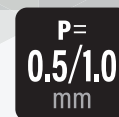


FH52 Series

0.5mm/1.0mm Pitch, 2.0mm Height, Bottom Contact, Front Flip, FPC/FFC Connector



TM Flip-Lock Pioneer Hirose



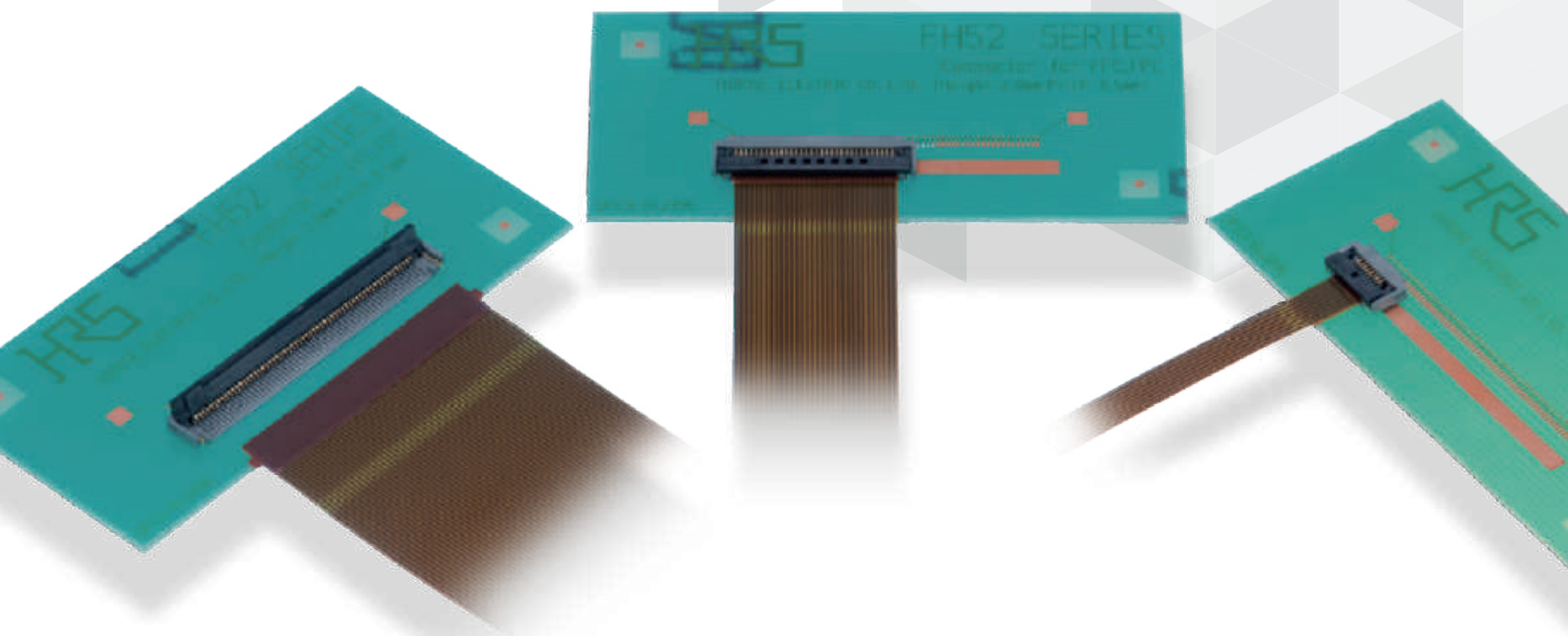
P=0.5/1.0mm



Heat-Resist



Wide Variation



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
Ноябрьск (3496)41-32-12
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

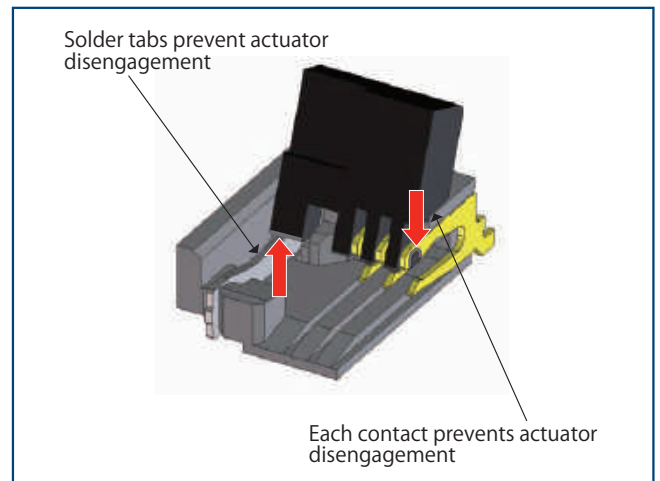
Киргизия +996(312)96-26-47

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. Highly reliable connection and robust design

Higher connector body strength and FPC/FFC connection reliability are required even more than before as connectors continue to be produced with higher pin counts. Compared with existing products (HRS 0.5mm pitch standard connector FH12 Series horizontal mounting type), FH52 Series has higher connection reliability due to the FPC/FFC positioning mechanism and provides a secure connection that prevents unlocking due to the original, robust design.

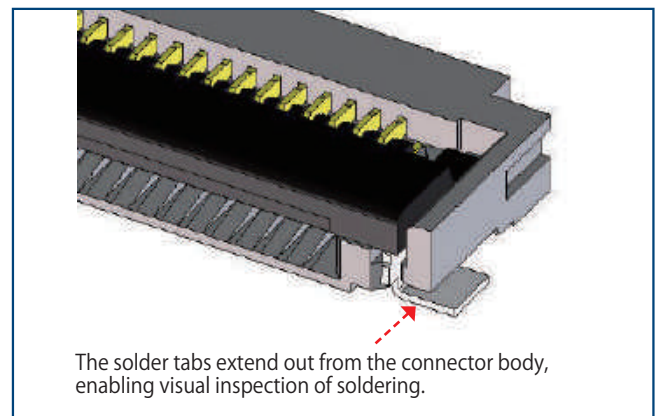


Secure Actuator Retention

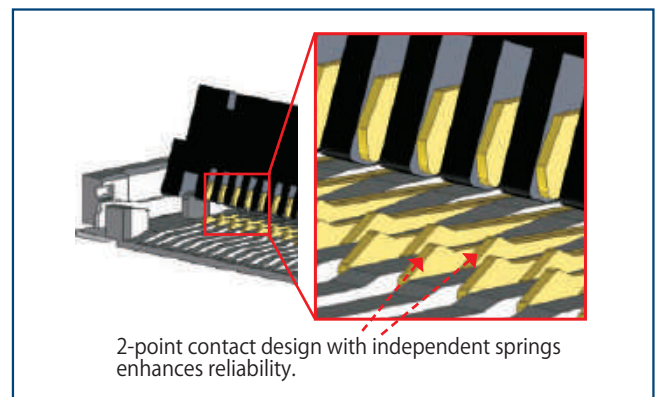
2. Product variations that meet a variety of needs

- FH52E : Long solder tabs type
Solder tabs extending from the connector body enable visual inspection of the soldering conditions.
- FH52K : Long solder tabs and 125°C (Note) heat resistance type
125°C heat resistant connector meets severe automotive requirements.
- FH52T : Long solder tabs and 2-point contact type
The 2 independent spring design connects with the FPC/FFC at 2 points, preventing contact failure due to dust adhesion.

Note : The heat resistant when using FFC is 105°C. When the heat resistant temperature is less than 125°C for FPC and 105°C for FFC, the heat resistant temperature of the FPC/FFC is applied.



Long Solder Tabs Type (FH52E/FH52K/FH52T)



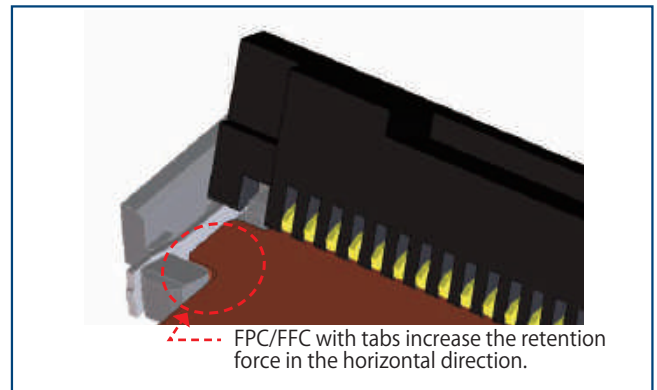
2-Point Contact (FH52T)

3. Flip lock simplifies operations

The flip lock (one-touch rotation) design enables easier FPC/FFC connection operation with less force. The clear tactile click upon locking is enhanced compared to existing products (FH12 horizontal mounting type) for a secure connection.

4. High FPC/FFC retention force

Tabbed FPC/FFCs enhanced retention force in the horizontal direction.



Connection Utilizing FPC/FFC Position Alignment Design

5. Accepts standard 0.3mm thick FPC/FFC

Compatible 0.3mm thickness FPC/FFC, which are easy to manufacture and have superb insertion performance

6. No pattern prohibited area on the bottom of the connector (Overmolding design)

The bottom surface of the connector is fully enclosed to eliminate contact exposure, removing PCB pattern restrictions and enhancing board design flexibility.

7. Halogen-free

All materials and substances used to produce this product comply with Halogen-free standards.

As defined in IEC 61249-2-21.

Br : 900ppm or less, Cl : 900ppm or less,

Br+Cl : 1,500ppm or less

Product Specifications

Rated Current (Note 1)	0.5A	Operating Temperature (Note 2)(Note 3)	-40 to +105°C
Rated Voltage	50V AC	Operating Humidity Range	RH 90% Max. (No Condensation)
		Storage Temperature Range (Note 4)	-10 to +50°C
		Storage Humidity Range (Note 4)	RH 90% Max. (No Condensation)

Adaptive FPC/FFC Contact Specifications	Thickness : = 0.3 ± 0.05mm Gold Plated
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Items	Specifications	Conditions
Insulation Resistance	500M Ω Min.	100V DC
Withstanding Voltage	No flashover or insulation breakdown	150Vms AC for 1 min.
Contact Resistance	50m Ω Max. Includes FPC/FFC conductor resistance	1mA (DC or 1000Hz)
Mating Durability (Insertion / Withdrawal)	Contact Resistance : 50m Ω Max. No damage, cracks, or parts dislocation	20 cycles
Vibration	No electrical discontinuity of 1 μ s or more Contact Resistance : 50m Ω Max. No damage, cracks, or parts dislocation	Frequency : 10 to 55Hz, single amplitude of 0.75mm, 10 cycles in each of the 3 directions
Shock	No electrical discontinuity of 1 μ s or more Contact Resistance : 50m Ω Max. No damage, cracks, or parts dislocation	Acceleration of 981m/s ² , duration of 6 ms, sine half-wave waveform, 3 cycles in each of the 3 axes
Humidity (Steady State)	Contact Resistance : 50m Ω Max. Insulation Resistance : 50M Ω Min. No damage, cracks, or parts dislocation	96 hours at temperature of 40°C and humidity of 90% to 95%
Temperature Cycle	Contact Resistance : 50m Ω Max. Insulation Resistance : 50M Ω Min. No damage, cracks, or parts dislocation	Temperature : -40 → +15 to +35 → +105 (Note 3) → +15 to +35°C Time : 30 → 2 to 3 → 30 → 2 to 3 (Minutes) 5 cycles
Resistance to Soldering Heat	No deformation of components affecting performance	Reflow : Peak temperature 250°C Max., 230°C or more, 60 seconds or less Manual soldering : 350 ± 10°C for 5 seconds

Note 1 : When passing the current through all of the contacts, use 70% of the current rating.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : FH52K withstands up to 125°C. The heat resistant when using FFC is 105°C. When the heat resistant temperature is less than 125°C for FPC and 105°C for FFC, the heat resistant temperature of the FPC/FFC is applied.

Note 4 : The term "storage" refers to products stored for long period of time prior to mounting and use. Operating Temperature Range and Humidity Range covers non-conducting condition of installed connectors in storage, shipment or during transportation.

Materials / Finish

Part	Materials	Color/Finish	Remarks
Insulator	LCP	Grey	UL94V-0
		Black	
Contacts	Copper Alloy	Partially Gold Plated	-
Solder Tabs	Brass	Tin Plated	

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.

1

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FH52

E

–

50

(25)

S

B

–

0.5

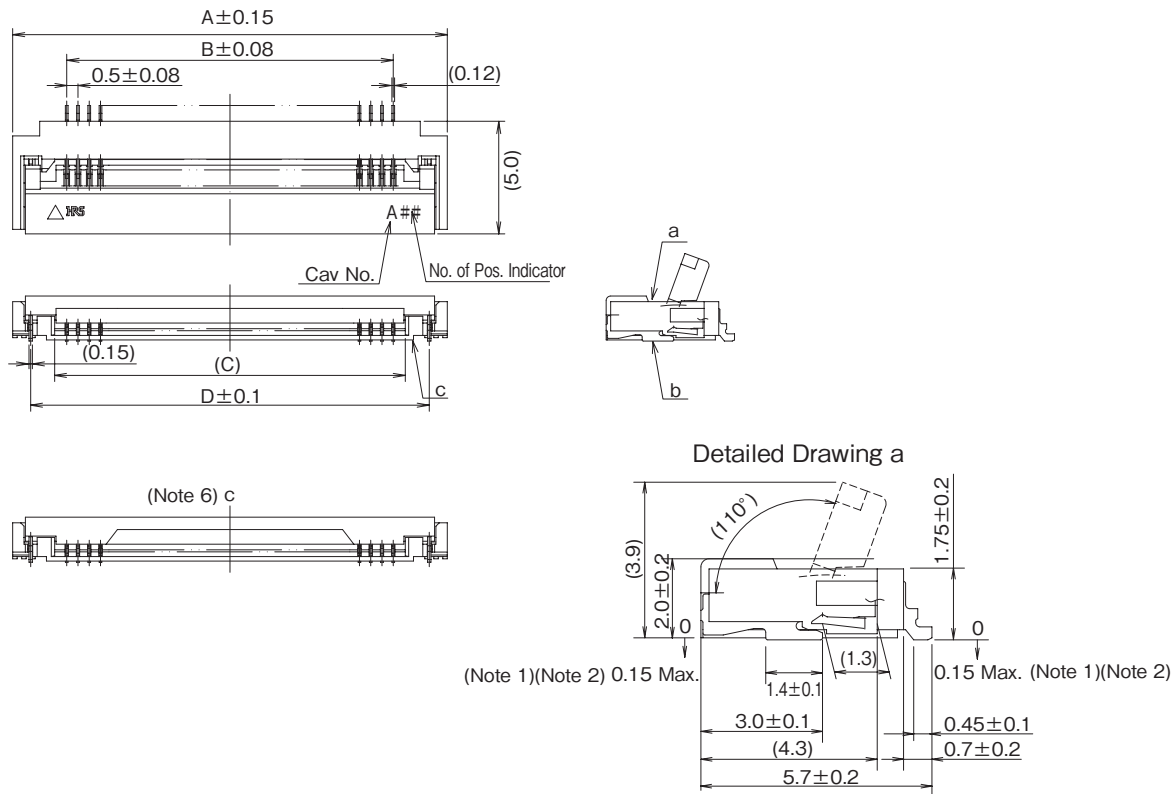
SH

(##)

1 Series Name	FH52	5 Contact Arrangement	Single (pole piece array)
2 Connector Type	Blank : Standard Type E : Long Solder Tabs Type K : Long Solder Tabs, 125℃ Heat Resistant Type T : Long Solder Tabs, 2-Point Contact Type	6 Alternating Direction	No Symbol : Standard Type (All Contacts Loaded) A : Alternating Contact Type (Alternating on the Polarity Side) B : Alternating Contact Type (Alternating on Opposite the Polarity Side)
		7 Contact Pitch	0.5mm, 1mm
3 No. of Pos.	Standard Type : No. of Pos. Alternating Contact Type : Mold Size	8 Termination Type	SH : SMT Horizontal Mounting Type
4 No. of Pos.	Standard Type : No Symbol Alternating Contact Type : No. of Pos.	9 Specification	Blank : Standard, Partially Gold Plated, 3,000pcs per reel (99) : Partially Gold Plated, 500pcs per reel

Connector Dimensional Drawing

FH52 (Standard Type) 0.5mm Pitch Product



Note 1 : The coplanarity of the contact and solder tab lead is 0.1 Max.

Note 2 : The contact lead position indicates the dimension from b, the bottom surface of the insulator body.

Note 3 : Packaged in tape and reel only. Check the "Packaging Specification" for details.

Note 4 : Sink mark reliefs may be added due to improvements.

Note 5 : Sight variations in color of the plastic compounds do not affect form, fit or function.

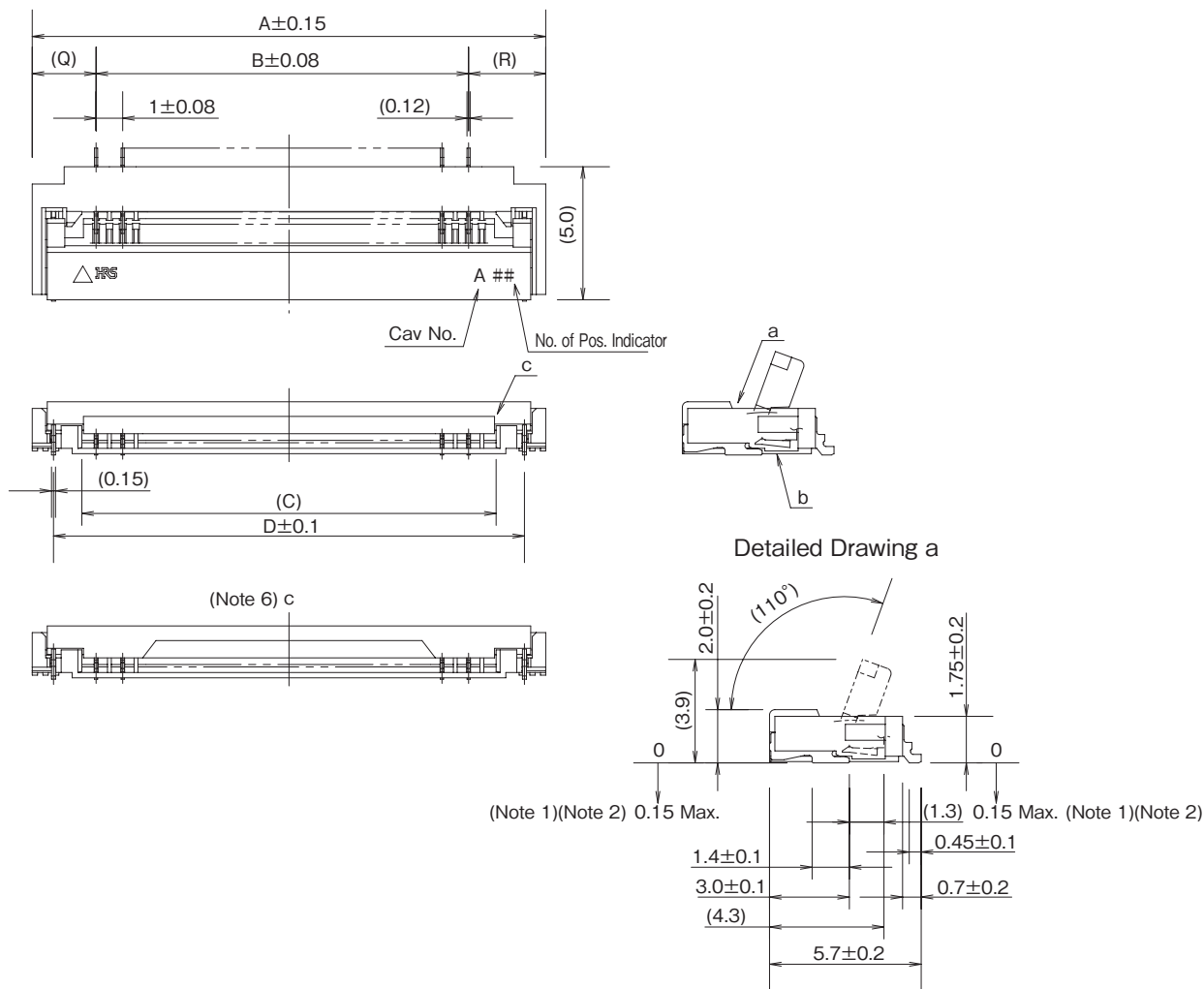
After reflow, the contact plating may change color, however this does not represent a quality issue.

