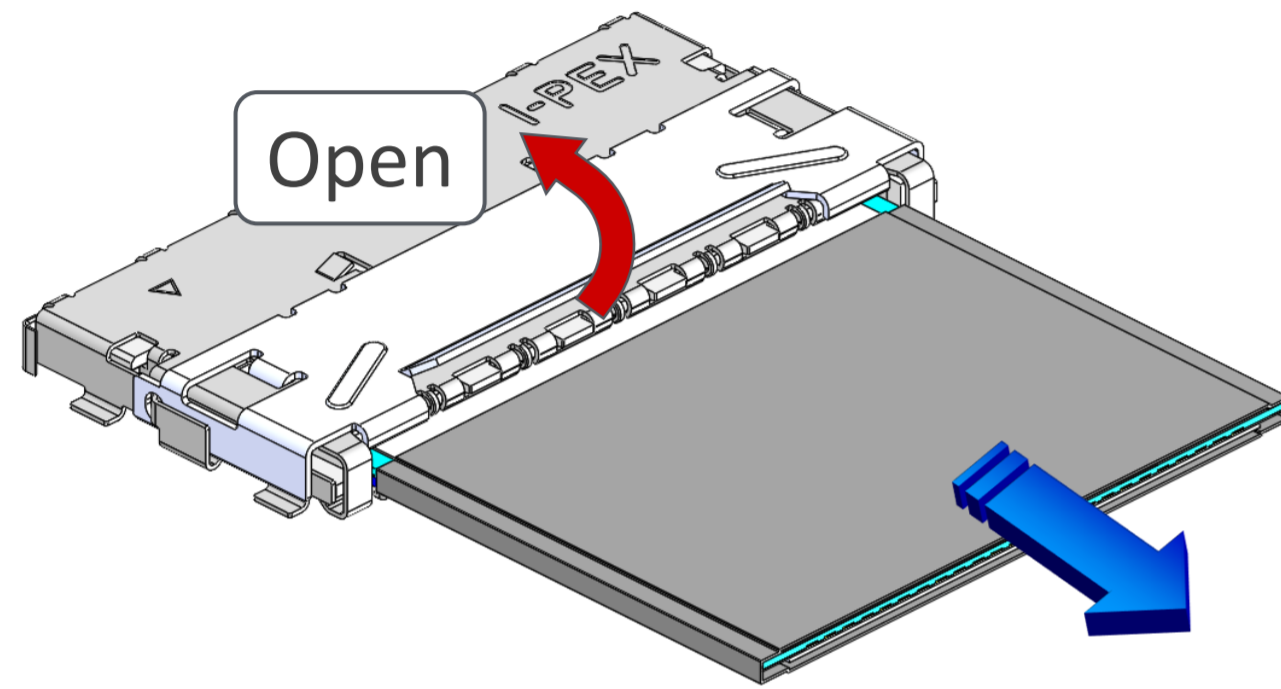
Product Name		EVAFLEX® 5-HD	EVAFLEX® 5-SE-G VT	EVAFLEX® 5-VS		EVAFLEX® 5-SE	EVAFLEX® 5-SE VT
Feature		 ZenShield®					
		<b>Full-Shielded High-speed (10+Gbps) FFC/FPC connector</b>	<b>One hand operation, Auto-locking connector Hold down (ground) for high-speed (4 Gbps)</b>	<b>PC panel industry standard footprint Shielded / Non-shielded High-speed (8+Gbps)</b>		<b>Non-shielded Horizontal mate</b>	<b>Non-shielded Vertical mate</b>
Part number		20952	20799	20535	20720 (TYPE CH)	20526	20539
Un-lock mechanism		Open top cover	Press the release button	Push down on the shell		Push down 2 buttons	Press the release button
Mating Type		Horizontal	Vertical	Horizontal		Horizontal	Vertical
Pitch (mm)		0.5					
Pin count	Range	10 - 40	20 - 60	10 - 50		10 - 60	10 - 80
	Available	24	20, 30, 40, 50, 60	10, 15, 20, 24, 30, 40, 50		10, 15, 22, 30, 40, 45, 50, 60	16, 22, 24, 26, 30, 40, 45, 50, 60, 80
Size (mm)	Height	2.00 +/- 0.20	6.6 +/- 0.30	1.90 +/- 0.10		2.40 +/- 0.20	6.00 +/- 0.30
	Width formula	5.2 + (0.5*?p)	8.00 + (0.5*?p)	6.25 + (0.5*?p)		13.10 + (0.5*?p)	11.5 + (0.5*?p)
	Depth	8.43 +/- 0.30	3.90 +/- 0.20	4.95 +/- 0.20		5.90 +/- 0.20	4.50 +/- 0.20
Wiping length (mm)		1.00	1.20	1.10		1.45	1.20
FFC/FPC insertion depth (mm)		4.30	5.35	3.30		3.80	4.20
FFC/FPC type		Shielded FFC	Shielded FFC, Non-shielded FFC/FPC	Shielded FFC, Non-shielded FFC/FPC		Non-shielded FFC/FPC	
FFC/FPC thickness (mm)		0.33 +/- 0.03	0.30 +/- 0.03	0.33 +/- 0.03		FPC : 0.30 +/- 0.03 FFC : 0.30 +/- 0.05	0.30 +/- 0.05
Contact point		Top	Signal contact tail side	Top		Top	Signal contact tail side
Compatibility (Footprint pattern)		Original		CABLINER®-VS		Original	
Current rating		0.30A/pin	0.35A/pin	0.30A/pin		0.35A/pin	
Performance (Reference only)		USB4 (20 Gbps/lane) USB 3.1 Gen 2 (10 Gbps) USB 3.1Gen 1 (5 Gbps) V-By-One HS 1.4 (4 Gbps)	eDP HBR (5.4 Gbps) V-By-One HS 1.4 (4 Gbps)	USB 3.1 Gen 1 (5 Gbps) eDP HBR (8.1 Gbps) HDMI 2.0 (6 Gbps) V-By-One HS 1.4 (4 Gbps) MiPi standards		LVDS	
Operating condition		233~358K (-40°C~+85°C) 85%RH max.	233~398K (-40°C ~ +125°C) 85%RH max.	233~358K (-40°C~+85°C) 85%RH max.	233~378k (-40°C~+105°C) 85%RH max	233~398K (-40°C~+125°C) 85%RH max.	233~358K (-40°C~+85°C) 85%RH max.
Automotive Standards		USCAR-2 (*)		USCAR-2 (*)			

Note : (\*) 40P tested. 2.5.6 Vibration & Shock V1 evaluation passed.

