FFC / FPC Connectors

ZenShield® Full EMI Shield 105℃ 125℃ Operating Temperature
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
Appearance		ZenShield®	125℃			125℃	
Feature		Full-Shielded High-speed (24+ Gbps) FFC/FPC connector	One hand operation, Auto-locking connector Hold down (ground) for high-speed (4+ Gbps)	PC panel industry standard footprint Shielded / Non-shielded High-speed (8+ Gbps)		Non-shielded Horizontal mate	Non-shielded Vertical mate
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		0.5 mm	0.5 mm	0.5 mm		0.5 mm	0.5 mm
Pin count	Range	10 to 40	20 to 60	10 to 50		10 to 60	10 to 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	Height	2.00 +/- 0.20 mm	6.6 +/- 0.20 mm	1.90 +/- 0.10 mm		2.40 +/- 0.20 mm	6.00 +/- 0.20 mm
	Width	5.2 + (0.5 x pin count) mm	8.00 + (0.5 x pin count) mm	6.25 + (0.5 x pin count) mm		13.10 + (0.5 x pin count) mm	11.5 + (0.5 x pin count) mm
	Depth	8.43 +/- 0.20 mm	3.90 +/- 0.20 mm	4.95 +/- 0.20 mm		5.90 +/- 0.20 mm	4.50 +/- 0.20 mm
Wiping length		1.00 mm	1.20 mm	1.10 mm		1.45 mm	1.20 mm
FFC/FPC Insertion Depth		4.30 mm	5.35 mm	3.30 mm		3.80 mm	4.20 mm
FFC/FPC Type		Shielded FFC	Shielded FFC, Non-shielded FFC/FPC	Shielded FFC, Non-shielded FFC/FPC		Non-shielded FFC/FPC	
FFC/FPC Thickness		0.33 +/- 0.03 mm	0.30 +/- 0.03 mm	0.33 +/- 0.03 mm		FPC : 0.30 +/- 0.03 mm FFC : 0.30 +/- 0.05 mm	0.30 +/- 0.05 mm
Contact Point		Top	Signal contact tail side	Top		Top	Signal contact tail side
Compatibility (Footprint Pattern)		Original	Original	CABLINE®-VS		Original	Original
Current Rating		0.30 A/pin	0.35 A/pin	0.30 A/pin		0.35 A/pin	0.35 A/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)	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	LVDS
Operating Condition		233 to 358K (-40 to +85℃) 85 %RH max.	233 to 398K (-4 to +125℃) 85 %RH max.	233 to 358K (-40 to +85℃) 85 %RH max.	233 to 378k (-40 to +105℃) 85 %RH max	233 to 398K (-40 to +125℃) 85 %RH max. (*2)	233 to 358K (-40 to +85℃) 85 %RH max.
Automotive Standards		-	USCAR-2 (*1)	-	USCAR-2 (*)	-	-

Note : (*1) 40 pin tested. 2.5.6 Vibration & Shock V1 evaluation passed. (*2) Supported when using high-temperature FPC.

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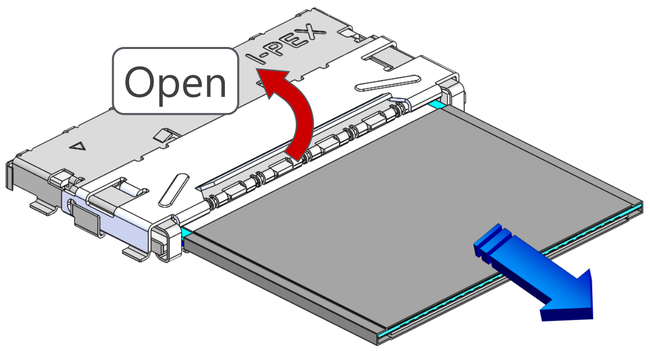
Auto-Locking FFC/FPC Connector - EVAFLEX® series -