Note 6 : The actuator design of the 60pos. type are shown in the figure.

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	Purchase Unit (##) : (00)	Purchase Unit (##) : (99)
FH52-6S-0.5SH(##)	CL0580-3304-0-##	6	7.3	2.5	3.57	5.7	3,000pcs per reel	500pcs per reel
FH52-8S-0.5SH(##)	CL0580-3305-3-##	8	8.3	3.5	4.57	6.7		
FH52-10S-0.5SH(##)	CL0580-3306-6-##	10	9.3	4.5	5.57	7.7		
FH52-11S-0.5SH(##)	CL0580-3320-7-##	11	9.8	5.0	6.07	8.2		
FH52-12S-0.5SH(##)	CL0580-3307-9-##	12	10.3	5.5	6.57	8.7		
FH52-15S-0.5SH(##)	CL0580-3302-5-##	15	11.8	7.0	8.07	10.2		
FH52-18S-0.5SH(##)	CL0580-3321-0-##	18	13.3	8.5	9.57	11.7		
FH52-20S-0.5SH(##)	CL0580-3309-4-##	20	14.3	9.5	10.57	12.7		
FH52-22S-0.5SH(##)	CL0580-3317-2-##	22	15.3	10.5	11.57	13.7		
FH52-24S-0.5SH(##)	CL0580-3318-5-##	24	16.3	11.5	12.57	14.7		
FH52-25S-0.5SH(##)	CL0580-3316-0-##	25	16.8	12.0	13.07	15.2		
FH52-26S-0.5SH(##)	CL0580-3319-8-##	26	17.3	12.5	13.57	15.7		
FH52-28S-0.5SH(##)	CL0580-3324-8-##	28	18.3	13.5	14.57	16.7		
FH52-30S-0.5SH(##)	CL0580-3310-3-##	30	19.3	14.5	15.57	17.7		
FH52-32S-0.5SH(##)	CL0580-3325-0-##	32	20.3	15.5	16.57	18.7		
FH52-40S-0.5SH(##)	CL0580-3300-0-##	40	24.3	19.5	20.57	22.7		
FH52-42S-0.5SH(##)	CL0580-3329-1-##	42	25.3	20.5	21.57	23.7		
FH52-45S-0.5SH(##)	CL0580-3311-6-##	45	26.8	22.0	23.07	25.2		
FH52-50S-0.5SH(##)	CL0580-3303-8-##	50	29.3	24.5	25.57	27.7		
FH52-60S-0.5SH(##)	CL0580-3301-2-##	60	34.3	29.5	30.57	32.7		

FH52 (Standard Type) 1.0mm Pitch Product



Note 1 : The coplanarity of the contact and solder tab lead is 0.1 Max.

Note 2 : The contact lead position indicates the dimension from b, the bottom surface of the insulator body.

Note 3 : Packaged in tape and reel only. Check the "Packaging Specification" for details.

Note 4 : Sink mark reliefs may be added due to improvements.

Note 5 : Sight variations in color of the plastic compounds do not affect form, fit or function. After reflow, the contact plating may change color, however this does not represent a quality issue.

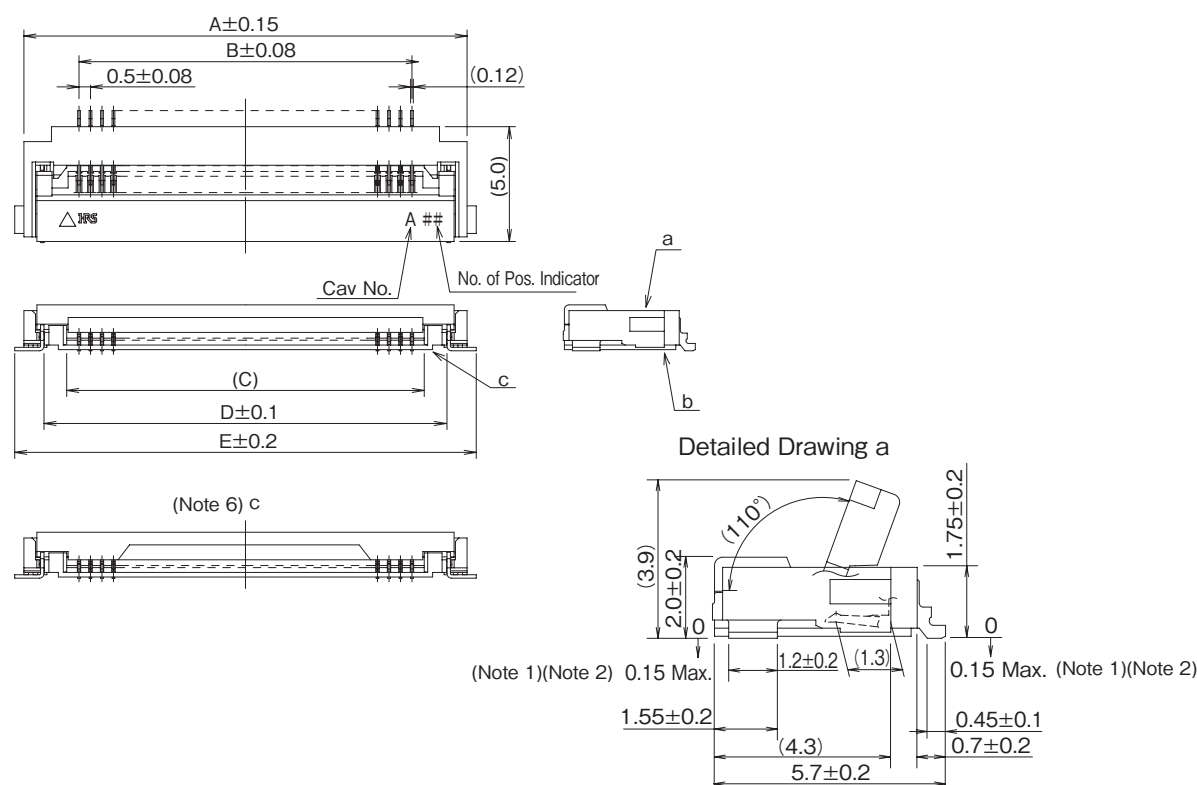
Note 6 : The actuator design of the 30pos. type are shown in the figure.

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	Q	R	Purchase Unit (##) : (00)	Purchase Unit (##) : (99)
FH52-10(4)SA-1SH(##)	CL0580-3330-0-##	4	9.3	3	5.57	7.7	2.9	3.4	3,000pcs per reel	500pcs per reel
FH52-5S-1SH(##) (Note)	CL0580-3336-7-##	5	9.8	4.0	6.07	8.2	2.9	2.9		
FH52-12S-1SH(##)	CL0580-3323-5-##	12	16.8	11	13.07	15.2	2.9	2.9		
FH52-32(16)SB-1SH(##) (Note)	CL0580-3338-2-##	16	20.3	15	16.57	18.7	2.4	2.9		
FH52-60(30)SB-1SH(##)	CL0580-3315-7-##	30	34.3	29	30.57	32.7	2.4	2.9		

Note : The (99) specification is only available for 4, 12 and 30pos.

FH52E (Long Solder Tabs Type) 0.5mm Pitch
Product

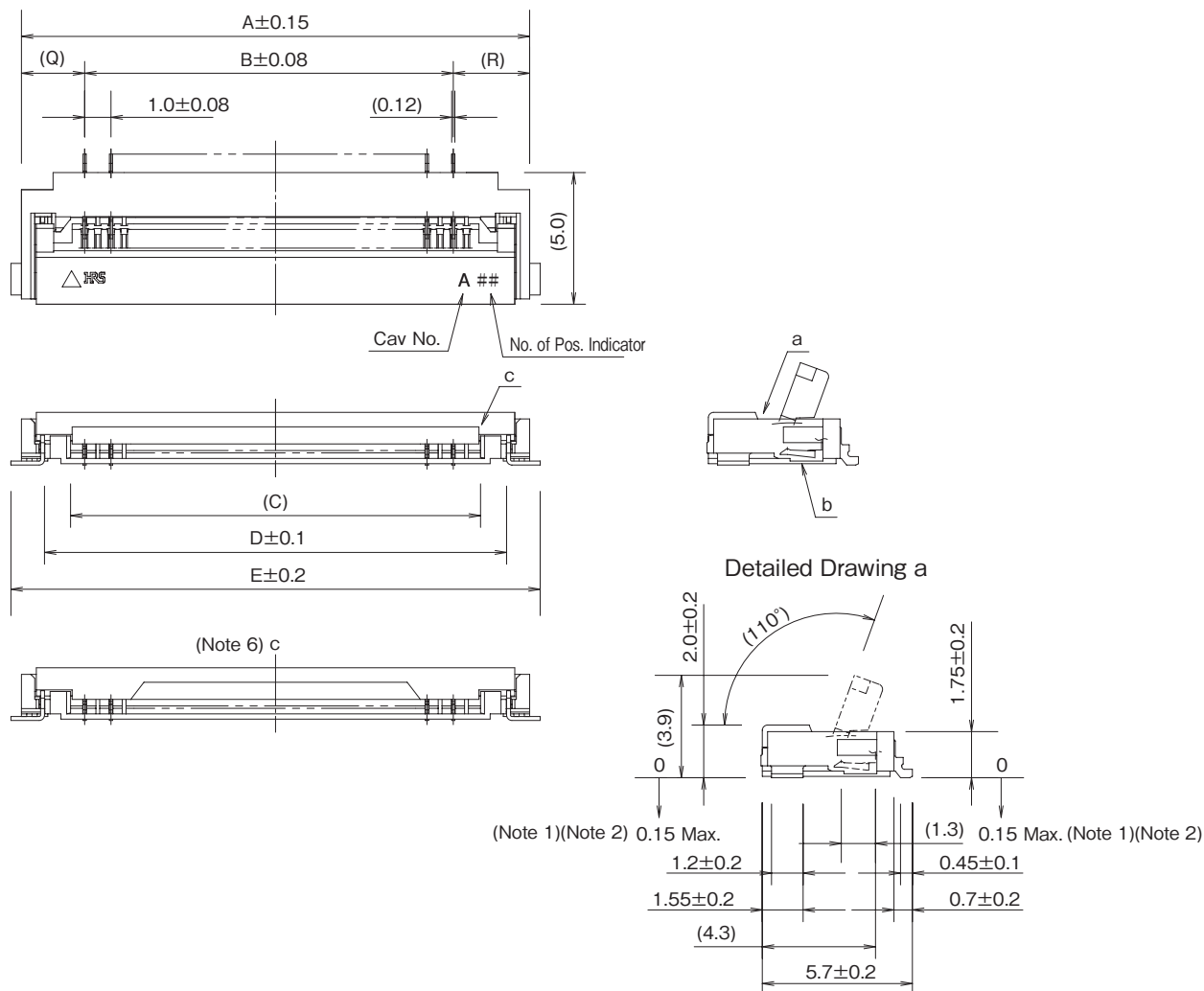


Note 1 : The coplanarity of the contact and solder tab lead is 0.1 Max.
Note 2 : The contact lead position indicates the dimension from b, the bottom surface of the insulator body.
Note 3 : Packaged in tape and reel only. Check the "Packaging Specification" for details.
Note 4 : Sink mark reliefs may be added due to improvements
Note 5 : Sight variations in color of the plastic compounds do not affect form, fit or function.
After reflow, the contact plating may change color, however this does not represent a quality issue.
Note 6 : The actuator design of the 60pos. type are shown in the figure.

Unit : mm									Purchase Unit	Purchase Unit
Part No.	HRS No.	No. of Pos.	A	B	C	D	E		(##) : (00)	(##) : (99)
FH52E-6S-0.5SH(##)	CL0580-3365-0-##	6	7.3	2.5	3.57	5.55	8.1	3,000pcs per reel	500pcs per reel	
FH52E-8S-0.5SH(##)	CL0580-3349-0-##	8	8.3	3.5	4.57	6.55	9.1			
FH52E-10S-0.5SH(##)	CL0580-3346-0-##	10	9.3	4.5	5.57	7.55	10.1			
FH52E-15S-0.5SH(##)	CL0580-3337-0-##	15	11.8	7.0	8.07	10.05	12.6			
FH52E-18S-0.5SH(##)	CL0580-3331-3-##	18	13.3	8.5	9.57	11.55	14.1			
FH52E-20S-0.5SH(##)	CL0580-3357-0-##	20	14.3	9.5	10.57	12.55	15.1			
FH52E-22S-0.5SH(##)	CL0580-3343-2-##	22	15.3	10.5	11.57	13.55	16.1			
FH52E-24S-0.5SH(##)	CL0580-3340-4-##	24	16.3	11.5	12.57	14.55	17.1			
FH52E-26S-0.5SH(##) (Note)	CL0580-3366-0-##	26	17.3	12.5	13.57	15.55	18.1			
FH52E-30S-0.5SH(##)	CL0580-3347-3-##	30	19.3	14.5	15.57	17.55	20.1			
FH52E-40S-0.5SH(##)	CL0580-3334-1-##	40	24.3	19.5	20.57	22.55	25.1			
FH52E-45S-0.5SH(##)	CL0580-3368-0-##	45	26.8	22.0	23.07	25.05	27.6			
FH52E-50S-0.5SH(##)	CL0580-3335-4-##	50	29.3	24.5	25.57	27.55	30.1			
FH52E-60S-0.5SH(##)	CL0580-3339-5-##	60	34.3	29.5	30.57	32.55	35.1			
FH52E-64S-0.5SH(##)	CL0580-3333-9-##	64	36.3	31.5	32.57	34.55	37.1			
FH52E-68S-0.5SH(##)	CL0580-3332-6-##	68	38.3	33.5	34.57	36.55	39.1			

Note : The (99) specification is available for all positions except 26pos.

FH52E (Long Solder Tabs Type) 1.0mm Pitch Product



Note 1 : The coplanarity of the contact and solder tab lead is 0.1 Max.

Note 2 : The contact lead position indicates the dimension from b, the bottom surface of the insulator body.

Note 3 : Packaged in tape and reel only. Check the "Packaging Specification" for details.

Note 4 : Sink mark reliefs may be added due to improvements

Note 5 : Sight variations in color of the plastic compounds do not affect form, fit or function.
After reflow, the contact plating may change color, however this does not represent a quality issue.

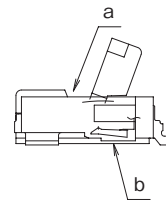
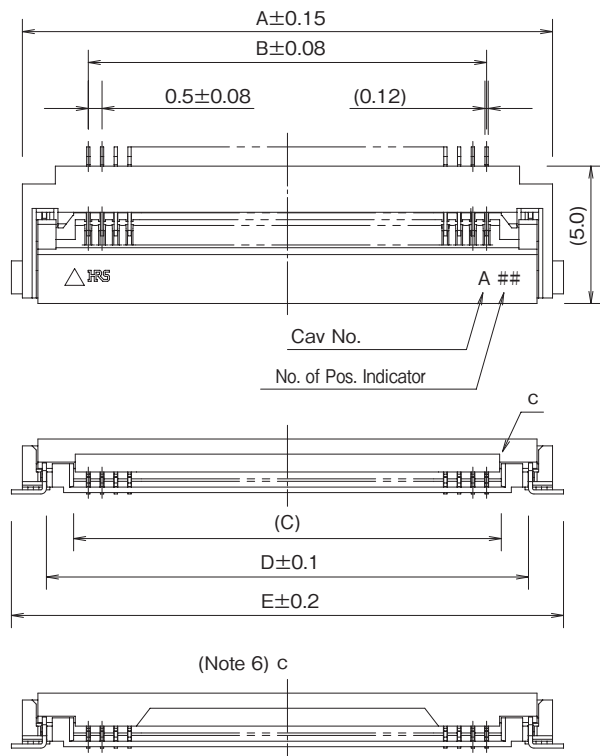
Note 6 : The actuator design of the 30pos. type are shown in the figure.

Unit : mm

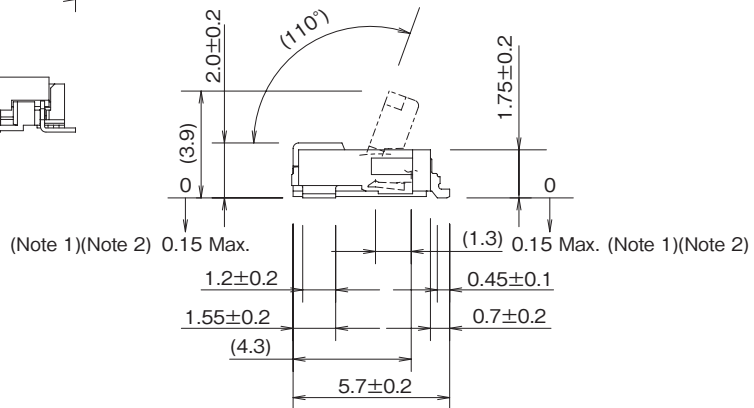
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Q	R	Purchase Unit (##) : (00)	Purchase Unit (##) : (99)
FH52E-8(4)SB-1SH(##)	CL0580-3351-0-##	4	8.3	3.0	4.57	6.55	9.1	2.4	2.9	3,000pcs per reel	500pcs per reel
FH52E-20(10)SA-1SH(##)	CL0580-3352-0-##	10	14.3	9.0	10.57	12.55	15.1	2.9	2.4		
FH52E-20(10)SB-1SH(##)	CL0580-3353-0-##	10	14.3	9.0	10.57	12.55	15.1	2.4	2.9		
FH52E-50(25)SA-1SH(##)	CL0580-3354-0-##	25	29.3	24.0	25.57	27.55	30.1	2.9	2.4		
FH52E-50(25)SB-1SH(##)	CL0580-3355-0-##	25	29.3	24.0	25.57	27.55	30.1	2.4	2.9		
FH52E-60(30)SB-1SH(##) (Note)	CL0580-3358-0-##	30	34.3	29.0	30.57	32.55	35.1	2.4	2.9		

Note : The (99) specification is available for all positions except 30pos.

