

FX25 Series

0.4mm Pitch, Small & Floating, Board-to-Board Connector

FunctionMAX™



P = 0.4mm



Floating



Compact



Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81

Россия +7(495)268-04-70

Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47

Казахстан +7(7172)727-132

Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35

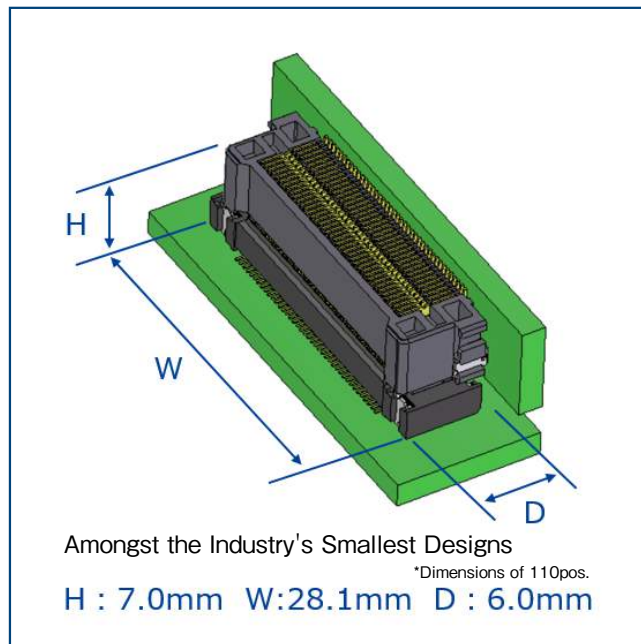
Киргизия +996(312)96-26-47

Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Features

1. 0.4mm Pitch, Compact, High Pin Count Connector

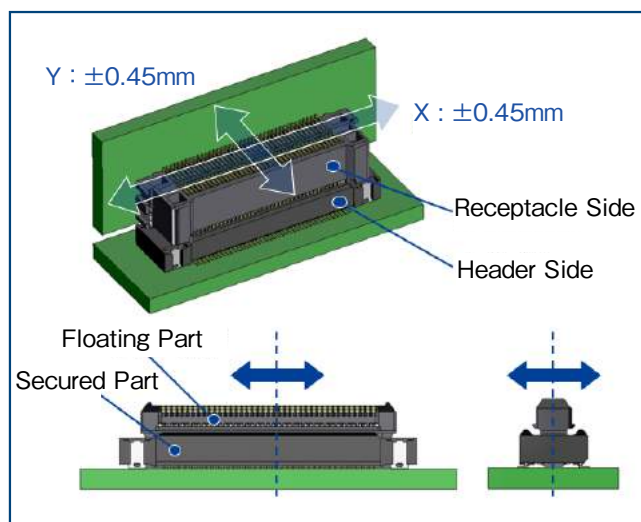
The FX25 Series contributes to space-saving in board design. Compared to Hirose's existing products with 0.5mm pitch, mounting area is reduced by approximately 40%. Furthermore, when compared to other manufacturer's products with the same 0.4mm pitch, FX25 has one of the smallest mounting areas and product volume.



2. Connection Type : Right Angle Connection

Header Side : Straight Type
 Receptacle Side : Right Angle Type

3. Floating Amount : $\pm 0.45\text{mm}$ in the X and Y directions



Floating Design

4. High Speed Transmission : 2.5Gbps

5. Current Capacity : 0.4A/pin

Contact uses a highly conductive material and can conduct 0.4A/pin.

6. Excellent Mating Operation Due to Wide Self-Alignment Guide

The self-alignment range of 0.75mm in both the X and Y direction contributes to assembly automation.

7. Effective Fitting Length : 1mm for High Contact Reliability Design

8. Pick & Place Mounting

This product has a flat surface for Pick & Place mounting

9. Can Inspect Soldered Area from the Top of the Connector

Application

The FX25 Series can be used in a wide range of consumer, medical, industrial and other products that require space-saving PCB design.

Product Specifications

Rated Current	0.4A	Operating Temperature (Note 1)	-55 to +85°C
Rated Voltage	50V AC/DC	Storage Temperature Range (Note 2)	-40 to +60°C
		Operating Humidity Range	Relative humidity : 85% Max. (Without Condensation)
		Storage Humidity Range (Note 2)	

Item	Specification	Conditions
Contact Resistance	60m Ω Max.	Measured at 100mA
Insulation Resistance	50M Ω Min.	Measured at 100V DC
Withstanding Voltage	No flashover or insulation breakdown	200V AC for 1 min.
Mating Durability	Contact Resistance : 80m Ω Max.	10 times insertion and extraction
Vibration Resistance	No electrical discontinuity of 1 μ s Min.	Frequency 10 to 55 Hz, single amplitude 0.75 mm, 1 cycle 5 min, 3 axial 10 cycles each
Shock Resistance	No electrical discontinuity of 1 μ s Min.	Acceleration 490m/s ² , Duration 11ms, 3 sine half-waves in both directions 3 times each
Moisture Resistance	Contact Resistance : 80m Ω Max. Insulation Resistance : 50M Ω Min.	Left for 96 hours at 40°C and 90 to 95% humidity
Temperature Cycle	Contact Resistance : 80m Ω Max. Insulation Resistance : 50M Ω Min.	Temperature : -55 → + 85°C Time : 30 → 30min., 5 cycles

Note 1 : Includes the temperature rise due to current flow.

Note 2 : "Storage" here refers to the long-term storage condition of unused products before the board is mounted.

The operating temperature and humidity range is applied when the circuit board is not energized after mounting, or when it is temporarily stored during transportation.

Material / Finish

Component		Material	Color / Finish	Remarks
Insulator	Header	LCP, Polyamide Resin	Black	UL94V-0
	Receptacle	LCP	Black	UL94V-0
Contact		Copper Alloy	Contact : Gold Plated (Nickel Underplating) Mounting : Gold Plated (Nickel Underplating)	-
Retention Tab		Brass	Tin Plating (Nickel Underplating)	-

Product Number Structure

Refer to the chart below when determining the product specifications from the product number.

Please select from the product numbers listed in this catalog when placing orders.

Header / Receptacle

FX25 - 110 P - 0.4 SV

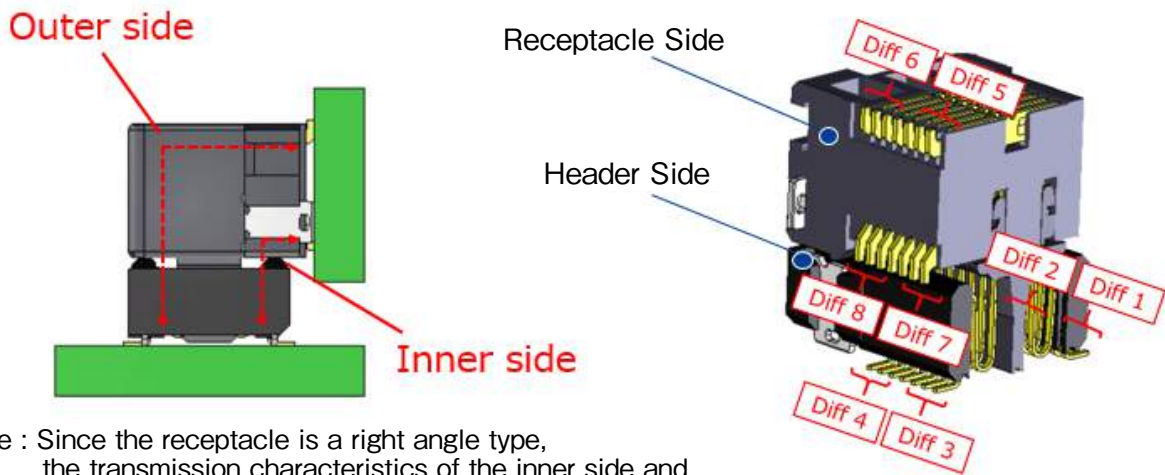
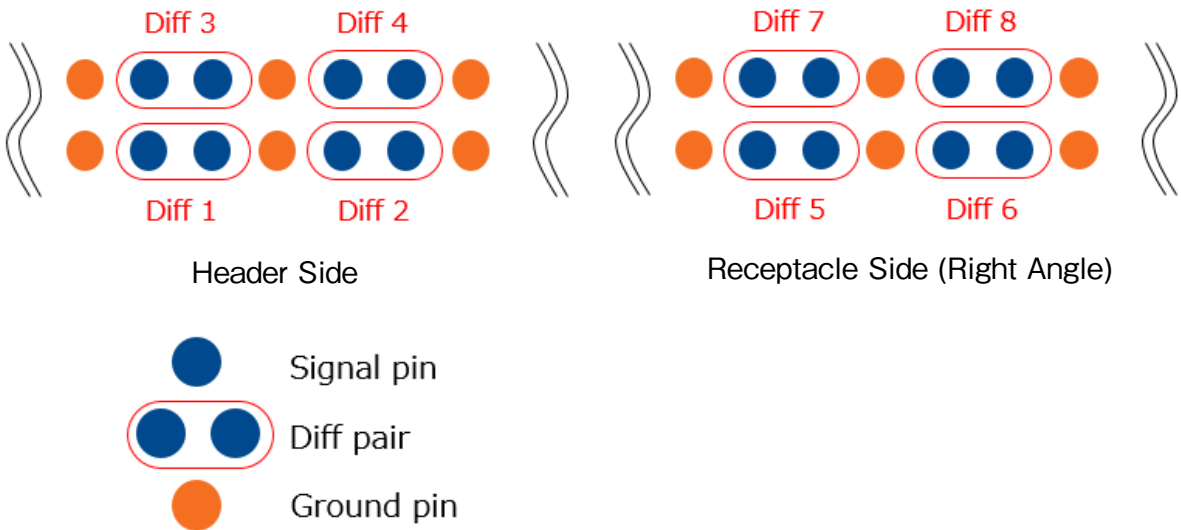
① ② ③ ④ ⑤

① Series Name	FX25	④ Contact Pitch	0.4mm
② No. of Pos.	Mass Production : 80, 110pos. Under Planning : 40, 60, 100, 120pos.	⑤ Product Type	SV : Straight Type SH : Right Angle Type
③ Connector Type	P : Header S : Receptacle		

High Speed Transmission Characteristics

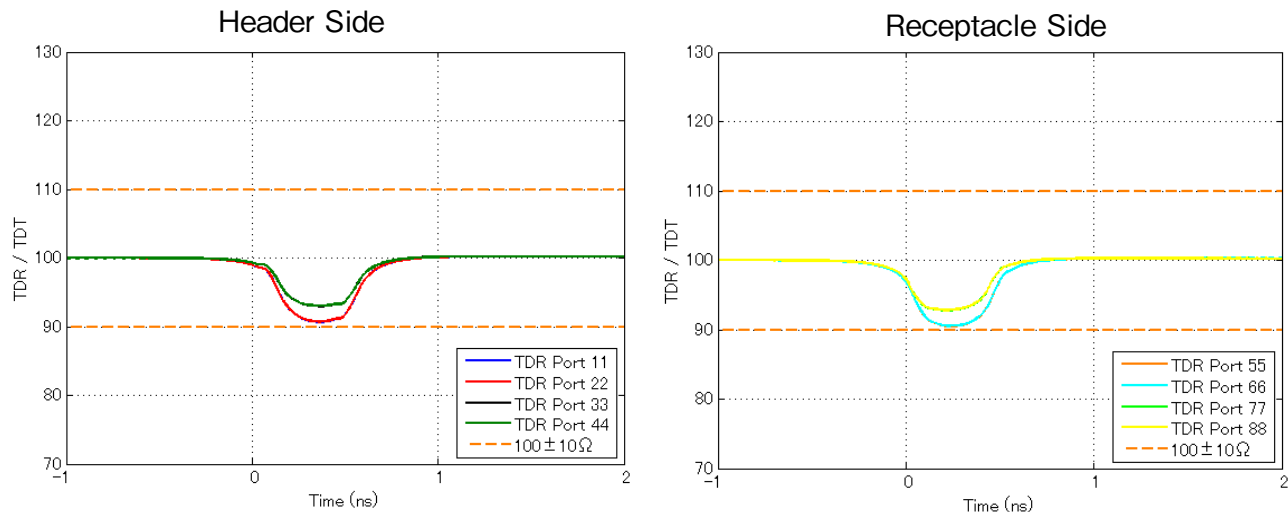
1. Pin Assignment

The following pin arrangement is recommended to match the 100Ω differential impedance and reduce crosstalk.



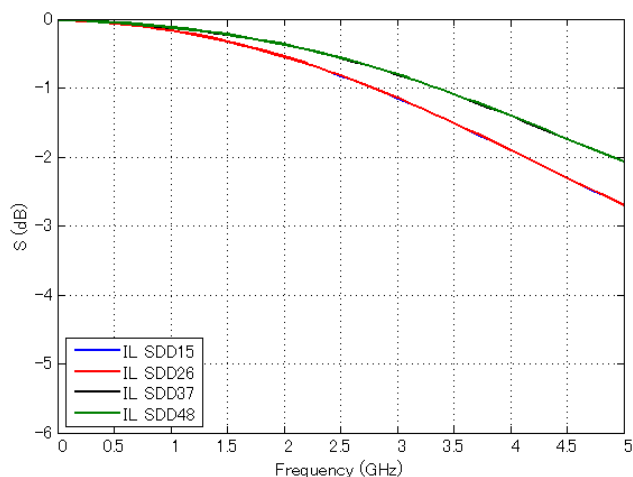
Note : Since the receptacle is a right angle type, the transmission characteristics of the inner side and outer side differ.

2. Differential Impedance 300ps Rise Time (20 to 80%)

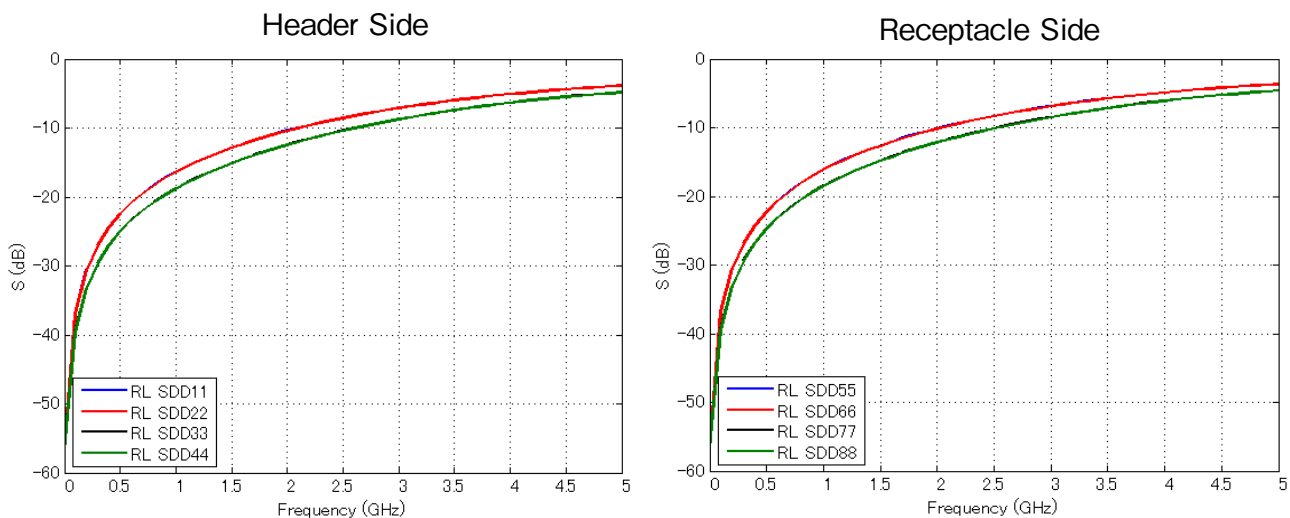


At a rise time of 300ps (20 to 80%), $100 \pm 10 \Omega$ is satisfied.

3. Insertion Loss

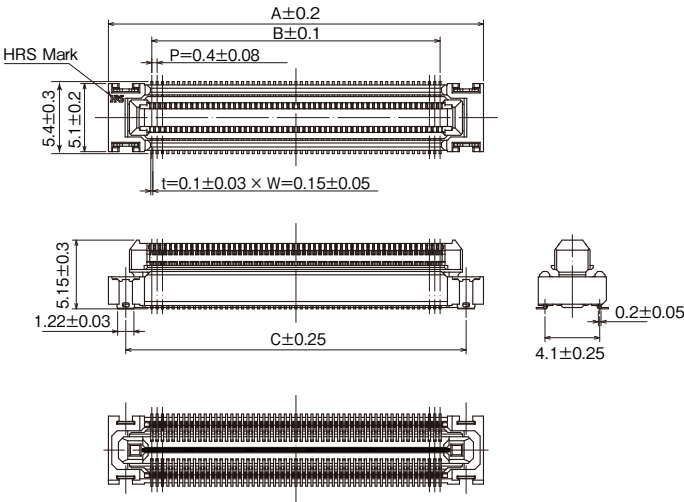
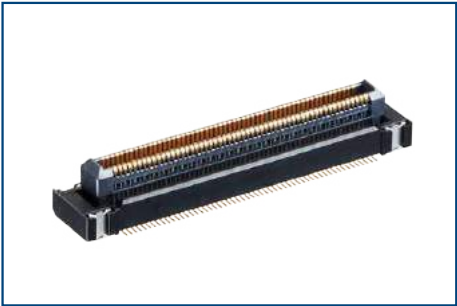


4. Return Loss

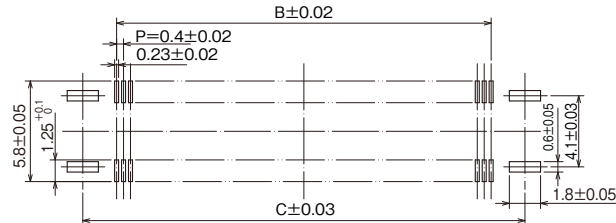


Excellent insertion loss and return loss up to 5GHz. If you have questions about the various transmission standards, please contact a Hirose representative.

Straight Header



Recommended PCB Layout



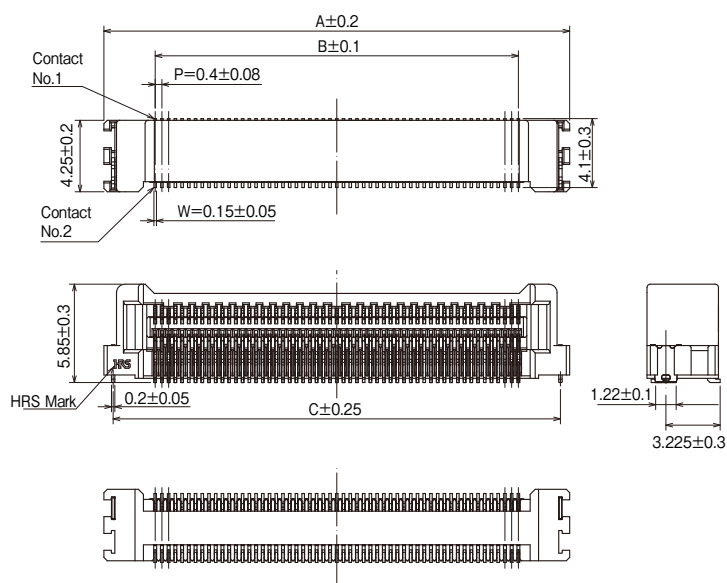
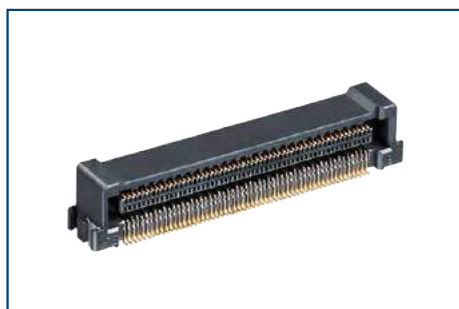
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
FX25-40P-0.4SV	Under Planning (Note 1)	40	14.1	7.6	11.5	-
FX25-60P-0.4SV	Under Planning (Note 1)	60	18.1	11.6	15.5	
FX25-80P-0.4SV	CL0575-4101-0-00	80	22.1	15.6	19.5	1,000pcs per reel
FX25-100P-0.4SV	Under Planning (Note 1)	100	26.1	19.6	23.5	-
FX25-110P-0.4SV	CL0575-4102-0-00	110	28.1	21.6	25.5	1,000pcs per reel
FX25-120P-0.4SV	Under Planning (Note 1)	120	30.1	23.6	27.5	-

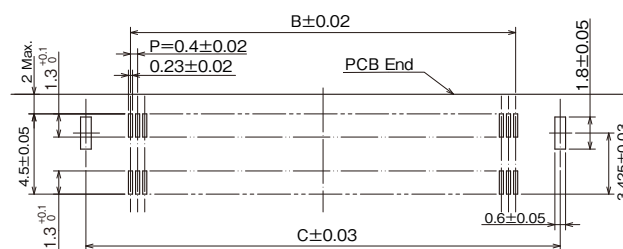
Note 1 : Pin counts without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Note 2 : The header side of this product does not have polarity. It can be mated with the receptacle in any orientation.