# Auto-Locking FFC/FPC Connector - EVAFLEX® series -

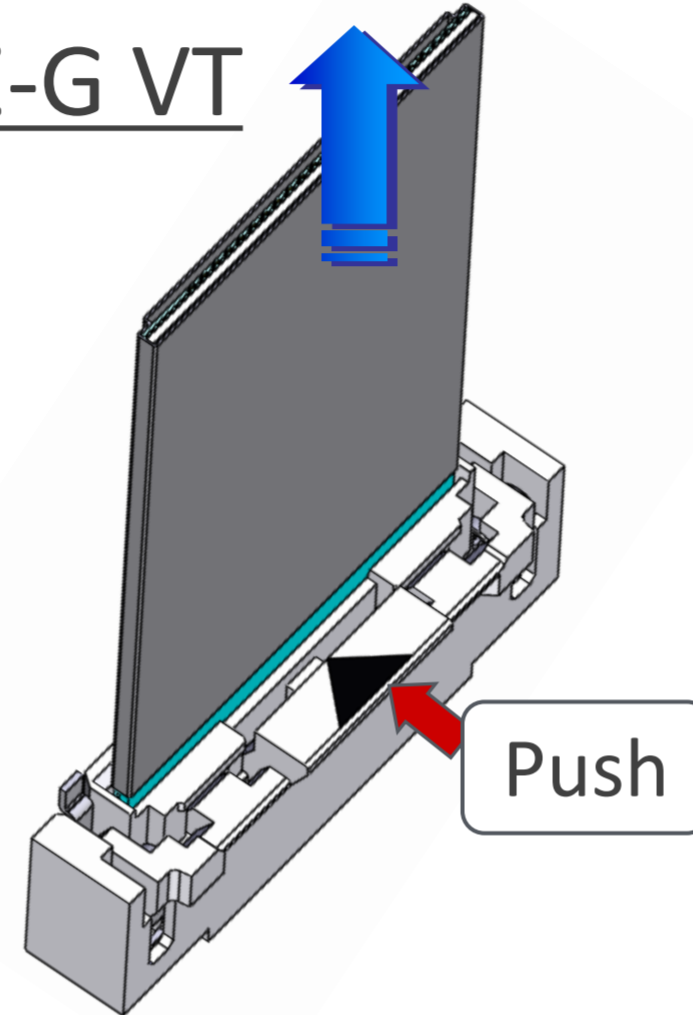
## Un-locking methods

### EVAFLEX® 5-HD



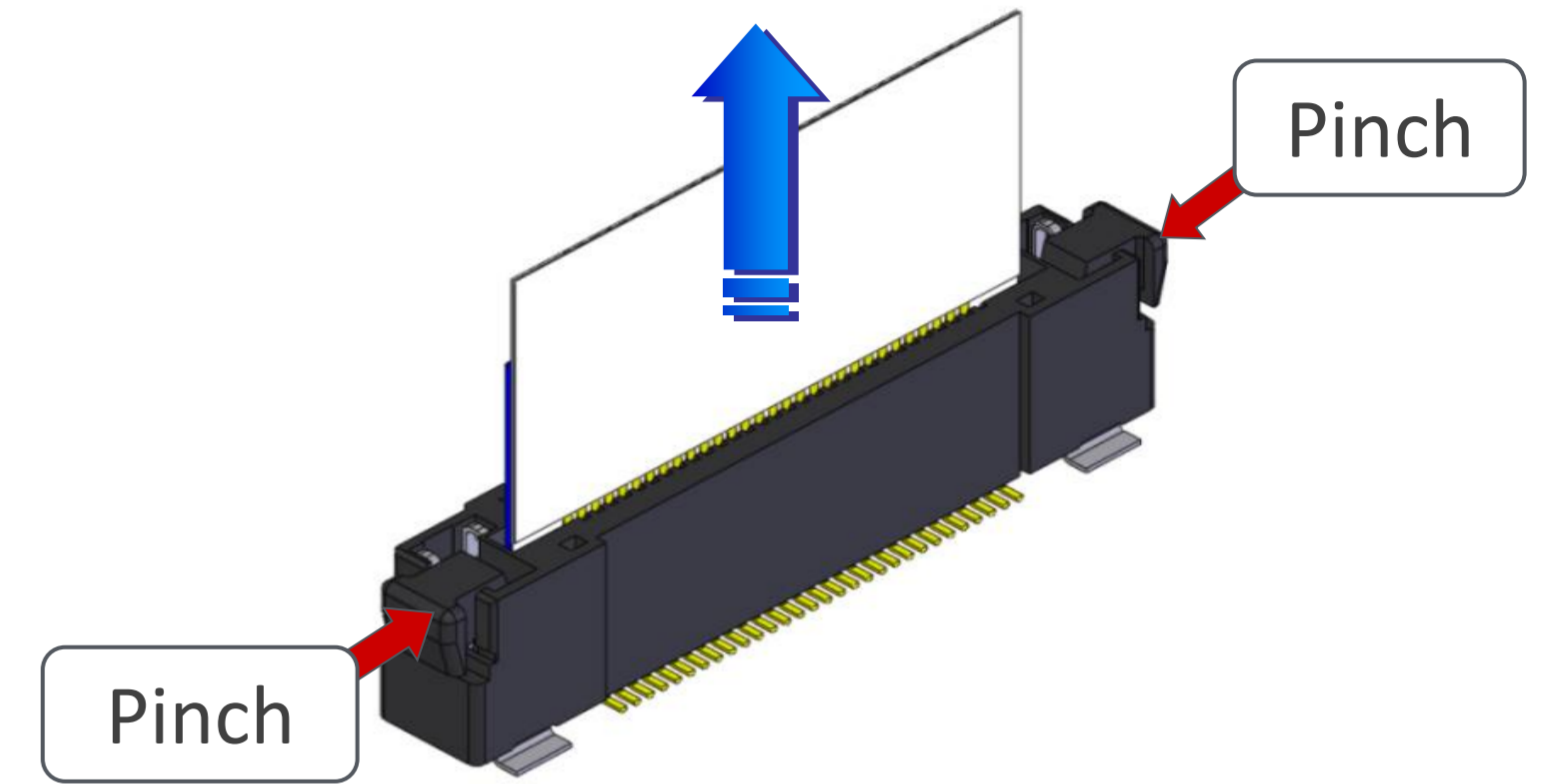
Open the cover and pull FPC/FFC out

### EVAFLEX® 5-SE-G VT



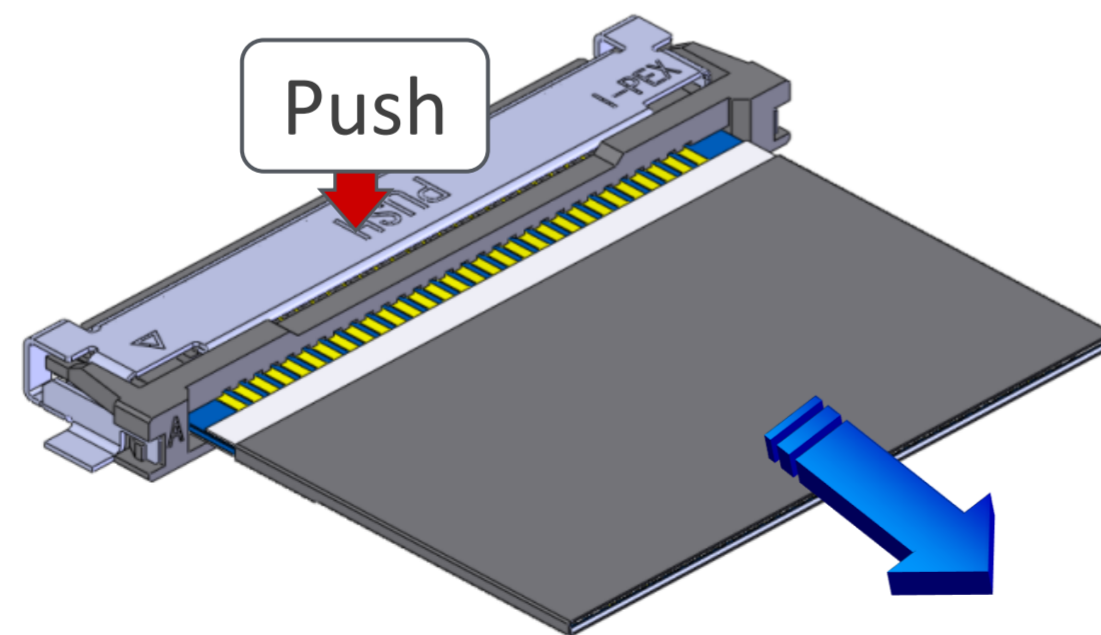
Push center lock release button and pull FPC/FFC out