■FH52K (Long Solder Tabs, 125°C Heat Resistant Type) 0.5mm Pitch Product



Detailed Drawing a



Note 1 : The coplanarity of the contact and solder tab lead is 0.1 Max.

Note 2 : The contact terminal lead position indicates the dimension from b, the bottom surface of the insulator body.

Note 3 : Packaged in tape and reel only. Check the "Packaging Specification" for details.

Note 4 : Sink mark reliefs may be added due to improvements

Note 5 : Sight variations in color of the plastic compounds do not affect form, fit or function.

After reflow, the contact plating may change color, however this does not represent a quality issue.

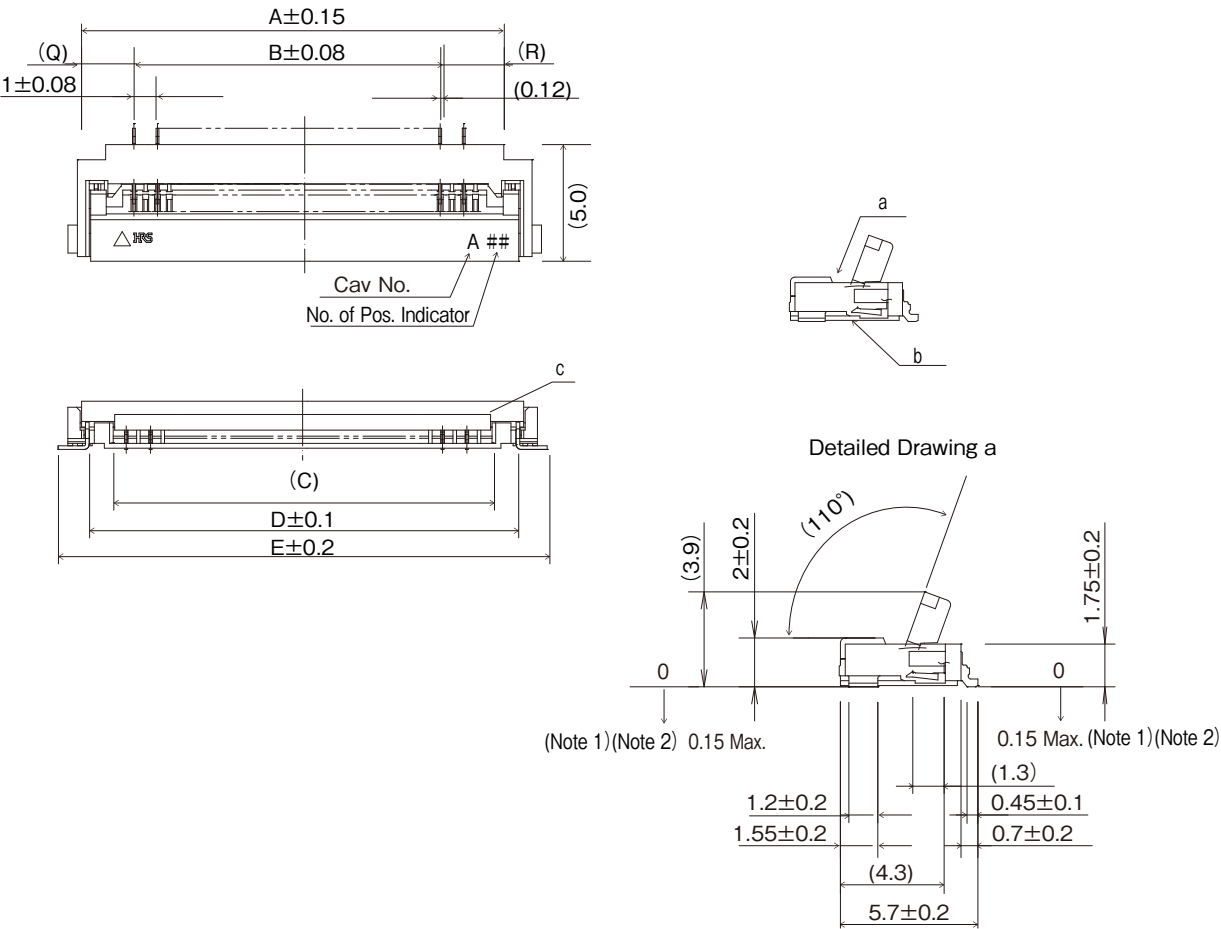
Note 6 : The actuator design of the 60pos. type are shown in the figure.

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit (##) : (00)	Purchase Unit (##) : (99)
FH52K-6S-0.5SH(##)	CL0580-4613-0-##	6	7.3	2.5	3.57	5.55	8.1	3,000pcs per reel	500pcs per reel
FH52K-8S-0.5SH(##)	CL0580-4611-0-##	8	8.3	3.5	4.57	6.55	9.1		
FH52K-10S-0.5SH(##)	CL0580-4606-0-##	10	9.3	4.5	5.57	7.55	10.1		
FH52K-12S-0.5SH(##)	CL0580-4629-0-##	12	10.3	5.5	6.57	8.55	11.1		
FH52K-15S-0.5SH(##)	CL0580-4617-0-##	15	11.8	7.0	8.07	10.05	12.6		
FH52K-18S-0.5SH(##)	CL0580-4636-0-##	18	13.3	8.5	9.57	11.55	14.1		
FH52K-20S-0.5SH(##)	CL0580-4604-0-##	20	14.3	9.5	10.57	12.55	15.1		
FH52K-22S-0.5SH(##)	CL0580-4632-0-##	22	15.3	10.5	11.57	13.55	16.1		
FH52K-24S-0.5SH(##)	CL0580-4633-0-##	24	16.3	11.5	12.57	14.55	17.1		
FH52K-25S-0.5SH(##)	CL0580-4634-0-##	25	16.8	12.0	13.07	15.05	17.6		
FH52K-26S-0.5SH(##)	CL0580-4635-0-##	26	17.3	12.5	13.57	15.55	18.1		
FH52K-30S-0.5SH(##)	CL0580-4631-0-##	30	19.3	14.5	15.57	17.55	20.1		
FH52K-32S-0.5SH(##)	CL0580-4600-9-##	32	20.3	15.5	16.57	18.55	21.1		
FH52K-34S-0.5SH(##)	CL0580-4601-0-##	34	21.3	16.5	17.57	19.55	22.1		
FH52K-40S-0.5SH(##)	CL0580-4620-0-##	40	24.3	19.5	20.57	22.55	25.1		
FH52K-45S-0.5SH(##)	CL0580-4637-0-##	45	26.8	22.0	23.07	25.05	27.6		
FH52K-50S-0.5SH(##)	CL0580-4609-0-##	50	29.3	24.5	25.57	27.55	30.1		
FH52K-60S-0.5SH(##)	CL0580-4607-0-##	60	34.3	29.5	30.57	32.55	35.1		
FH52K-68S-0.5SH(##)	CL0580-4614-0-##	68	38.3	33.5	34.57	36.55	39.1		
FH52K-80S-0.5SH(05) (Note)	CL0580-4641-0-05	80	44.3	39.5	40.57	42.55	45.1	-	-

Note : The (05) specification is available for 80pos. only. The purchase unit is 2,000pcs per reel for specification (05) of FH52K-80S-0.5SH.

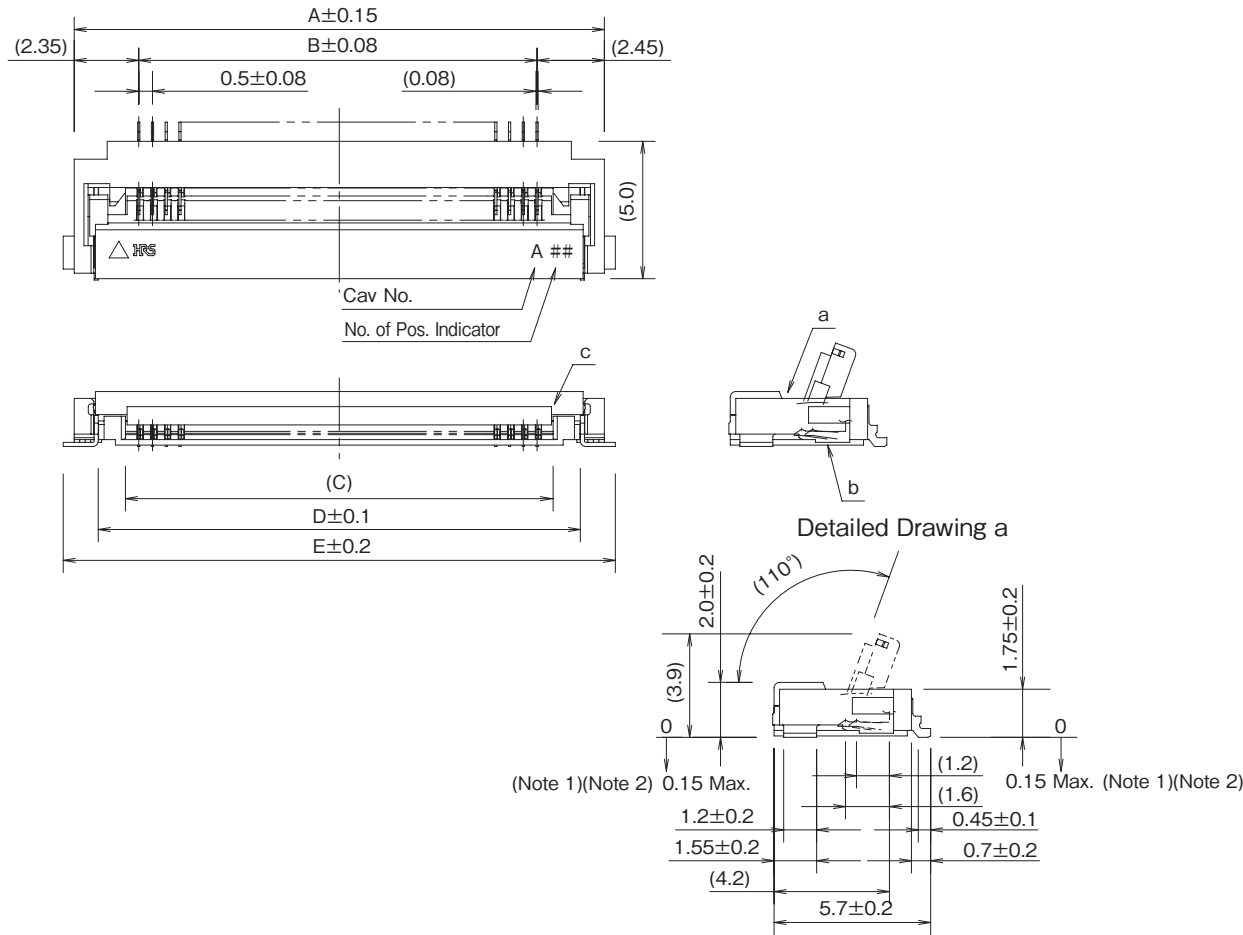
FH52K (Long Solder Tabs, 125°C Heat Resistant Type) 1.0mm Pitch Product



Note 1 : The coplanarity of the contact and solder tab lead is 0.1 Max.
Note 2 : The contact lead position indicates the dimension from b, the bottom surface of the insulator body.
Note 3 : Packaged in tape and reel only. Check the "Packaging Specification" for details.
Note 4 : Sink mark reliefs may be added due to improvements
Note 5 : Sight variations in color of the plastic compounds do not affect form, fit or function.
After reflow, the contact plating may change color, however this does not represent a quality issue.

Unit : mm											
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Q	R	Purchase Unit (##) : (00)	Purchase Unit (##) : (99)
FH52K-12(6)SA-1SH(##)	CL0580-4638-0-##	6	10.3	5.0	6.57	8.55	11.1	2.9	2.4	3,000pcs per reel	500pcs per reel
FH52K-20(10)SB-1SH(##)	CL0580-4630-0-##	10	14.3	9.0	10.57	12.55	15.1	2.4	2.9		

FH52T (Long Solder Tabs, 2-Point Contact Type) 0.5mm Pitch Product



- Note 1 : The coplanarity of the contact and solder tab lead is 0.1 Max.
 Note 2 : The contact lead position indicates the dimension from b, the bottom surface of the insulator body.
 Note 3 : Packaged in tape and reel only. Check the "Packaging Specification" for details.
 Note 4 : Sink mark reliefs may be added due to improvements
 Note 5 : Sight variations in color of the plastic compounds do not affect form, fit or function.
 After reflow, the contact plating may change color, however this does not represent a quality issue.

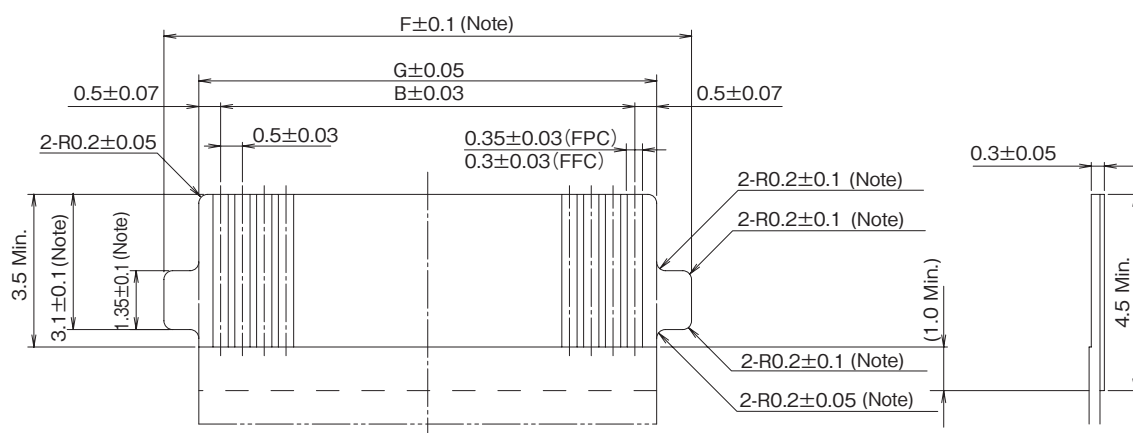
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit (##) : (00)	Purchase Unit (##) : (99)
FH52T-10S-0.5SH(##)	CL0580-4503-0-##	10	9.3	4.5	5.57	7.55	10.1	3,000pcs per reel	500pcs per reel
FH52T-24S-0.5SH(##)	CL0580-4500-0-##	24	16.3	11.5	12.57	14.55	17.1		
FH52T-32S-0.5SH(##)	CL0580-4502-0-##	32	20.3	15.5	16.57	18.55	21.1		
FH52T-50S-0.5SH(##)	CL0580-4501-7-##	50	29.3	24.5	25.57	27.55	30.1		

● Recommended PCB Mounting Pattern and Metal Mask Dimensions

Figure 1 is a dimensional drawing of the connector image. The drawing shows a rectangular layout with various dimensions and tolerances. Key dimensions include: overall width $B \pm 0.05$, overall height 4.6 ± 0.05 , a central vertical gap of 0.85 ± 0.05 , a horizontal gap of 0.5 ± 0.05 , a vertical gap of 2 ± 0.05 , a horizontal gap of 0.3 ± 0.03 (Land pattern), a horizontal gap of 0.25 ± 0.03 (Metal mask), a horizontal gap of 0.8 ± 0.03 , and a horizontal gap of $E \pm 0.05$. A label "Connector image" points to the central area.

● Recommended FPC/FFC Dimensions



16

Unit : mm

Part No.	HRS No.	No. of Pos.	B	E	F	G
FH52-6S-0.5SH(##)	CL0580-3304-0-##	6	2.5	5.1	5.1	3.5
FH52-8S-0.5SH(##)	CL0580-3305-3-##	8	3.5	6.1	6.1	4.5
FH52-10S-0.5SH(##)	CL0580-3306-6-##	10	4.5	7.1	7.1	5.5
FH52-11S-0.5SH(##)	CL0580-3320-7-##	11	5.0	7.6	7.6	6.0
FH52-12S-0.5SH(##)	CL0580-3307-9-##	12	5.5	8.1	8.1	6.5
FH52-15S-0.5SH(##)	CL0580-3302-5-##	15	7.0	9.6	9.6	8.0
FH52-18S-0.5SH(##)	CL0580-3321-0-##	18	8.5	11.1	11.1	9.5
FH52-20S-0.5SH(##)	CL0580-3309-4-##	20	9.5	12.1	12.1	10.5
FH52-22S-0.5SH(##)	CL0580-3317-2-##	22	10.5	13.1	13.1	11.5
FH52-24S-0.5SH(##)	CL0580-3318-5-##	24	11.5	14.1	14.1	12.5
FH52-25S-0.5SH(##)	CL0580-3316-0-##	25	12.0	14.6	14.6	13.0
FH52-26S-0.5SH(##)	CL0580-3319-8-##	26	12.5	15.1	15.1	13.5
FH52-28S-0.5SH(##)	CL0580-3324-8-##	28	13.5	16.1	16.1	14.5
FH52-30S-0.5SH(##)	CL0580-3310-3-##	30	14.5	17.1	17.1	15.5
FH52-32S-0.5SH(##)	CL0580-3325-0-##	32	15.5	18.1	18.1	16.5
FH52-40S-0.5SH(##)	CL0580-3300-0-##	40	19.5	22.1	22.1	20.5
FH52-42S-0.5SH(##)	CL0580-3329-1-##	42	20.5	23.1	23.1	21.5
FH52-45S-0.5SH(##)	CL0580-3311-6-##	45	22.0	24.6	24.6	23.0
FH52-50S-0.5SH(##)	CL0580-3303-8-##	50	24.5	27.1	27.1	25.5
FH52-60S-0.5SH(##)	CL0580-3301-2-##	60	29.5	32.1	32.1	30.5

Unit : mm

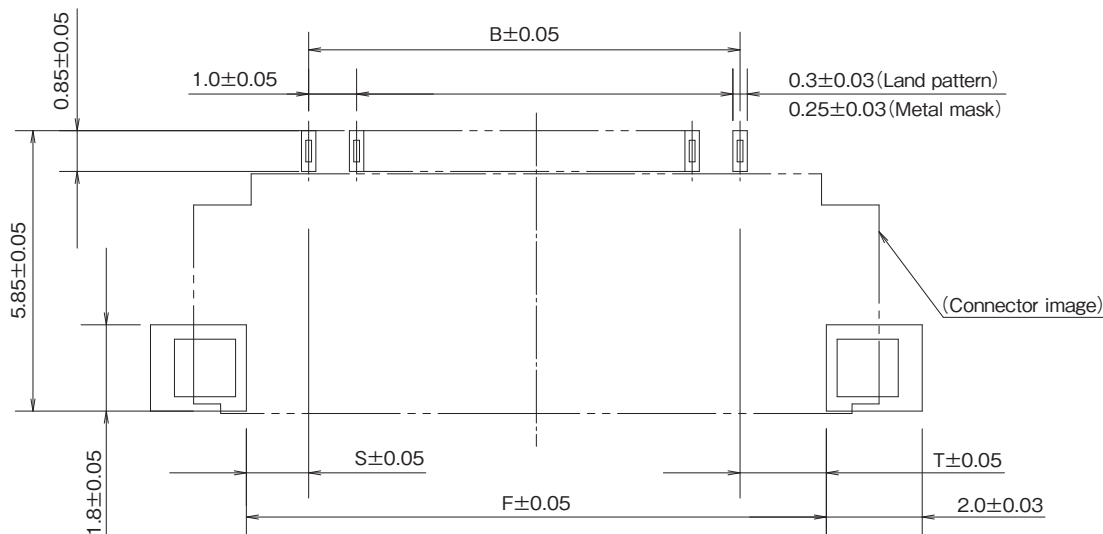
Part No.	HRS No.	No. of Pos.	B	F	G	H
FH52E-6S-0.5SH(##)	CL0580-3365-0-##	6	2.5	5.1	5.1	3.5
FH52E-8S-0.5SH(##)	CL0580-3349-0-##	8	3.5	6.1	6.1	4.5
FH52E-10S-0.5SH(##)	CL0580-3346-0-##	10	4.5	7.1	7.1	5.5
FH52E-15S-0.5SH(##)	CL0580-3337-0-##	15	7.0	9.6	9.6	8.0
FH52E-18S-0.5SH(##)	CL0580-3331-3-##	18	8.5	11.1	11.1	9.5
FH52E-20S-0.5SH(##)	CL0580-3357-0-##	20	9.5	12.1	12.1	10.5
FH52E-22S-0.5SH(##)	CL0580-3343-2-##	22	10.5	13.1	13.1	11.5
FH52E-24S-0.5SH(##)	CL0580-3340-4-##	24	11.5	14.1	14.1	12.5
FH52E-26S-0.5SH(##) (Note)	CL0580-3366-0-##	26	12.5	15.1	15.1	13.5
FH52E-30S-0.5SH(##)	CL0580-3347-3-##	30	14.5	17.1	17.1	15.5
FH52E-40S-0.5SH(##)	CL0580-3334-1-##	40	19.5	22.1	22.1	20.5
FH52E-45S-0.5SH(##)	CL0580-3368-0-##	45	22.0	24.6	24.6	23.0
FH52E-50S-0.5SH(##)	CL0580-3335-4-##	50	24.5	27.1	27.1	25.5
FH52E-60S-0.5SH(##)	CL0580-3339-5-##	60	29.5	32.1	32.1	30.5
FH52E-64S-0.5SH(##)	CL0580-3333-9-##	64	31.5	34.1	34.1	32.5
FH52E-68S-0.5SH(##)	CL0580-3332-6-##	68	33.5	36.1	36.1	34.5

Note : The (99) specification is available for all positions except 26pos.