Right Angle Receptacle



Recommended PCB Layout



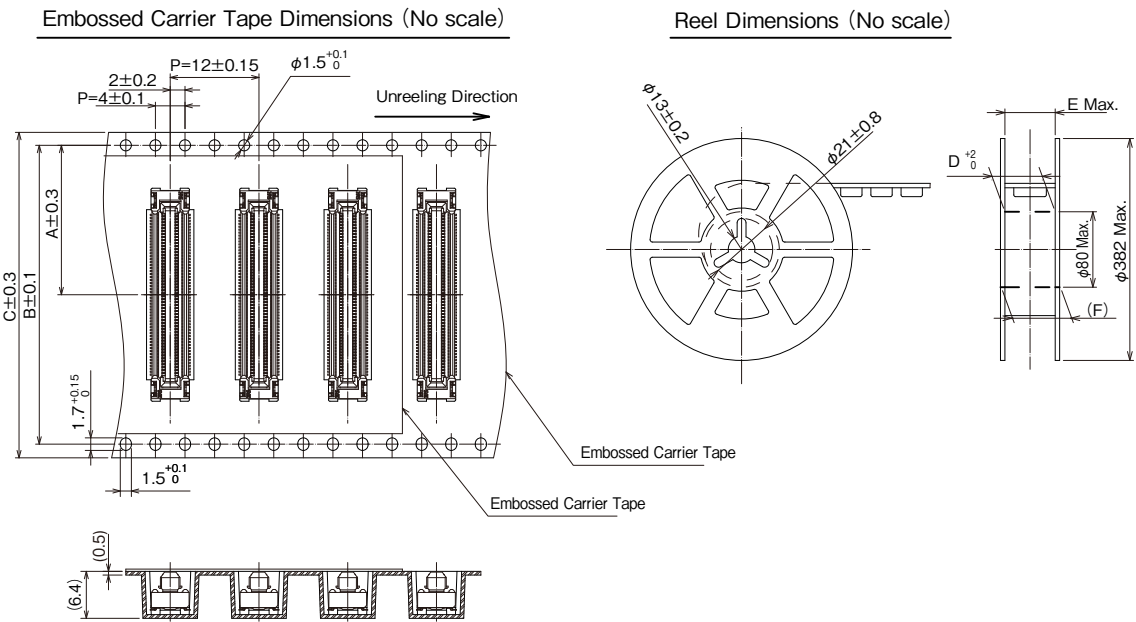
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
FX25-40S-0.4SH	Under Planning (Note)	40	13.7	7.6	12.6	-
FX25-60S-0.4SH	Under Planning (Note)	60	17.7	11.6	16.6	
FX25-80S-0.4SH	CL0575-4101-0-00	80	21.7	15.6	20.6	1,000psc per reel
FX25-100S-0.4SH	Under Planning (Note)	100	25.7	19.6	24.6	-
FX25-110S-0.4SH	CL0575-4102-0-00	110	27.7	21.6	26.6	1,000psc per reel
FX25-120S-0.4SH	Under Planning (Note)	120	29.7	23.6	28.6	-

Note : Pin counts without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Packaging Specifications

Header (FX25-##P-0.4SV)

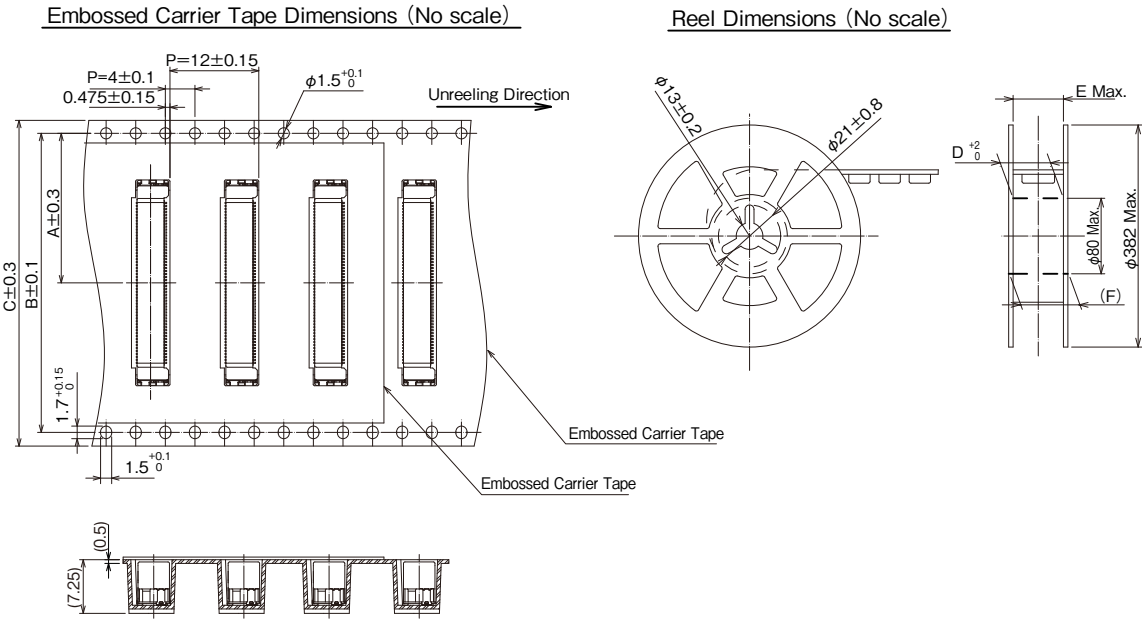


Unit : mm

Part No.	HRS No.	A	B	C	D	E	F
FX25-40P-0.4SV	Under Planning (Note 1)	-	-	-	-	-	-
FX25-60P-0.4SV	Under Planning (Note 1)	-	-	-	-	-	-
FX25-80P-0.4SV	CL0575-4001-0-00	20.2	40.4	44.0	44.4	47.4	50.4
FX25-100P-0.4SV	Under Planning (Note 1)	-	-	-	-	-	-
FX25-110P-0.4SV	CL0575-4002-0-00	20.2	40.4	44.0	44.4	47.4	50.4
FX25-120P-0.4SV	Under Planning (Note 1)	-	-	-	-	-	-

Note : Pin counts without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Receptacle (FX25-##S-0.4SH)

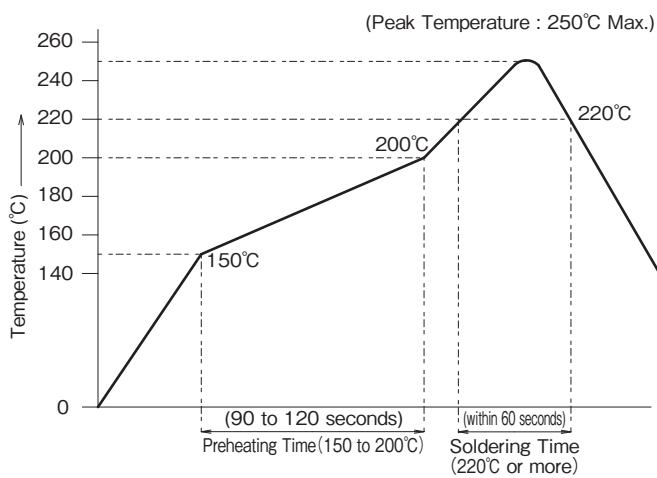


Unit : mm

Part No.	HRS No.	A	B	C	D	E	F
FX25-40S-0.4SH	Under Planning (Note)	-	-	-	-	-	-
FX25-60S-0.4SH	Under Planning (Note)	-	-	-	-	-	-
FX25-80S-0.4SH	CL0575-4101-0-00	20.2	40.4	44.0	44.4	47.4	50.4
FX25-100S-0.4SH	Under Planning (Note)	-	-	-	-	-	-
FX25-110S-0.4SH	CL0575-4102-0-00	20.2	40.4	44.0	44.4	47.4	50.4
FX25-120S-0.4SH	Under Planning (Note)	-	-	-	-	-	-

Note : Pin counts without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Recommended Temperature Profile



< Applicable Conditions >

Test PCB Dimensions : 110 × 60 × 1.6mm
Material : Glass epoxy
Solder Composition : Sn-3Ag-0.5Cu
Flux Content : 11wt%
Metal Mask Thickness : 0.12mm, 0.15mm
Number of Reflow Times : 2 times Max.

This temperature profile is for the above conditions.
The temperature profile may vary depending on the type of cream solder, the manufacturer, the board size and other conditions such as mounting materials. Please check the mounting status before use.

Cleaning Conditions

Organic Solvent Cleaning

Solvent	Cleaning at Normal Temperature	Heated Cleaning
IPA (Isopropyl Alcohol)	OK	OK

Water-Based Cleaning

When using water-based cleaning agents (e.g., terpene, and alkali saponifiers), select the cleaning agent based on the documentation issued by the various manufacturers, which describes its effects on metals and resins. Do not to leave moisture on the connectors.

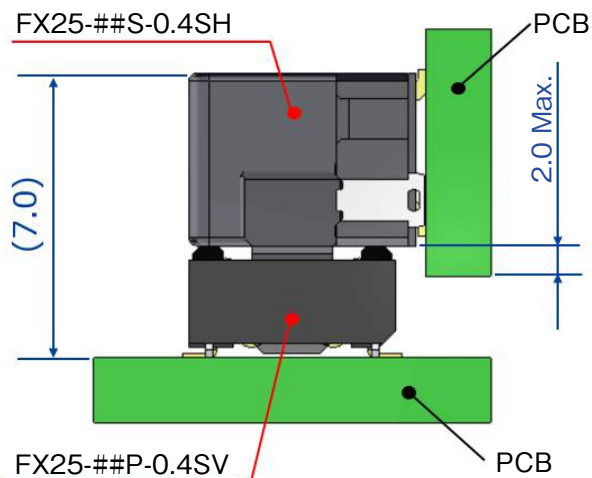
Cleaning Precautions

Residual flux or cleaning agents on the connectors from cleaning with organic solvents or water-based cleaners may cause deterioration of the electrical performance. It is important to check that a thorough washing has been performed.

Precautions During Use

Specified Dimensions Between PCBs

Please confirm the Drawing and use within the specified dimensions.



Securing PCBs

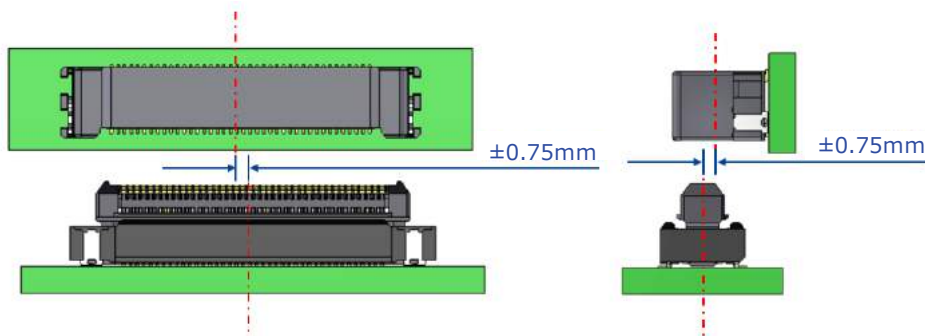
Using only connectors is not recommended. If the board is supported only by the connector, an excessive load may be applied to the connector which may result in damage or contact failure.

Take measures to secure the board other than using the connector.

Mating Precautions

The self-alignment range is $\pm 0.75\text{mm}$ in the X and Y directions.

While following the guide, insert the connector straight in without applying excessive load during mating.



Self-Alignment Range :

X Axis Direction (Longitudinal Direction) : $\pm 0.75\text{mm}$

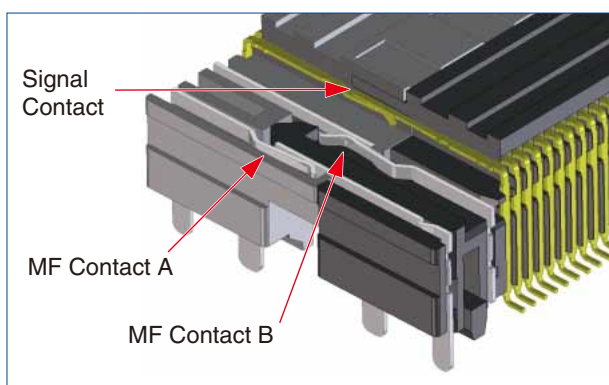
Y Axis Direction (Lateral Direction) : $\pm 0.75\text{mm}$

Mating Precautions

It is recommended to operate the connector straight without tilting the connector. If it is not possible to operate the connector straight due to the layout of the board or the panel design, refrain from bending the connector as much as possible during mating while making sure not to apply excessive force. When mating is completed, align the connectors so they are connected straight.

High Speed Transmission, 0.8mm Pitch Connectors for PCB Connections

FX18 Series



■ Features

- 0.8mm pitch
- Connection type : Coplanar /right angle / parallel (height : 10 to 45mm)
- No of pos.: 40, 60, 80, 100, 120, 140
- MF (multi-functional) contact

The FX18 series utilizes guideposts on both sides of the connector. These guide posts double as multi-functional contacts as well as an aligning structure.

- 1) Enhanced ground connections between PCB's
- 2) Capable of being used as power source lines (3 A/line)
- 3) A sequenced 3-level structure that contains signal contacts

- Effective mating length of 2mm (Signal contact)

This connector utilizes a 2.0mm effective mating length for its signal contacts and provides a sufficient amount of margin for its mating sequence. (MF contact A : 2.5mm/ MF contact B : 1.5mm)

- Resistant to excess mating force

The structure is equipped with dip contacts that help prevent damage caused by excessive mating forces and provides stability to both sides of the connector.

- Simplified mating with large guides

Generous lead-in shape simplifies the mating operation. (lead in opening amount : ± 1 mm). The guides also prevent inverse mating.

■ High speed transmission characteristics

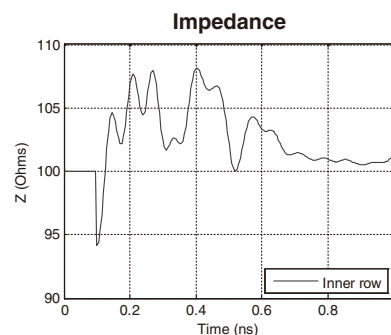
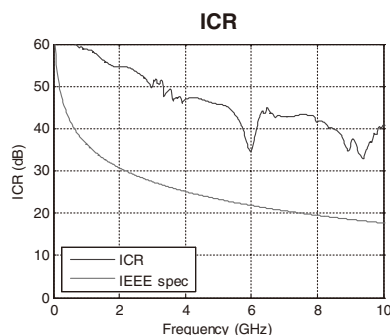
● ICR

(Insertion-loss-to-Crosstalk-Ratio)

Enough margin with regulated ICR data of IEEE802.3ap 10 Gbps transmission standard.

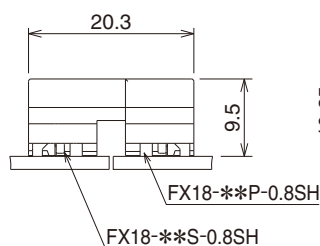
● Differential impedance data

With a strict time of $T_r = 35$ ps, its contact structure matches 100 Ohm $\pm 10\%$ differential impedance.

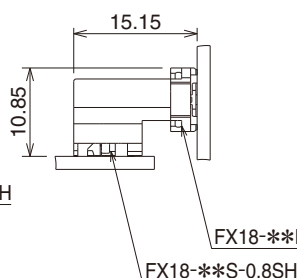


■ Mating variation diagram

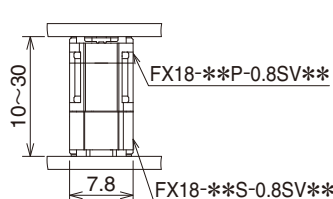
Coplanar connection type



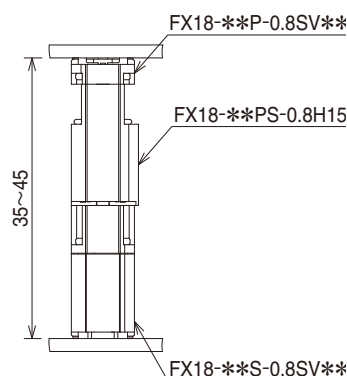
Right angle connection type



Parallel connection type (2 piece)



Parallel connection type (3 piece)



Product Specifications

Ratings	Rated Current	0.5A (signal contacts) 3.0A (MF contact) (Note 3)	Operating Temperature Range : -55~85°C (Note 1) Storage Temperature Range : -10~60°C (Note 2)
	Rated Voltage	AC100V	

Item	Specifications	Conditions
1. Contact Resistance	Maximum of 90mΩ	Measured with 100mA
2. Insulation Resistance	Minimum of 1,000MΩ	Measured with DC 250V
3. Withstanding Voltage	No flashover or breakdown	Electrification for 1 minutes at AC 300V
4. Durability	Contact Resistance: Maximum of 100mΩ	500 mating cycles
5. Vibration Resistance	No electrical discontinuity of 1μ or greater	10 cycles each for the three axial directions (1 cycle = 5 minutes) at frequency 10-55 Hz, half amplitude 0.75mm
6. Shock Resistance	No electrical discontinuity of 1μ or greater	Acceleration: 490m/s ² , Retention time: 11ms, Semi-sinusoidal 3 axes both directions 3 times each.
7. Humidity Resistance	Contact Resistance:Maximum of 100mΩ Insulation Resistance: Minimum of 1,000MΩ	96 hours at temperature : 40°C and humidity : 90~95%
8. Temperature Cycles	Contact Resistance: Maximum of 100mΩ Insulation Resistance: Minimum of 1,000MΩ	Temperature -55 °C → 85°C Time 30 → 30 minutes 5 cycles

(Note 1) Includes the temperature rise of power lines

(Note 2) The term "storage" refers to the long-term storage condition of unused products before PCB mounting.

(Note 3) Rated current is per contact.

Materials

●Right angle receptacle/right angle header/straight header

Component	Materials	Color/Finish	Specifications
Insulator	Polyamide resin	Black	UL94V-0
Signal Contact	Phosphorous bronze	Contact part : Gold plating Mounting part : Gold plating	————
MF Contact	Phosphorous bronze	Contact part : Gold plating Mounting part : Pure tin plating	————

●Straight header 10mm height /Straight receptacle 15mm and 20mm heights

Component	Materials	Color/Finish	Specifications
Insulator	Polyamide resin	Black	UL94V-0
Signal Contact	Phosphorous bronze	Contact part : Gold plating Mounting part : Gold plating	————
MF Contact	Copper alloy	Contact part : Gold plating Mounting part : Pure tin plating	————

●Straight receptacle 10mm height

Component	Materials	Color/Finish	Specifications
Insulator	Polyamide resin	Black	UL94V-0
Signal Contact	Copper alloy	Contact part : Gold plating Mounting part : Gold plating	————
MF Contact	Copper alloy	Contact part : Gold plating Mounting part : Pure tin plating	————

●Interposer 15mm height

Component	Materials	Color/Finish	Specifications
Insulator	Polyamide resin/PBT resin	Black	UL94V-0
Signal Contact	Copper alloy	Contact part : Gold plating	————
MF Contact	Copper alloy	Contact part : Gold plating	————

Product Number Structure

Refer to the charts below for determining specific part number characteristics.

Please select connectors listed in this catalog when placing orders and be sure to check the latest delivery specifications at the time of ordering the product.

● Right angle receptacle

FX18 - 60 S - 0.8 SH

① ② ③ ④ ⑤

● Right angle header

FX18 - 60 P - 0.8 SH

① ② ③ ④ ⑤

● Straight header

FX18 - 60 P - 0.8 SV 10

① ② ③ ④ ⑤ ⑥

● Straight receptacle

FX18 - 60 S - 0.8 SV 15

① ② ③ ④ ⑤ ⑥

● Interposer

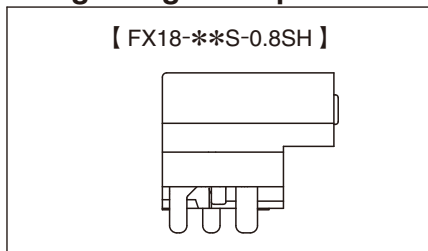
FX18 - 60 PS - 0.8 H 15

① ② ③ ④ ⑤ ⑥

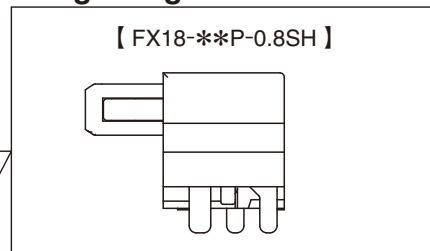
① Series Name	: FX18
② No. of Contacts	
③ Connector Type	S : Receptacle type P : Header type
④ Contact Pitch	: 0.8mm
⑤ Product Shape	SH : Right angle type SV : Straight type H : Interposer type
⑥ Stacking Height	

FX18 Series Mating Diagram

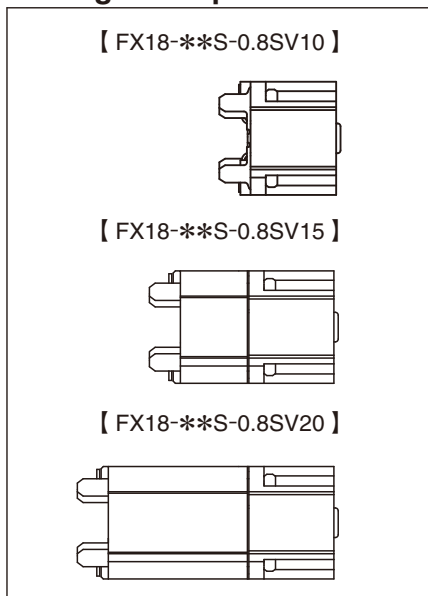
● Right angle receptacle



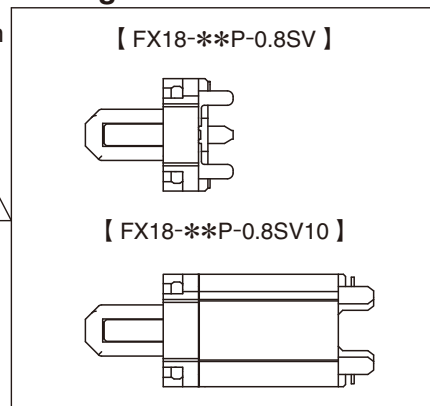
● Right angle header



● Straight receptacle



● Straight header

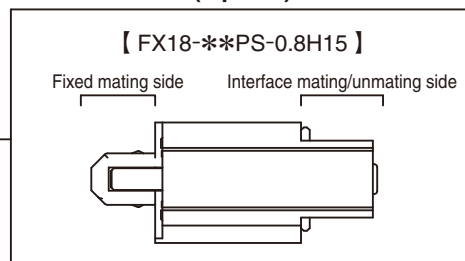


Coplanar connection

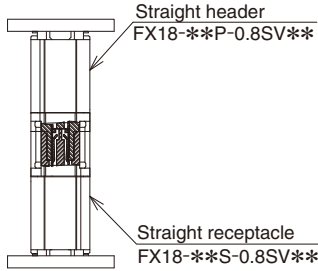
Right angle connection

Parallel connection
(2 piece)

Parallel connection
(3 piece)



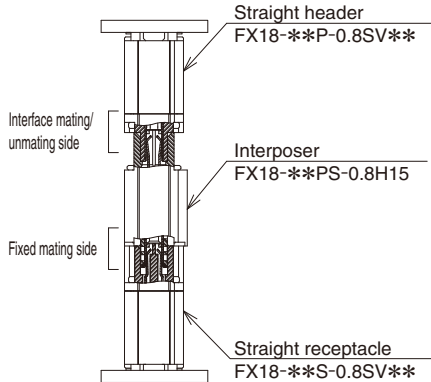
2 piece Parallel Connection Type



Stack height variation table (2 piece)

	FX18-**-P-0.8SV	FX18-**-P-0.8SV10
FX18-**-S-0.8SV10	10mm	20mm
FX18-**-S-0.8SV15	15mm	25mm
FX18-**-S-0.8SV20	20mm	30mm

3 piece parallel connection type



Stack height variation table (3 pieces)

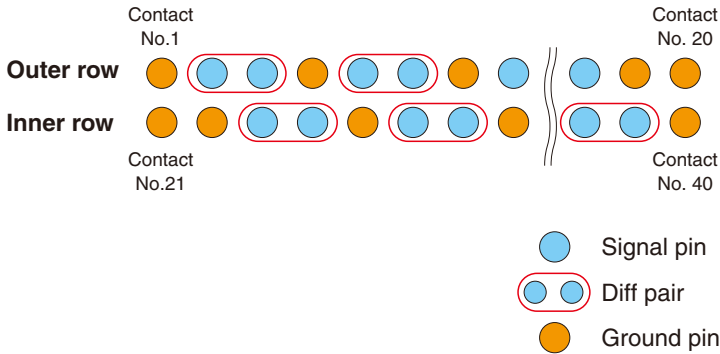
	FX18-**-PS-0.8H15	
	FX18-**-P-0.8SV	FX18-**-P-0.8SV10
FX18-**-S-0.8SV10	25mm	35mm
FX18-**-S-0.8SV15	30mm	40mm
FX18-**-S-0.8SV20	35mm	45mm

SI Data

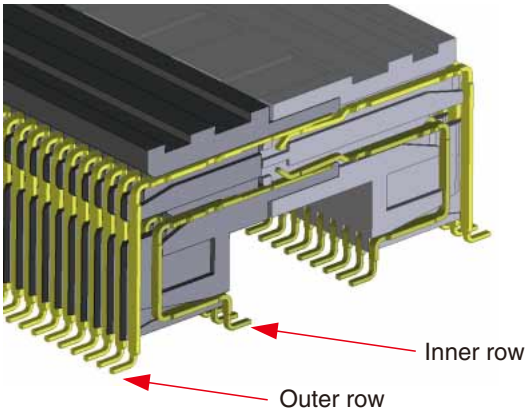
Contact assignment

We recommend the following contact configuration to match 100 ohm differential impedance and reduce crosstalk.