### EVAFLEX® 5-SE VT



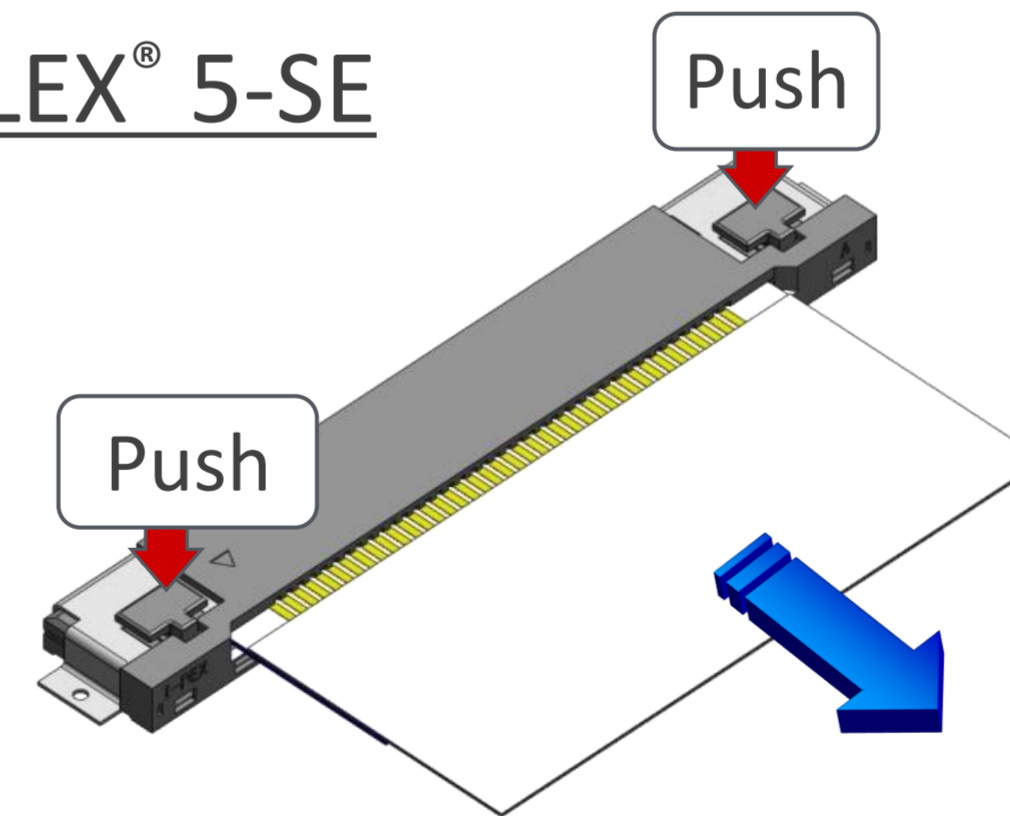
Hold both sides lock release button and pull FPC/FFC out

### EVAFLEX® 5-VS



Push down on the shell and pull FPC/FFC out

### EVAFLEX® 5-SE



Push both ends lock release button and pull FPC/FFC out

# FFC manufacturers supporting EVAFLEX<sup>®</sup> 5 series

Sumitomo Electric Industries, Ltd.

<http://global-sei.com/ewp/E/products/category/fc.html>

Proterial, Ltd.

<https://www.proterial.com/e/>

BANDO DENSEN Co., Ltd.

<http://www.bew.co.jp/>




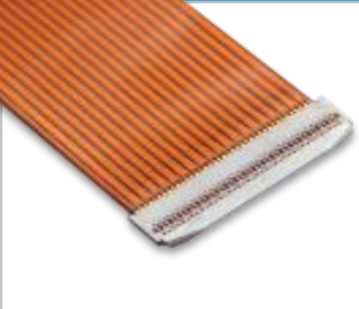
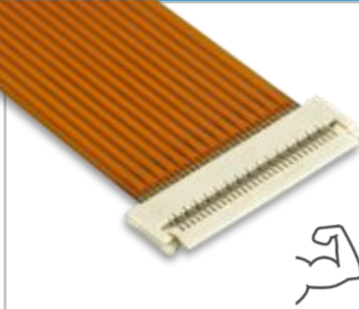



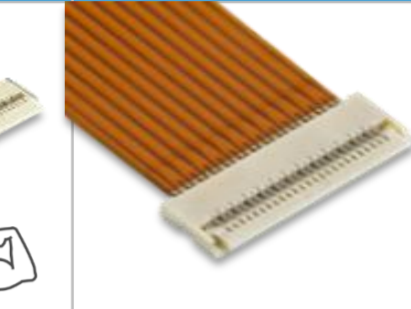

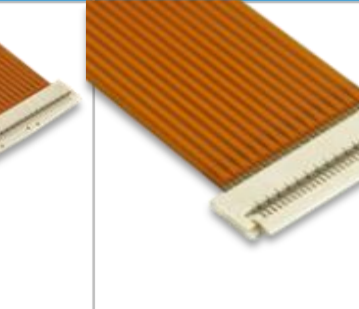
Alysium-Tech GmbH

[http://www.alysium-tech.com/product/components/ffc\\_-\\_fpc\\_connectors](http://www.alysium-tech.com/product/components/ffc_-_fpc_connectors)

\* All connectors are back flip type unless otherwise specified.

Click on each product information to jump to the web.

# FFC / FPC Connectors
























Product Name	MINIFLEX® 175-ST	MINIFLEX® 2-BF	MINIFLEX® 3-BFN						MINIFLEX® 3-BFNH			
			Standard	L	L-HD	LK	L-LK	L-LK-HD	Standard	L	L-HD	
Feature												
		<b>0.52mm Super low profile Mechanical lock</b>	<b>Up to 120 positions with only 0.9 mm height</b>	<b>One of the smallest at 0.3 mm pitch</b>	<b>Easy operation with long actuator</b>	<b>Easy operation with long actuator Robust type</b>	<b>Easy operation with Mechanical lock</b>	<b>Easy operation with long actuator Mechanical lock</b>	<b>Mechanical lock Robust type</b>	<b>Common footprint pattern compatible with industry standard products</b>	<b>Easy operation with Long actuator</b>	<b>Easy operation with long actuator Robust type</b>
Part Number	20622	20617	20527	20538	20982	20599	20584	20655	20613	20605	20660	
Contact Pitch (mm)	0.175	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Board Pitch (mm)	0.35	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
Pin Count	Range	7-31 (odd)	80-120 (even)	13-41 (odd)	33-65 (odd)	15-75 (odd)	9-37 (odd)	29-71 (odd)	11-57 (odd)	7-71 (odd)	33-71 (odd)	7-71 (odd)
	Available	16, 19	80, 100, 120	13,15,17,19,21,23,25,27,29,31,33,35,37,39,41	33,35,39,41,45,49,51,55,57,61,65	51	9,11,13,15,17,19,21,23,25,27,29,31,33,35,37	51,53,57,61,71	11, 40, 45	7,9,11,21,23,25,31, 33,35,39,41,45	51, 61, 71	39, 61
* Please inquire for pin counts not listed as available or outside of the pin count range.												
Height (mm)	0.52+/-0.05	0.90+/-0.10	0.90+/-0.10	0.90+/-0.10	0.90+/-0.10	0.90+/-0.10	0.90+/-0.10	0.90+/-0.10	0.90+/-0.10	0.90+/-0.10	0.90+/-0.10	
Width Formula (mm)	1.915+(0.175*?p)	1.5+(0.2*?p)	0.9+(0.3*?p)	0.9+(0.3*?p)	1.5 + (0.3*?p)	2.1 + (0.3*?p)	2.1 + (0.3*?p)	2.7 + (0.3*?p)	1.5+(0.3*?p)	1.5+(0.3*?p)	2.1 + (0.3*?p)	
Depth (mm)	Actuator Open	2.65	3.30	2.55	2.55	2.55	2.55	2.55	2.95	2.95	2.95	
	Actuator Close	3.0	4.5	3.0	3.5	3.5	3.0	3.5	3.15	3.5	3.5	
Wiping Length (mm)	Contact A	0.85	0.95	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	
	Contact B	0.40	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	
FPC Insertion Depth (mm)	1.05	1.4	1.1	1.1	1.1	1.1	1.1	1.1	1.35	1.35	1.35	
FPC Thickness (mm)	0.12+/-0.03	0.2+/-0.03	0.2+/-0.03	0.2+/-0.03	0.2+/-0.03	0.2+/-0.03	0.2+/-0.03	0.2+/-0.03	0.2+/-0.03	0.2+/-0.03	0.2+/-0.03	
Current Rating	0.3A/pin	0.2A/pin	0.3A /pin	0.3A /pin	0.3A /pin	0.3A /pin	0.3A /pin	0.3A /pin	0.3A /pin	0.3A /pin	0.3A /pin	
Contact point	Top	Top and Bottom	Top and Bottom	Top and Bottom	Top and Bottom	Top and Bottom	Top and Bottom	Top and Bottom	Top and Bottom	Top and Bottom	Top and Bottom	
Footpattern compatibility	Original	Original	Original	Original	Original	Original	Original	Original	Panasonic Y3B	Panasonic Y3B	Original	