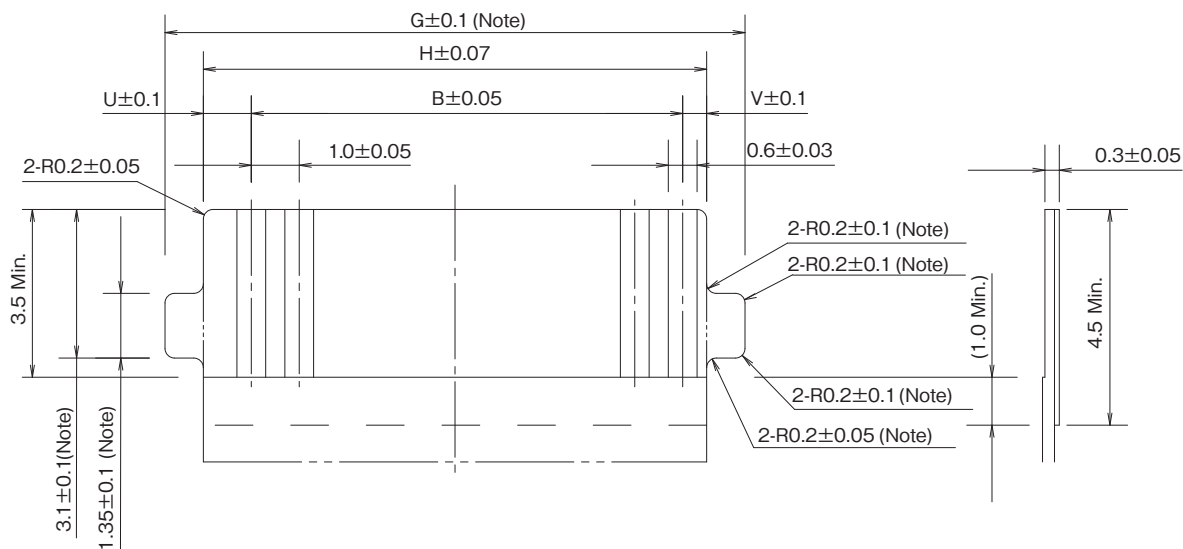
FH52E (Long Solder Tabs Type) 1.0mm Pitch Product

Recommended PCB Mounting Pattern and Metal Mask Dimensions

Recommended metal mask thickness : 0.12mm



Recommended FPC/FFC Dimensions



Note : FPC/FFC without tabs can also be used.

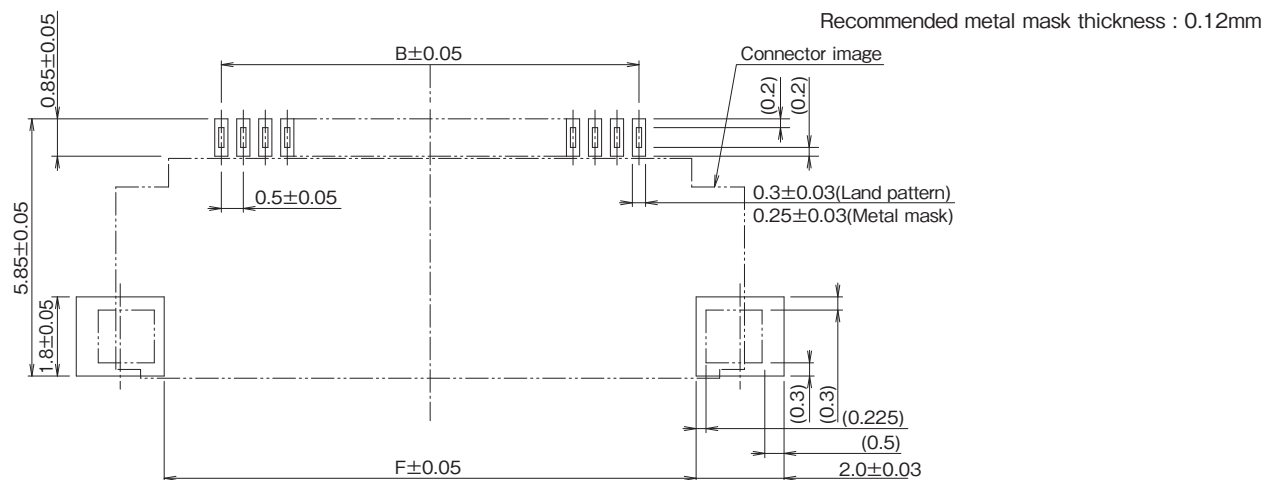
When using FPC/FFC without tabs the specified dimensions are not necessary.

Unit : mm

Part No.	HRS No.	No. of Pos.	B	F	G	H	S	T	U	V
FH52E-8(4)SB-1SH(##)	CL0580-3351-0-##	4	3.0	6.1	6.1	4.5	1.3	1.8	1.0	0.5
FH52E-20(10)SA-1SH(##)	CL0580-3352-0-##	10	9.0	12.1	12.1	10.5	1.8	1.3	0.5	1.0
FH52E-20(10)SB-1SH(##)	CL0580-3353-0-##	10	9.0	12.1	12.1	10.5	1.3	1.8	1.0	0.5
FH52E-50(25)SA-1SH(##)	CL0580-3354-0-##	25	24.0	27.1	27.1	25.5	1.8	1.3	0.5	1.0
FH52E-50(25)SB-1SH(##)	CL0580-3355-0-##	25	24.0	27.1	27.1	25.5	1.3	1.8	1.0	0.5
FH52E-60(30)SB-1SH(##) (Note)	CL0580-3358-0-##	30	34.3	32.1	32.1	30.5	1.3	1.8	1.0	0.5

Note : The (99) specification is available for all positions except 30pos.

● Recommended PCB Mounting Pattern and Metal Mask Dimensions



G $\pm$ 0.1 (Note)
 H $\pm$ 0.05
 B $\pm$ 0.03
 0.5 $\pm$ 0.07
 0.5 $\pm$ 0.03
 0.35 $\pm$ 0.03 (FPC)
 0.3 $\pm$ 0.03 (FFC)
 2-R0.2 $\pm$ 0.05
 2-R0.2 $\pm$ 0.1 (Note)
 2-R0.2 $\pm$ 0.1 (Note)
 2-R0.2 $\pm$ 0.1 (Note)
 2-R0.2 $\pm$ 0.05 (Note)
 3.5 Min.
 3.1 $\pm$ 0.1 (Note)
 1.35 $\pm$ 0.1 (Note)
 0.3 $\pm$ 0.05
 4.5 Min.
 (1.0 Min.)

Note : FPC/FFC without tabs can also be used.
When using FPC/FFC without tabs the specified dimensions are not necessary.

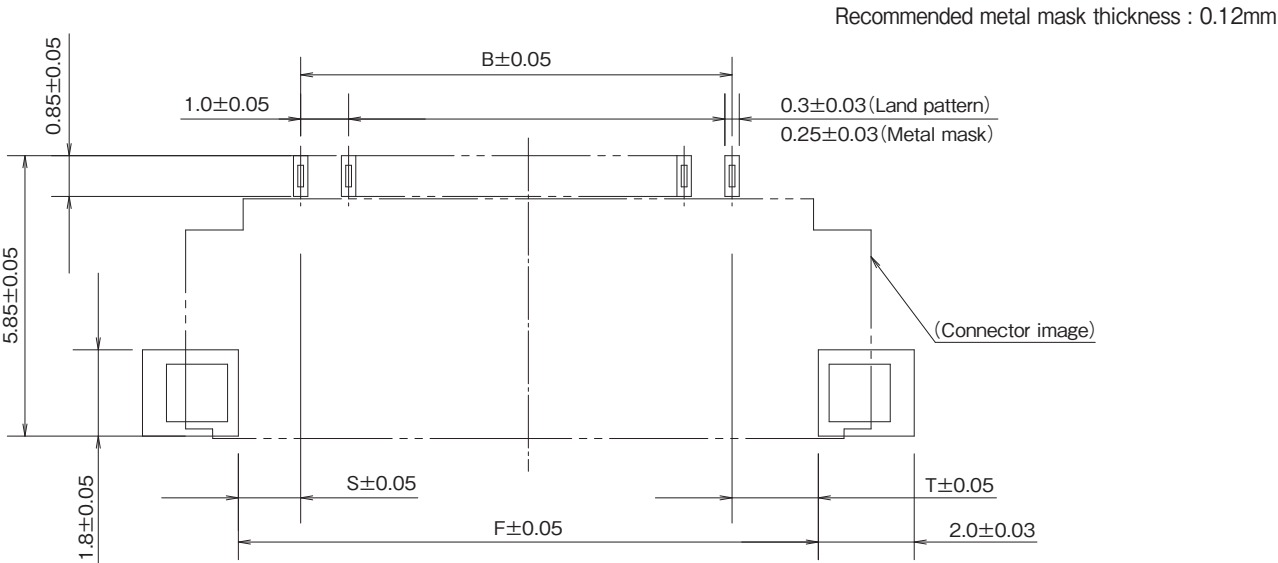
Unit : mm

Part No.	HRS No.	No. of Pos.	B	F	G	H
FH52K-6S-0.5SH(##)	CL0580-4613-0-##	6	2.5	5.1	5.1	3.5
FH52K-8S-0.5SH(##)	CL0580-4611-0-##	8	3.5	6.1	6.1	4.5
FH52K-10S-0.5SH(##)	CL0580-4606-0-##	10	4.5	7.1	7.1	5.5
FH52K-12S-0.5SH(##)	CL0580-4629-0-##	12	5.5	8.1	8.1	6.5
FH52K-15S-0.5SH(##)	CL0580-4617-0-##	15	7.0	9.6	9.6	8.0
FH52K-18S-0.5SH(##)	CL0580-4636-0-##	18	8.5	11.1	11.1	9.5
FH52K-20S-0.5SH(##)	CL0580-4604-0-##	20	9.5	12.1	12.1	10.5
FH52K-22S-0.5SH(##)	CL0580-4632-0-##	22	10.5	13.1	13.1	11.5
FH52K-24S-0.5SH(##)	CL0580-4633-0-##	24	11.5	14.1	14.1	12.5
FH52K-25S-0.5SH(##)	CL0580-4634-0-##	25	12.0	14.6	14.6	13.0
FH52K-26S-0.5SH(##)	CL0580-4635-0-##	26	12.5	15.1	15.1	13.5
FH52K-30S-0.5SH(##)	CL0580-4631-0-##	30	14.5	17.1	17.1	15.5
FH52K-32S-0.5SH(##)	CL0580-4600-9-##	32	15.5	18.1	18.1	16.5
FH52K-34S-0.5SH(##)	CL0580-4601-0-##	34	16.5	19.1	19.1	17.5
FH52K-40S-0.5SH(##)	CL0580-4620-0-##	40	19.5	22.1	22.1	20.5
FH52K-45S-0.5SH(##)	CL0580-4637-0-##	45	22.0	24.6	24.6	23.0
FH52K-50S-0.5SH(##)	CL0580-4609-0-##	50	24.5	27.1	27.1	25.5
FH52K-60S-0.5SH(##)	CL0580-4607-0-##	60	29.5	32.1	32.1	30.5
FH52K-68S-0.5SH(##)	CL0580-4614-0-##	68	33.5	36.1	36.1	34.5
FH52K-80S-0.5SH(05) (Note)	CL0580-4641-0-05	80	39.5	42.1	42.1	40.5

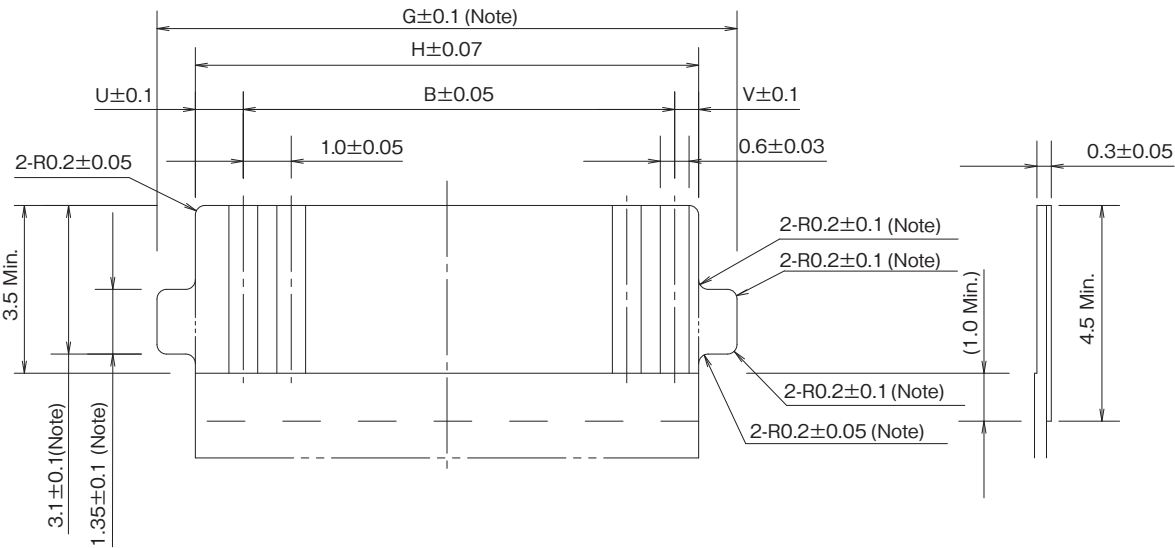
Note : The (05) specification is available for 80pos. only. The purchase unit is 2,000pcs per reel for specification (05) of FH52K-80S-0.5SH.

FH52K (Long Solder Tabs, 125°C Heat Resistant Type) 1.0mm Pitch Product

Recommended PCB Mounting Pattern and Metal Mask Dimensions



Recommended FPC/FFC Dimensions

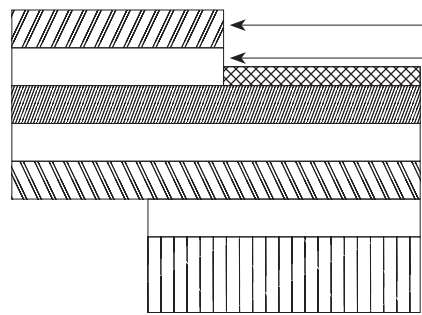


Note : FPC/FFC without tabs can also be used.
When using FPC/FFC without tabs the specified dimensions are not necessary.

Unit : mm										
Part No.	HRS No.	No. of Pos.	B	F	G	H	S	T	U	V
FH52K-12(6)SA-1SH(##)	CL0580-4638-0-##	6	5.0	8.1	8.1	6.5	1.8	1.3	0.5	1.0
FH52K-20(10)SB-1SH(##)	CL0580-4630-0-##	10	9.0	12.1	12.1	10.5	1.3	1.8	1.0	0.5

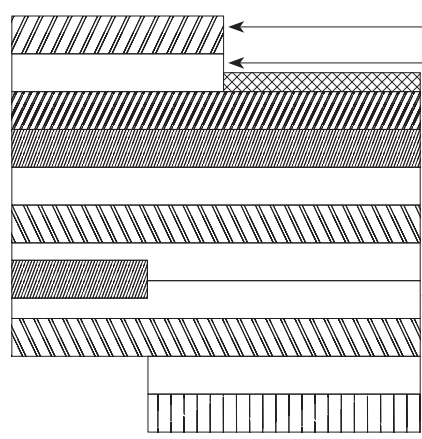
FPC/FFC Construction (Recommended Specifications)

1. Single-Sided FPC (FPC : Flexible Printed Circuit)



Material Name	Material	Thickness (μm)
Covering Film Layer	Polyimide 1mil	(25)
Cover Adhesive		(25)
Surface Treatment	0.2 μm Thick Gold Plated over 1 to 5 μm Thick Nickel Underplating	3
Copper Foil	Cu 1oz	35
Base Adhesive	Thermosetting Adhesive	25
Base Film	Polyimide 1mil thick	25
Reinforcement Material Adhesive	Thermosetting Adhesive	30
Stiffener	Polyimide 7mil thick	175
Total		293

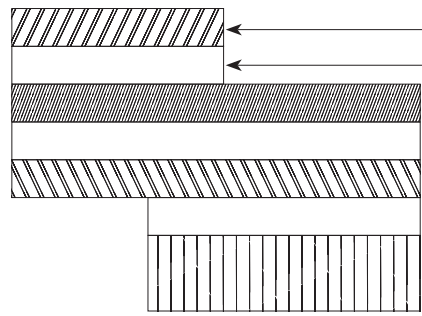
2. Double-Sided FPC (FPC : Flexible Printed Circuit)



Material Name	Material	Thickness (μm)
Covering Film Layer	Polyimide 1mil	(25)
Cover Adhesive		(25)
Surface Treatment	0.2 μm Thick Gold Plated over 1 to 5 μm Thick Nickel Underplating	3
Through-hole Copper	Cu	15
Copper Foil	Cu 1/2oz	18
Base Adhesive	Thermosetting Adhesive	18
Base Film	Polyimide 1mil thick	25
Base Adhesive	Thermosetting Adhesive	18
Copper Foil	Cu 1/2oz	(18)
Cover Adhesive	Thermosetting Adhesive	25
Covering Layer Film	Polyimide 1mil thick	25
Reinforcement Material Adhesive	Thermosetting Adhesive	50
Stiffener	Polyimide 4mil thick	100
Total		297

Note : Use of double-sided FPC with copper foil is not recommended in order to prevent release of the FPC due to bending.