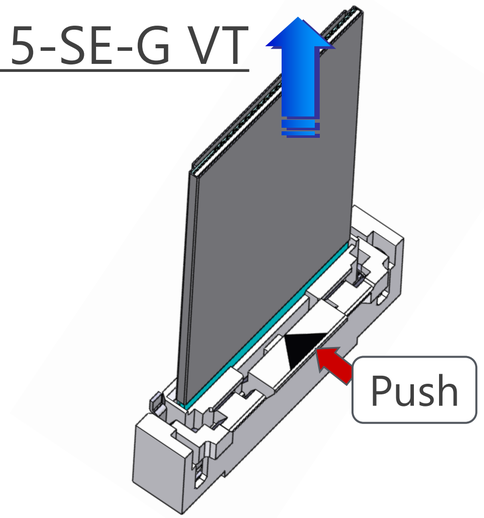
Un-locking methods

EVAFLEX® 5-HD



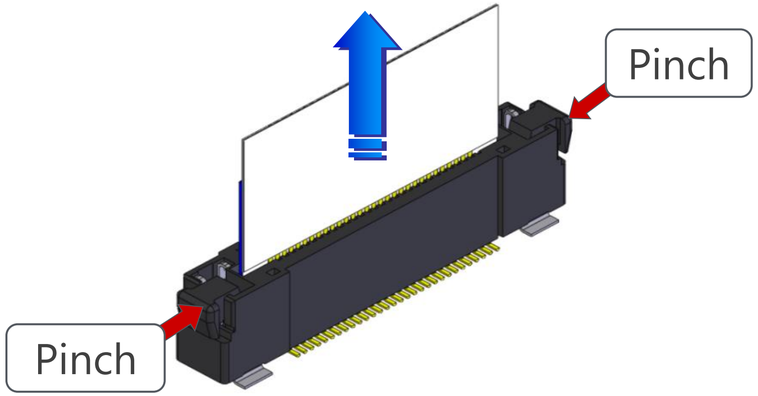
Open the cover and pull FPC/FFC out

EVAFLEX® 5-SE-G VT



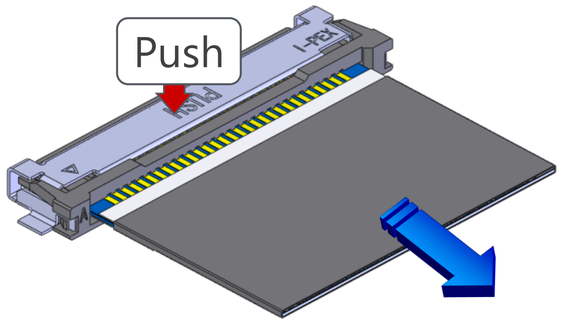
Push center lock release button and pull FPC/FFC out

EVAFLEX® 5-SE VT



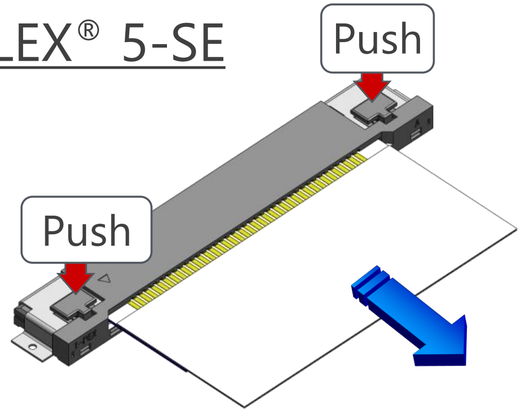
Hold both sides lock release button and pull FPC/FFC out

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

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FFC manufacturers supporting EVAFLEX® 5 series

Sumitomo Electric Industries, Ltd.
http://global-sei.com/ewp/E/products/category/fc.html

BANDO DENSEN Co., ltd.
http://www.bew.co.jp/

HEUNSUNG INDUSTRIAL INC.
http://eunsung-ind.com/

LUXSHARE ICT
https://www.luxshare-ict.com/en/solution/automotive-medical.html

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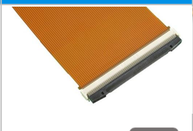
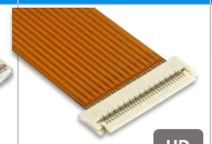
LK Mechanical lock HD Hold down 105℃ 125℃ Operating Temperature

* All connectors are back flip type unless otherwise specified.

FFC / FPC Connectors

Click on each product information to jump to the web.