# FFC / FPC Connectors

 Mechanical lock
  Hold down
  High temp. (105-125°C)
  Robot ready

 Front flip type
 \* All connectors are back flip type unless otherwise specified.

Click on each product information to jump to the web.

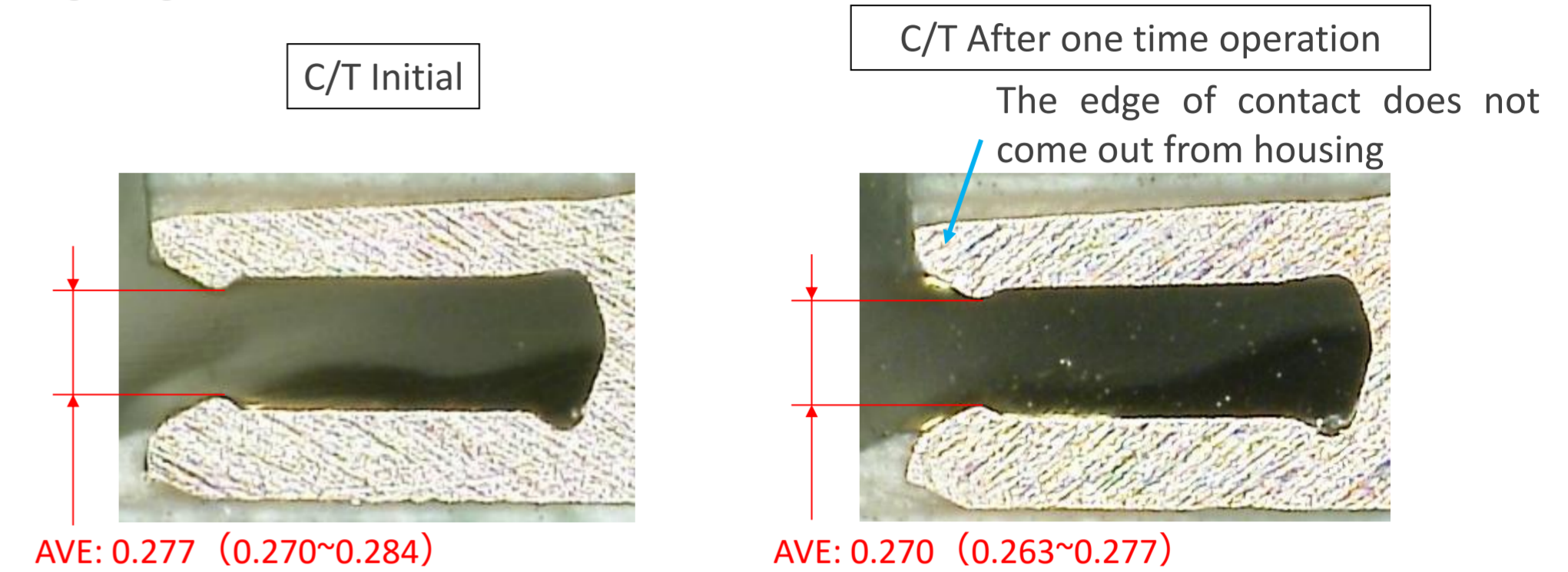
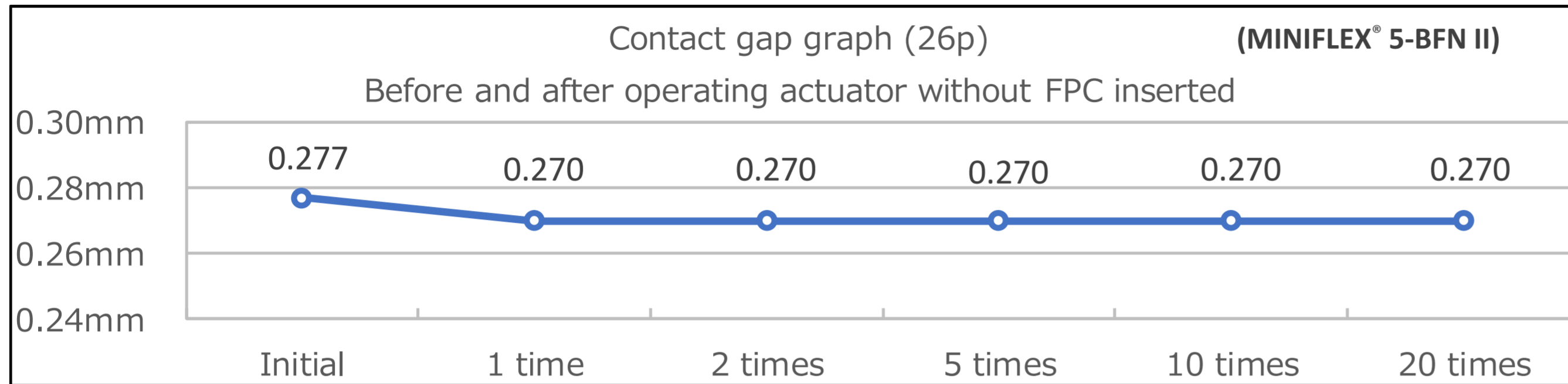
Product Name		MINIFLEX® 4-ST	MINIFLEX® 5-BFN II			DW-5	MINIFLEX® 5-FF
			Standard	L	LK		
Feature		 	   	   	    	  	    
		<b>0.4mm Low profile Mechanical lock</b>	<b>Robust type For high-temp (125°C)</b>	<b>For high-temp (125°C) Easy operation with long actuator</b>	<b>For high-temp (125°C) Mechanical lock with hold down</b>	<b>Hybrid type for FPC and Discrete Wire (AWG#34)</b>	<b>For high-temp(125°C) Robust type</b>
Part Number		20588	20542	20586	20600	20597 / 20598	20647
Contact Pitch (mm)		0.4	0.5	0.5	0.5	0.5	0.5
Board Pitch (mm)		0.4	0.5	0.5	0.5	0.5	0.5
Pin Count	Range	4-15	4-30 (even)	32-60 (even)	4-28 (even)	6-20 (even)	10-80 (even)
	Available	4, 6, 8, 10, 12	4,6,8,10,12,14,16,18,20, 22,24,26,28,30	32, 34, 40, 50, 54	4,6,8,10,12,14,16,18, 20,24	6, 8, 10	20,30,40,50, 55,60,64,68
* Please inquire for pin counts not listed as available or outside of the pin count range.							
Height (mm)		0.50+/-0.05	1.0 +/-0.1	1.0 +/-0.1	1.0 +/-0.1	1.0 +/-0.1	2.55 +/-0.2
Width Formula (mm)		1.9+(0.4*?p)	1.7+(0.5*?p)	1.7+(0.5*?p)	2.7+(0.5*?p)	Rece: 3.7+(0.5*?p) Plug: 3.8+(0.5*?p)	4.9+(0.5*?p)
Depth (mm)	Actuator Open	2.7	3.0	3.0	3.0	Mating FPC : 3.0 Mating PLUG CABLE : 4.9	6.4
	Actuator Close	3.0	3.5	4.0	3.5	Mating FPC : 3.5 Mating PLUG CABLE : 5.39	7.2
Wiping Length (mm)		0.8	1.0	1.0	1.0	1.0	1.4
FPC Insertion Depth(mm)		1.00	1.3	1.3	1.3	1.3	4.15
FPC Thickness (mm)		0.12+/-0.03	0.3+/-0.05	0.3+/-0.05	0.3+/-0.05	0.2+/-0.03	0.3+/-0.05
Current Rating		0.4A /pin (6A/conn.)	0.5A /pin (7A/conn.)	0.5A /pin (7A/conn.)	0.5A /pin (7A/conn.)	FPC:0.5A /pin DW(AWG#34) :0.7A/ pin	0.5A /pin
Contact Point		Top	Top and Bottom	Top and Bottom	Top and Bottom	Top and Bottom	Bottom
Footpattern compatibility		Original	Original	Original	Original	Original	HRS FH28 Kyocera 6288
Kyocera Automotive Standards							LV214 (*)