3. FFC (FFC : Flexible Flat Cable)



Material Name	Material	Thickness (μm)
Polyester Film		(12)
Adhesive	Thermoplastic Polyester	(30)
Gold Plated Annealed Copper Foil with Nickel Underplating		35
Adhesive	Polyester	30
Polyester		12
Adhesive	Polyester	30
Stiffener	Polyester	188
Total		295

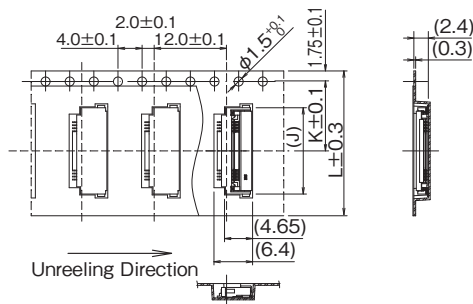
Note : Typical thickness tolerance is about $\pm 20 \mu m$

4. Precautions

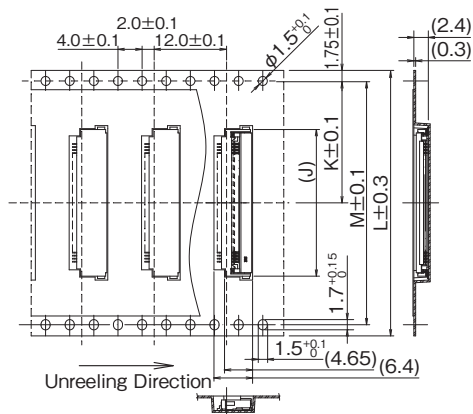
1. This is a reference FPC/FFC construction. Make the thickness of the FPC/FFC mated portion $0.30 \pm 0.05mm$ in reference to the FPC/FFC construction.
2. Contact an FPC/FFC maker for details on component construction.

Packaging Specification

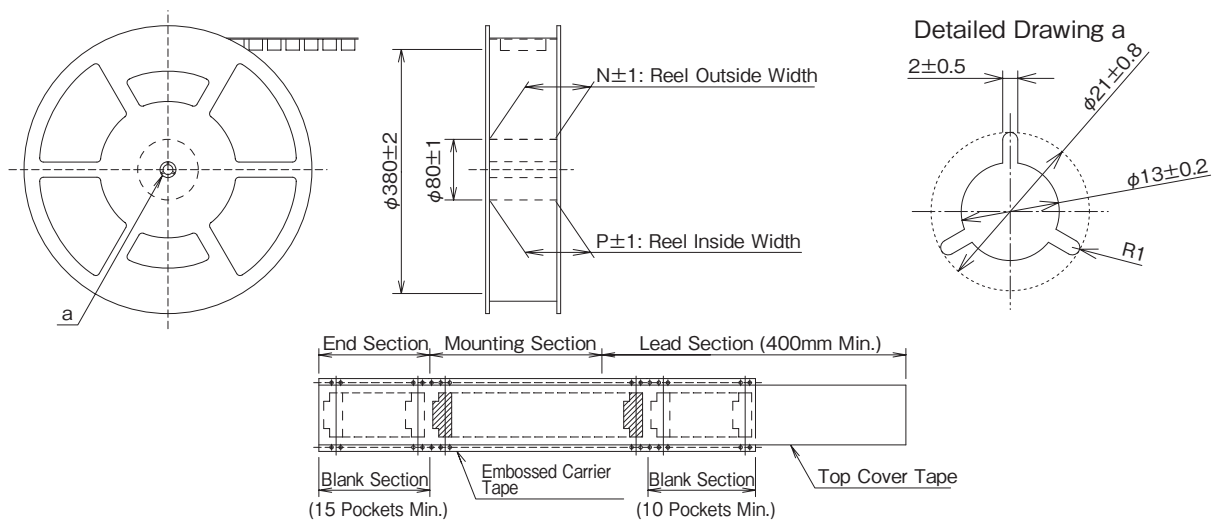
● Embossed Carrier Tape Dimensions (Tape Width 24mm Max.)



● Embossed Carrier Tape Dimensions (Tape Width 32mm Min.)



● Reel Dimensions



FH52 (Standard Type) 0.5mm Pitch Product

Unit : mm

Part No.	HRS No.	No. of Pos.	J	K	L	M	N	P
FH52-6S-0.5SH(##)	CL0580-3304-0-##	6	7.6	11.5	24.0	-	29.4	25.4
FH52-8S-0.5SH(##)	CL0580-3305-3-##	8	8.6					
FH52-10S-0.5SH(##)	CL0580-3306-6-##	10	9.6					
FH52-11S-0.5SH(##)	CL0580-3320-7-##	11	10.1					
FH52-12S-0.5SH(##)	CL0580-3307-9-##	12	10.6					
FH52-15S-0.5SH(##)	CL0580-3302-5-##	15	12.1					
FH52-18S-0.5SH(##)	CL0580-3321-0-##	18	13.6					
FH52-20S-0.5SH(##)	CL0580-3309-4-##	20	14.6					
FH52-22S-0.5SH(##)	CL0580-3317-2-##	22	15.6	14.2	32.0	28.4	37.4	33.4
FH52-24S-0.5SH(##)	CL0580-3318-5-##	24	16.6					
FH52-25S-0.5SH(##)	CL0580-3316-0-##	25	17.1					
FH52-26S-0.5SH(##)	CL0580-3319-8-##	26	17.6					
FH52-28S-0.5SH(##)	CL0580-3324-8-##	28	18.6					
FH52-30S-0.5SH(##)	CL0580-3310-3-##	30	19.6					
FH52-32S-0.5SH(##)	CL0580-3325-0-##	32	20.6	20.2	44.0	40.4	49.4	45.4
FH52-40S-0.5SH(##)	CL0580-3300-0-##	40	24.6					
FH52-42S-0.5SH(##)	CL0580-3329-1-##	42	25.6					
FH52-45S-0.5SH(##)	CL0580-3311-6-##	45	27.1					
FH52-50S-0.5SH(##)	CL0580-3303-8-##	50	29.6					
FH52-60S-0.5SH(##)	CL0580-3301-2-##	60	34.6	26.2	56.0	52.4	61.4	57.4

FH52 (Standard Type) 1.0mm Pitch Product

Unit : mm

Part No.	HRS No.	No. of Pos.	J	K	L	M	N	P
FH52-10(4)SA-1SH(##)	CL0580-3330-0-##	4	9.6	11.5	24.0	-	29.4	25.4
FH52-5S-1SH(##) (Note)	CL0580-3336-7-##	5	10.1	11.5	24.0		29.4	25.4
FH52-12S-1SH(##)	CL0580-3323-5-##	12	17.1	14.2	32.0	28.4	37.4	33.4
FH52-32(16)SB-1SH(##) (Note)	CL0580-3338-2-##	16	20.6	20.2	44.0	40.4	49.4	45.4
FH52-60(30)SB-1SH(##)	CL0580-3315-7-##	30	34.6	26.2	56.0	52.4	61.4	57.4

Note : The (99) specification is only available for 4, 12 and 30pos.

FH52E (Long Solder Tabs Type) 0.5mm Pitch Product

Unit : mm

Part No.	HRS No.	No. of Pos.	J	K	L	M	N	P
FH52E-6S-0.5SH(##)	CL0580-3365-0-##	6	7.6	11.5	24.0	-	29.4	25.4
FH52E-8S-0.5SH(##)	CL0580-3349-0-##	8	8.6					
FH52E-10S-0.5SH(##)	CL0580-3346-0-##	10	9.6					
FH52E-15S-0.5SH(##)	CL0580-3337-0-##	15	12.1					
FH52E-18S-0.5SH(##)	CL0580-3331-3-##	18	13.6					
FH52E-20S-0.5SH(##)	CL0580-3357-0-##	20	14.6					
FH52E-22S-0.5SH(##)	CL0580-3343-2-##	22	15.6	14.2	32.0	28.4	37.4	33.4
FH52E-24S-0.5SH(##)	CL0580-3340-4-##	24	16.6					
FH52E-26S-0.5SH(##) (Note)	CL0580-3366-0-##	26	17.6					
FH52E-30S-0.5SH(##)	CL0580-3347-3-##	30	19.6	20.2	44.0	40.4	49.4	45.4
FH52E-40S-0.5SH(##)	CL0580-3334-1-##	40	24.6					
FH52E-45S-0.5SH(##)	CL0580-3368-0-##	45	27.1					
FH52E-50S-0.5SH(##)	CL0580-3335-4-##	50	29.6					
FH52E-60S-0.5SH(##)	CL0580-3339-5-##	60	34.6	26.2	56.0	52.4	61.4	57.4
FH52E-64S-0.5SH(##)	CL0580-3333-9-##	64	36.6					
FH52E-68S-0.5SH(##)	CL0580-3332-6-##	68	38.6					

Note : The (99) specification is available for all positions except 26pos.

FH52E (Long Solder Tabs Type) 1.0mm Pitch Product

Unit : mm

Part No.	HRS No.	No. of Pos.	J	K	L	M	N	P
FH52E-8(4)SB-1SH(##)	CL0580-3351-0-##	4	8.6	11.5	24.0	-	29.4	25.4
FH52E-20(10)SA-1SH(##)	CL0580-3352-0-##	10	14.6					
FH52E-20(10)SB-1SH(##)	CL0580-3353-0-##	10	14.6					
FH52E-50(25)SA-1SH(##)	CL0580-3354-0-##	25	29.6	20.2	44.0	40.4	49.4	45.4
FH52E-50(25)SB-1SH(##)	CL0580-3355-0-##	25	29.6					
FH52E-60(30)SB-1SH(##) (Note)	CL0580-3358-0-##	30	34.6	26.2	56.0	52.4	61.4	57.4

Note : The (99) specification is available for all positions except 30pos.

FH52K (Long Solder Tabs, 125°C Heat Resistant Type) 0.5mm Pitch Product

Unit : mm

Part No.	HRS No.	No. of Pos.	J	K	L	M	N	P
FH52K-6S-0.5SH(##)	CL0580-4613-0-##	6	7.6	11.5	24.0	-	29.4	25.4
FH52K-8S-0.5SH(##)	CL0580-4611-0-##	8	8.6					
FH52K-10S-0.5SH(##)	CL0580-4606-0-##	10	9.6					
FH52K-12S-0.5SH(##)	CL0580-4629-0-##	12	10.6					
FH52K-15S-0.5SH(##)	CL0580-4617-0-##	15	12.1					
FH52K-18S-0.5SH(##)	CL0580-4636-0-##	18	13.6					
FH52K-20S-0.5SH(##)	CL0580-4604-0-##	20	14.6	14.2	32.0	28.4	37.4	33.4
FH52K-22S-0.5SH(##)	CL0580-4632-0-##	22	15.6					
FH52K-24S-0.5SH(##)	CL0580-4633-0-##	24	16.6					
FH52K-25S-0.5SH(##)	CL0580-4634-0-##	25	17.1					
FH52K-26S-0.5SH(##)	CL0580-4635-0-##	26	17.6					
FH52K-30S-0.5SH(##)	CL0580-4631-0-##	30	19.6	20.2	44.0	40.4	49.4	45.4
FH52K-32S-0.5SH(##)	CL0580-4600-9-##	32	20.6					
FH52K-34S-0.5SH(##)	CL0580-4601-0-##	34	21.6					
FH52K-40S-0.5SH(##)	CL0580-4620-0-##	40	24.6					
FH52K-45S-0.5SH(##)	CL0580-4637-0-##	45	27.1					
FH52K-50S-0.5SH(##)	CL0580-4609-0-##	50	29.6					
FH52K-60S-0.5SH(##)	CL0580-4607-0-##	60	34.6	26.2	56.0	52.4	61.4	57.4
FH52K-68S-0.5SH(##)	CL0580-4614-0-##	68	38.6					
FH52K-80S-0.5SH(05) (Note)	CL0580-4641-0-05	80	44.6	34.2 ± 0.3	72.0+0.4/-0.3	68.4	77.4	73.4

Note : The (05) specification is available for 80pos. only. The purchase unit is 2,000pcs per reel for specification (05) of FH52K-80S-0.5SH.

FH52K (Long Solder Tabs, 125°C Heat Resistant Type) 1.0mm Pitch Product

Unit : mm

Part No.	HRS No.	No. of Pos.	J	K	L	M	N	P
FH52K-12(6)SA-1SH(##)	CL0580-4638-0-##	6	10.6	11.5	24.0	-	29.4	25.4
FH52K-20(10)SB-1SH(##)	CL0580-4630-0-##	10	14.6			-		

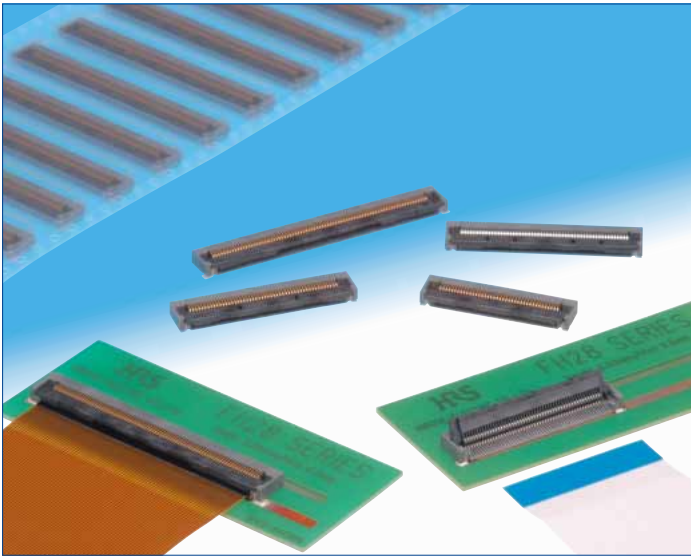
FH52T (Long Solder Tabs, 2-Point Contact Type) 0.5mm Pitch Product

Unit : mm

Part No.	HRS No.	No. of Pos.	J	K	L	M	N	P
FH52T-10S-0.5SH(##)	CL0580-4503-0-##	10	9.6	11.5	24.0	-	29.4	25.4
FH52T-24S-0.5SH(##)	CL0580-4500-0-##	24	16.6	14.2	32.0	28.4	37.4	33.4
FH52T-32S-0.5SH(##)	CL0580-4502-0-##	32	20.6	20.2	44.0	40.4	49.4	45.4
FH52T-50S-0.5SH(##)	CL0580-4501-7-##	50	29.6	26.2	56.0	52.4	61.4	57.4

0.5mm/1mm Pitch, 2.55mm Height, 125°C Heat Resistant FPC/FFC Connectors

FH28K Series



Robust Lock Design

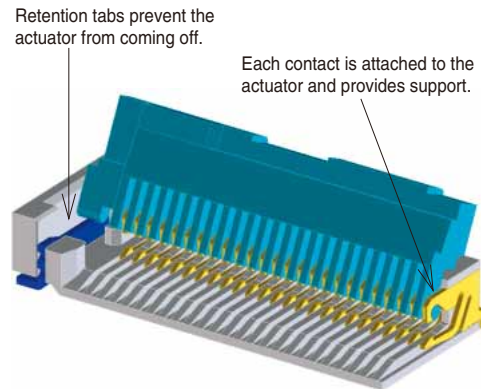


Fig.1

■ Features

1. 125°C heat resistance

The 125°C heat resistance design makes FH28K ideal for use in applications requiring high heat resistance such as automotive.

2. Highly reliable connection and robust design

High pin count connectors require a reinforced connector body and high FPC/FFC retention. With its unique FPC/FFC positioning mechanism and robust design that prevents accidental disengagement, the FH28K Series achieves high connection reliability.

3. Flip lock provides superior operability

The flip lock design makes it easier to engage/disengage the actuator and reduces the required force needed to operate. A clear tactile click is delivered upon the successful completion of the mating process. (Fig.1)

4. Enhanced FPC/FFC retention force

Compared to Hirose's 0.5mm pitch connector the FH12 Series, vertical retention force for the FPC/FFC is 2.5 times stronger and horizontal retention force is 2 times stronger.

*Horizontal retention force value achieved by use of FPC positioning tabs. Use of FPC without positioning tabs results in a horizontal retention value equivalent to FH12 Series.

5. Compatible with 0.3mm FPC/FFC thickness

Compatible with easy to manufacture and easy to insert 0.3mm thick FPC/FFC.

6. No pattern prohibited area on bottom of connector (Overmolding Design)

The bottom of the connector is fully covered with resin, eliminating contact exposure and any restrictions on PCB pattern routing for enhanced design freedom.

7. Pick & Place Mounting

Offered in tape and reel packaging that is compatible with automatic machine mounting. (2,000pcs/reel)

8. Halogen-free

All materials and substances used to produce this product comply with Halogen-free standards.

*Defined according to IEC61249-2-21. Br : 900ppm maximum, Cl : 900ppm maximum, Br+Cl : 1,500ppm maximum

9. Multiple packing options

The standard packaging is 2,000pcs/reel, but FH28K is also offered in 500pcs/reel. (The outer diameter of the reel will be ϕ 330mm in this case.)