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
Appearance		LK HD	 HD			 HD	LK	LK	LK HD			HD
Feature		0.52mm Super low profile Mechanical lock	Up to 120 positions with only 0.9 mm height	One of the smallest at 0.3 mm pitch	Easy operation with long actuator	Easy operation with long actuator Robust type	Easy operation with Mechanical lock	Easy operation with long actuator Mechanical lock	Mechanical lock Robust type	Common footprint pattern compatible with industry standard products	Easy operation with Long actuator	Easy operation with long actuator Robust type
Part Number		20622	20617	20527	20538	20982	20599	20584	20655	20613	20605	20660
Contact Pitch		0.175 mm	0.2 mm	0.3 mm	0.3 mm	0.3 mm	0.3 mm	0.3 mm	0.3 mm	0.3 mm	0.3 mm	0.3 mm
Board Pitch		0.35 mm	0.4 mm	0.6 mm	0.6 mm	0.6 mm	0.6 mm	0.6 mm	0.6 mm	0.6 mm	0.6 mm	0.6 mm
Pin Count	Range	7 to 31	80 to 120	13 to 41	33 to 65	15 to 75	9 to 37	29 to 71	11 to 57	7 to 71	33 to 71	7 to 71
	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		0.52+/-0.05 mm	0.90+/-0.10 mm	0.90+/-0.10 mm	0.90+/-0.10 mm	0.90+/-0.10 mm	0.90+/-0.10 mm	0.90+/-0.10 mm	0.90+/-0.10 mm	0.90+/-0.10 mm	0.90+/-0.10 mm	0.90+/-0.10 mm
Width		1.915 + (0.175 x pin count) mm	1.5 + (0.2 x pin count) mm	0.9 + (0.3 x pin count) mm	0.9 + (0.3 x pin count) mm	1.5 + (0.3 x pin count) mm	2.1 + (0.3 x pin count) mm	2.1 + (0.3 x pin count) mm	2.7 + (0.3 x pin count) mm	1.5 + (0.3 x pin count) mm	1.5 + (0.3 x pin count) mm	2.1 + (0.3 x pin count) mm
Depth	Actuator Open	2.65 mm	3.30 mm	2.55 mm	2.55 mm	2.55 mm	2.55 mm	2.55 mm	2.55 mm	2.95 mm	2.95 mm	2.95 mm
	Actuator Close	3.0 mm	4.5 mm	3.0 mm	3.5 mm	3.5 mm	3.0 mm	3.5 mm	3.5 mm	3.15 mm	3.5 mm	3.5 mm
Wiping Length	Contact A	0.85 mm	0.95 mm	0.9 mm	0.9 mm	0.9 mm	0.9 mm	0.9 mm	0.9 mm	1.0 mm	1.0 mm	1.0 mm
	Contact B	0.40 mm	0.45 mm	0.45 mm	0.45 mm	0.45 mm	0.45 mm	0.45 mm	0.45 mm	0.45 mm	0.45 mm	0.45 mm
FPC Insertion Depth		1.05 mm	1.4 mm	1.1 mm	1.1 mm	1.1 mm	1.1 mm	1.1 mm	1.1 mm	1.35 mm	1.35 mm	1.35 mm
FPC Thickness		0.12 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm	0.2 +/- 0.03 mm
Current Rating		0.3 A/pin	0.2 A/pin	0.3 A/pin	0.3 A/pin	0.3 A/pin	0.3 A/pin	0.3 A/pin	0.3 A/pin	0.3 A/pin	0.3 A/pin	0.3 A/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

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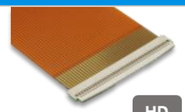
FF Front flip type LK Mechanical lock HD Hold down 105℃ 125℃ Operating Temperature

All connectors are back flip type unless otherwise specified.