Note : (\*) 68P tested. Evaluations passed except for PG19 Environmental simulation.

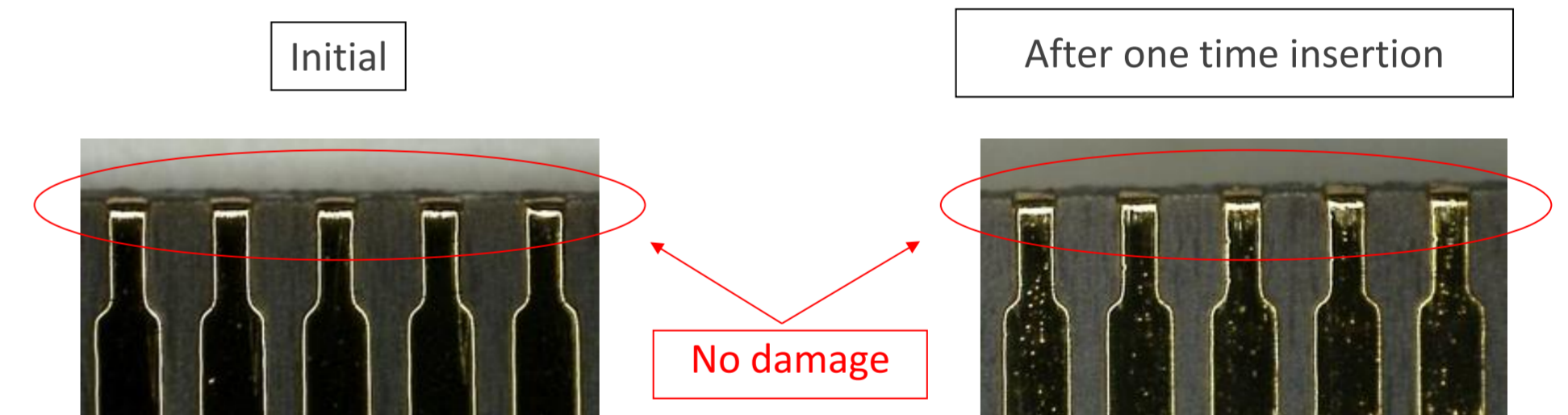
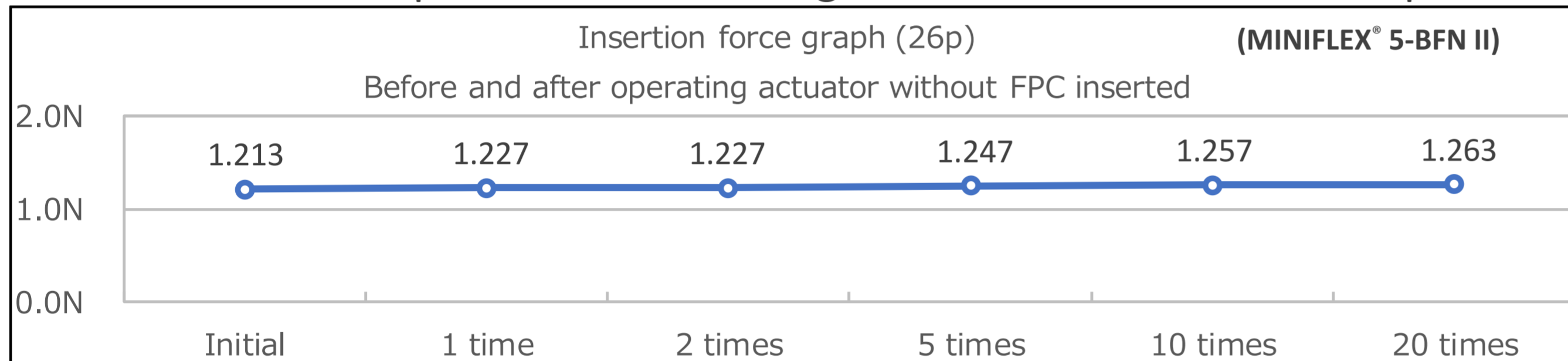
# If connector actuator was closed accidentally without FPC inserted...

Do not change the temperature while the actuator is in a closed state. No reflow soldering should be done when the actuator closed state. FPC insertion force remove extra space between force and will increase after first actuator operation without the FPC being inserted. It is strongly recommended to avoid any actuator open / close operation without the FPC being inserted from the beginning.