The FPC positioning mechanism and FPC tabs help to guide and hold the FPC prior to engaging the actuator

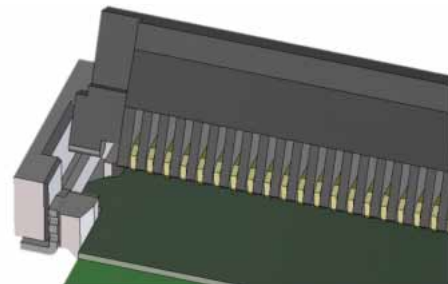


Fig.2

Can also be used with straight sided, non-tabbed FPC/FFC

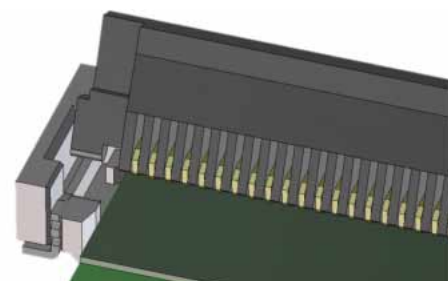


Fig.3

Product Specifications

Ratings	Rated Current 0.5A Rated Voltage 50Vrms AC	Operating Temperature Range -40 to +125°C (Note 1) Operating Humidity Range Relative humidity 90% or less (no condensation)	Storage Temperature Range -10 to +50°C (Note 2) Storage Humidity Range Relative humidity 90% or less (no condensation)
Adaptive FPC/FFC Contact Specifications	t=0.3±0.05 Gold plating 125°C Heat Resistant FPC/FFC		
Item	Specification	Conditions	
1. Insulation Resistance	Minimum of 500MΩ	Measured with 100V DC	
2. Withstanding Voltage	No flashover or breakdown	150Vrms AC is applied for 1 min.	
3. Contact Resistance	Maximum of 50mΩ *Includes FPC/FFC conductor resistance	Measured at 1mA (DC or 1,000Hz)	
4. Mating Durability	Contact Resistance : Maximum of 50mΩ No damaged, cracked or looseness of parts	20 mating cycles	
5. Vibration Resistance	No electrical discontinuity of 1μs or greater Contact Resistance : Maximum of 50mΩ No damages, cracks and looseness of parts	Frequency : 10 to 55Hz Single amplitude of 0.75mm for 10 cycles in 3 axial directions	
6. Shock Resistance	No electric discontinuity of 1μs or greater Contact Resistance : Maximum of 50mΩ No damaged, cracked or looseness of parts	Acceleration of 981m/s ² , 6ms duration, sine half-wave waveform 3 cycles in each of the 3 axis	
7. Humidity Resistance of Steady State	Contact Resistance : Maximum of 50mΩ Insulation Resistance : Minimum of 50MΩ No damaged, cracked or looseness of parts	96 hours at temperature : 60°C and humidity : 90 to 95%	
8. Temperature Cycles	Contact Resistance : Maximum of 50mΩ Insulation Resistance : Minimum of 50MΩ No damaged, cracked or looseness of parts	Temperature : -40→+15 to +35→+125→+15 to +35°C Time : 30→2 to 3→30→2 to 3 minutes 1000 cycles	
9. Solder Heat Resistance	Should not have external deformity or loose parts	Reflow : according to the Recommended Temperature Profile Hand solder : 350±10°C for 5 seconds	

Note 1 : Includes temperature rise caused by current flow.

Note 2 : The term "storage" here refers to products stored for a long period prior to board mounting and use. The operating temperature and humidity range covers the non-energized condition of connectors after board mounting and the temporary storage.

Materials / Finish

Component	Materials	Color/Finish	Remarks
Insulator	LCP	Gray	UL94V-0
	LCP	Black	
Contact	Copper Alloy	Partially Gold Plated	_____
Metal fitting	Brass	Pure 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.

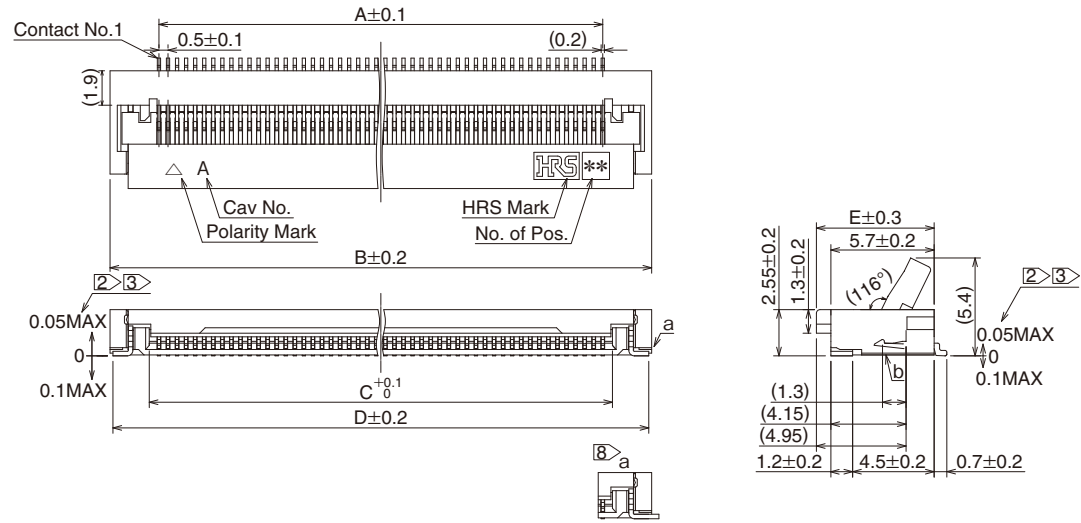
FH 28K H - 50 (25) S B - 0.5 SH (98)

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① Series Name : FH	⑥ Contact arrangement : Single (single row)
② Series No. : 28K	⑦ Eccentric direction : Blank...Standard type (without eccentricity) B...Eccentric type (contacts on the opposite side of polarity mark)
③ None : Standard type H : Space-saving type	⑧ Contact Pitch : 0.5mm, 1mm
④ Standard type : The number of positions Eccentric type : Number of positions in 0.5mm housing	⑨ Mounting direction , SH...SMT horizontal mounting type
⑤ Standard type : Blank Eccentric type : Number of positions	⑩ Specification : Blank ...Standard, 2,000 pcs/reel (98)...500 pcs/reel

Connector Dimensions

0.5mm Pitch Product



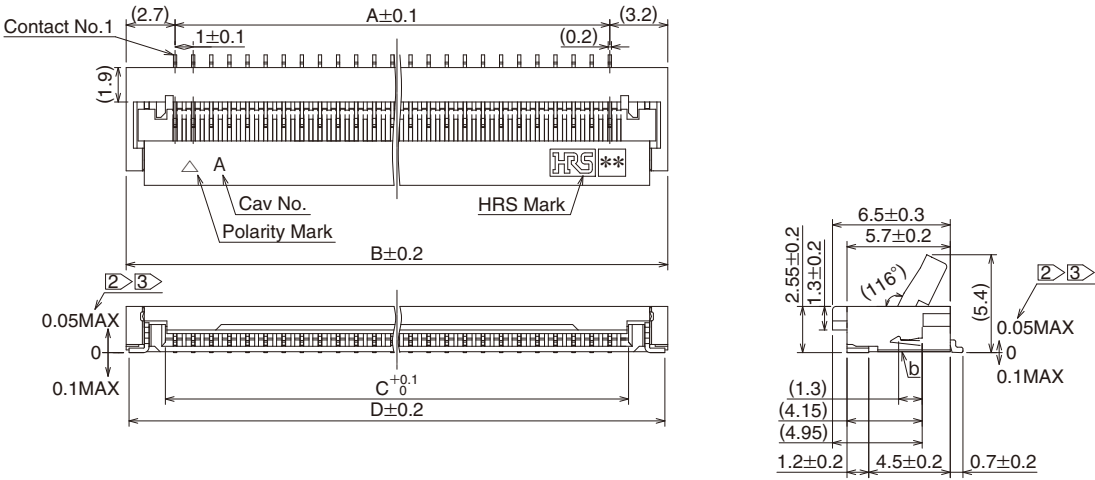
- Notes
- 1 The dimension in parentheses are for reference.
 - 2 Lead co-planarity including retention tabs shall be 0.1 max.
 - 3 Indicates dimensions from surface b.
 - 4 Delivered in tape and reel packages. See the packaging specifications for details.
 - 5 Note that preventive hole for sink mark or slits could be added for improvement.
 - 6 Black spots may appear on the molded plastic however this does not represent a quality issue.
 - 7 This product satisfies halogen free requirements defined as 900ppm maximum chlorine, 900ppm maximum bromine, and 1500ppm maximum total of chlorine and bromine.
 - 8 FH28KH has retention tabs extending outward from the connector body as shown in the diagram.

Connector Dimensions Table

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E
FH28K-10S-0.5SH(**)	586-1876-0 **	10	4.5	9.9	5.57	9.58	6.5
FH28K-15S-0.5SH(**)	586-1883-0 **	15	7	12.4	8.07	12.08	6.5
FH28K-20S-0.5SH(**)	586-1879-0 **	20	9.5	14.9	10.57	14.58	6.5
FH28K-28S-0.5SH(**)	586-1880-0 **	28	13.5	18.9	14.57	18.58	6.5
FH28K-30S-0.5SH(**)	586-1877-0 **	30	14.5	19.9	15.57	19.58	6.5
FH28K-40S-0.5SH(**)	586-1878-0 **	40	19.5	24.9	20.57	24.58	6.5
FH28K-45S-0.5SH(**)	586-1884-0 **	45	22	27.4	23.07	27.08	6.5
FH28K-50S-0.5SH(**)	586-1875-0 **	50	24.5	29.9	25.57	29.58	6.5
FH28K-55S-0.5SH(**)	586-1881-0 **	55	27	32.4	28.07	32.08	6.5
FH28K-60S-0.5SH(**)	586-1872-0 **	60	29.5	34.9	30.57	34.58	6.5
FH28K-64S-0.5SH(**)	586-1882-0 **	64	31.5	36.9	32.57	36.58	6.5
FH28K-68S-0.5SH(**)	586-1873-0 **	68	33.5	38.9	34.57	38.58	6.5
FH28K-74S-0.5SH(**)	586-1885-0 **	74	36.5	41.9	37.57	41.58	6.5
FH28KH-80S-0.5SH(**)	586-1874-0 **	80	39.5	44.9	40.57	45.7	6

■Connector Dimensions
1mm Pitch Product



- Notes 1 The dimension in parentheses are for reference.
- 2> Lead co-planarity including retention tabs shall be 0.1 max.
- 3> Indicates dimensions from surface b.
- 4 Delivered in tape and reel packages. See the packaging specifications for details.
- 5 Note that preventive hole for sink mark or slits could be added for improvement.
- 6 Black spots may appear on the molded plastic however this does not represent a quality issue.
- 7 This product satisfies halogen free requirements defined as 900ppm maximum chlorine, 900ppm maximum bromine, and 1500ppm maximum total of chlorine and bromine.

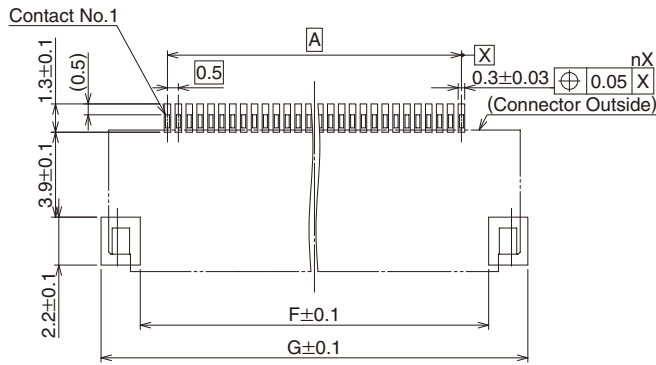
■Connector Dimensions Table

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D
FH28K-20(10)SB-1SH(**)	—	10	9	14.9	10.57	14.58
FH28K-30(15)SB-1SH(**)	—	15	14	19.9	15.57	19.58
FH28K-40(20)SB-1SH(**)	—	20	19	24.9	20.57	24.58
FH28K-50(25)SB-1SH(**)	—	25	24	29.9	25.57	29.58
FH28K-60(30)SB-1SH(**)	—	30	29	34.9	30.57	34.58
FH28K-64(32)SB-1SH(**)	—	32	31	36.9	32.57	36.58
FH28K-68(34)SB-1SH(**)	—	34	33	38.9	34.57	38.58

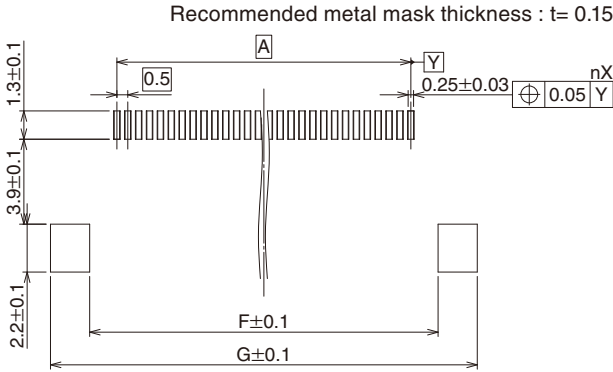
Note : Contact positions without HRS No. are currently planned for development.
Please contact Hirose for detailed information about product variation.

◆ Recommended PCB Layout
for 0.5mm Pitch Products

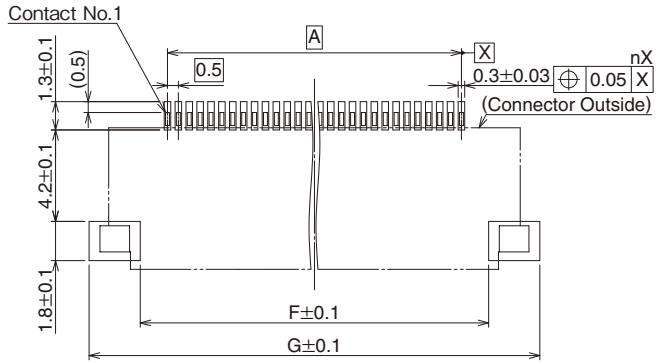


Standard Type (FH28K)

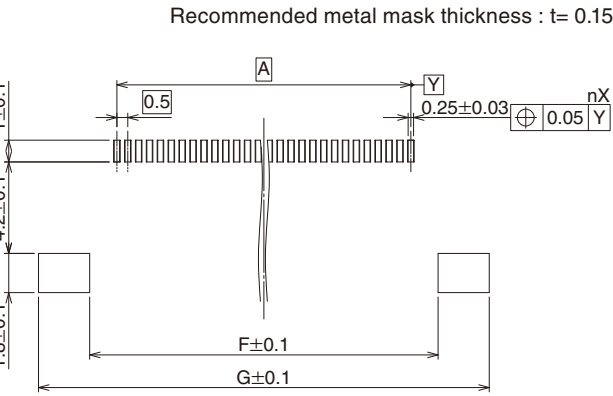
◆ Recommended Metal Mask Dimensions
for 0.5mm Pitch Products



Standard Type (FH28K)



Space-saving Type (FH28KH)



Space-saving Type (FH28KH)

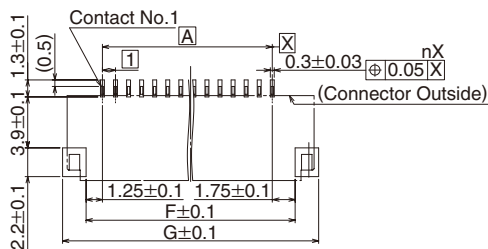
Note : 'n' indicates the number of positions.

◆ Recommended PCB Layout and Metal Mask Dimensions

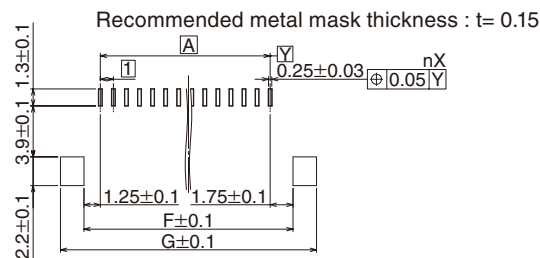
Unit : mm

Part No.	HRS No.	No. of Pos.	A	F	G
FH28K-10S-0.5SH(**)	586-1876-0 **	10	4.5	7	10.6
FH28K-15S-0.5SH(**)	586-1883-0 **	15	7	9.5	13.1
FH28K-20S-0.5SH(**)	586-1879-0 **	20	9.5	12	15.6
FH28K-28S-0.5SH(**)	586-1880-0 **	28	13.5	16	19.6
FH28K-30S-0.5SH(**)	586-1877-0 **	30	14.5	17	20.6
FH28K-40S-0.5SH(**)	586-1878-0 **	40	19.5	22	25.6
FH28K-45S-0.5SH(**)	586-1884-0 **	45	22	24.5	28.1
FH28K-50S-0.5SH(**)	586-1875-0 **	50	24.5	27	30.6
FH28K-55S-0.5SH(**)	586-1881-0 **	55	27	29.5	33.1
FH28K-60S-0.5SH(**)	586-1872-0 **	60	29.5	32	35.6
FH28K-64S-0.5SH(**)	586-1882-0 **	64	31.5	34	37.6
FH28K-68S-0.5SH(**)	586-1873-0 **	68	33.5	36	39.6
FH28K-74S-0.5SH(**)	586-1885-0 **	74	36.5	39	42.6
FH28KH-80S-0.5SH(**)	586-1874-0 **	80	39.5	42	45.6

◆ Recommended PCB Layout for 1mm Pitch Products



◆ Recommended Metal Mask Dimensions for 1mm Pitch Products



Note : 'n' indicates the number of positions.

◆ Recommended PCB Layout and Metal Mask Dimensions

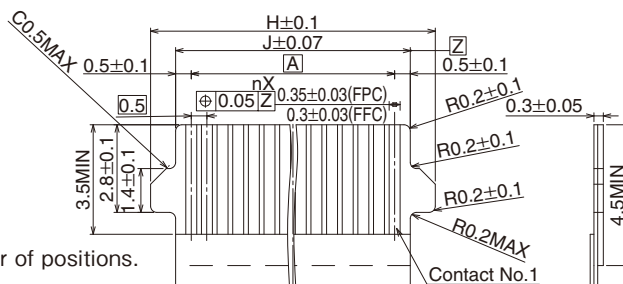
Unit : mm

Part No.	HRS No.	No. of Pos.	A	F	G
FH28K-20(10)SB-1SH(**)	—	10	9	12	15.6
FH28K-30(15)SB-1SH(**)	—	15	14	17	20.6
FH28K-40(20)SB-1SH(**)	—	20	19	22	25.6
FH28K-50(25)SB-1SH(**)	—	25	24	27	30.6
FH28K-60(30)SB-1SH(**)	—	30	29	32	35.6
FH28K-64(32)SB-1SH(**)	—	32	31	34	37.6
FH28K-68(34)SB-1SH(**)	—	34	33	36	39.6

Note : Contact positions without HRS No. are currently planned for development.

Please contact Hirose for detailed information about product variation.

◆ Recommended FPC/FFC Dimensions for 0.5mm Pitch Products



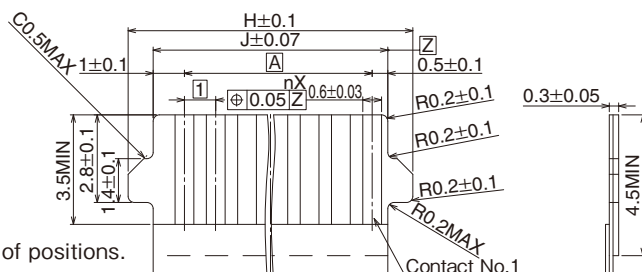
Note : 'n' indicates the number of positions.