Contact assignment (40 pos.)

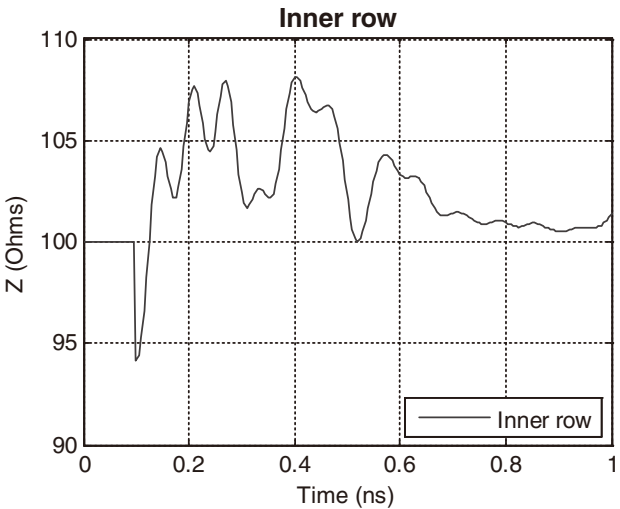
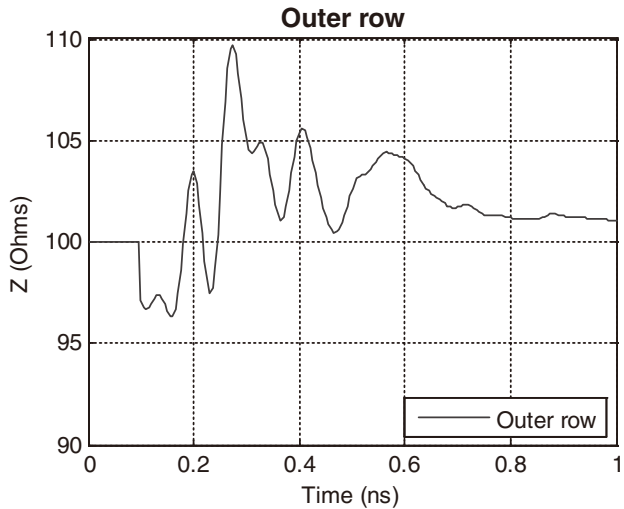


Coplanar connection type showing signal contact shape



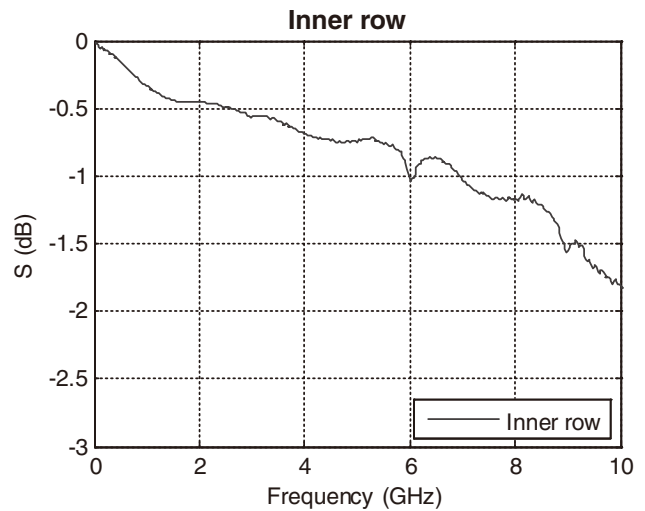
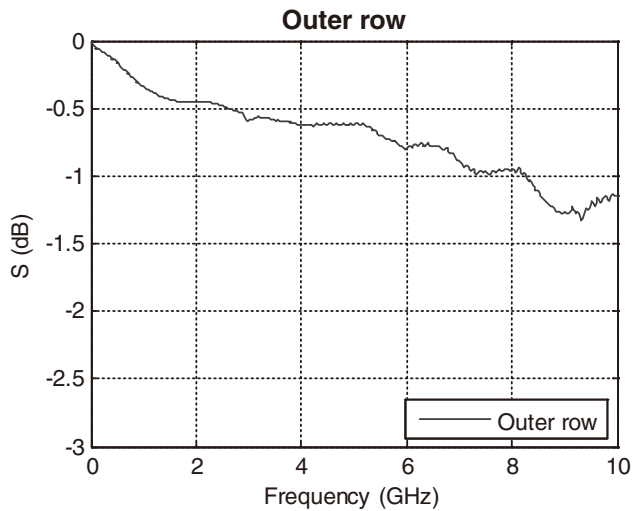
Impedance

Satisfies $100\Omega \pm 10\%$ at $T_r = 35$ ps



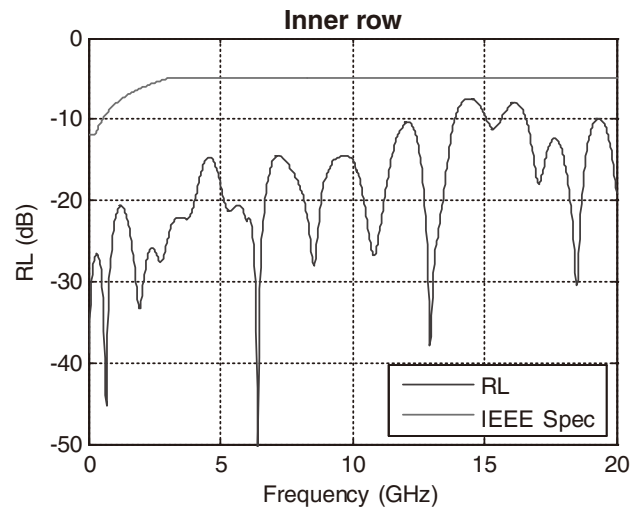
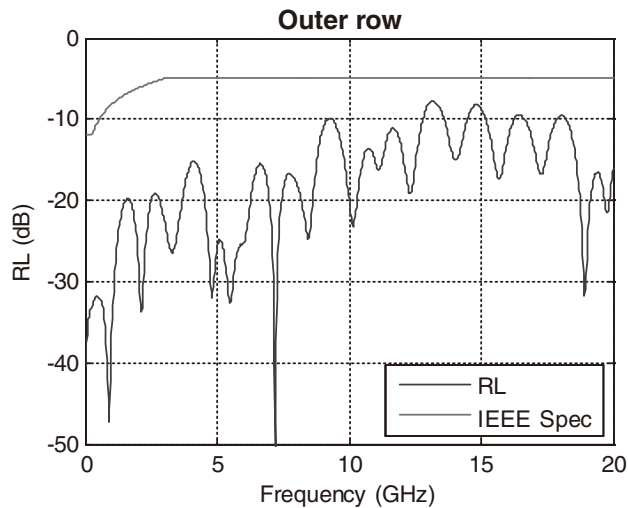
● Insertion loss

Maintains a good insertion loss of up to 10 GHz



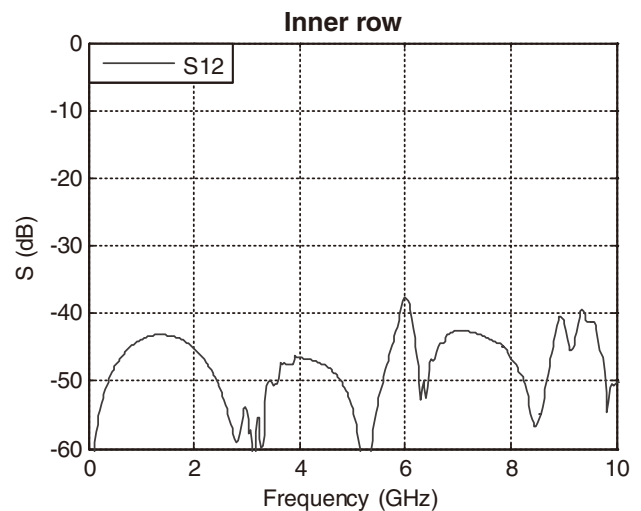
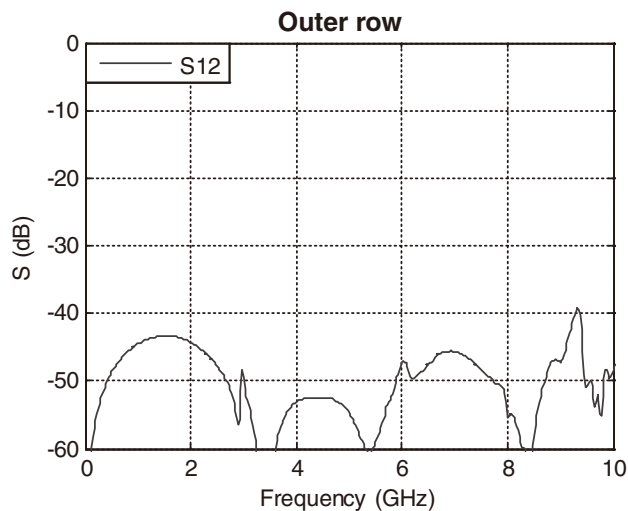
● Return loss

Enough margin to satisfy IEEE802.3ap 10 Gbps transmission protocol.



● NEXT

Lower crosstalk up to 10 GHz



Contact assignment (40 pos.)

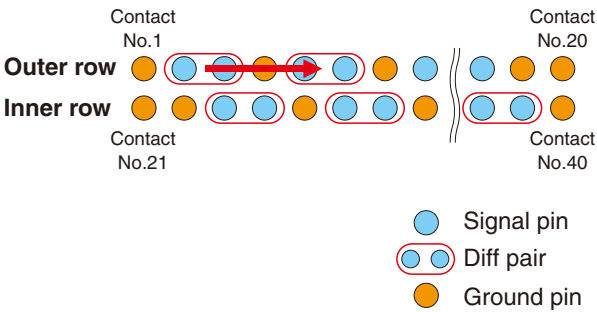


Fig 1.

Contact assignment (40 pos.)

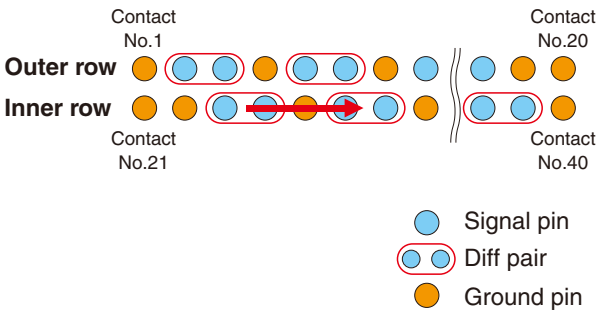
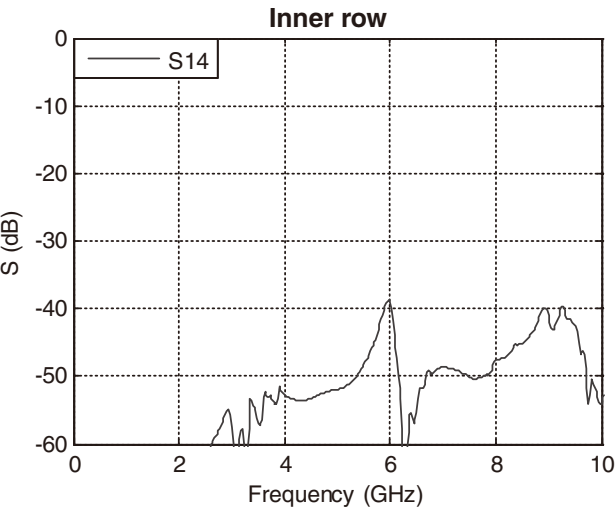
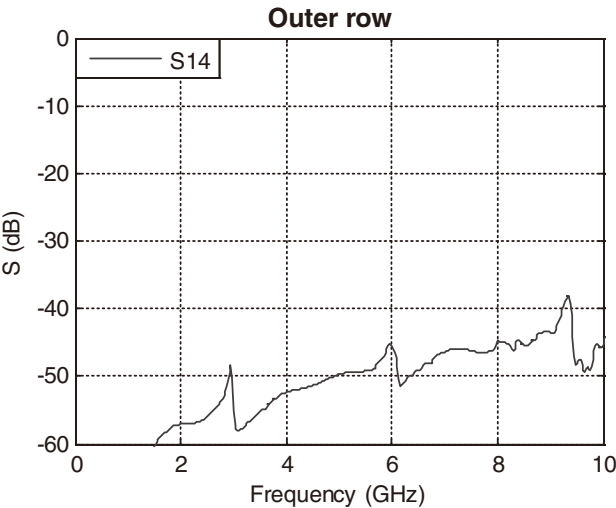


Fig 2.

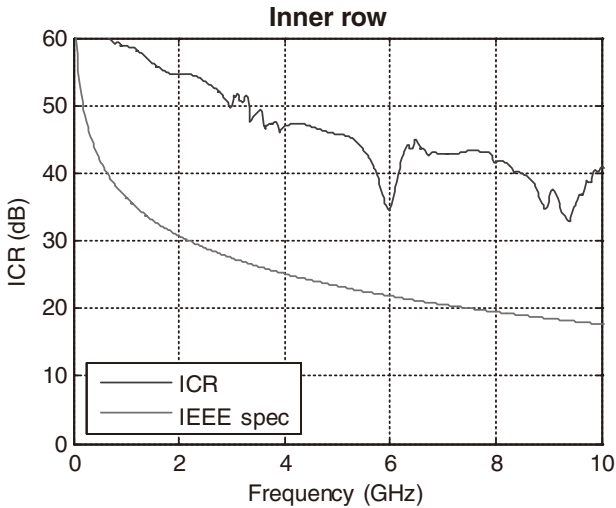
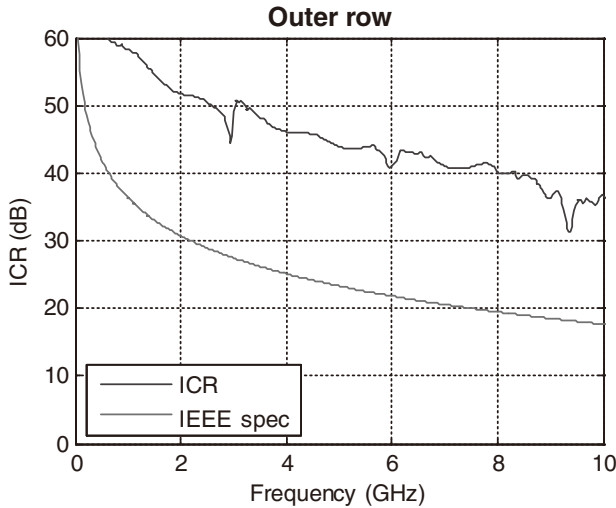
●FEXT

Lower crosstalk up to 10 GHz

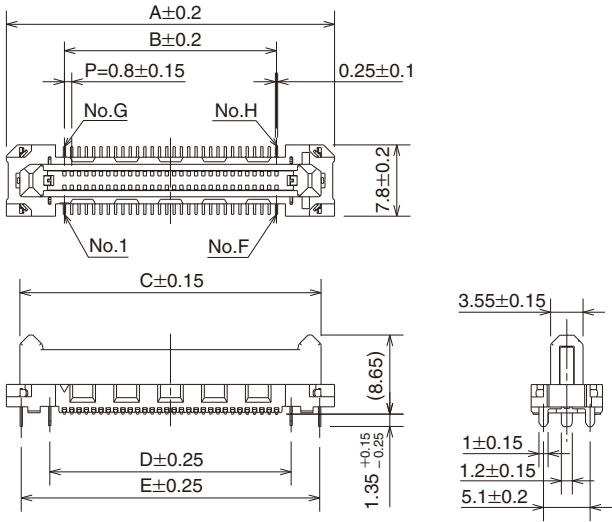
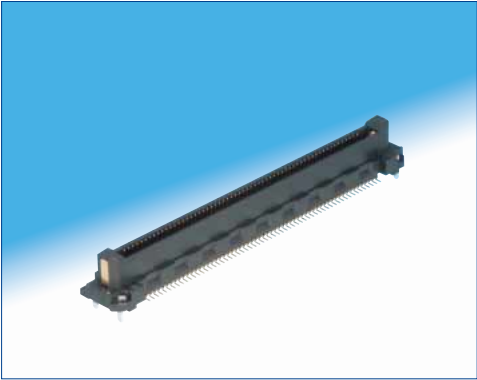


●ICR-FEXT

Enough margin to satisfy IEEE802.3ap 10 Gbps transmission protocol.