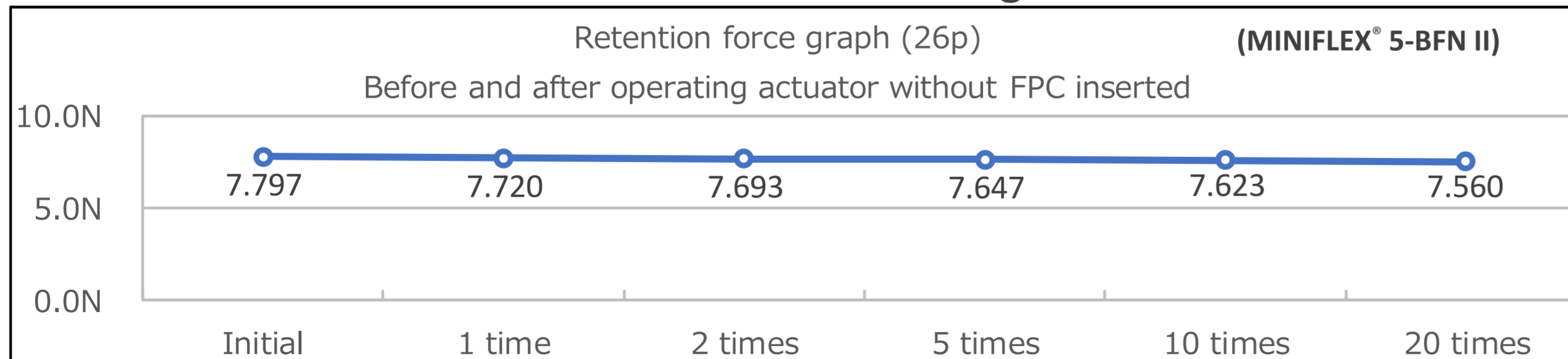
## ■ Connector will still function reliably



## ■ Connector still performs even though the insertion force went up



## ■ Retention force of connector does not change



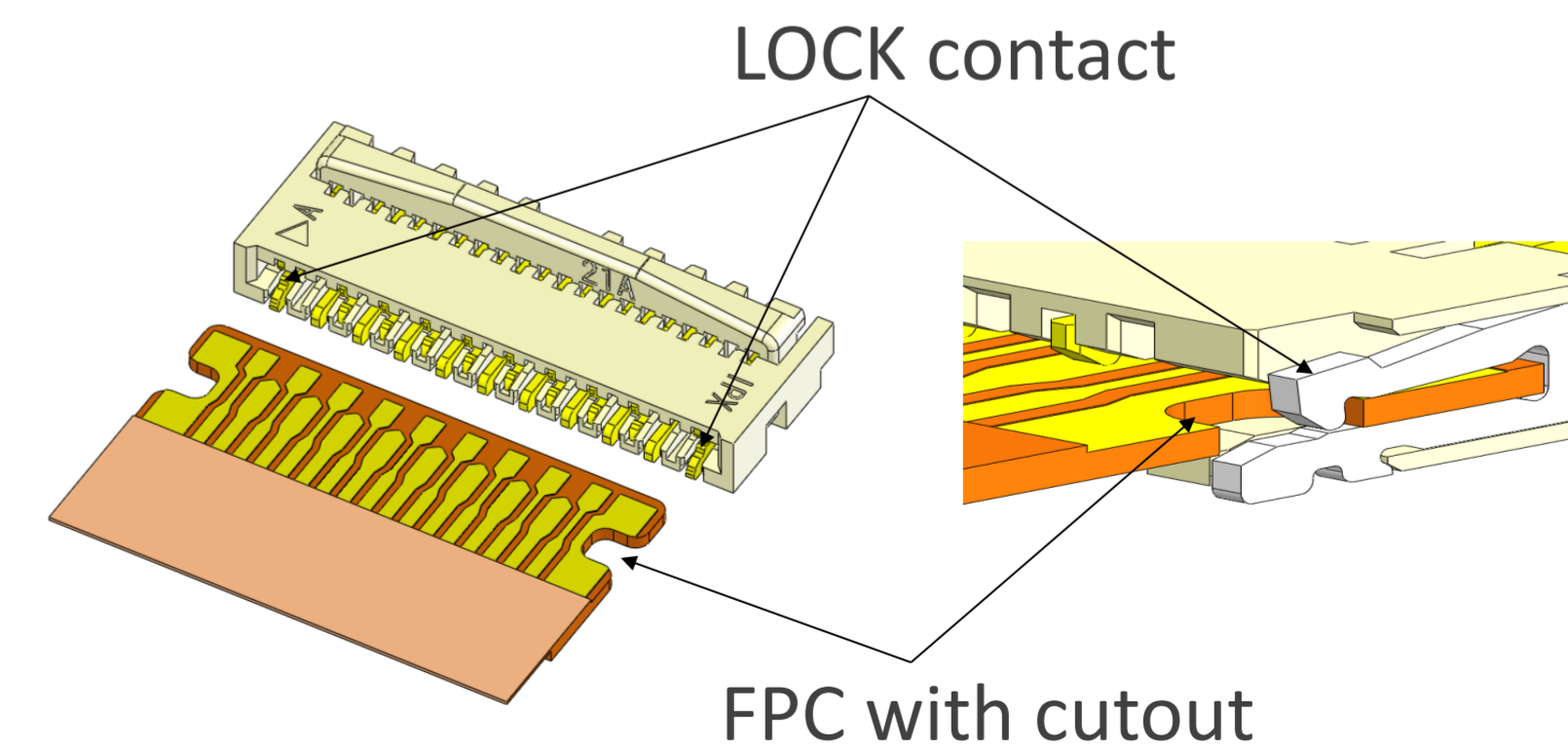
# Additional mechanical lock available for higher FPC retention force

0.175 mm, 0.2 mm, 0.3 mm pitch product FPC retention force

	<b>L</b> 175-ST	2-BF	<b>L</b> 3-BFN	3-BFN LK	<b>L</b> 3-BFN L	3-BFN L LK	3-BFNH	3-BFNH L
FPC Retention Force (Actual)	8.59N (19P)	31.33N (100P)	6.70N (19P)	11.37N (19P)	17.95N (51P)	23.45N (51P)	9.32N (23P)	20.97N (51P)
LOCK Contact Retention Force	5.44N (19P)	N/A	N/A	5.50N (19P)	N/A	5.50N (51P)	N/A	N/A

0.4 mm, 0.5 mm pitch product FPC retention force comparison

	<b>L</b> 4-ST	5-FF	5-BFN II	<b>L</b> 5-BFN II LK (03)	5-BFN II L
FPC Retention Force (Actual)	5.89N (10P)	51.72N (30P)	7.52N (16P)	14.50N (16P)	11.43N (32P)
LOCK Contact Retention Force	4.60N (10P)	N/A	N/A	6.98N (16P)	N/A