FFC / FPC Connectors

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		
Appearance		LK	HD 125℃	 HD 125℃	LK HD 125℃	LK HD	HD 125℃ FF
Feature		0.4mm Low profile Mechanical lock	Robust type For high-temp (125℃)	For high-temp (125℃) Easy operation with long actuator	For high-temp (125℃) Mechanical lock with hold down	Hybrid type for FPC and Discrete Wire (AWG 34)	For high-temp(125℃) Robust type
Part Number		20588	20542	20586	20600	20597 / 20598	20647
Contact Pitch		0.4 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Board Pitch		0.4 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Pin Count	Range	4 to 15	4 to 30 mm	32 to 60	4 to 28	6 to 20	10 to 80
	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		0.50 +/- 0.05 mm	1.0 +/- 0.1 mm	1.0 +/- 0.1 mm	1.0 +/- 0.1 mm	1.0 +/- 0.1 mm	2.55 +/- 0.2 mm
Width		1.9 + (0.4 x pin count) mm	1.7 + (0.5 x pin count) mm	1.7 + (0.5 x pin count) mm	2.7 + (0.5 x pin count) mm	Rece: 3.7 + (0.5 x pin count) mm Plug: 3.8 + (0.5 x pin count) mm	4.9 + (0.5 x pin count) mm
Depth	Actuator Open	2.7 mm	3.0 mm	3.0 mm	3.0 mm	Mating FPC : 3.0 mm Mating PLUG CABLE : 4.9 mm	6.4 mm
	Actuator Close	3.0 mm	3.5 mm	4.0 mm	3.5 mm	Mating FPC : 3.5 mm Mating PLUG CABLE : 5.39 mm	7.2 mm
Wiping Length		0.8 mm	1.0 mm	1.0 mm	1.0 mm	1.0 mm	1.4 mm
FPC Insertion Depth		1.00 mm	1.3 mm	1.3 mm	1.3 mm	1.3 mm	4.15 mm
FPC Thickness		0.12 +/- 0.03 mm	0.3+/-0.03 mm	0.3+/-0.03 mm	0.3+/-0.03 mm	0.2+/-0.03 mm	0.3+/-0.05 mm
Current Rating		0.4 A/pin (6 A/conn.)	0.5 A/pin (7 A/conn.)	0.5 A/pin (7 A/conn.)	0.5 A/pin (7 A/conn.)	FPC: 0.5 A/pin DW (AWG 34): 0.7 A/pin	0.5 A/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
Automotive Standards		-	-	-	-	-	LV214 (*)

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

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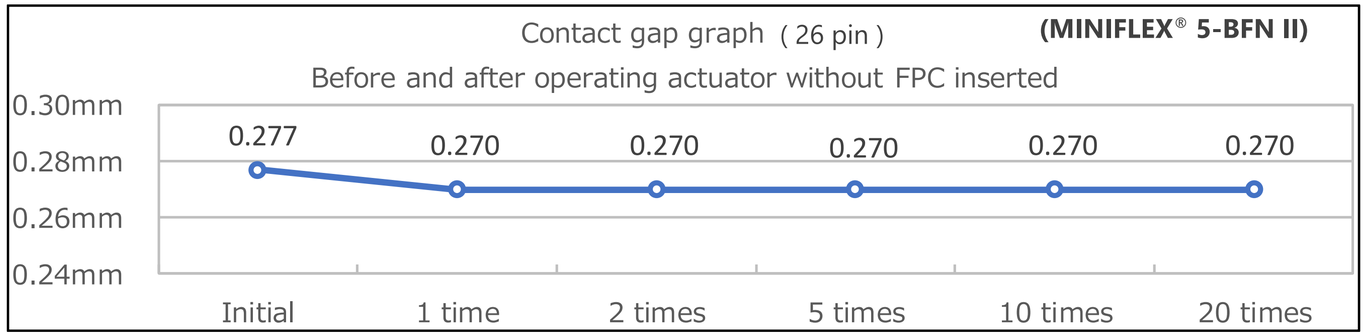
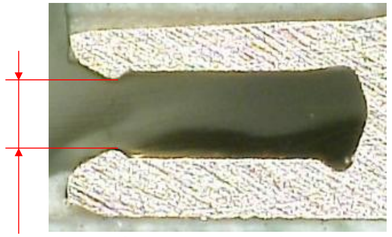
If connector actuator was closed accidentally without FPC inserted…