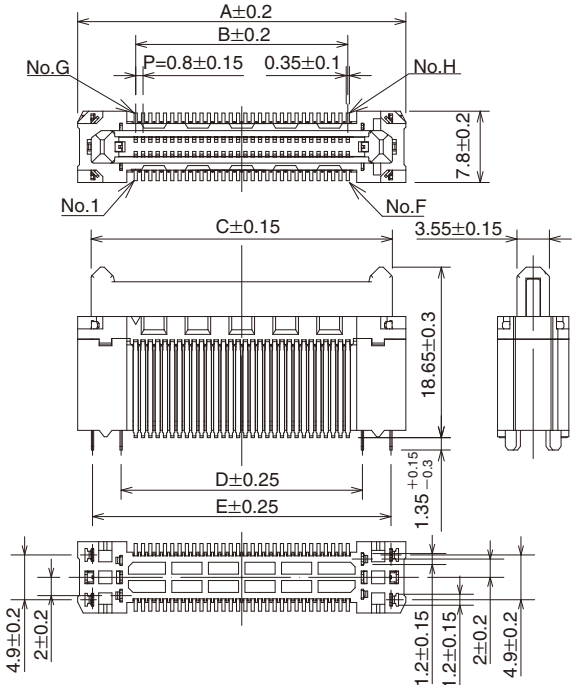
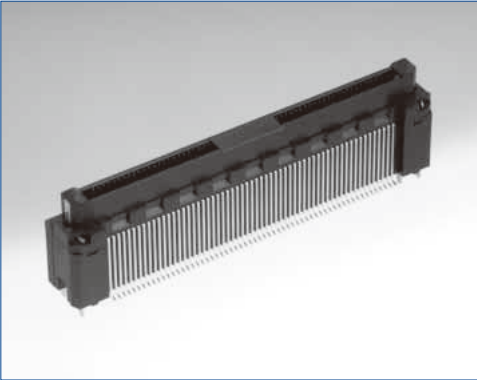
●Straight header



Unit : mm

Part No.	HRS No.	A	B	C	D	E	F	G	H (No of contacts)
FX18-40P-0.8SV	579-0016-0	27.9	15.2	24.95	18.4	24.65	20	21	40
FX18-60P-0.8SV	579-0017-2	35.9	23.2	32.95	26.4	32.65	30	31	60
FX18-80P-0.8SV	579-0018-5	43.9	31.2	40.95	34.4	40.65	40	41	80
FX18-100P-0.8SV	579-0019-8	51.9	39.2	48.95	42.4	48.65	50	51	100
FX18-120P-0.8SV	579-0020-7	59.9	47.2	56.95	50.4	56.65	60	61	120
FX18-140P-0.8SV	579-0021-0	67.9	55.2	64.95	58.4	64.65	70	71	140

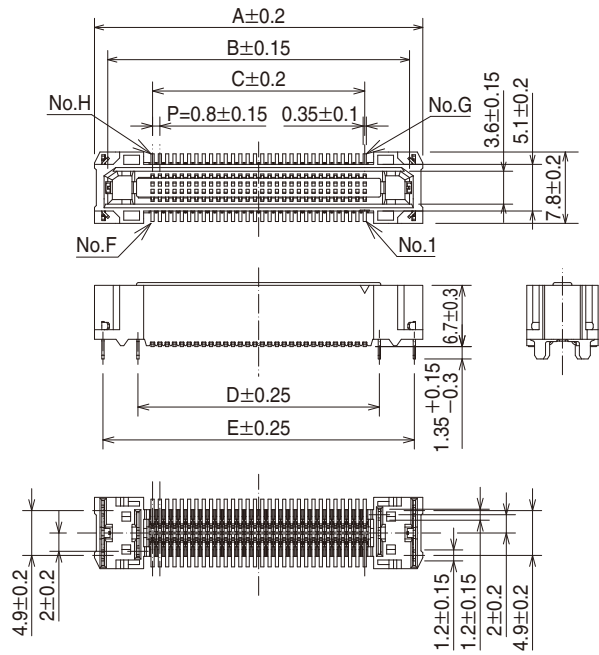
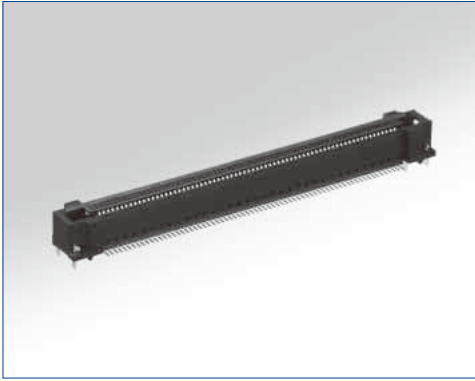
● Straight header (10mm stack height)



Unit : mm

Part No.	HRS No.	A	B	C	D	E	F	G	H (No of contacts)
FX18-40P-0.8SV10	579-0022-2	27.9	15.2	24.95	18.4	24.65	20	21	40
FX18-60P-0.8SV10	579-0023-5	35.9	23.2	32.95	26.4	32.65	30	31	60
FX18-80P-0.8SV10	579-0024-8	43.9	31.2	40.95	34.4	40.65	40	41	80
FX18-100P-0.8SV10	579-0034-1	51.9	39.2	48.95	42.4	48.65	50	51	100
FX18-120P-0.8SV10	579-0025-0	59.9	47.2	56.95	50.4	56.65	60	61	120
FX18-140P-0.8SV10	579-0035-4	67.9	55.2	64.95	58.4	64.65	70	71	140

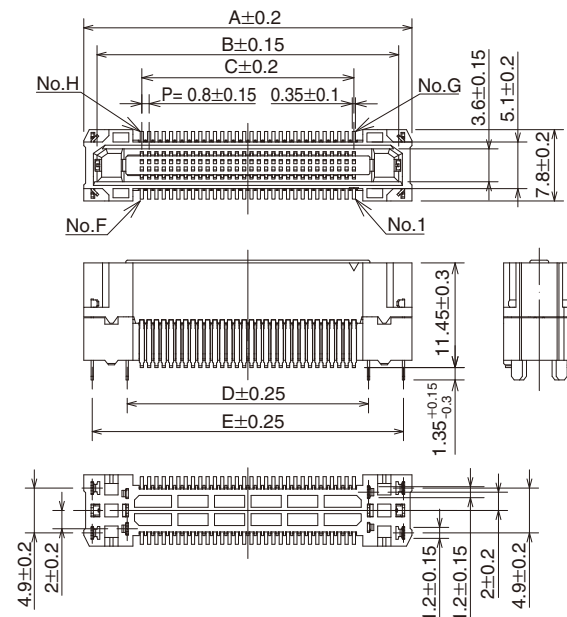
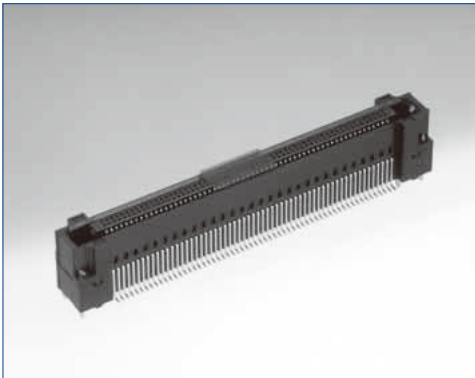
● Straight receptacle (10mm stack height)



Unit : mm

Part No.	HRS No.	A	B	C	D	E	F	G	H (No. of contacts)
FX18-40S-0.8SV10	579-0055-1	27.9	25	15.2	18.4	26.05	20	21	40
FX18-60S-0.8SV10	579-0056-4	35.9	33	23.2	26.4	34.05	30	31	60
FX18-80S-0.8SV10	579-0057-7	43.9	41	31.2	34.4	42.05	40	41	80
FX18-100S-0.8SV10	579-0058-0	51.9	49	39.2	42.4	50.05	50	51	100
FX18-120S-0.8SV10	579-0059-2	59.9	57	47.2	50.4	58.05	60	61	120
FX18-140S-0.8SV10	579-0060-1	67.9	65	55.2	58.4	66.05	70	71	140

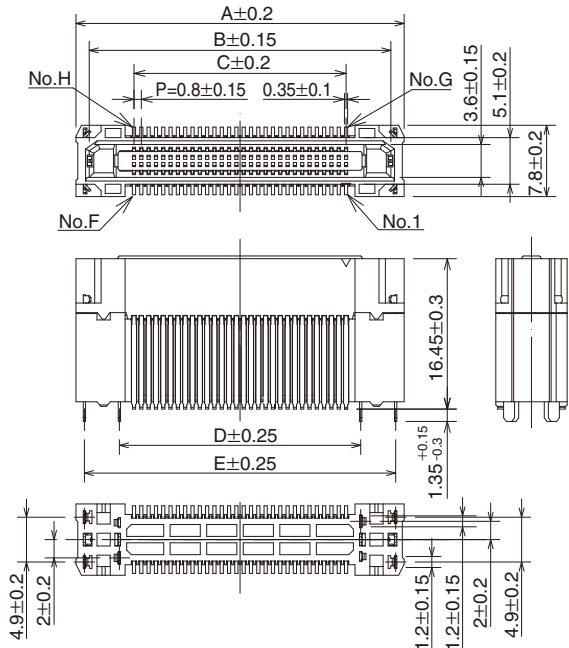
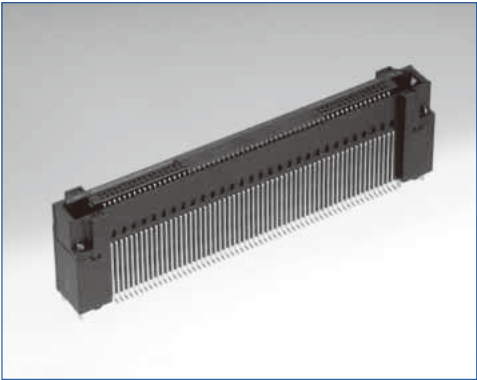
● Straight receptacle (15mm stack height)



Unit : mm

Part No.	HRS No.	A	B	C	D	E	F	G	H (No. of contacts)
FX18-40S-0.8SV15	579-0026-3	27.9	25	15.2	18.4	26.05	20	21	40
FX18-60S-0.8SV15	579-0027-6	35.9	33	23.2	26.4	34.05	30	31	60
FX18-80S-0.8SV15	579-0028-9	43.9	41	31.2	34.4	42.05	40	41	80
FX18-100S-0.8SV15	579-0036-7	51.9	49	39.2	42.4	50.05	50	51	100
FX18-120S-0.8SV15	579-0029-1	59.9	57	47.2	50.4	58.05	60	61	120
FX18-140S-0.8SV15	579-0037-0	67.9	65	55.2	58.4	66.05	70	71	140

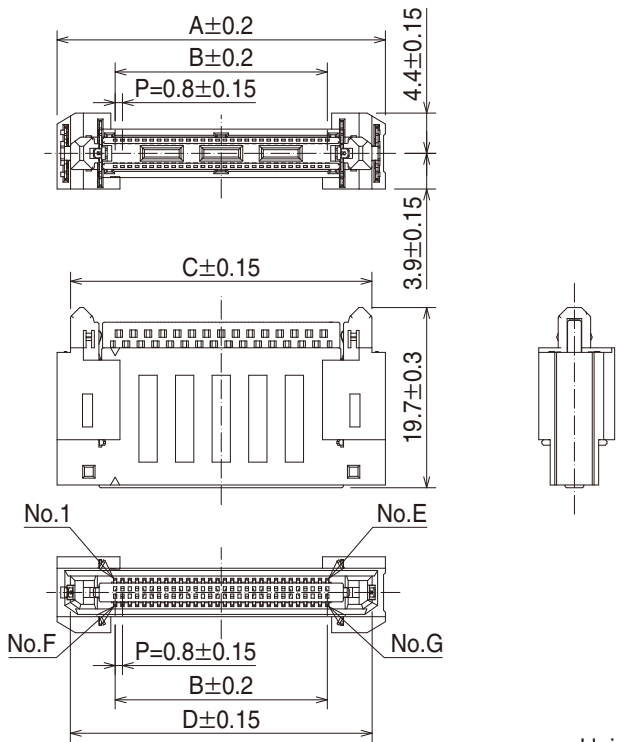
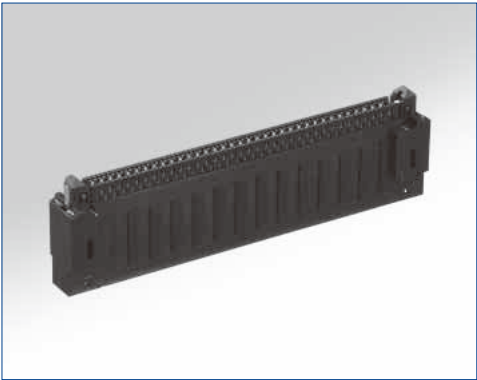
●Straight receptacle (20mm stack height)



Unit : mm

Part No.	HRS No.	A	B	C	D	E	F	G	H (No. of contacts)
FX18-40S-0.8SV20	579-0030-0	27.9	25	15.2	18.4	26.05	20	21	40
FX18-60S-0.8SV20	579-0031-3	35.9	33	23.2	26.4	34.05	30	31	60
FX18-80S-0.8SV20	579-0032-6	43.9	41	31.2	34.4	42.05	40	41	80
FX18-100S-0.8SV20	579-0038-2	51.9	49	39.2	42.4	50.05	50	51	100
FX18-120S-0.8SV20	579-0033-9	59.9	57	47.2	50.4	58.05	60	61	120
FX18-140S-0.8SV20	579-0039-5	67.9	65	55.2	58.4	66.05	70	71	140

●Interposer (15mm height)



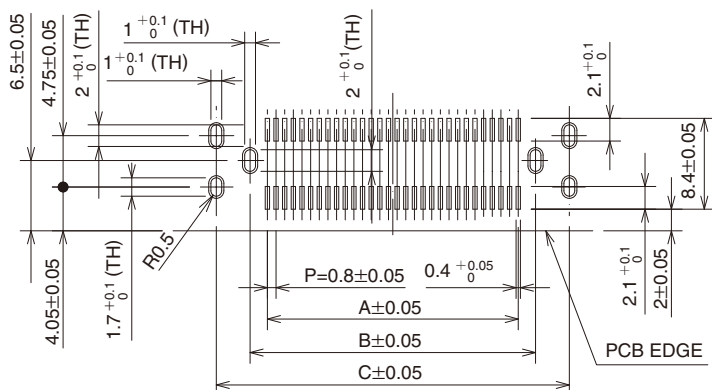
Unit : mm

Part No.	HRS No.	A	B	C	D	E	F	G (No. of contacts)
FX18-40PS-0.8H15	579-0049-9	27.9	15.2	24.95	25	20	21	40
FX18-60PS-0.8H15	579-0050-8	35.9	23.2	32.95	33	30	31	60
FX18-80PS-0.8H15	579-0051-0	43.9	31.2	40.95	41	40	41	80
FX18-100PS-0.8H15	579-0052-3	51.9	39.2	48.95	49	50	51	100
FX18-120PS-0.8H15	579-0053-6	59.9	47.2	56.95	57	60	61	120
FX18-140PS-0.8H15	579-0054-9	67.9	55.2	64.95	65	70	71	140

Recommended Land Pattern Dimensions

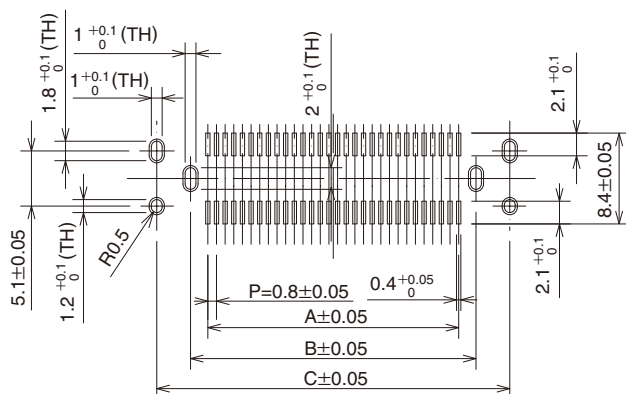
(PCB thickness : $t = 1.6\text{mm}$ /Metal mask thickness : $t = 0.12\text{mm}$)

Right angle receptacle/right angle header



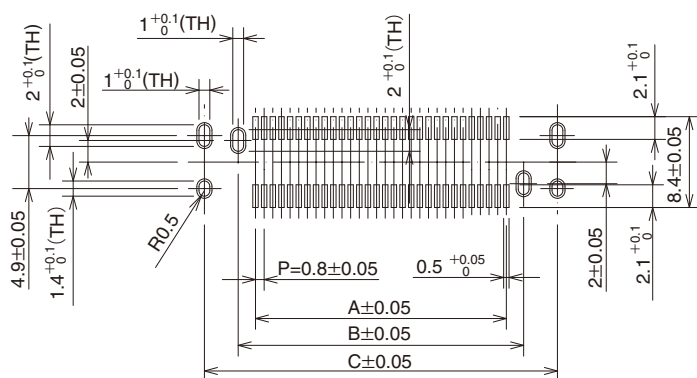
Part No.	A	B	C
FX18-40S-0.8SH	15.2	18.4	24.65
FX18-40P-0.8SH			
FX18-60S-0.8SH	23.2	26.4	32.65
FX18-60P-0.8SH			
FX18-80S-0.8SH	31.2	34.4	40.65
FX18-80P-0.8SH			
FX18-100S-0.8SH	39.2	42.4	48.65
FX18-100P-0.8SH			
FX18-120S-0.8SH	47.2	50.4	56.65
FX18-120P-0.8SH			
FX18-140S-0.8SH	55.2	58.4	64.65
FX18-140P-0.8SH			

Straight header



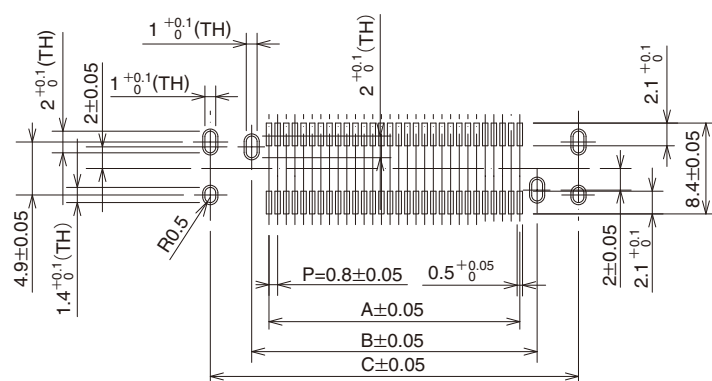
Part No.	A	B	C
FX18-40P-0.8SV	15.2	18.4	24.65
FX18-60P-0.8SV	23.2	26.4	32.65
FX18-80P-0.8SV	31.2	34.4	40.65
FX18-100P-0.8SV	39.2	42.4	48.65
FX18-120P-0.8SV	47.2	50.4	56.65
FX18-140P-0.8SV	55.2	58.4	64.65

Straight header (SV 10mm height)



Part No.	A	B	C
FX18-40P-0.8SV10	15.2	18.4	24.65
FX18-60P-0.8SV10	23.2	26.4	32.65
FX18-80P-0.8SV10	31.2	34.4	40.65
FX18-100P-0.8SV10	39.2	42.4	48.65
FX18-120P-0.8SV10	47.2	50.4	56.65
FX18-140P-0.8SV10	55.2	58.4	64.65

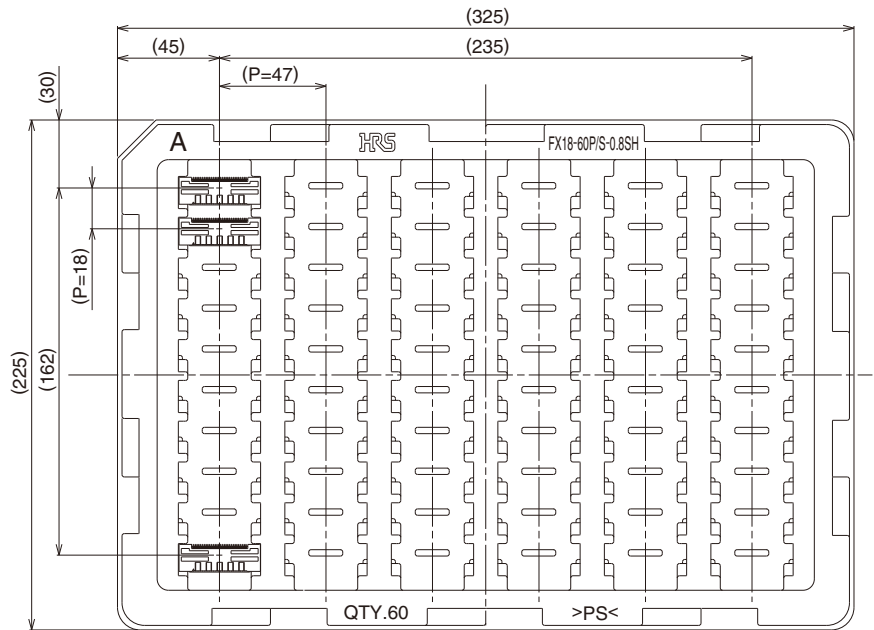
Straight receptacle (SV10/SV15/SV20mm heights)



Part No.	A	B	C
FX18-40S-0.8SV10/15/20	15.2	18.4	26.05
FX18-60S-0.8SV10/15/20	23.2	26.4	34.05
FX18-80S-0.8SV10/15/20	31.2	34.4	42.05
FX18-100S-0.8SV10/15/20	39.2	42.4	50.05
FX18-120S-0.8SV10/15/20	47.2	50.4	58.05
FX18-140S-0.8SV10/15/20	55.2	58.4	66.05

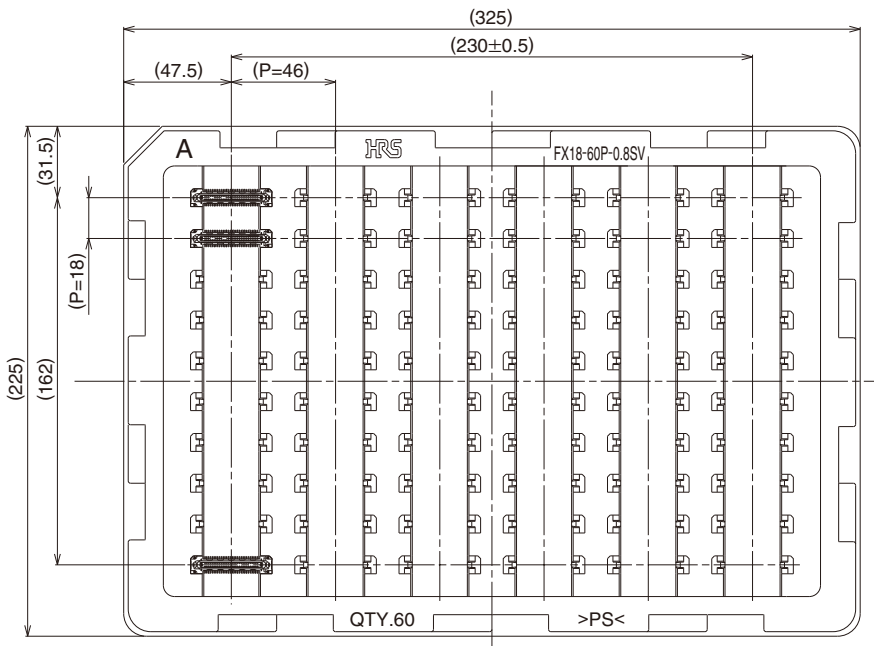
◆ Packaging tray (dimensions and quantities)

●Right angle receptacle/right angle header



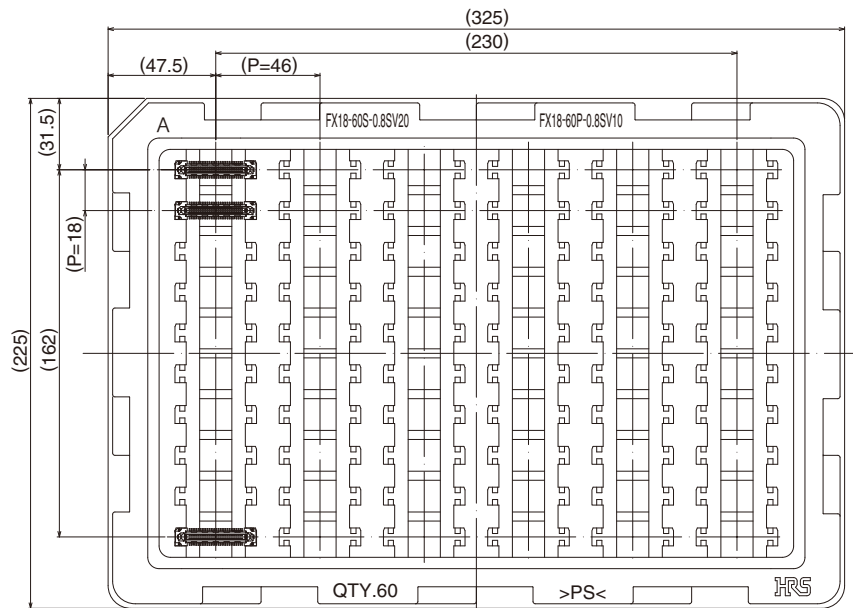
Part No.	Quantity
FX18-40S-0.8SH	70
FX18-40P-0.8SH	
FX18-60S-0.8SH	60
FX18-60P-0.8SH	
FX18-80S-0.8SH	50
FX18-80P-0.8SH	
FX18-100S-0.8SH	40
FX18-100P-0.8SH	
FX18-120S-0.8SH	40
FX18-120P-0.8SH	
FX18-140S-0.8SH	40
FX18-140P-0.8SH	