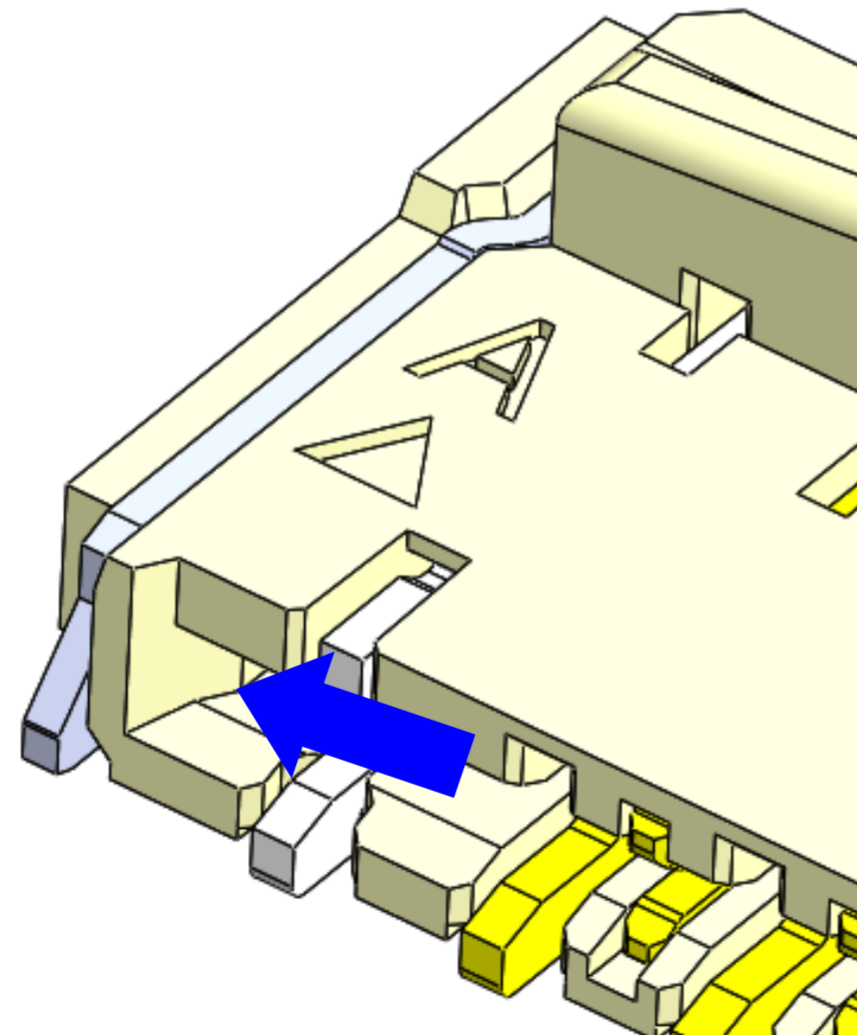
**L** Mechanical lock with FPC cutout

# Hold down

Hold down to improve strength of side wall and to prevent actuator drop off

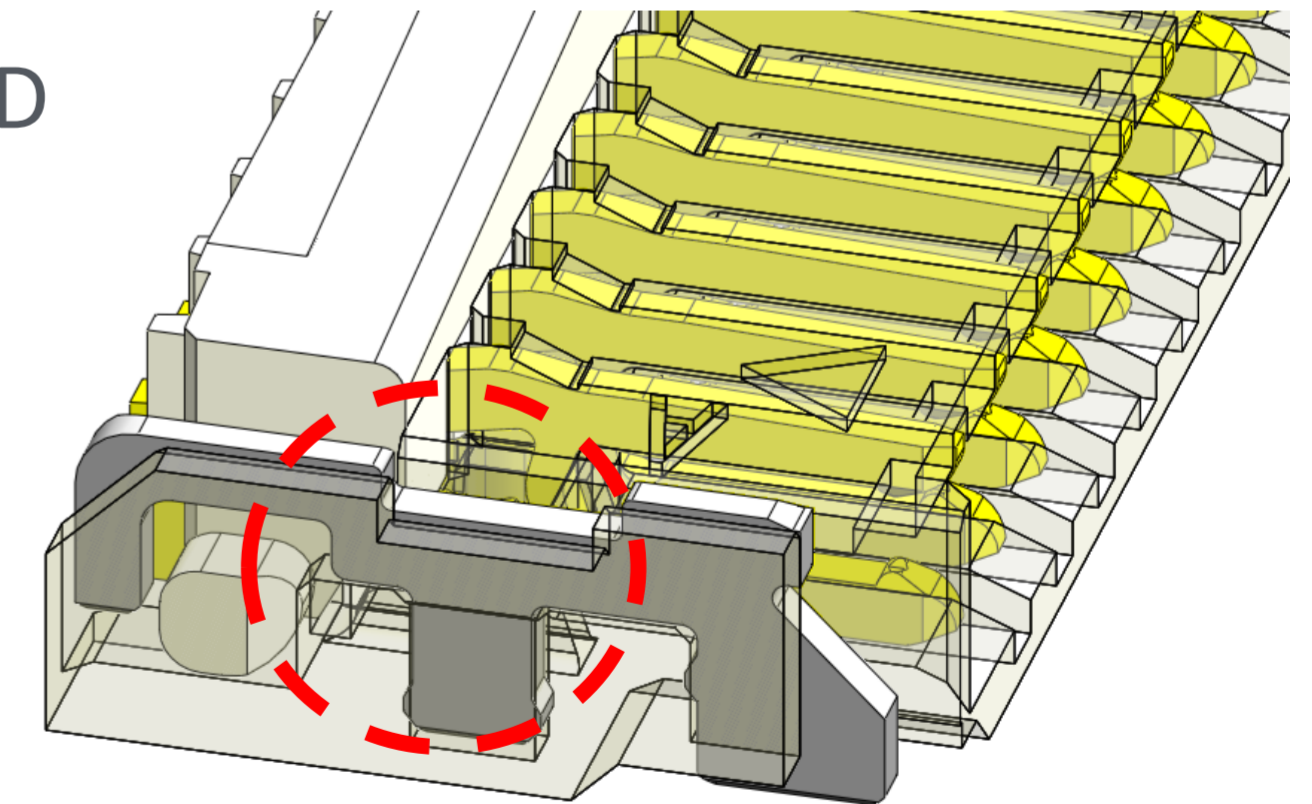
<Strength improvement>

MINIFLEX® 175-ST  
MINIFLEX® 2-BF  
MINIFLEX® 3-BFN L-HD  
MINIFLEX® 3-BFN L-LK-HD  
MINIFLEX® 3-BFNH L-HD  
MINIFLEX® 5-BFN II