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



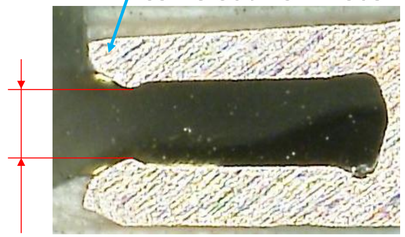
C/T Initial



AVE: 0.277（0.270 to 0.284）

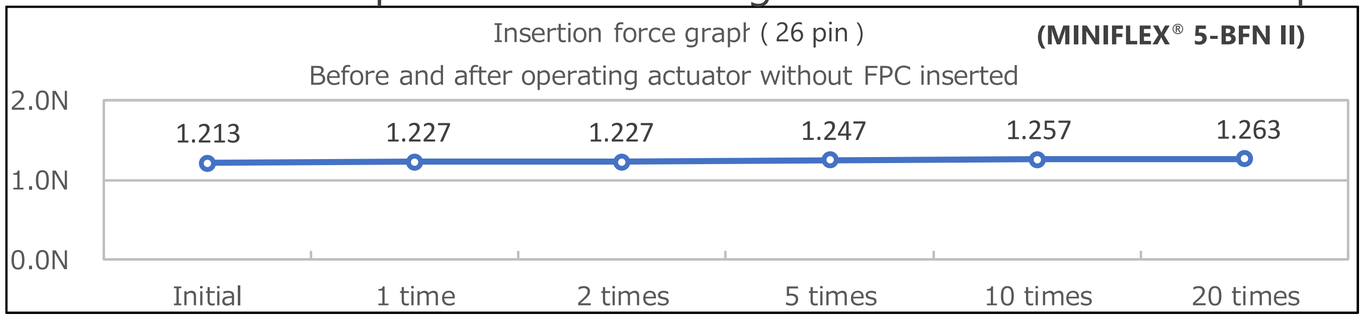
C/T After one time operation

The edge of contact does not come out from housing



AVE: 0.270（0.263 to 0.277）

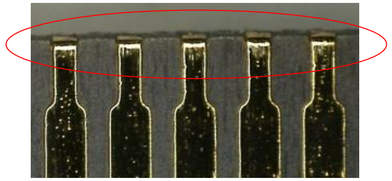
■ Connector still performs even though the insertion force went up



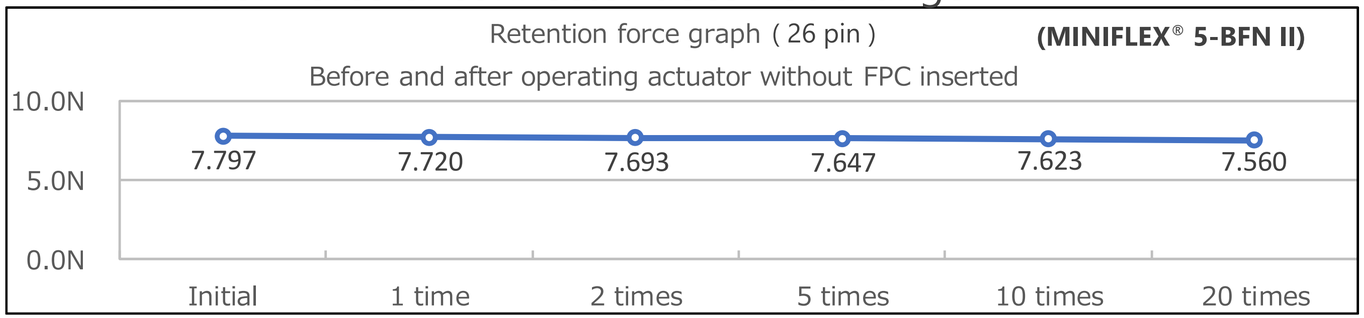
Initial

No damage

After one time insertion



■ Retention force of connector does not change



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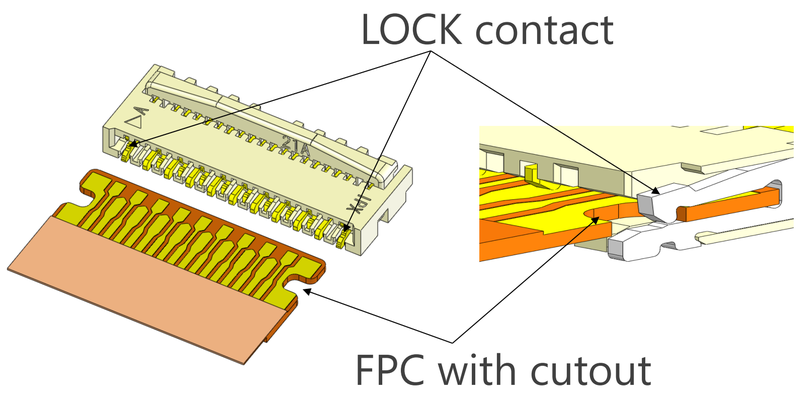
Additional mechanical lock available for higher FPC retention force

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

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

0.4 mm, 0.5 mm pitch product FPC retention force comparison

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



L Mechanical lock with FPC cutout

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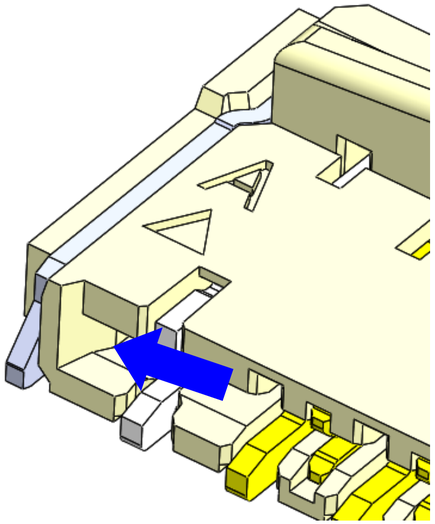
Hold down