●Straight header/Straight receptacle for 10mm stack height



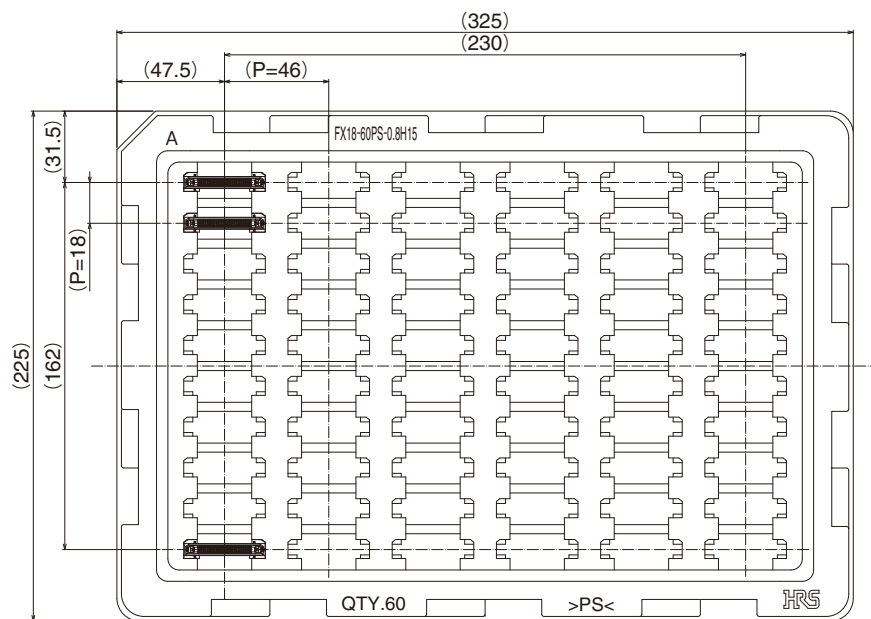
Part No.	Quantity
FX18-40P-0.8SV	70
FX18-40S-0.8SV10	
FX18-60P-0.8SV	60
FX18-60S-0.8SV10	
FX18-80P-0.8SV	50
FX18-80S-0.8SV10	
FX18-100P-0.8SV	40
FX18-100S-0.8SV10	
FX18-120P-0.8SV	40
FX18-120S-0.8SV10	
FX18-140P-0.8SV	40
FX18-140S-0.8SV10	

●Straight header 10mm/Straight receptacle 15mm/Straight receptacle 20mm



Part No.	Quantity
FX18-40P-0.8SV10	60
FX18-40S-0.8SV15	
FX18-40S-0.8SV20	
FX18-60P-0.8SV10	60
FX18-60S-0.8SV15	
FX18-60S-0.8SV20	
FX18-80P-0.8SV10	50
FX18-80S-0.8SV15	
FX18-80S-0.8SV20	
FX18-100P-0.8SV10	40
FX18-100S-0.8SV15	
FX18-100S-0.8SV20	
FX18-120P-0.8SV10	40
FX18-120S-0.8SV15	
FX18-120S-0.8SV20	
FX18-140P-0.8SV10	30
FX18-140S-0.8SV15	
FX18-140S-0.8SV20	

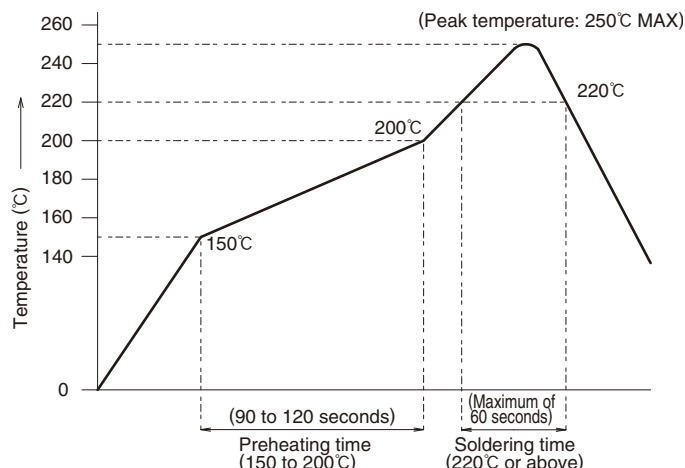
●Interposer 15mm height



Part No.	Quantity
FX18-40PS-0.8H15	60
FX18-60PS-0.8H15	60
FX18-80PS-0.8H15	50
FX18-100PS-0.8H15	40
FX18-120PS-0.8H15	40
FX18-140PS-0.8H15	30

◆ Temperature Profile

This temperature profile was tested under the following conditions, and any attempt to recreate will vary depending on the external conditions.



(Applicable Conditions)

Test PCB Size Dimensions : 110 × 50 × 1.6 (mm)

Material : Glass epoxy

Solder composition : Sn- 3 Ag- 0.5 Cu

Flux contained quantity : 11 wt%

Metal mask thickness : 0.12mm

(Note 1) This temperature profile contains

recommended values and is for reference only.

(Note 2) Reflow process should not exceed 2 times.

(Note 3) Cream solder type: Will differ due to the amount used and manufacturer

◆ Washing conditions

● Washing with organic solvent

Solvent	Washing in normal temperature	Washing in heated condition
IPA (Isopropyl alcohol)	○	○

● Water based cleaning

When using water based cleaning agents (including terpene, and alkali saponifiers), pay special attention to how the cleaning agent will react to specific metals and plastics before selecting one of them. Various cleaning agent manufacturers publish reaction tables for their cleaning agents. Do not leave connectors with moisture remaining on them.

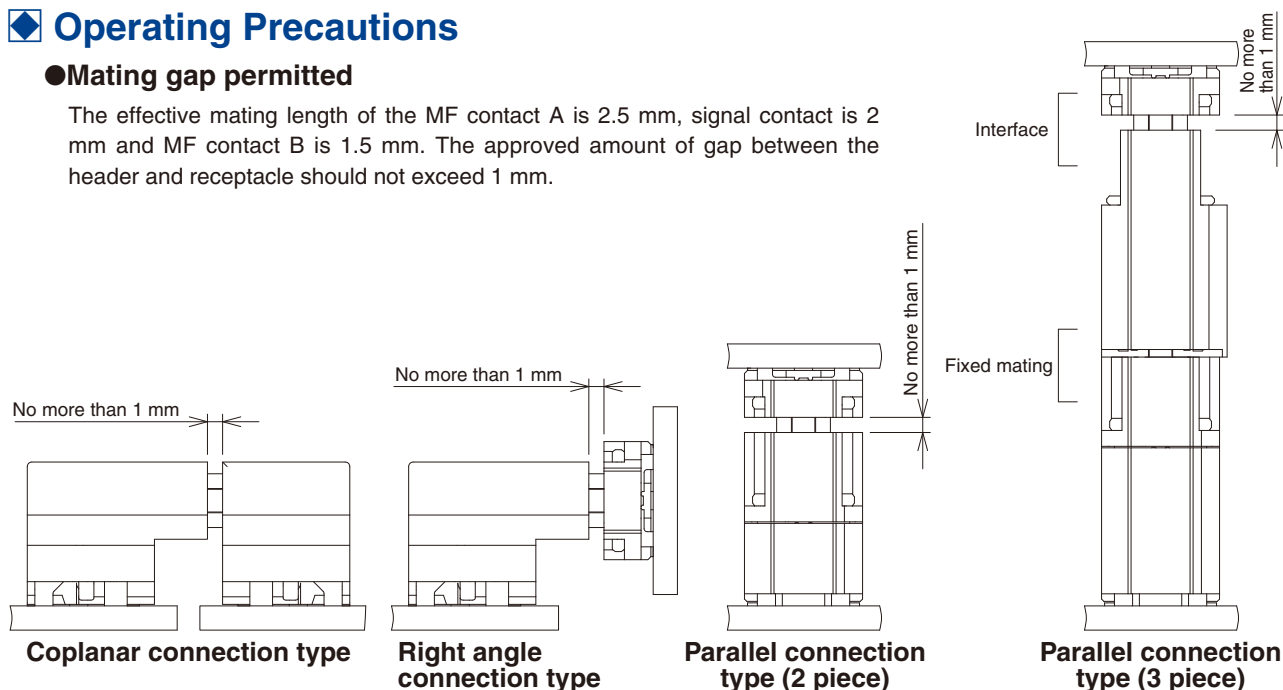
● Cautions when washing

The electrical performance may deteriorate if the flux or cleaning detergent is left on the connector after the cleaning. Check thoroughly to ensure that there is no residue left on any of the surfaces.

◆ Operating Precautions

● Mating gap permitted

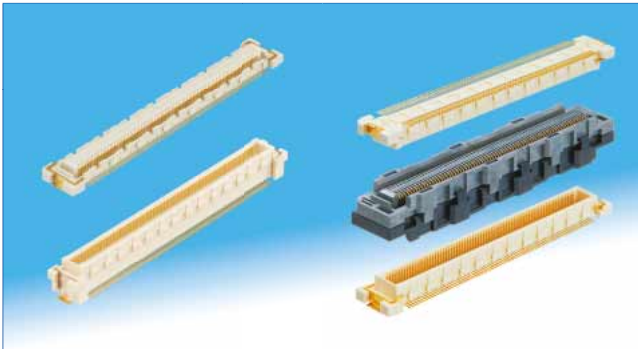
The effective mating length of the MF contact A is 2.5 mm, signal contact is 2 mm and MF contact B is 1.5 mm. The approved amount of gap between the header and receptacle should not exceed 1 mm.



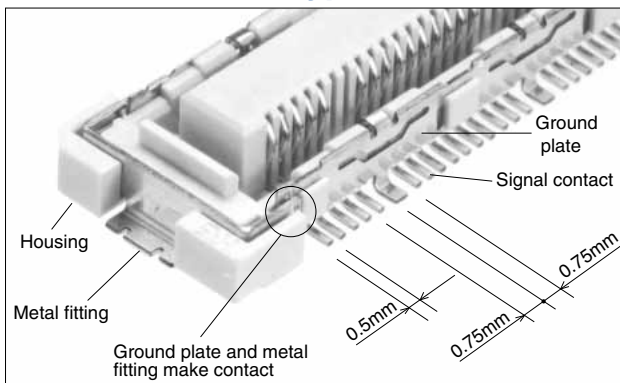
- Provide another form of support to the PCB, this connector was not designed to be the main form of support.
- Do not mate the connectors at an angle, refer to the rotation mating/unmating guideline (TADC 4-210630). (For the guideline, please contact the sales representative of our company.)
- When using the 15mm height interposer, be cautious of the items listed below.
 - 1) The lock on the fixed mating side of the interposer is not designed to be the mate/unmate point. This section should not be mated/unmated more than 5 times.
 - 2) When mating these connectors, make sure to mate the fixed mating side first then mate the interface mating/unmating side to the header.
 - 3) The effective mating length of the MF contact A is 2.5mm, signal contact is 2mm and MF contact B is 1.5mm.
 - 4) The approved amount of gap between the header and receptacle should not exceed 1 mm.

15+Gbps 0.5mm pitch Stacking Connectors

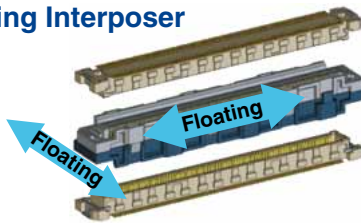
FX10 Series Electrical Interface for the OIF 100G Long-Haul DWDM Transmission Module (MSA-100GLH)



With GND Plate Type



Floating Interposer



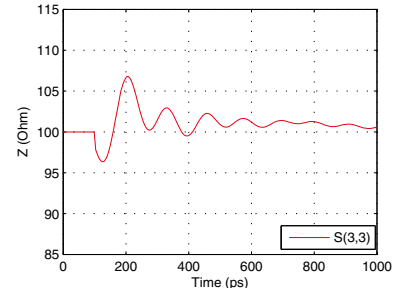
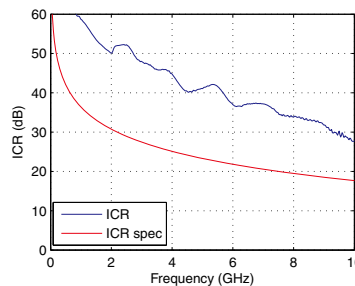
Signal Integrity Features

Insertion-Loss-to-Crosstalk-Ratio(ICR)

The insertion-loss-to-crosstalk-ratio (ICR) with five-aggressor differential FEXT meets the extrapolated IEEE 802.3ap specification for 15+Gbps.

Differential Impedance

85Ω configuration and 100Ω configuration are available.



Stack Height

2-piece type

With ground plate

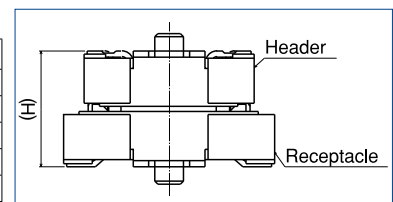
Receptacles	Headers	FX10#-xP/x-SV	FX10#-xP/x-SV1
FX10#-*S/*-SV		4mm	5mm

Without ground plate

Receptacles	Headers	FX10#-xP-SV	FX10#-xP-SV1	FX10#-xP-SV2	FX10#-xP-SV3	FX10#-xP-SV4
FX10#-*S-SV		4mm	5mm	6mm	7mm	8mm

3-piece type

Stacking Height	Header (Mating side)	Interposer	Header(Fixed side)
8mm	FX10#-xP-SV	FX10-xIP-xD(Q)-8H	FX10#-xP-SV
9mm	FX10#-xP-SV		FX10#-xP-SV1
10mm	FX10#-xP-SV1		FX10#-xP-SV1
11mm	FX10#-xP-SV2	FX10-xIP-xD(Q)-8PH	FX10#-xP-SV1
12mm	FX10#-xP-SV3		FX10#-xP-SV1
13mm	FX10#-xP-SV4		FX10#-xP-SV1



(H) : Reference dimension

Mechanical Features

0.5mm Pitch

Stacking height : 4 to 8mm (2-piece type) 8 to 13mm (3-piece type)

Number of Contacts

With ground plate : 80 / 100 / 120 / 140
Without ground plate : 96 / 120 / 144 / 168
3-piece interposer : 120 / 144 / 168

OIF MSA-100GLH Electrical Interface

FX10A-168P/S-SV(83) assembly is specified for the OIF 100G Long-Haul DWDM Transmission Module host line card - MSA-100GLH electrical connector.



Suited to High-Density Applications

The 0.5 mm signal contact pitch provides a smaller overall connector, using less mounting area on the board.

Optional Ground Plate

An alternate style without the ground plate is available. The space provided by the ground plate removal has been filled with additional signal contacts.
<3-piece type>

●Smooth floating with high speed transmission capability supported by unique 3-piece floating system

●Multiple connectors are allowed on the same PCB (Allowable Mis-alignment Range : ± 0.3mm in XY direction)

General Product Specifications (2 piece type)

Rating	Rated current	0.3 A	Operating temperature range	-55 to 85°C (Note 1)	Storage temperature range	-10 to +60°C (Note 2)
	Rated voltage	50 V AC	Operating humidity range	Relative humidity 95% max (No condensation)	Storage humidity range	40 to 70% (Note 2)

Item	Requirements	Conditions
1. Insulation resistance	100MΩ min	Measured at 100 V DC
2. Voltage resistance	No flashover or breakdown	150 V AC applied for 1 minute
3. Contact resistance	60mΩ max	Measured at 100 mA
4. Vibration resistance	No electrical discontinuity for 1μs or greater No damage, cracks, or parts looseness	Frequency : 10 to 55 Hz, amplitude of 0.75 mm in 3 axis directions, 10 cycles each.
5. Shock resistance	No electrical discontinuity for 1μs or greater No damage, cracks, or parts looseness	Acceleration of 490 m/s ² , 11ms duration, sine half-wave waveform, for 3 cycles in both directions of each of the 3 axes
6. Damp heat (Steady state)	Contact resistance of 70mΩ max, insulation resistance of 100MΩ min, no damage, cracks, or parts looseness	Temperature of 40°C, humidity of 90 to 95%, duration 96 h
7. Temperature cycle	Contact resistance of 70mΩ max, insulation resistance of 100MΩ min, no damage, cracks, or parts looseness	Temperature : -55°C → 15 to 35°C → 85°C → 15 to 35°C Time : 30 min. → 2 to 3 min. → 30 min. → 2 to 3 min. for 5 cycles
8. Mating Cycles	Contact resistance of 70mΩ max No damage, cracks, or parts looseness	50 times
9. Resistance to soldering heat	No melting of resin portion which affects performance	Reflow : At the recommended temperature profile Soldering iron temperature : 360°C for 5 seconds

Note 1 : Includes temperature rise caused by current flow.

Note 2 : The term storage refers to unused products kept for a long time prior to board mounting. Operating temperature and humidity range are applicable to the non-conducting state after board assembly.

Note 3 : Information contained in this catalog represents general requirements for this series. Contact us for the drawings and specifications for a specific part number shown.

Materials / Finish

Part	Material	Finish	Notes
Insulator	LCP	Beige	UL94V-0
Contacts	Phosphor bronze	Header	Contact Area: Gold plating Lead Area: Tin plating
		Receptacle	Contact Area: Gold plating Lead Area: Flash plating
Ground plate	Phosphor bronze	Tin plating	_____
Metal fitting	Phosphor bronze	Tin plating	_____

Product Number Structure

Refer to the chart below when determining the product specifications from the product number.

Please select from the product numbers listed in this catalog when placing orders.

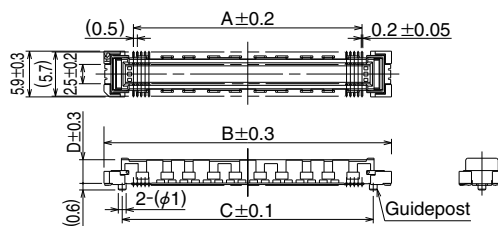
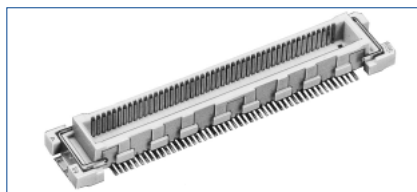
FX10 **#** - ***** **P** / ***** - **SV** **1** **(**)**

3

① Series name : FX10	④ Connector type P : Header S : Receptacle
② A : With guide post B : Without guide post	⑤ Mounting style SV : Straight SMT
③ Number of contacts With ground plate Signal/Ground : 80/8, 100/10, 120/12, 140/14 Without ground plate Signal : 96, 120, 144, 168	⑥ Product height Blank : Standard 1 : Standard + 1mm
	⑦ Packaging options Blank, (71) : Tray packaging (21), (91) : Embossed tape packaging

■Headers without ground plate

●4mm Stacking Height



Unit : mm

Part No.	HRS No.	No. of Contacts Signal	A	B	C	D	E	F	Remarks
FX10A-96P-SV(**)	570-0041-0 **	96	23.5	31.1	26.4	3.5	31.5	28.3	With guideposts
FX10A-120P-SV(**)	570-0042-2 **	120	29.5	37.1	32.4		37.5	34.3	
FX10A-144P-SV(**)	570-0043-5 **	144	35.5	43.1	38.4		43.5	40.3	
FX10A-168P-SV(**)	570-0044-8 **	168	41.5	49.1	44.4	4.5	49.5	46.3	
FX10A-96P-SV1(**)	570-0141-4 **	96	23.5	31.1	26.4		31.5	28.3	
FX10A-120P-SV1(**)	570-0142-7 **	120	29.5	37.1	32.4		37.5	34.3	
FX10A-144P-SV1(**)	570-0143-0 **	144	35.5	43.1	38.4	5.25	43.5	40.3	
FX10A-168P-SV1(**)	570-0144-2 **	168	41.5	49.1	44.4		49.5	46.3	
FX10A-120P-SV2(**)	570-0059-5 **	120	29.5	37.1	32.4		37.5	34.3	
FX10A-144P-SV2(**)	570-0056-7 **	144	35.5	43.1	38.4	6.25	43.5	40.3	
FX10A-168P-SV2(**)	570-0302-1 **	168	41.5	49.1	44.4		49.5	46.3	
FX10A-120P-SV3(**)	570-0060-4 **	120	29.5	37.1	32.4		37.5	34.3	
FX10A-144P-SV3(**)	570-0057-0 **	144	35.5	43.1	38.4	7.25	43.5	40.3	Without guideposts
FX10A-168P-SV3(**)	570-0304-7 **	168	41.5	49.1	44.4		49.5	46.3	
FX10A-120P-SV4(**)	570-0061-7 **	120	29.5	37.1	32.4		37.5	34.3	
FX10A-144P-SV4(**)	570-0058-2 **	144	35.5	43.1	38.4	3.5	43.5	40.3	
FX10A-168P-SV4(**)	570-0306-2 **	168	41.5	49.1	44.4		49.5	46.3	
FX10B-96P-SV(**)	570-0051-3 **	96	23.5	31.1	—		31.5	28.3	
FX10B-120P-SV(**)	570-0052-6 **	120	29.5	37.1	—	4.5	37.5	34.3	
FX10B-144P-SV(**)	570-0053-9 **	144	35.5	43.1	—		43.5	40.3	
FX10B-168P-SV(**)	570-0054-1 **	168	41.5	49.1	—		49.5	46.3	
FX10B-96P-SV1(**)	570-0151-8 **	96	23.5	31.1	—	5.25	31.5	28.3	
FX10B-120P-SV1(**)	570-0152-0 **	120	29.5	37.1	—		37.5	34.3	
FX10B-144P-SV1(**)	570-0153-3 **	144	35.5	43.1	—		43.5	40.3	
FX10B-168P-SV1(**)	570-0154-6 **	168	41.5	49.1	—	6.25	49.5	46.3	
FX10B-168P-SV2(**)	570-0303-4 **	168	41.5	49.1	—		49.5	46.3	
FX10B-168P-SV3(**)	570-0305-0 **	168	41.5	49.1	—		49.5	46.3	
FX10B-144P-SV4(**)	570-0063-0 **	144	35.5	43.1	—	7.25	43.5	40.3	
FX10B-168P-SV4(**)	570-0307-5 **	168	41.5	49.1	—		49.5	46.3	

[Specifications number]-**, (**)

(71) : Tray packaging / AuP 0.1μm

(83) : Embossed tape packaging 1RL : 1000pcs / AuP 0.76μm

(85) : Embossed tape packaging 1RL : 250pcs / AuP 0.76μm

(91) : Embossed tape packaging 1RL : 1000pcs / AuP 0.1μm

(93) : Tray packaging / AuP 0.76μm

Note 1: There is no polarity with respect to board mounting for this product.