◆ Recommended FPC/FFC Dimensions

Unit : mm

Part No.	HRS No.	No. of Pos.	A	H	J
FH28K-10S-0.5SH(**)	586-1876-0 **	10	4.5	7.1	5.5
FH28K-15S-0.5SH(**)	586-1883-0 **	15	7	9.6	8
FH28K-20S-0.5SH(**)	586-1879-0 **	20	9.5	12.1	10.5
FH28K-28S-0.5SH(**)	586-1880-0 **	28	13.5	16.1	14.5
FH28K-30S-0.5SH(**)	586-1877-0 **	30	14.5	17.1	15.5
FH28K-40S-0.5SH(**)	586-1878-0 **	40	19.5	22.1	20.5
FH28K-45S-0.5SH(**)	586-1884-0 **	45	22	24.6	23
FH28K-50S-0.5SH(**)	586-1875-0 **	50	24.5	27.1	25.5
FH28K-55S-0.5SH(**)	586-1881-0 **	55	27	29.6	28
FH28K-60S-0.5SH(**)	586-1872-0 **	60	29.5	32.1	30.5
FH28K-64S-0.5SH(**)	586-1882-0 **	64	31.5	34.1	32.5
FH28K-68S-0.5SH(**)	586-1873-0 **	68	33.5	36.1	34.5
FH28K-74S-0.5SH(**)	586-1885-0 **	74	36.5	39.1	37.5
FH28KH-80S-0.5SH(**)	586-1874-0 **	80	39.5	42.1	40.5

◆ Recommended FPC/FFC Dimensions for 1mm Pitch Products



Note : 'n' indicates the number of positions.

◆ Recommended FPC/FFC Dimensions

Unit : mm

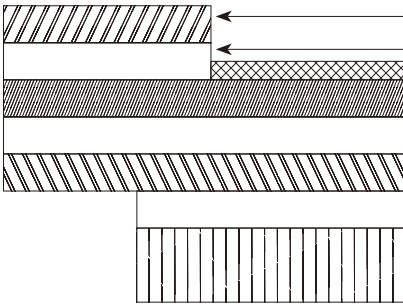
Part No.	HRS No.	No. of Pos.	A	H	J
FH28K-20(10)SB-1SH(**)	—	10	9	12.1	10.5
FH28K-30(15)SB-1SH(**)	—	15	14	17.1	15.5
FH28K-40(20)SB-1SH(**)	—	20	19	22.1	20.5
FH28K-50(25)SB-1SH(**)	—	25	24	27.1	25.5
FH28K-60(30)SB-1SH(**)	—	30	29	32.1	30.5
FH28K-64(32)SB-1SH(**)	—	32	31	34.1	32.5
FH28K-68(34)SB-1SH(**)	—	34	33	36.1	34.5

Note : Contact positions without HRS No. are currently planned for development.

Please contact Hirose for detailed information about product variation.

◆FH28K Series FPC/FFC Material Configuration (Recommended Specifications)

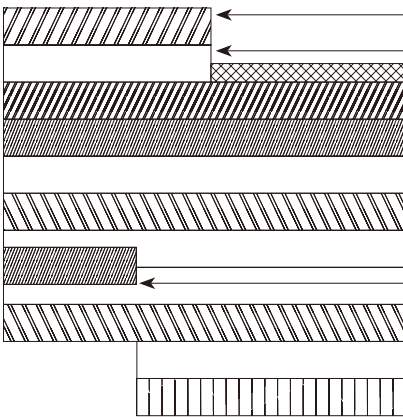
1. Single-Sided FPC



FPC : Flexible Printed Circuit

Layer	Materials	Thickness (μm)
Cover Lay Film	Polymide 1mil	(25)
Cover Adhesive		(25)
Surface Treatment	Nickel Under Plating 1~5μm+ gold plating 0.2μm	3
Copper Foil	Cu 1oz	35
Base Adhesive	Heat Stiffener Adhesive	25
Base Film	Polymide 1mil	25
Stiffener Adhesive	Heat Stiffener Adhesive	30
Reinforcing Film	Polymide 7mil	175
Total		293

2. Double-Sided FPC

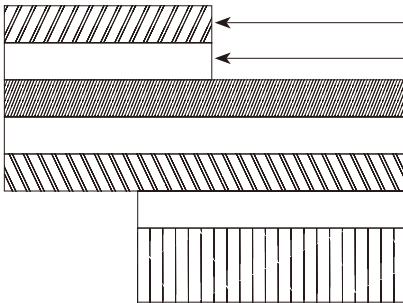


FPC : Flexible Printed Circuit

Layer	Materials	Thickness (μm)
Cover Lay Film	Polymide 1mil	(25)
Cover Adhesive		(25)
Surface Treatment	Nickel Under Plating 1~5μm+ Gold Plating 0.2μm	3
Through Hole Copper	Cu	15
Copper Foil	Cu 1/2oz	18
Base Adhesive	Heat Stiffener Adhesive	18
Base Film	Polymide 1mil	25
Base Adhesive	Heat Stiffener Adhesive	18
Copper Foil	Cu 1/2oz	(18)
Cover Adhesive	Heat Stiffener Adhesive	25
Cover Lay Film	Polymide 1mil	25
Stiffener Adhesive	Heat Stiffener Adhesive	50
Reinforcing Film	Polymide 4mil	100
Total		297

* Remove the copper foil on the back of double-sided FPC to avoid damage due to FPC bending.

3. FFC



FFC : Flexible Flat Cable

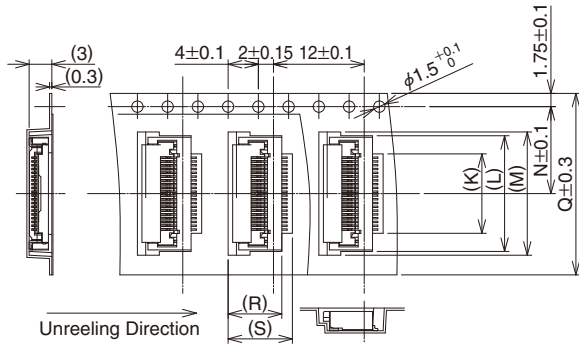
Layer	Materials	Thickness (μm)
Polyester Film		12
Adhesive	Polyester Thermal Plasticity	30
Annealed Copper Foil (Gold Plated with Nickel Under Plating)		35
Adhesive	Polyester Type	30
Polyester		12
Adhesive	Polyester Type	30
Reinforcing Film	Polyester Type	188
Total		295

Nominal thickness tolerance is approximately $\pm 20\mu\text{m}$.

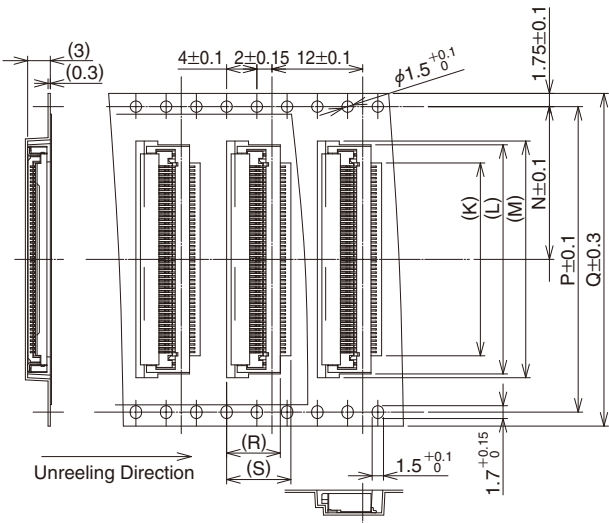
1. These specifications are an example of the material configuration of an FPC/FFC ($t = 0.3 \pm 0.05$) used on the FH28K series.
2. Please contact the FPC/FFC manufacturer for the material configurations of their FPC/FFC.

◆Packaging Specifications

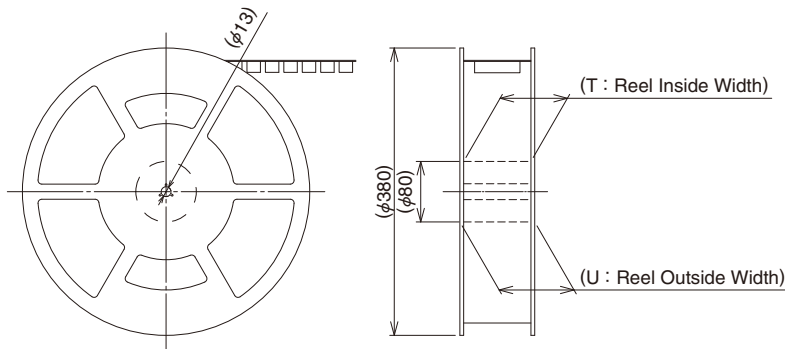
●Embossed Carrier Tape Dimensions
(with a maximum tape width of 24mm)



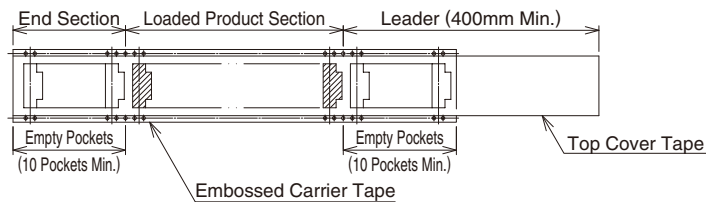
●Embossed Carrier Tape Dimensions
(with a maximum tape width of 32mm)



●Reel Dimensions



●Leader, Trailer Dimensions



◆ Packaging specification dimensions for 0.5mm pitch products

Unit : mm

Part No.	HRS No.	No. of Pos.	K	L	M	N	P	Q	R	S	T	U
FH28K-10S-0.5SH(**)	586-1876-0 **	10	5.5	10.3	11.3	11.5	—	24	7.1	8.5	25.4	29.4
FH28K-15S-0.5SH(**)	586-1883-0 **	15	8	12.8	13.8	11.5	—	24	7.1	8.5	25.4	29.4
FH28K-20S-0.5SH(**)	586-1879-0 **	20	10.5	15.3	16.3	11.5	—	24	7.1	8.5	25.4	29.4
FH28K-28S-0.5SH(**)	586-1880-0 **	28	14.5	19.3	20.3	14.2	28.4	32	7.1	8.5	33.4	37.4
FH28K-30S-0.5SH(**)	586-1877-0 **	30	15.5	20.3	21.3	14.2	28.4	32	7.1	8.5	33.4	37.4
FH28K-40S-0.5SH(**)	586-1878-0 **	40	20.5	25.3	—	20.2	40.4	44	7.1	8.5	45.4	49.4
FH28K-45S-0.5SH(**)	586-1884-0 **	45	23	27.8	28.8	20.2	40.4	44	7.1	8.5	45.4	49.4
FH28K-50S-0.5SH(**)	586-1875-0 **	50	25.5	30.3	—	20.2	40.4	44	7.1	8.5	45.4	49.4
FH28K-55S-0.5SH(**)	586-1881-0 **	55	28	32.8	—	20.2	40.4	44	7.1	8.5	45.4	49.4
FH28K-60S-0.5SH(**)	586-1872-0 **	60	30.5	35.3	36.3	26.2	52.4	56	7.1	8.5	57.4	61.4
FH28K-64S-0.5SH(**)	586-1882-0 **	64	32.5	37.3	—	26.2	52.4	56	7.1	8.5	57.4	61.4
FH28K-68S-0.5SH(**)	586-1873-0 **	68	34.5	39.3	40.3	26.2	52.4	56	7.1	8.5	57.4	61.4
FH28K-74S-0.5SH(**)	586-1885-0 **	74	37.5	42.3	43.3	26.2	52.4	56	7.1	8.5	57.4	61.4
FH28KH-80S-0.5SH(**)	586-1874-0 **	80	40.5	45.3	46.3	26.2	52.4	56	6.6	8	57.4	61.4

◆ Packaging specification dimensions for 1mm pitch products

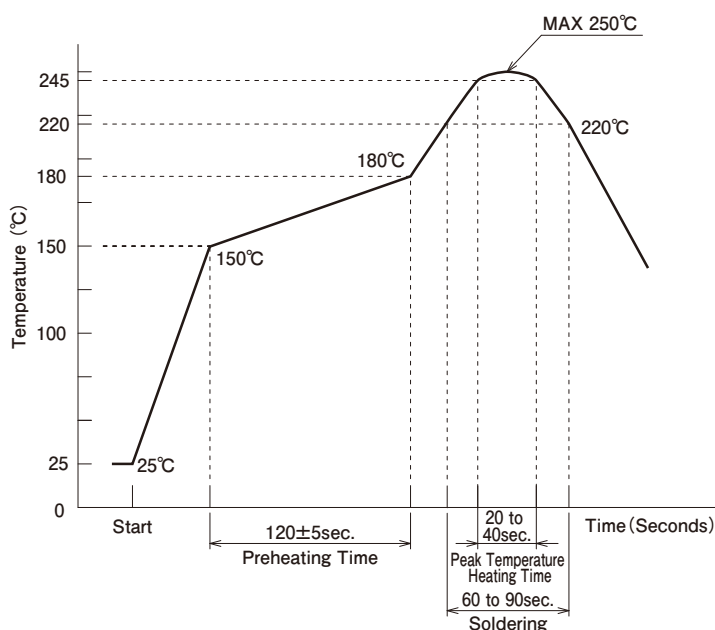
Unit : mm

Part No.	HRS No.	No. of Pos.	K	L	M	N	P	Q	R	S	T	U
FH28K-20(10)SB-1SH(**)	—	10	10.5	15.3	16.3	11.5	—	24	7.1	8.5	25.4	29.4
FH28K-30(15)SB-1SH(**)	—	15	15.5	20.3	21.3	14.2	28.4	32	7.1	8.5	33.4	37.4
FH28K-40(20)SB-1SH(**)	—	20	20.5	25.3	—	20.2	40.4	44	7.1	8.5	45.4	49.4
FH28K-50(25)SB-1SH(**)	—	25	25.5	30.3	—	20.2	40.4	44	7.1	8.5	45.4	49.4
FH28K-60(30)SB-1SH(**)	—	30	30.5	35.3	36.3	26.2	52.4	56	7.1	8.5	57.4	61.4
FH28K-64(32)SB-1SH(**)	—	32	32.5	37.3	—	26.2	52.4	56	7.1	8.5	57.4	61.4
FH28K-68(34)SB-1SH(**)	—	34	34.5	39.3	40.3	26.2	52.4	56	7.1	8.5	57.4	61.4

Note : Contact positions without HRS No. are currently planned for development.

Please contact Hirose for detailed information about product variation.

◆ Recommended soldering profile



Applicable Conditions

- Reflow type : Far red/hot air reflow
- Reflow furnace atmosphere : Atmosphere
- Reflow soldering : 2 cycles Max.
- Soldering : Cream type
Sn/3.0Ag/0.5Cu
(M705-GRN360-K2-V made by
Senju Metal Industry Co.)
- Testing PCB : PCB material and size
Glass epoxy 80×100×1.6mm
Land size, per recommended
PCB layout.
- Metal mask : Thickness and opening size
per recommended metal mask
dimensions

This solder profile is based on the conditions provided above.

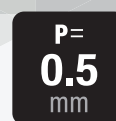
Please check the mounting conditions before use. Conditions such as solder paste types, manufacturer, PCB size and any other soldering materials may alter the performance of such materials.

FH65 Series

0.5mm Pitch, Height 1.2mm, Bottom Contact,
Front Flip, 125°C Compatible, FPC/FFC Connector



TM Flip-Lock Pioneer Hirose



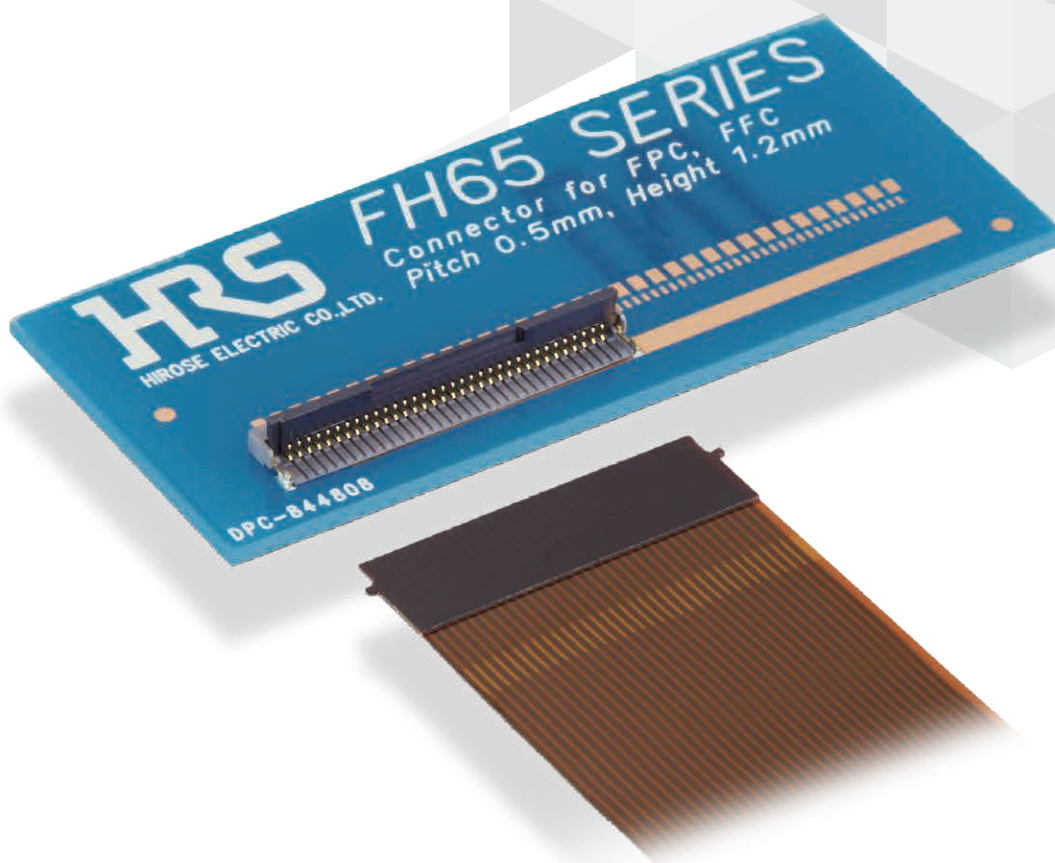
P= 0.5mm



Heat-Resist



Front Flip



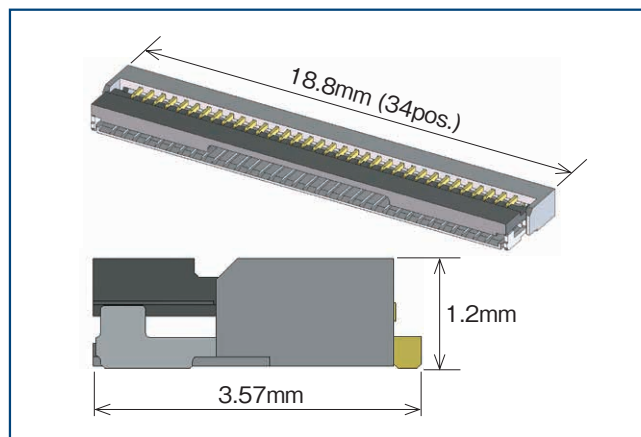
Features

1. Heat Resistant up to 125°C

FH65 withstands heat up to 125°C, making it ideal for applications requiring heat resistance such as automotive equipment.

2. Low Profile, Space-Saving Design

Space-saving with 1.2mm height and 3.57mm depth.