<Designed to prevent actuator drop off>

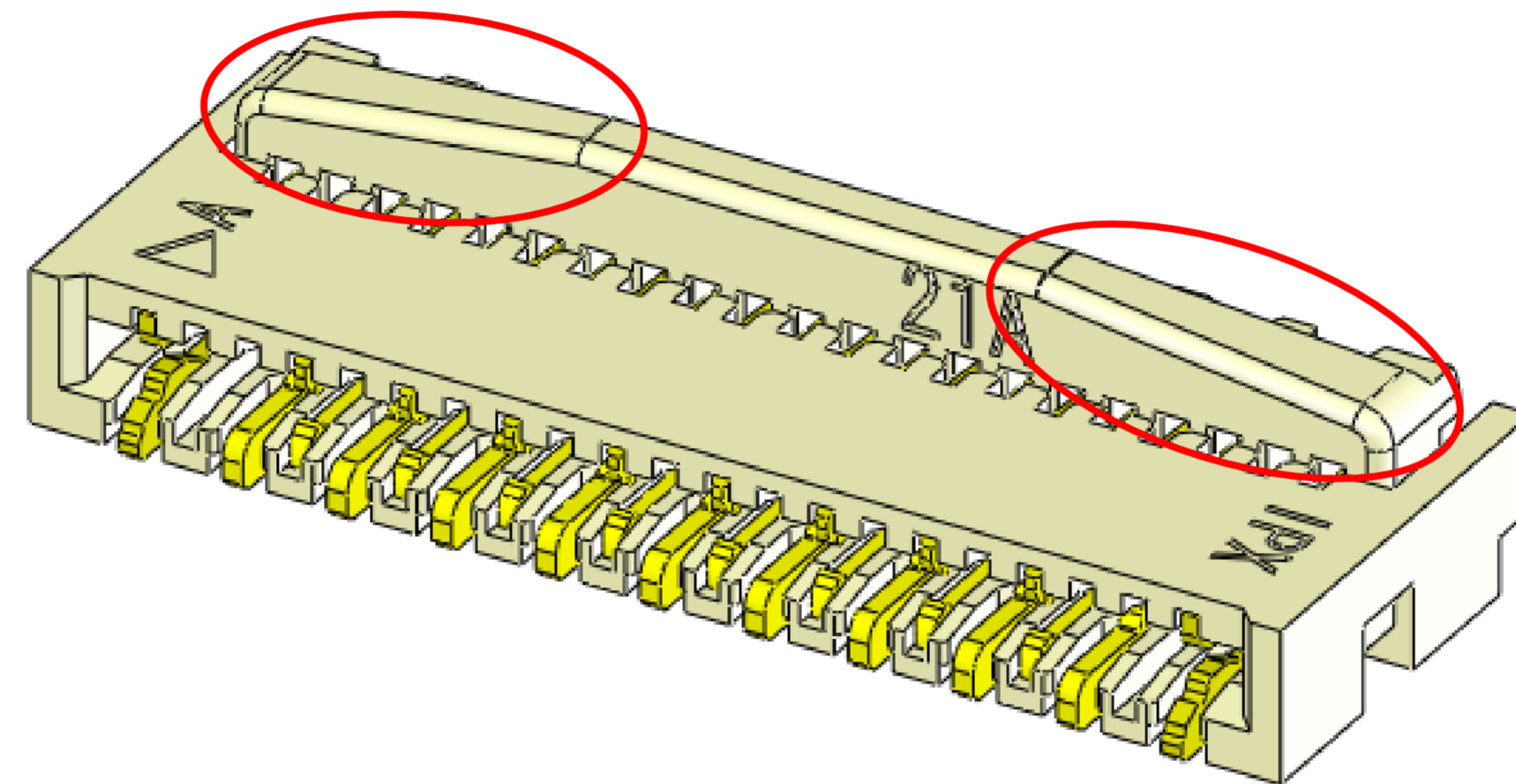
MINIFLEX® 175-ST  
MINIFLEX® 2-BF  
MINIFLEX® 3-BFNH L-HD  
MINIFLEX® 5-BFN II





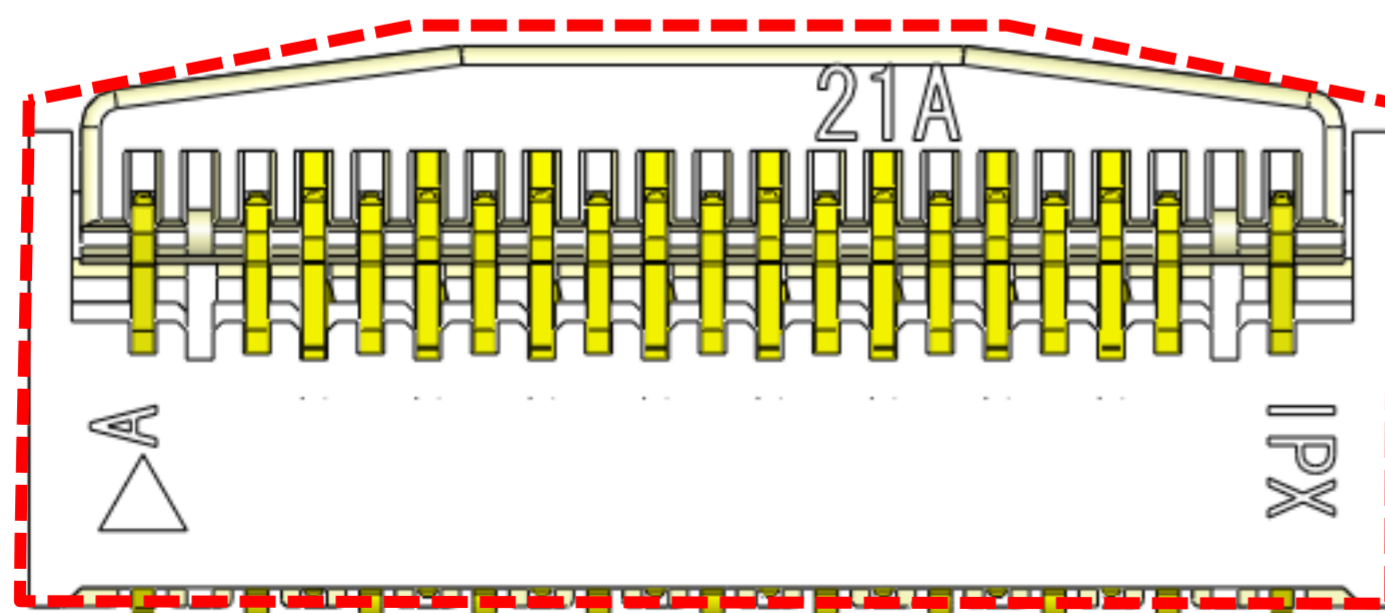
# Half-lock prevention with curved actuator design

Curved design guide users to press center of the actuator to prevent half lock

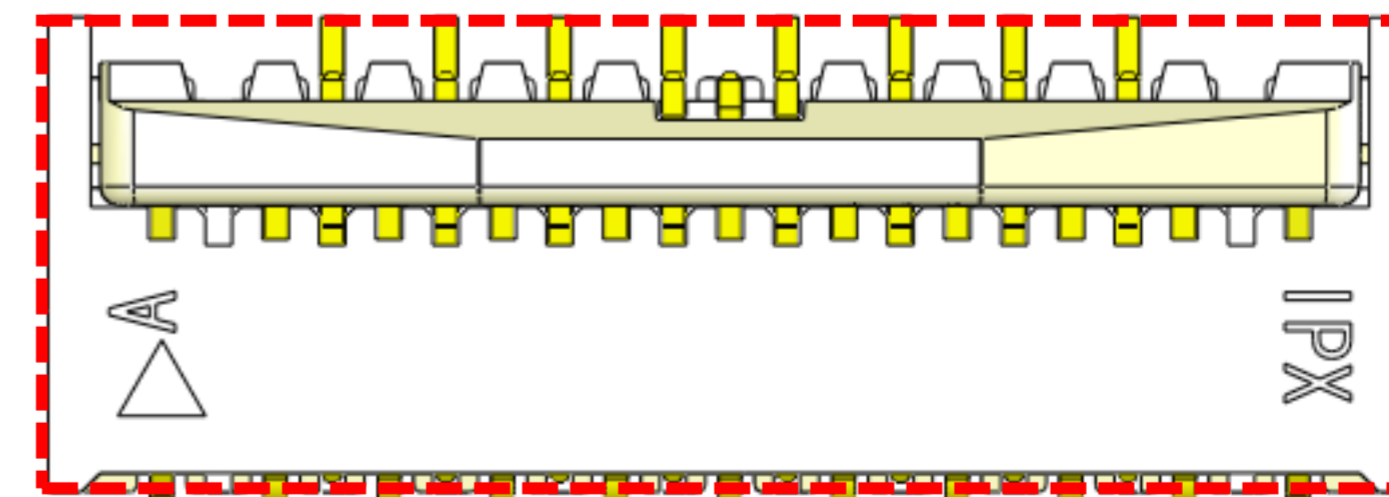


Easy to check Actuator closed position visually from top

Easy confirmation of actuator CLOSE/OPEN state



Actuator  
CLOSED



Actuator  
OPEN

# I-PEX Product Series



**MHF<sup>®</sup>**  
Series  
RF Connectors



**EVAFLEX<sup>®</sup>**  
Series  
**MINIFLEX<sup>®</sup>**  
Series  
FPC/FFC Connectors



**AP**  
Series  
Terminals



**CABLINE<sup>®</sup>**  
Series  
Micro-Coaxial/ Twinax  
Connectors



**ISH<sup>®</sup>**  
Series  
**IARPB<sup>®</sup>**  
Series  
Wire-to-Board  
Connectors



**MINIDOCK<sup>™</sup>**  
Series  
I/O Connectors



**NOVASTACK<sup>®</sup>**  
Series  
Board-to-Board  
Connectors



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**I-PEX Inc.**