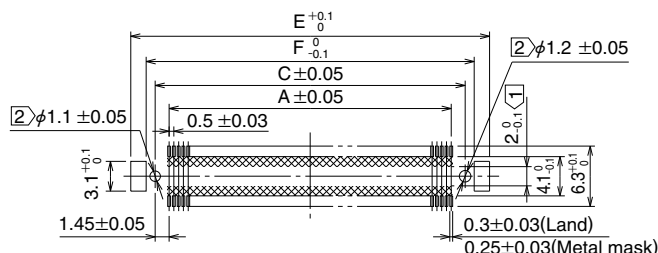
Note 2: The coplanarity of this product's SMT leads is 0.1mm or less.

Note 3: Please order embossed tape packaged items by the reel.

◆Recommended PCB Layout

Dimensions (Metal mask)

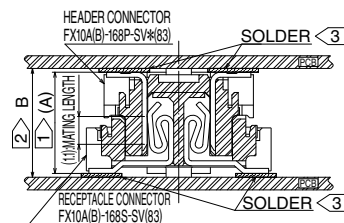
Recommended metal mask thickness : 0.15mm



Note ① The cross-hatched area  inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

Note ② Not required in products without guideposts.

■Board-to-Board Distance



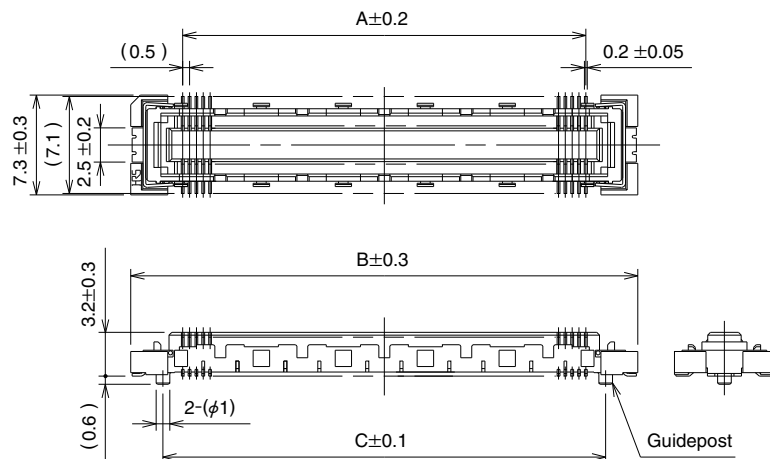
	FX10A(B)-168S-SV(83)	
	①(A)	②(B)
FX10A(B)-168P-SV(83)	4	4.3±0.127
FX10A(B)-168P-SV1(83)	5	5.3±0.127
FX10A(B)-168P-SV2(83)	6	6.0±0.127
FX10A(B)-168P-SV3(83)	7	7.0±0.127
FX10A(B)-168P-SV4(83)	8	8.0±0.127

Note ① Stacking height from lead to lead (reference dimensions)

② Board-to-board distance

③ Stencil (metal mask) shall be based on Hirose's recommended aperture and thickness.

■Receptacles without ground plate



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	D	E	Remarks
		Signal						
FX10A-96S-SV(**)	570-0241-9 **	96	23.5	31.1	26.4	31.5	28.3	With guideposts
FX10A-120S-SV(**)	570-0242-1 **	120	29.5	37.1	32.4	37.5	34.3	
FX10A-144S-SV(**)	570-0243-4 **	144	35.5	43.1	38.4	43.5	40.3	
FX10A-168S-SV(**)	570-0244-7 **	168	41.5	49.1	44.4	49.5	46.3	
FX10B-96S-SV(**)	570-0251-2 **	96	23.5	31.1	26.4	31.5	28.3	Without guideposts
FX10B-120S-SV(**)	570-0252-5 **	120	29.5	37.1	32.4	37.5	34.3	
FX10B-144S-SV(**)	570-0253-8 **	144	35.5	43.1	38.4	43.5	40.3	
FX10B-168S-SV(**)	570-0254-0 **	168	41.5	49.1	44.4	49.5	46.3	

[Specifications number] - **, (* *)

Blank: Tray packaging / AuP 0.1μm

(21) : Embossed tape packaging 1RL : 1000pcs / AuP 0.1μm

(83) : Embossed tape packaging 1RL : 1000pcs / AuP 0.76μm

(84) : Embossed tape packaging 1RL : 500pcs / AuP 0.76μm

(85) : Embossed tape packaging 1RL : 250pcs / AuP 0.76μm

(93) : Tray packaging / AuP 0.76μm

Note 1 : There is no polarity with respect to board mounting for this product.

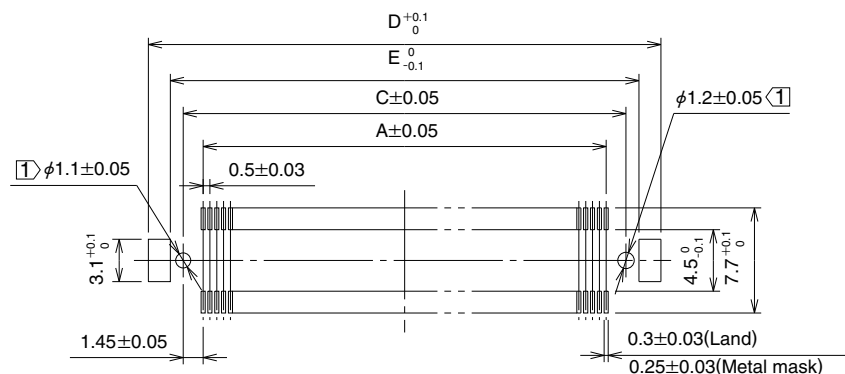
Note 2 : The coplanarity of this product's SMT leads is 0.1mm or less.

Note 3 : Please order embossed tape packaged items by the reel.

Note 4 : Using multiple connectors between two boards is not recommended.

◆Recommended PCB Layout Dimensions (Metal mask)

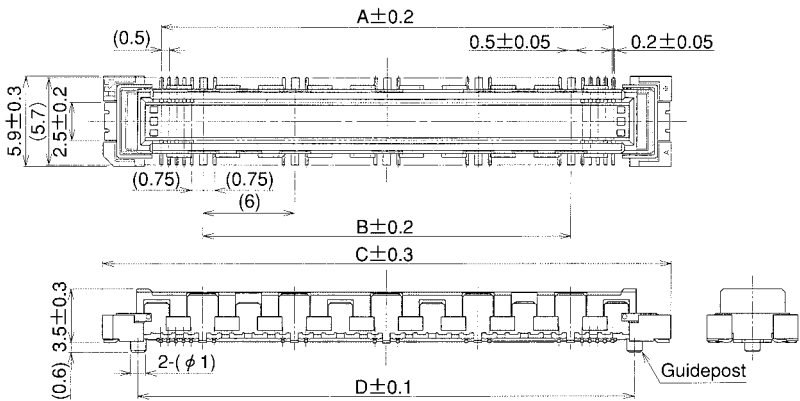
Recommended metal mask thickness : 0.15mm



Note ① Not required in products without guideposts.

■Headers with ground plate

●4mm Stacking Height



Unit : mm

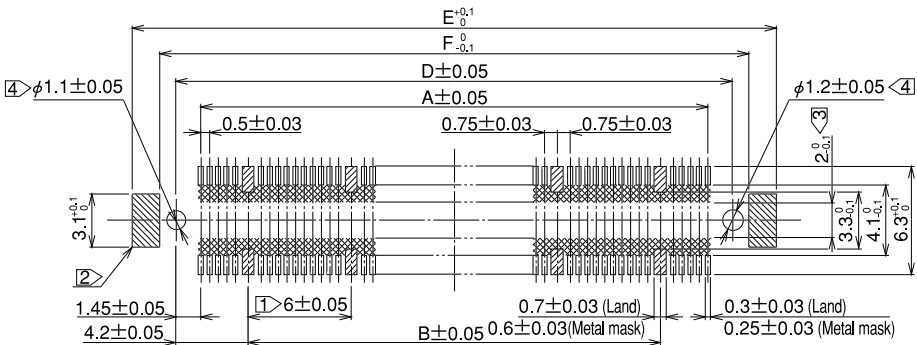
Part No.	HRS No.	No.of Contacts		A	B	C	D	E	F	Remarks
		Signal	Ground							
FX10A-80P/8-SV(**)	570-0001-5 **	80	8	23.5	18	31.1	26.4	31.5	28.3	With guideposts
FX10A-100P/10-SV(**)	570-0002-8 **	100	10	29.5	24	37.1	32.4	37.5	34.3	
FX10A-120P/12-SV(**)	570-0003-0 **	120	12	35.5	30	43.1	38.4	43.5	40.3	
FX10A-140P/14-SV(**)	570-0004-3 **	140	14	41.5	36	49.1	44.4	49.5	46.3	
FX10B-80P/8-SV(**)	570-0021-2 **	80	8	23.5	18	31.1	—	31.5	28.3	Without guideposts
FX10B-100P/10-SV(**)	570-0022-5 **	100	10	29.5	24	37.1	—	37.5	34.3	
FX10B-120P/12-SV(**)	570-0023-8 **	120	12	35.5	30	43.1	—	43.5	40.3	
FX10B-140P/14-SV(**)	570-0024-0 **	140	14	41.5	36	49.1	—	49.5	46.3	

[Specifications number] - **, (**)
 (71) : Tray packaging
 (91) : Embossed tape packaging

Note 1 : There is no polarity with respect to board mounting for this product.
 Note 2 : The coplanarity of this product's SMT leads is 0.1mm or less.
 Note 3 : Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)
 Note 4 : Using multiple connectors between identical boards is not recommended.

◆Recommended PCB Layout Dimensions (Metal mask)

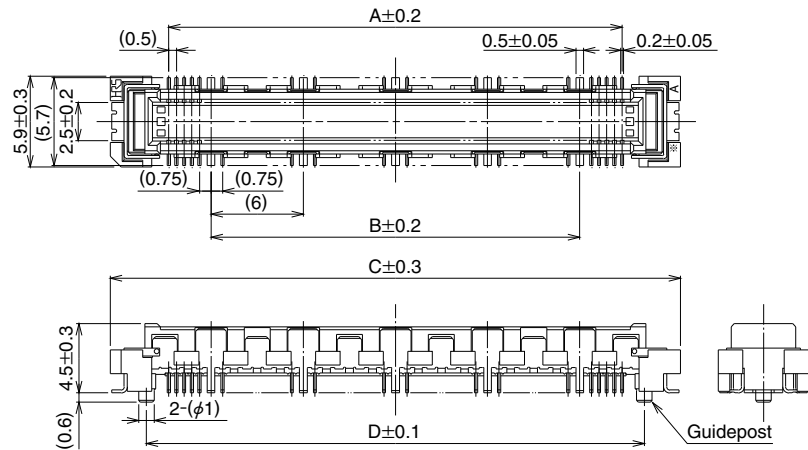
Recommended metal mask thickness : 0.15mm



- Note 1> Cross-hatched portions, totaling n places, indicate the ground circuits.
 2> Cross-hatched portions, 2 places on both sides, indicate the metal fittings.
 3> The cross-hatched area inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.
 4> Not required in products without guideposts.

■Headers with ground plate

●5mm Stacking Height



Unit : mm

Part No.	HRS No.	No. of Contacts		A	B	C	D	E	F	Remarks
		Signal	Ground							
FX10A-80P/8-SV1(**)	570-0101-0 **	80	8	23.5	18	31.1	26.4	31.5	28.3	With guideposts
FX10A-100P/10-SV1(**)	570-0102-2 **	100	10	29.5	24	37.1	32.4	37.5	34.3	
FX10A-120P/12-SV1(**)	570-0103-5 **	120	12	35.5	30	43.1	38.4	43.5	40.3	
FX10A-140P/14-SV1(**)	570-0104-8 **	140	14	41.5	36	49.1	44.4	49.5	46.3	
FX10B-80P/8-SV1(**)	570-0121-7 **	80	8	23.5	18	31.1	—	31.5	28.3	Without guideposts
FX10B-100P/10-SV1(**)	570-0122-0 **	100	10	29.5	24	37.1	—	37.5	34.3	
FX10B-120P/12-SV1(**)	570-0123-2 **	120	12	35.5	30	43.1	—	43.5	40.3	
FX10B-140P/14-SV1(**)	570-0124-5 **	140	14	41.5	36	49.1	—	49.5	46.3	

[Specifications number] - **, (**)

(71) : Tray packaging

(91) : Embossed tape packaging

Note 1 : There is no polarity with respect to board mounting for this product.

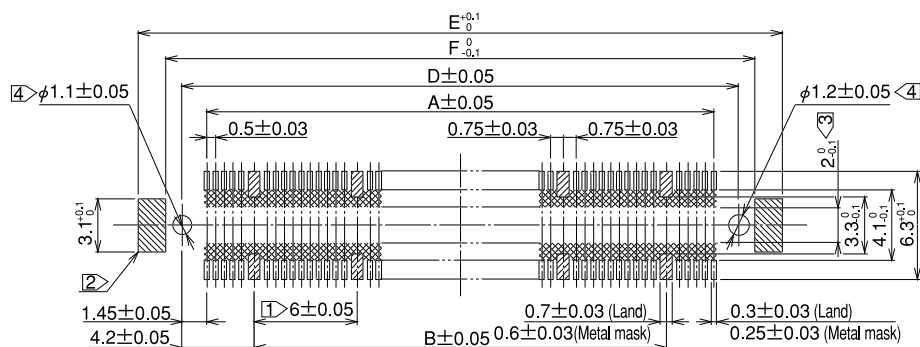
Note 2 : The coplanarity of this product's SMT leads is 0.1mm or less.

Note 3 : Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

Note 4 : Using multiple connectors between identical boards is not recommended.

◆Recommended PCB Layout Dimensions (Metal mask)

Recommended metal mask thickness : 0.15mm



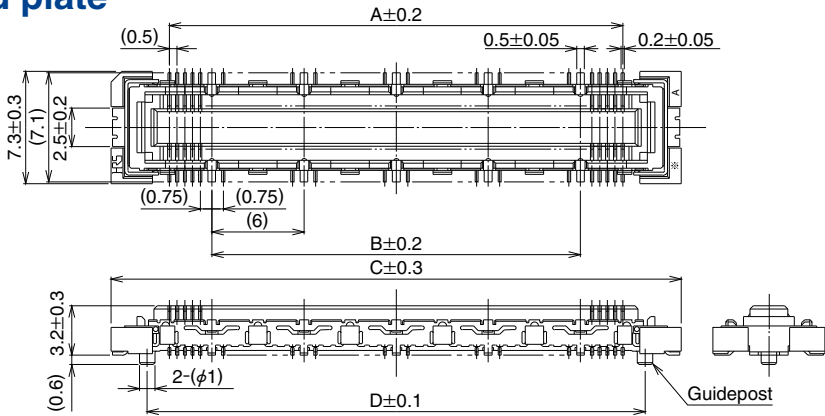
Note ① Cross-hatched portions, totaling n places, indicate the ground circuits.

② Cross-hatched portions, 2 places on both sides, indicate the metal fittings.

③ The cross-hatched area  inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

④ Not required in products without guideposts.

■Receptacles with ground plate



Unit : mm

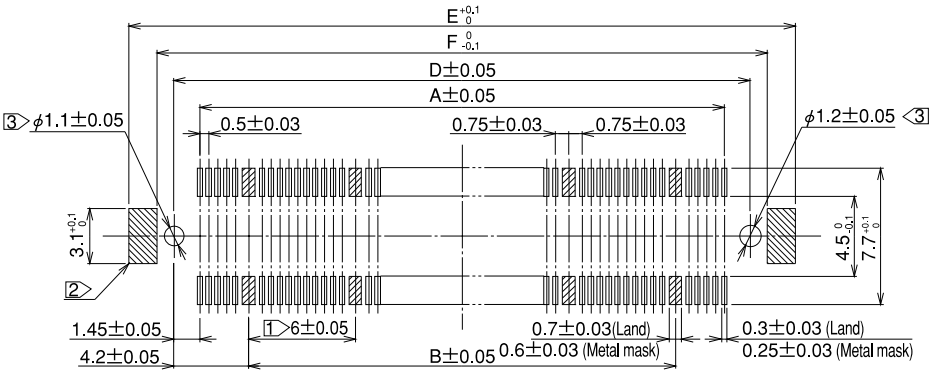
Part No.	HRS No.	No. of Contacts		A	B	C	D	E	F	Remarks
		Signal	Ground							
FX10A-80S/8-SV(**)	570-0201-4 **	80	8	23.5	18	31.1	26.4	31.5	28.3	With guideposts
FX10A-100S/10-SV(**)	570-0202-7 **	100	10	29.5	24	37.1	32.4	37.5	34.3	
FX10A-120S/12-SV(**)	570-0203-0 **	120	12	35.5	30	43.1	38.4	43.5	40.3	
FX10A-140S/14-SV(**)	570-0204-2 **	140	14	41.5	36	49.1	44.4	49.5	46.3	
FX10B-80S/8-SV(**)	570-0221-1 **	80	8	23.5	18	31.1	—	31.5	28.3	Without guideposts
FX10B-100S/10-SV(**)	570-0222-4 **	100	10	29.5	24	37.1	—	37.5	34.3	
FX10B-120S/12-SV(**)	570-0223-7 **	120	12	35.5	30	43.1	—	43.5	40.3	
FX10B-140S/14-SV(**)	570-0224-0 **	140	14	41.5	36	49.1	—	49.5	46.3	

[Specifications number] - **, (**)
(71) : Tray packaging
(91) : Embossed tape packaging

Note 1 : There is no polarity with respect to board mounting for this product.
Note 2 : The coplanarity of this product's SMT leads is 0.1mm or less.
Note 3 : Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

◆Recommended PCB Layout Dimensions (Metal mask)

Recommended metal mask thickness : 0.15mm



Note ① Cross-hatched portions, totaling n places, indicate the ground circuits.
② Cross-hatched portions, 2 places on both sides, indicate the metal fittings.
③ Not required in products without guideposts.

■General Product Specifications (3 piece type)

Rating	Rated current	0.3A	Operating temperature range	-55 to 85°C (Note 1)	Storage temperature range	-10 to +60°C (Note 2)
	Rated voltage	50V AC	Operating humidity range	Relative humidity 95% max (No condensation)	Storage humidity range	40 to 70% (Note 2)

Item	Requirements	Conditions
1. Insulation resistance	100MΩ min	Measured at 100 V DC
2. Voltage resistance	No flashover or breakdown	150 V AC applied for 1 minute
3. Contact resistance	8mm height : 80mΩ max 9mm height : 85mΩ max 10mm height : 90mΩ max 11mm height : 95mΩ max 12mm height : 100mΩ max 13mm height : 105mΩ max	Measured at 100 mA
4. Vibration resistance	No electrical discontinuity for 1μs or greater No damage, cracks, or parts looseness	Frequency : 10 to 55 Hz, amplitude of 0.75mm in 3 axis directions, 10 cycles each.
5. Shock resistance	No electrical discontinuity for 1μs or greater No damage, cracks, or parts looseness	Acceleration of 490m/s ² , 11ms duration, sine half-wave waveform, for 3 cycles in both directions of each of the 3 axes
6. Damp heat (Steady state)	Contact resistance change : 20 mΩ or less, insulation resistance of 100MΩ min, no damage, cracks, or parts looseness	Temperature of 40°C, humidity of 90 to 95%, duration 96 h
7. Temperature cycle	Contact resistance change : 20mΩ or less, insulation resistance of 100MΩ min, no damage, cracks, or parts looseness	Temperature : -55°C → 15 to 35°C → 85°C → 15 to 35°C Time : 30 min. → 2 to 3 min. → 30 min. → 2 to 3 min. for 5 cycles
8. Mating Cycles	Contact resistance change : 20mΩ or less No damage, cracks, or parts looseness	50 times

Note 1 : Includes temperature rise caused by current flow.

Note 2 : The term storage refers to unused products kept for a long time prior to board mounting. Operating temperature and humidity range are applicable to the non-conducting state after board assembly.

Note 3 : Information contained in this catalog represents general requirements for this series. Contact us for the drawings and specifications for a specific part number shown.

■Materials / Finish

Part	Material	Finish	Notes
Insulator	LCP	Black/Gray	UL94V-0
Contacts	Phosphor bronze	Contact Area: Gold plating	_____
Ground bar	Phosphor bronze	Ni plating	_____

■Product Number Structure

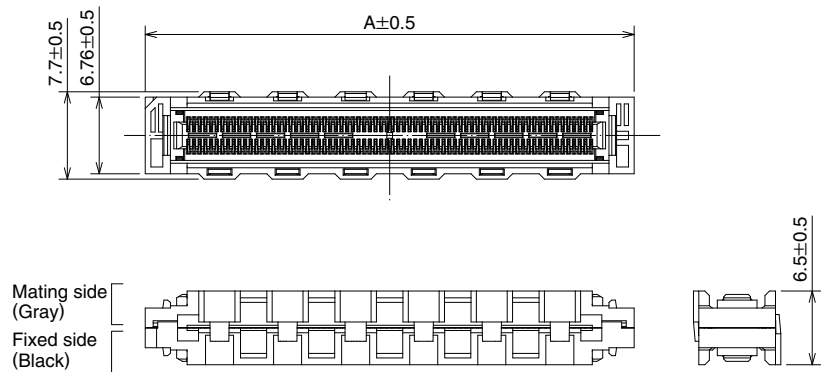
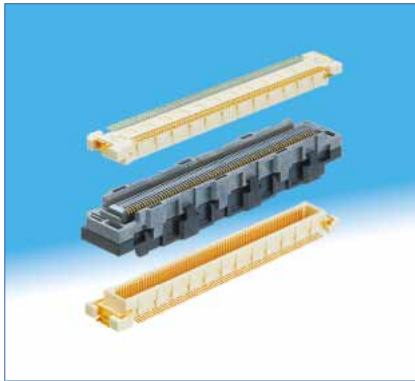
Refer to the chart below when determining the product specifications from the product number.