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

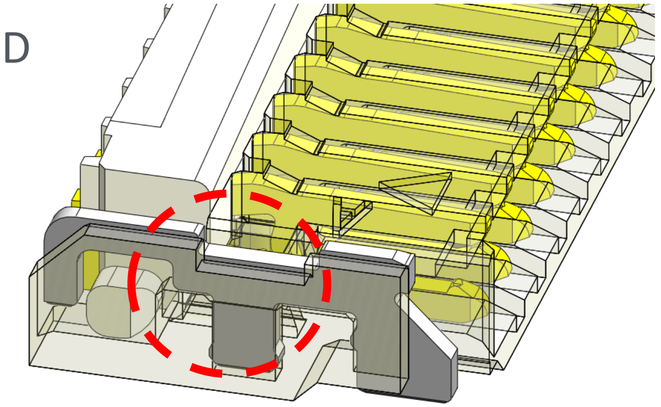
＜Strength improvement＞

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



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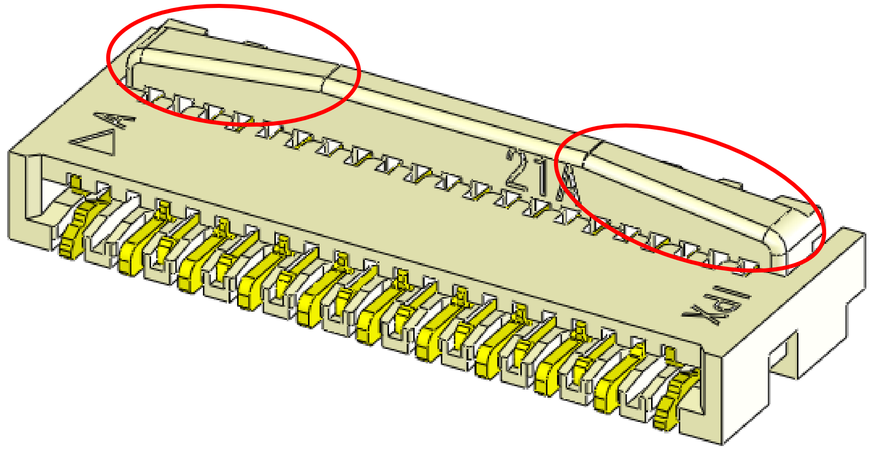
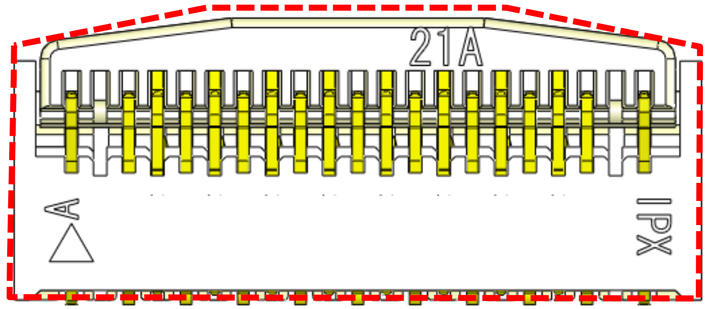
Half-lock prevention with curved actuator design

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

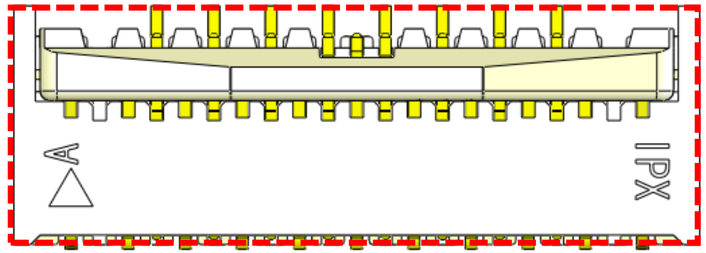


Easy to check Actuator closed position visually from top

Easy confirmation of actuator CLOSE/OPEN state



Actuator CLOSED



Actuator OPEN

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RF Connectors

EVAFLEX®
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Twinaxial
Connectors

ISH®
Series

IARPB®
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Wire-to-Board
Connectors

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I/O Connectors

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Board-to-Board
Connectors

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