Please select from the product numbers listed in this catalog when placing orders.

FX10 - # IP - 36 DM1 - #H (#)
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Series Name : FX10	⑥ Pin configuration Blank = Standard (all diff pairs), M* =Reduced GND pins
② Pin count : 120, 144, 168 pins	⑦ Stacking height 8H : 8 to 10mm 8PH : 11 to 13mm
③ Connector type IP : Interposer	⑧ Specification suffix # (Blank) : Ni1.5μm + Au0.1μm (03) : Ni1.5μm + Au0.76μm
④ Number of Diff-pairs	
⑤ Signal type D : Diff. 100 ohm Q : Diff. 85 ohm (Blank) : Open pin field	

Interposer (3piece type)



Unit : mm

Part No.	HRS No.	Signal type	Differential pairs	Single- ended pins	Ground pins	A	Remarks
FX10-168IP-40D-8H(**)	608-0001-3 **	100Ω	40	4	84	49.1	For 8 to 10mm height
FX10-168IP-40D-8PH(**)	608-0004-1 **						For 11 to 13mm height
FX10-168IP-52Q-8H(**)	608-0002-6 **	85Ω	52	8	56		For 8 to 10mm height
FX10-168IP-52Q-8PH(**)	608-0005-4 **						For 11 to 13mm height
FX10-168IP-8H(**)	608-0003-9 **	Open pin field	0	168	0		For 8 to 10mm height
FX10-168IP-8PH(**)	608-0006-7 **						For 11 to 13mm height
FX10-144IP-32D-8H(**)	608-0007-0 **	100Ω	32	12	68	43.1	For 8 to 10mm height
FX10-144IP-32D-8PH(**)	608-0011-7 **						For 11 to 13mm height
FX10-144IP-44Q-8H(**)	608-0008-2 **	85Ω	44	8	48		For 8 to 10mm height
FX10-144IP-44Q-8PH(**)	608-0010-4 **						For 11 to 13mm height
FX10-144IP-8H(**)	608-0009-5 **	Open pin field	0	144	0		For 8 to 10mm height
FX10-144IP-8PH(**)	608-0012-0 **						For 11 to 13mm height
FX10-120IP-28D-8H(**)	608-0013-2 **	100Ω	28	4	60	37.1	For 8 to 10mm height
FX10-120IP-28D-8PH(**)	608-0014-5 **						For 11 to 13mm height
FX10-120IP-36Q-8H(**)	608-0015-8 **	85Ω	36	8	40		For 8 to 10mm height
FX10-120IP-36Q-8PH(**)	608-0016-0 **						For 11 to 13mm height
FX10-120IP-8H(**)	608-0017-3 **	Open pin field	0	120	0		For 8 to 10mm height
FX10-120IP-8PH(**)	608-0018-6 **						For 11 to 13mm height

[Specifications number] **, (* *)

Blank : Contact plating Ni1.5μm+Au0.1μm

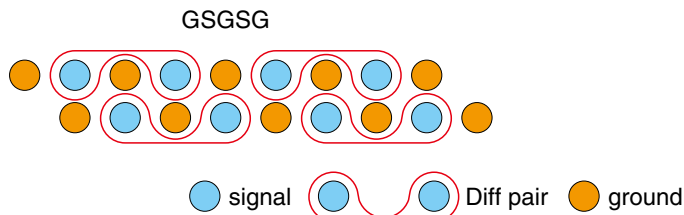
(03) : Contact plating Ni1.5μm+Au0.76μm

Stacking height	Header (Mating side)	Interposer	Header (Fixed side)
8mm	FX10#-xP-SV	FX10-xIP-xD(Q)-8H	FX10#-xP-SV
9mm	FX10#-xP-SV		FX10#-xP-SV1
10mm	FX10#-xP-SV1		FX10#-xP-SV1
11mm	FX10#-xP-SV2	FX10-xIP-xD(Q)-8PH	FX10#-xP-SV1
12mm	FX10#-xP-SV3		FX10#-xP-SV1
13mm	FX10#-xP-SV4		FX10#-xP-SV1

Signal integrity (2 piece type)

Pin assignment

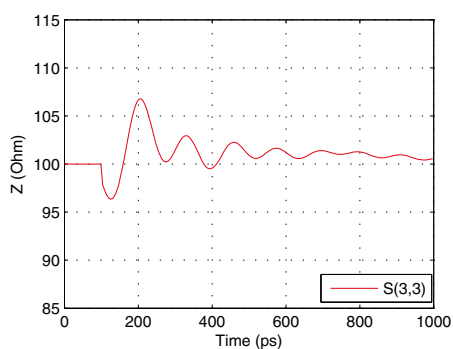
To match 100 ohm differential impedance and to reduce crosstalk, a staggered GSGSG pin assignment is recommended. (G=ground and S=signal)



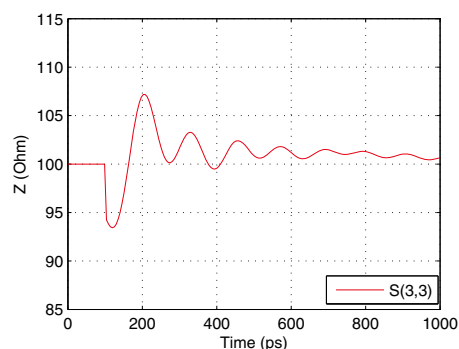
Impedance

The differential impedance is 100 +/- 10 ohm for FX10 at 30 ps rise time (20% to 80%).

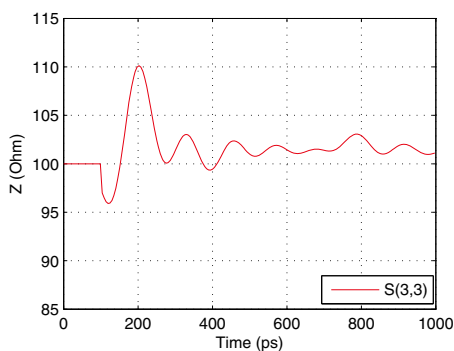
4mm (without GND)



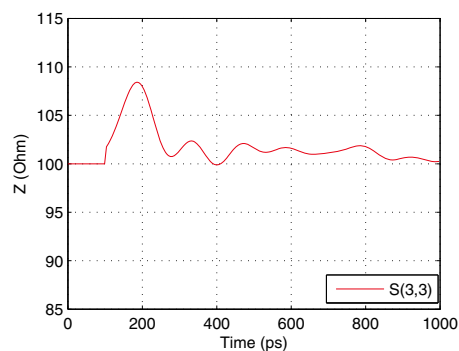
5mm (without GND)



4mm (with GND)



5mm (with GND)

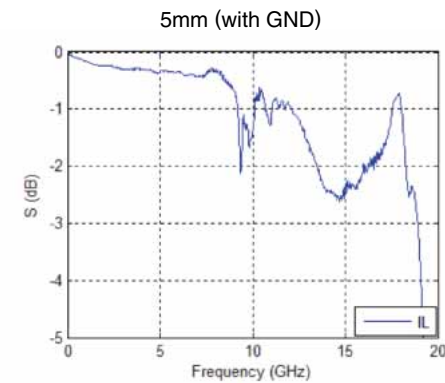
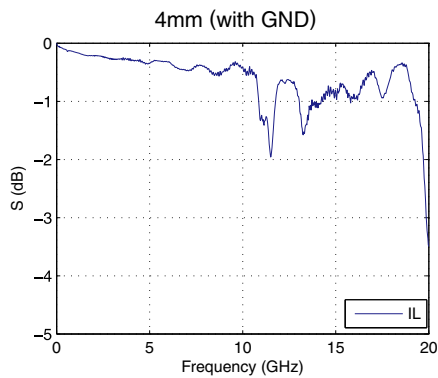
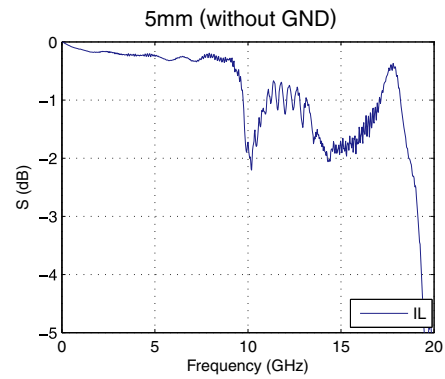
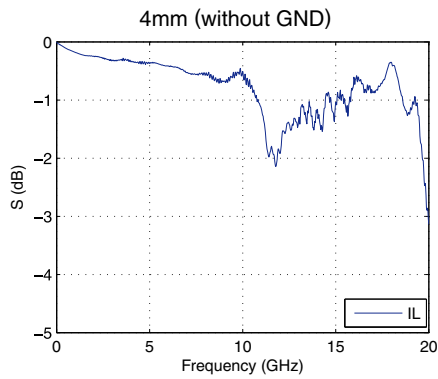


Propagation delay

The propagation delay is 62 and 67 ps for FX10 of 4mm and 5mm height (with and without GND), respectively.

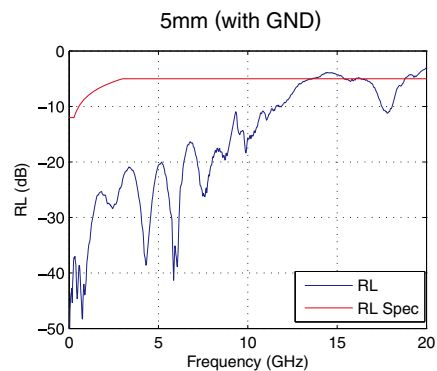
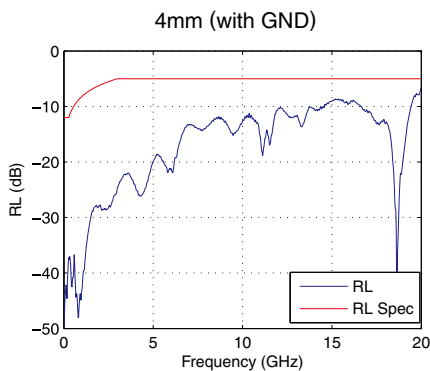
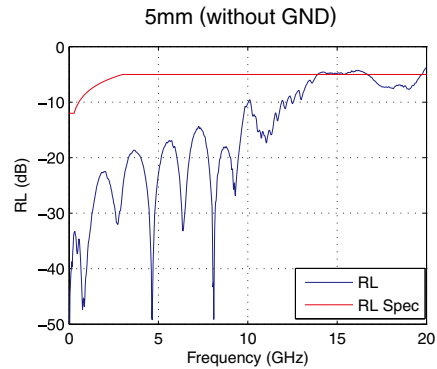
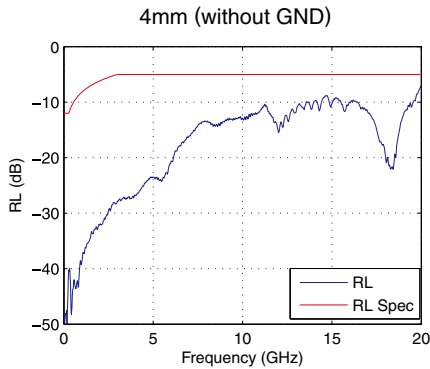
● Insertion loss

The differential insertion loss crosses 1dB at 10.8 and 9.2GHz for FX10 of 4mm and 5mm height, respectively.



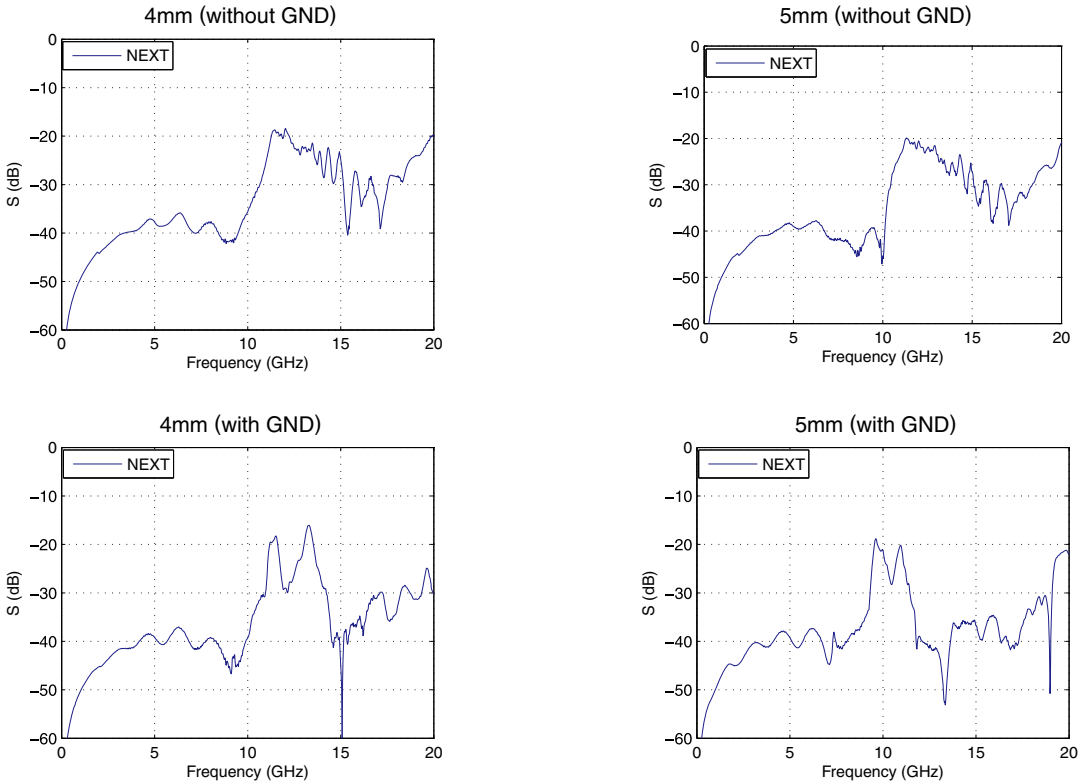
● Return loss

The differential return loss meets the IEEE 802.3ap specification to 20+ and 13.5 GHz for FX10 of 4mm and 5mm height, respectively.



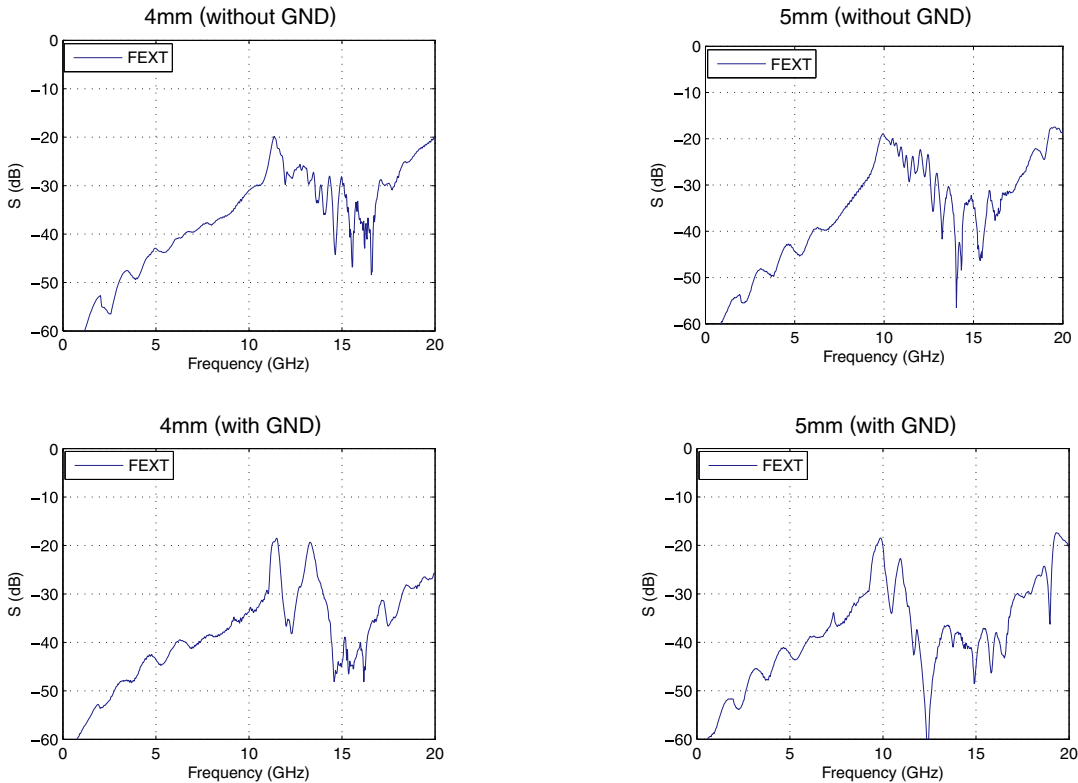
● Near-end crosstalk (NEXT)

The staggered GSGSG pin assignment results in low differential NEXT between neighboring pairs.



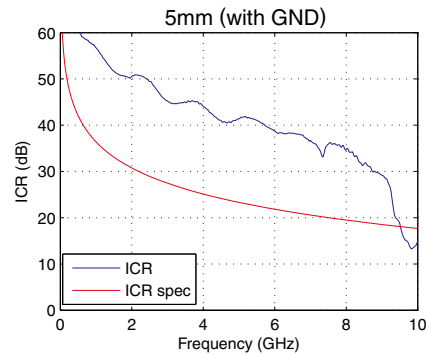
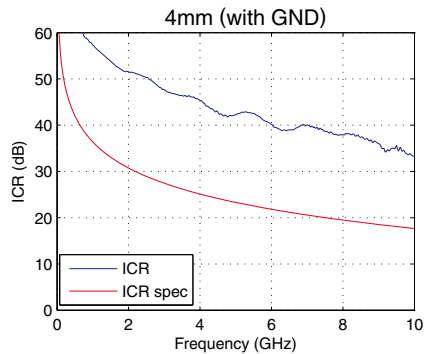
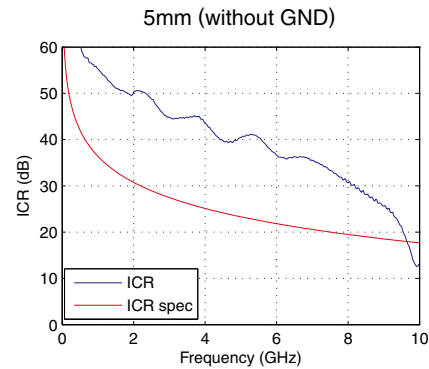
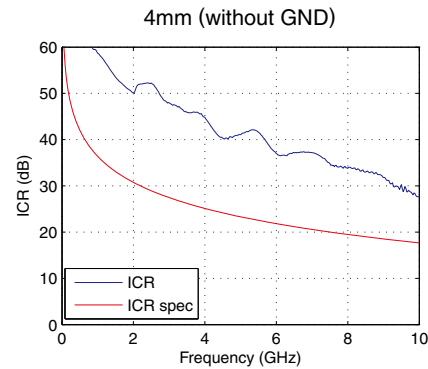
● Far-end crosstalk (FEXT)

The staggered GSGSG pin assignment results in low differential FEXT between neighboring pairs.



● Insertion-loss-to-crosstalk ratio (ICR)

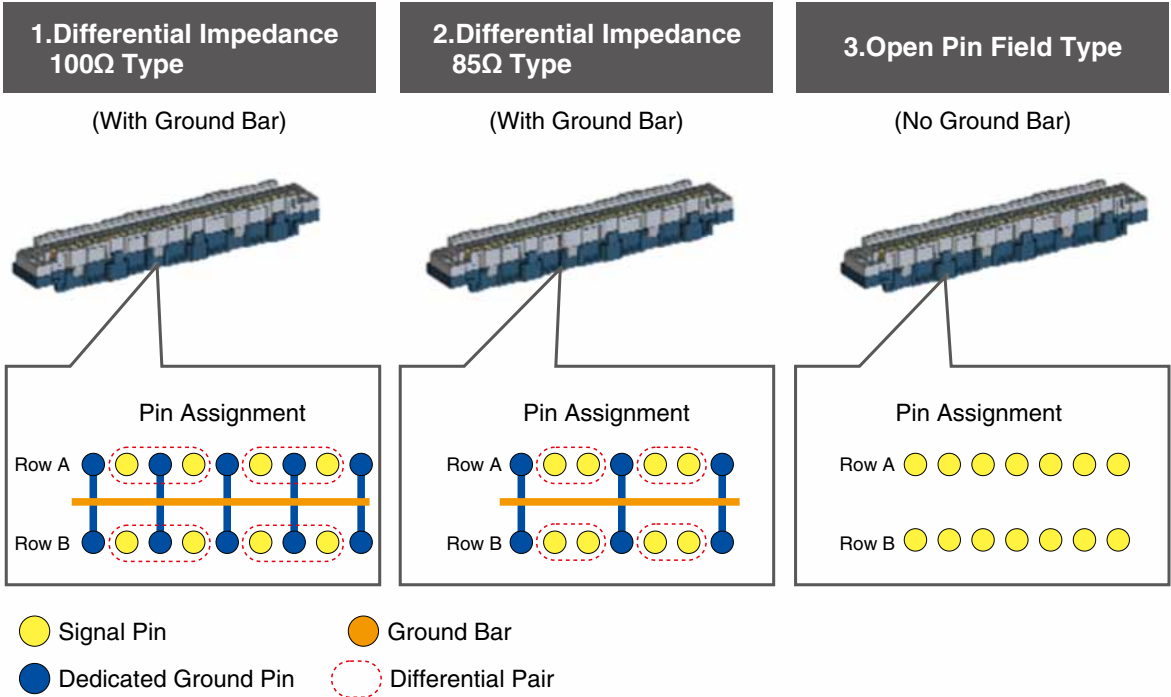
The insertion-loss-to-crosstalk ratio (ICR) with five-aggressor differential FEXT meets the extrapolated IEEE 802.3ap specification to 10+ Gbps.



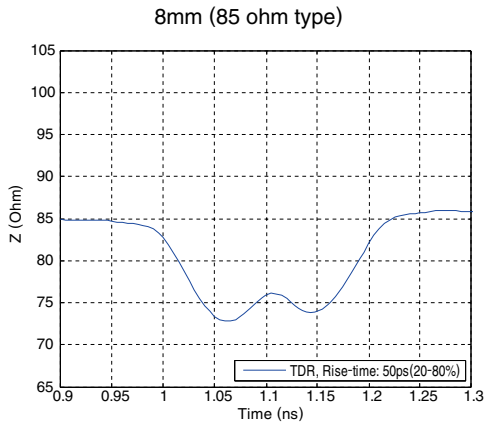
■Signal integrity (3-piece type)

● Pin assignment

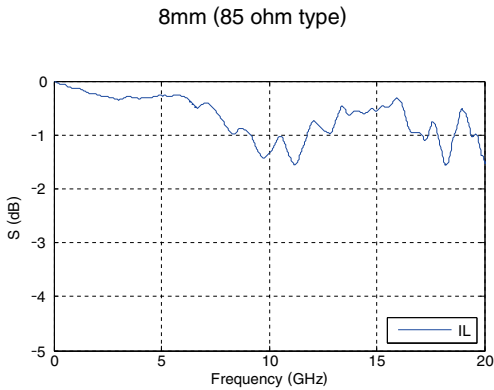
For 100 ohm type interposer, pin assignment shall be GSGSG.
For 85 ohm type interposer, pin assignment shall be GSSG.



● Impedance

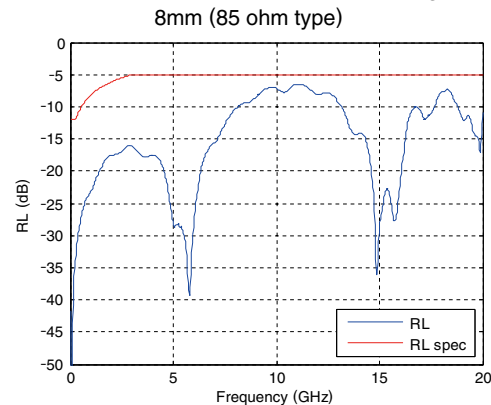


● Insertion Loss

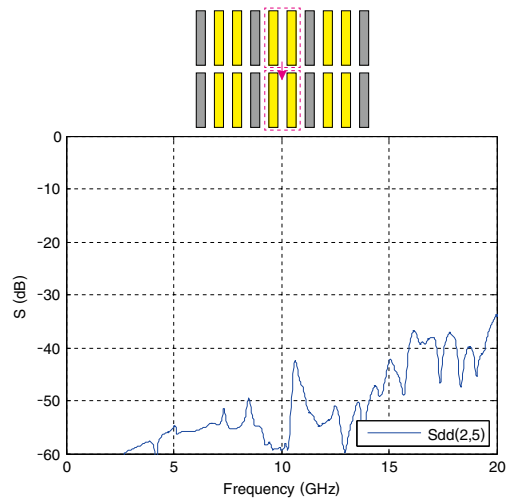
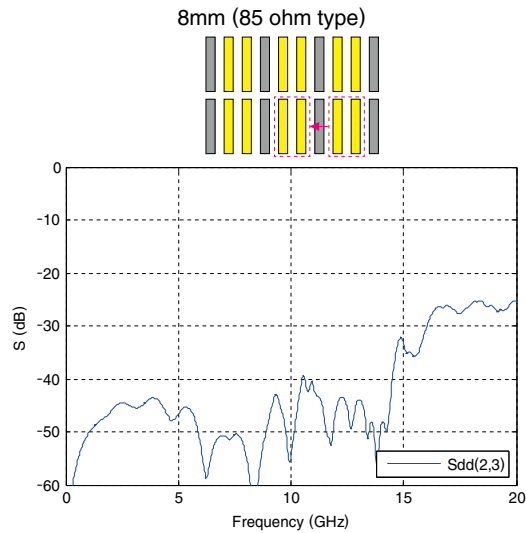


● Return Loss

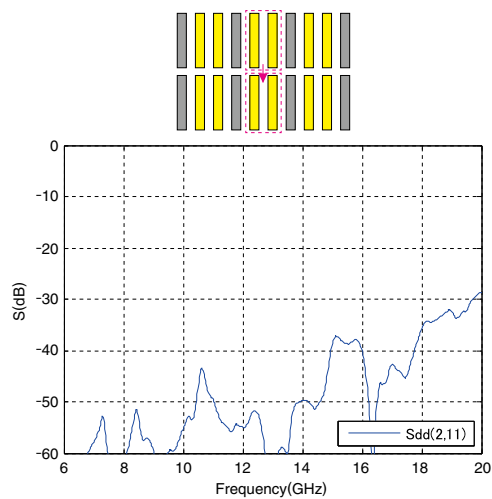
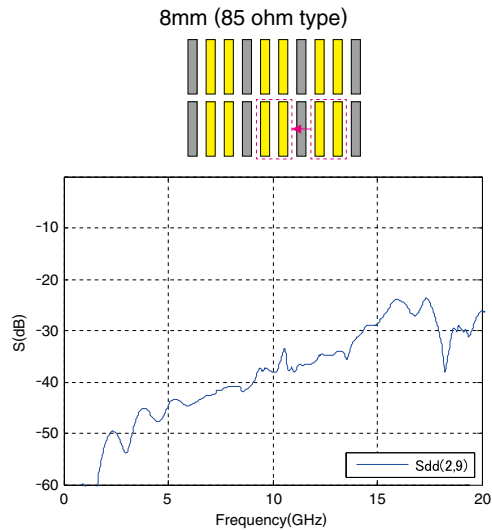
The differential return loss meets the IEEE 802.3ap specification to 20+GHz for FX10 of 8mm height.



● Near-end crosstalk (NEXT)

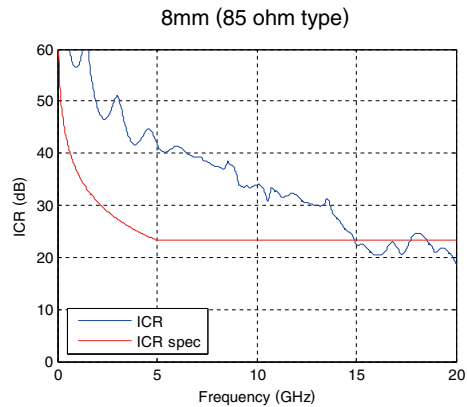


● Far-end crosstalk (FEXT)



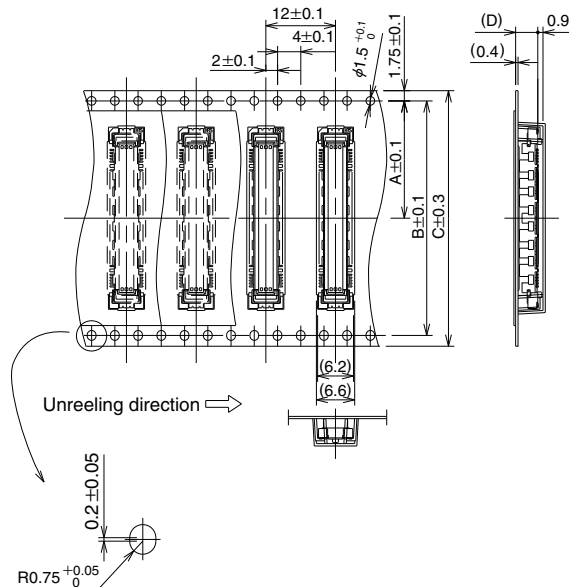
● Insertion-loss-to-crosstalk ratio (ICR)

The insertion-loss-to-crosstalk ratio (ICR) with five-aggressor differential FEXT meets the extrapolated IEEE 802.3ap specification to 15+Gbps.

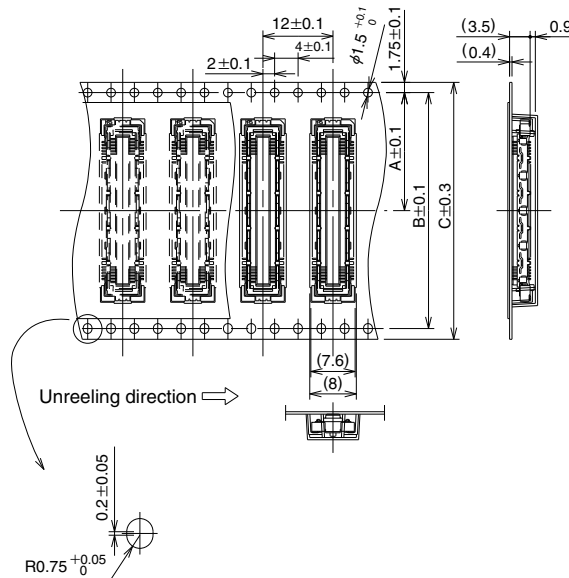


◆Embossed Carrier Tape Dimensions

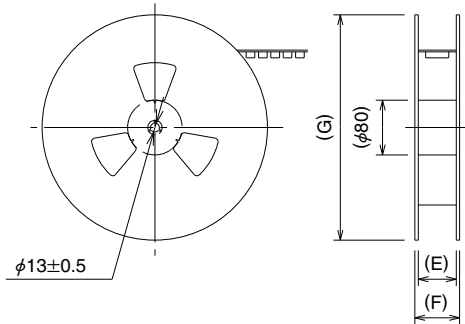
●Headers



●Receptacles



●Reel Dimensions



Unit : mm

Insertion Connector	A	B	C	D	E	F	G
FX10#-80P/8-SV	20.2	40.4	44	3.8	45.5	50.5	330
FX10#-100P/10-SV	26.2	52.4	56		59	64	
FX10#-120P/12-SV							
FX10#-140P/14-SV	34.2	68.4	72		76.5	81.5	
FX10#-96P-SV	20.2	40.4	44		45.5	50.5	
FX10#-120P-SV	26.2	52.4	56		59	64	
FX10#-144P-SV							
FX10#-168P-SV	34.2	68.4	72		76.5	81.5	
FX10#-80P/8-SV1	20.2	40.4	44	4.8	45.5	50.5	370
FX10#-100P/10-SV1	26.2	52.4	56		59	64	
FX10#-120P/12-SV1							
FX10#-140P/14-SV1	34.2	68.4	72		76.5	81.5	
FX10#-96P-SV1	20.2	40.4	44		45.5	50.5	
FX10#-120P-SV1	26.2	52.4	56		59	64	
FX10#-144P-SV1							
FX10#-168P-SV1	34.2	68.4	72		76.5	81.5	

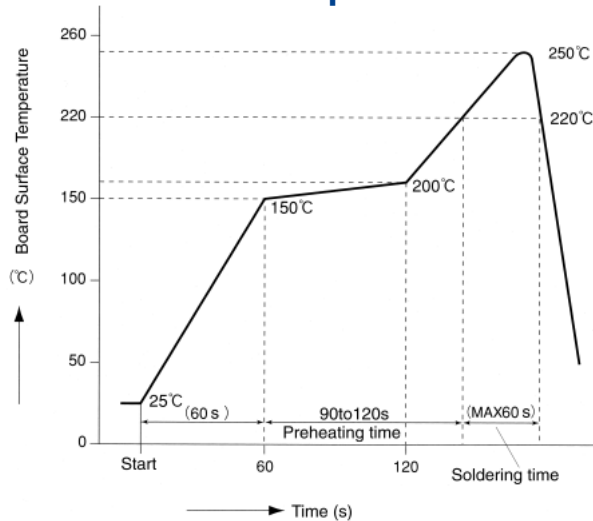
Note : There is no polarity with respect to embossed tape packaging for this product.

Unit : mm

Insertion Connector	A	B	C	E	F	G
FX10#-80S/8-SV	20.2	40.4	44	45.5	50.5	330
FX10#-100S/10-SV	26.2	52.4	56	59	64	
FX10#-120S/12-SV				59	64	
FX10#-140S/14-SV	34.2	68.4	72	76.5	81.5	
FX10#-96S-SV	20.2	40.4	44	45.5	50.5	
FX10#-120S-SV	26.2	52.4	56	59	64	
FX10#-144S-SV	26.2	52.4	56	59	64	370
FX10#-168S-SV				76.5	81.5	

Note : There is no polarity with respect to embossed tape packaging for this product.

◆Recommended Temperature Profile



HRS test Conditions

Test board Glass epoxy 161mm×100mm×1.6mm thick
Solder method : Reflow
Solder composition : Paste,
96.5%Sn/3%Ag/0.5%Cu
Metal mask : 0.15mm thick
Reflow cycles : 2 cycles

The temperature profile is based on the above conditions. In individual applications the actual temperature may vary, depending on solder paste type, volume/thickness and board size/thickness. Consult your solder paste and equipment manufacturer for specific recommendations.

◆Washing Conditions

Organic Solvent Cleaning

Solvent	Room temperature washing	Heated washing
IPA (Isopropyl alcohol)	○	○
HCFC (Hydrochlorofluorocarbon)		

Water Type Cleaning

When using water based cleaning agents (e.g., terpene, alkali saponifiers) make sure the labeling discloses any effect on metals, platings and plastics. Remove any moisture after cleaning. Residual flux or cleaning agents in the contact areas may affect the electrical performance.

Cleaning Precautions

Residual flux or cleaning agents in the contact areas may affect the electrical performance. Please make sure a thorough cleaning operation has been completed.

◆Connector Handling Precautions

1. Mating lengths and creepage distance

The effective wipe length for this product is 1.1mm for the signal contact and 1 mm for the ground contact. Creepage of the header and receptacle during mating should be within 0.5 mm of the fully mated position.

2. PCB support

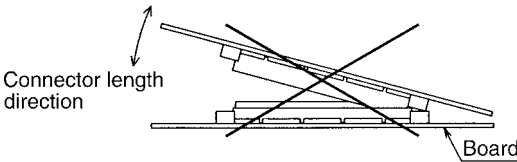
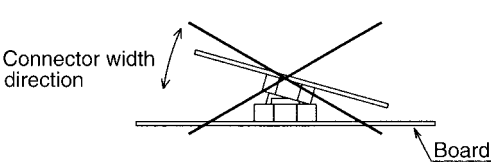
Note that boards should not be supported solely by the connectors themselves. Support should be in the form of spacers and screws or other suitable methods to support the boards.

3. Solder repairs

During repair, the flux could wick onto the contact area of the connector and cause reduced contact reliability. In this case, make sure you understand washing conditions before washing is implemented.

4. Miscellaneous

- Note that excessive twisting while inserting or withdrawing connectors will cause damage.

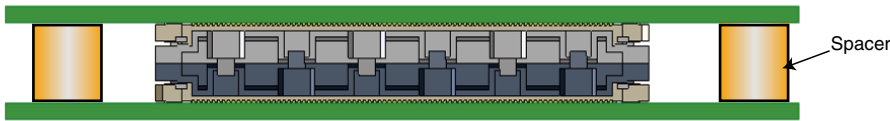


- Slight color differences on the molded items may be noted. However, these color differences will not affect the connector's performance.

◆Spacer

Spacers are required to support the PWB's and protect the SMT solder joints.

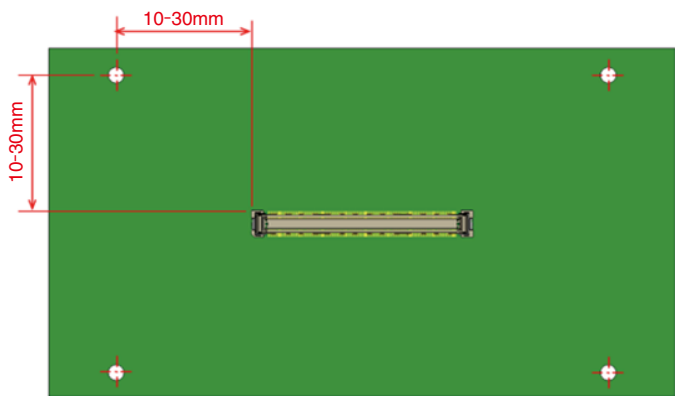
Suggested spacer style is shown below:



Spacer, male-male, M3 thread

The recommended spacer height corresponds to the interposer stacking height as shown in the chart below.

Stacking height	Recommended spacer height	Remark
4mm	4.3 ± 0.127mm	2 piece type
5mm	5.3 ± 0.127mm	
6mm	6 ± 0.127mm	
7mm	7 ± 0.127mm	
8mm	8 ± 0.127mm	
8mm	8 ± 0.127mm	3 piece type
9mm	9 ± 0.127mm	
10mm	10 ± 0.127mm	
11mm	11 ± 0.127mm	
12mm	12 ± 0.127mm	
13mm	13 ± 0.127mm	

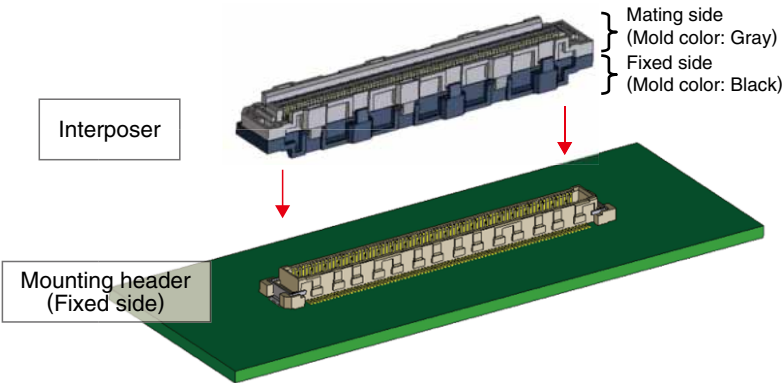


◆Recommended spacer location

Four spacers located diagonally are required. Spacers should be located 10 to 30mm from the connector to prevent excessive mechanical loading on the interconnections. If assembly will be subjected to vibration, spacer should be located to prevent resonance, and additional spacer may be required.

■ Interposer installation

Position the interposer directly over the mounting header. (Interposers have no polarity.) Fixed side (black side) of the interposer shall be mated with the mounting header (fixed side). Do not use SV2, SV3, or SV4 headers on both sides of the interposer. The wiping length on the mating side becomes shorter.

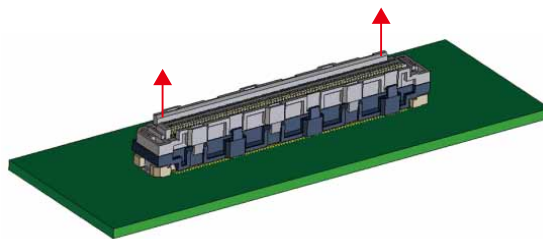


Stacking height	Header (Mating side)	Interposer	Header (Fixed side)
8mm	FX10#-xP-SV	FX10-xIP-xD(Q)-8H	FX10#-xP-SV
9mm	FX10#-xP-SV		FX10#-xP-SV1
10mm	FX10#-xP-SV1		FX10#-xP-SV1
11mm	FX10#-xP-SV2	FX10-xIP-xD(Q)-8PH	FX10#-xP-SV1
12mm	FX10#-xP-SV3		FX10#-xP-SV1
13mm	FX10#-xP-SV4		FX10#-xP-SV1

◆ Interposer removal

The interposer can be removed from the mounting header by hand. (No special tools are needed.)

Removal and re-mating of the fixed side can reduce the extraction force of the fixed side due to wear. It is recommended to replace the interposer to a new one once removed.



◆ Multiple Mating

<2-piece type>

It is not recommended to use multiple 2-piece FX10 connectors on the same PWB.

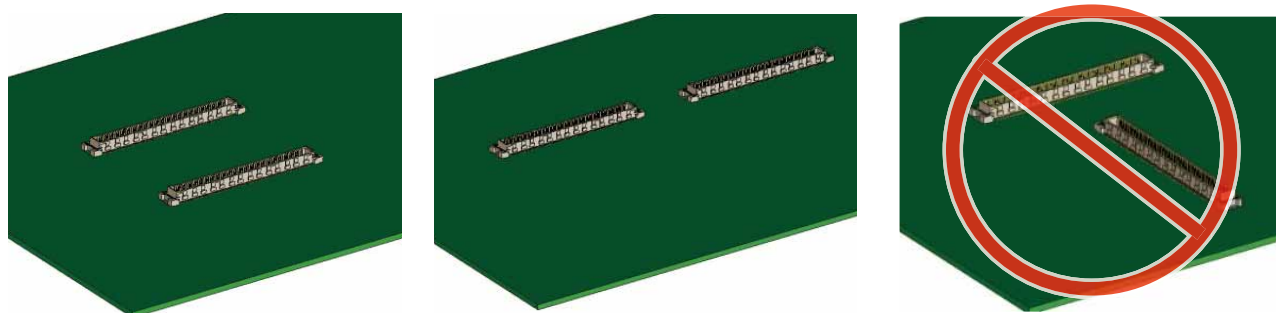


<3-piece type>

FX10 3-piece type has multiple mating capability.

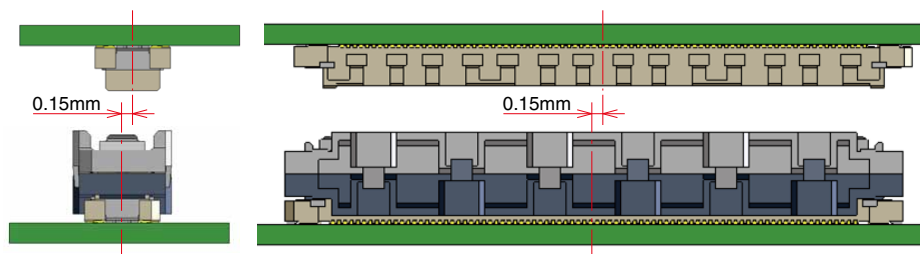
If multiple connectors are used on the same PWB, they must be oriented in the same direction.

It is not recommended to mix orientations.



● Mating tolerance (3-piece type)

Due to the floating interposer, FX10 3-piece type can accept mating tolerances of up to $\pm 0.15\text{mm}$ tolerance in the X-axis and up to $\pm 0.15\text{mm}$ in the Y-axis.



Алматы (7273)495-231
Ангартск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81

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Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47

Казахстан +7(7172)727-132

Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35

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