3. Satisfies severe requirements for various automotive applications

This space-saving design satisfies severe requirements for various automotive applications. (Ex. Temperature cycles)

Temperature

-55 → +15 to +35 → +125 → +15 to +35°C

Time

30 → 2 to 3 → 30 → 2 to 3 minutes

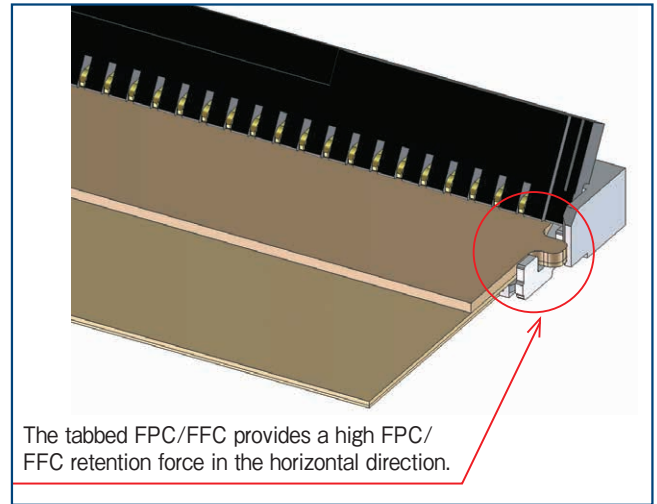
1,000 cycles under the above conditions

4. Flip-lock enables excellent workability

The flip-lock (one-touch rotation) ZIF design enables easy and reliable FPC/FFC connection. In addition, the firm and clear tactile click prevents incomplete locking.

5. High FPC/FFC Retention Force

The tabbed FPC/FFC provides a high FPC/FFC retention force in the horizontal direction.



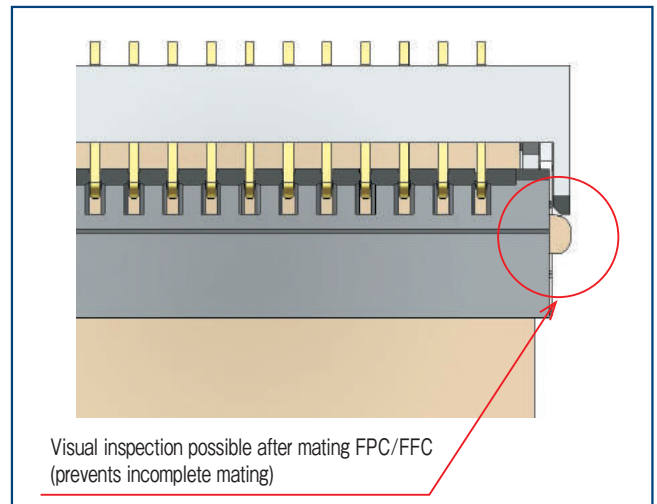
Connection using the FPC/FFC temporary holding mechanism

6. FPC/FFC can be inserted easily.

The FPC/FFC positioning mechanism enables the FPC/FFC to be temporary held in place in the correct mating position.

7. Easy visual inspection after mating FPC/FFC

Easy to visually check if FPC/FFC is correctly mated by the FPC/FFC positioning mechanism.



8. Supports 0.3mm FPC/FFC thickness

Supports the thickness of 0.3mm, which eases manufacturing and insertion.

9. Environmental Compatibility

No chlorine or bromine exceeding the standard values are used in this connector.

As defined by IEC 61249-2-21.

Br : 900ppm Max., Cl : 900ppm Max.,

Br+Cl : 1,500ppm Max.

Product Specifications

Rated Current	0.5A	Operating Temperature (Note 1)	-40 to +125°C
Rated Voltage	50V AC/DC	Storage Temperature Range (Note 2)	-10 to +50°C

Operating Humidity Range	Relative humidity 90% RH or less (no condensation)	Storage Humidity Range	Relative humidity 90% RH or less (no condensation)
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Recommended FPC/FFC SPC	t=0.3 ± 0.05 Gold plated 125°C resistant FPC/FFC
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Items	Specifications	Conditions
Insulation Resistance	500M Ω Min.	100V DC
Withstanding Voltage	No flashover or insulation breakdown	150V AC
Contact Resistance	50m Ω Max. *Including FPC conductor resistance	1mA AC
Mating Durability	Contact resistance : 50m Ω Max. No damages, cracks and looseness of parts	20 times
Vibration Resistance	No electrical discontinuity of 1 μ s or longer Contact resistance : 50m Ω Max. No damages, cracks and looseness of parts	Frequency : 10 to 55Hz, half amplitude : 0.75mm, for 10 cycles in 3 axial directions.
Shock Resistance	No electrical discontinuity of 1 μ s or longer Contact resistance : 50m Ω Max. No damages, cracks and looseness of parts	Acceleration : 981m/s ² , duration 6ms, half-sine wave, at 3 times in 3 axial directions
High Temperature and High Humidity Environment	Contact resistance : 50m Ω Max. Insulation resistance : 50M Ω Min. No damages, cracks and looseness of parts	1000 hours at +85°C and humidity of 90 to 95%
Temperature Cycles	Contact resistance : 50m Ω Max. Insulation resistance : 50M Ω Min. No damages, cracks and looseness of parts	Temperature : -55 → +15 to +35 → +125 → +15 to +35°C Time : 30 → 2 to 3 → 30 → 2 to 3 minutes 1000 cycles with above conditions
Resistance to Soldering Heat	No deformation of case or excessive looseness of the contacts	Reflow : See recommended temperature profile Manual soldering : +400 ± 10°C , 5 seconds

Note 1 : Includes temperature rise due to current flow.

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

The operating temperature and humidity are applicable after PCB mounting when the product is not energized.

Materials / Finish

Parts	Material	Finish	UL Regulation
Insulator	LCP	Gray	UL94V-0
	PPS	Black	UL94V-0
Contact	Coper Alloy	Nickel Barrier Gold Plating	-
Retention Tab	Brass	Pure Tin Reflow Glating	-

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.

FH65 - 34S - 0.5 SH (##)

1

2

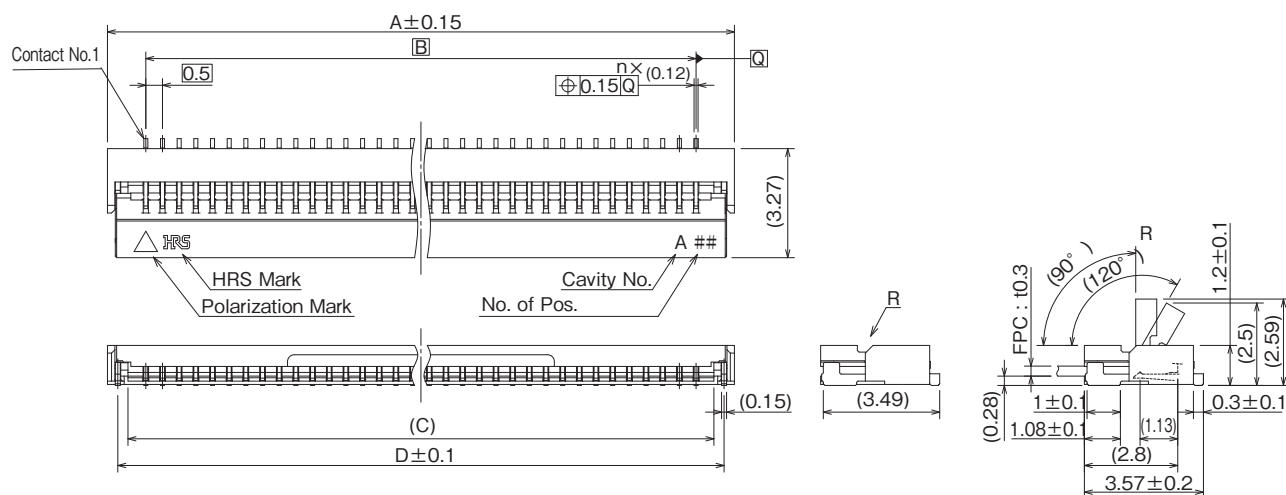
3

4

5

1 Series Name	FH65	4 Terminal Type	SH : SMT Horizontal Mounting Type
2 No.of Pos.	8, 10, 15, 34	5 Specifications	None : Standard (5,000pcs/reel) (99) : 500pcs/reel (For trial production)
3 Contact Pitch	0.5mm		

Connector Dimensions



Note 1 : The dimensions in parentheses are for reference.

Note 2 : Lead co-planarity including solder tab leads shall be 0.1mm Max.

Note 3 : Delivered with tape and reel packages. See the packaging specifications for details.

Note 4 : Note that a preventive hole for sink mark or slit could be added for improvement.

Note 5 : Black spots may appear on the resin but this does not affect product performance.

Note 6 : This product satisfies halogen free requirements defined as below.

900ppm maximum chlorine, 900ppm maximum bromine, and 1500ppm maximum total of chlorine and bromine.

Note 7 : 'n' represents the number of contacts.

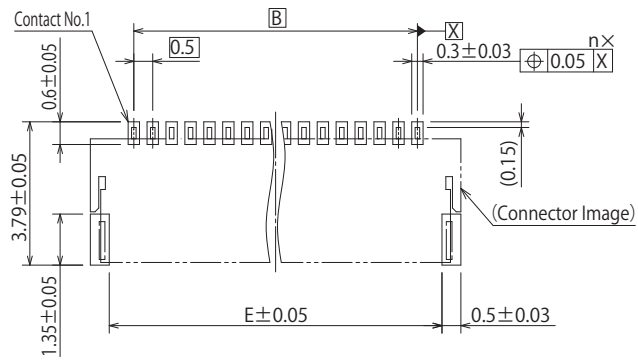
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	Purchase Unit (##) : None	Purchase Unit (##) : 99
FH65-4S-0.5SH(##)	Under Planning (Note)	4	3.8	1.5	2.57	3.18	-	-
FH65-6S-0.5SH(##)	Under Planning (Note)	6	4.8	2.5	3.57	4.18	-	-
FH65-8S-0.5SH(##)	CL0580-4703-0-##	8	5.8	3.5	4.57	5.18	5,000 per reel	500 per reel
FH65-10S-0.5SH(##)	CL0580-4704-0-##	10	6.8	4.5	5.57	6.18		-
FH65-12S-0.5SH(##)	CL0580-4708-0-##	12	7.8	5.5	6.57	7.18		-
FH65-14S-0.5SH(##)	Under Planning (Note)	14	8.8	6.5	7.57	8.18	-	-
FH65-15S-0.5SH(##)	CL0580-4701-0-##	15	9.3	7.0	8.07	8.68	5,000 per reel	500 per reel
FH65-16S-0.5SH(##)	Under Planning (Note)	16	9.8	7.5	8.57	9.18	-	-
FH65-18S-0.5SH(##)	Under Planning (Note)	18	10.8	8.5	9.57	10.18	-	-
FH65-20S-0.5SH(##)	Under Planning (Note)	20	11.8	9.5	10.57	11.18	-	-
FH65-22S-0.5SH(##)	Under Planning (Note)	22	12.8	10.5	11.57	12.18	-	-
FH65-24S-0.5SH(##)	Under Planning (Note)	24	13.8	11.5	12.57	13.18	-	-
FH65-26S-0.5SH(##)	Under Planning (Note)	26	14.8	12.5	13.57	14.18	-	-
FH65-28S-0.5SH(##)	Under Planning (Note)	28	15.8	13.5	14.57	15.18	-	-
FH65-30S-0.5SH(##)	Under Planning (Note)	30	16.8	14.5	15.57	16.18	-	-
FH65-32S-0.5SH(##)	Under Planning (Note)	32	17.8	15.5	16.57	17.18	-	-
FH65-34S-0.5SH(##)	CL0580-4700-0-##	34	18.8	16.5	17.57	18.18	5,000 per reel	500 per reel
FH65-36S-0.5SH(##)	Under Planning (Note)	36	19.8	17.5	18.57	19.18	-	-
FH65-40S-0.5SH(##)	Under Planning (Note)	40	21.8	19.5	20.57	21.18	-	-
FH65-45S-0.5SH(##)	Under Planning (Note)	45	24.3	22.0	23.07	23.68	-	-

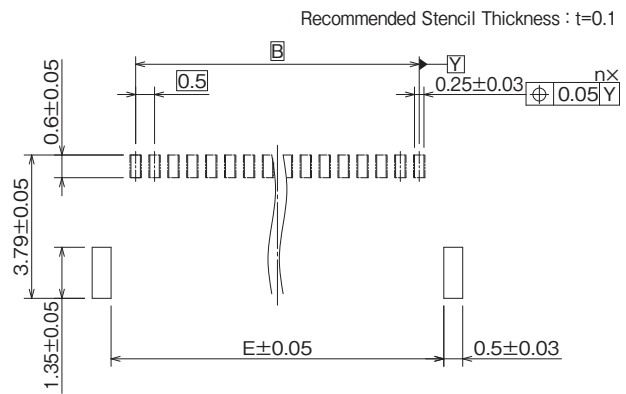
Note : Contact positions without HRS No. are currently under planning.

Please contact a Hirose representative for detailed information about product variations.

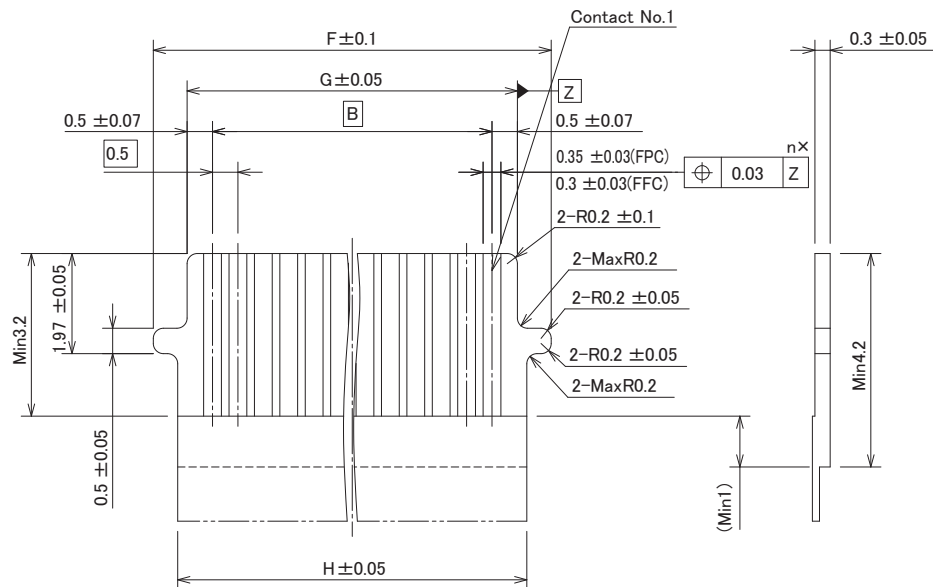
Recommended PCB Mounting Pattern



Recommended Metal Mask Dimensions



Recommended FPC/FFC Dimensions



Unit : mm

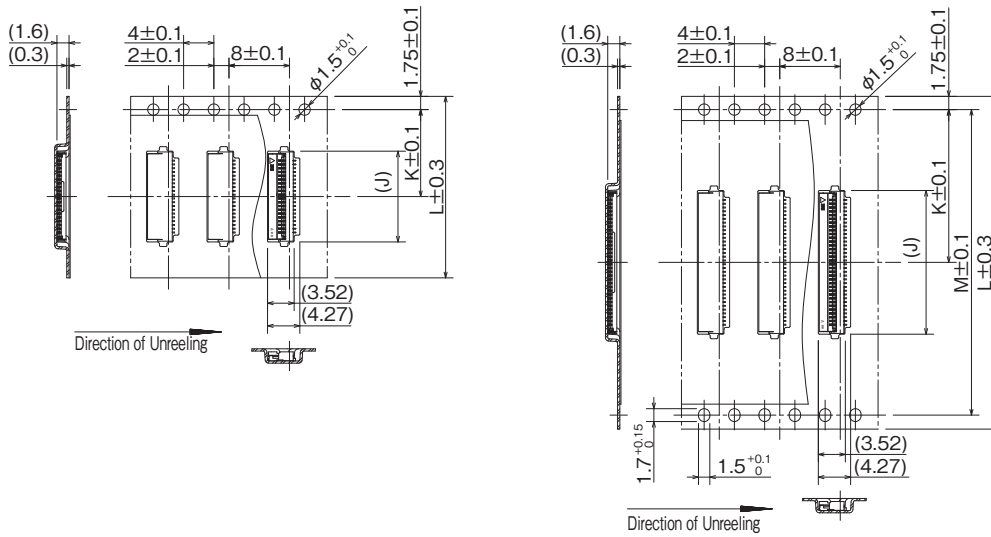
Part No.	HRS No.	No. of Pos.	B	E	F	G	H
FH65-4S-0.5SH(##)	Under Planning (Note)	4	1.5	2.8	3.83	2.5	2.87
FH65-6S-0.5SH(##)	Under Planning (Note)	6	2.5	3.8	4.83	3.5	3.87
FH65-8S-0.5SH(##)	CL0580-4703-0-##	8	3.5	4.8	5.83	4.5	4.87
FH65-10S-0.5SH(##)	CL0580-4704-0-##	10	4.5	5.8	6.83	5.5	5.87
FH65-12S-0.5SH(##)	CL0580-4708-0-##	12	5.5	6.8	7.83	6.5	6.87
FH65-14S-0.5SH(##)	Under Planning (Note)	14	6.5	7.8	8.83	7.5	7.87
FH65-15S-0.5SH(##)	CL0580-4701-0-##	15	7.0	8.3	9.33	8.0	8.37
FH65-16S-0.5SH(##)	Under Planning (Note)	16	7.5	8.8	9.83	8.5	8.87
FH65-18S-0.5SH(##)	Under Planning (Note)	18	8.5	9.8	10.83	9.5	9.87
FH65-20S-0.5SH(##)	Under Planning (Note)	20	9.5	10.8	11.83	10.5	10.87
FH65-22S-0.5SH(##)	Under Planning (Note)	22	10.5	11.8	12.83	11.5	11.87
FH65-24S-0.5SH(##)	Under Planning (Note)	24	11.5	12.8	13.83	12.5	12.87
FH65-26S-0.5SH(##)	Under Planning (Note)	26	12.5	13.8	14.83	13.5	13.87
FH65-28S-0.5SH(##)	Under Planning (Note)	28	13.5	14.8	15.83	14.5	14.87
FH65-30S-0.5SH(##)	Under Planning (Note)	30	14.5	15.8	16.83	15.5	15.87
FH65-32S-0.5SH(##)	Under Planning (Note)	32	15.5	16.8	17.83	16.5	16.87
FH65-34S-0.5SH(##)	CL0580-4700-0-##	34	16.5	17.8	18.83	17.5	17.87
FH65-36S-0.5SH(##)	Under Planning (Note)	36	17.5	18.8	19.83	18.5	18.87
FH65-40S-0.5SH(##)	Under Planning (Note)	40	19.5	20.8	21.83	20.5	20.87
FH65-45S-0.5SH(##)	Under Planning (Note)	45	22.0	23.3	24.33	23.0	23.37

Note : Contact positions without HRS No. are currently under planning.

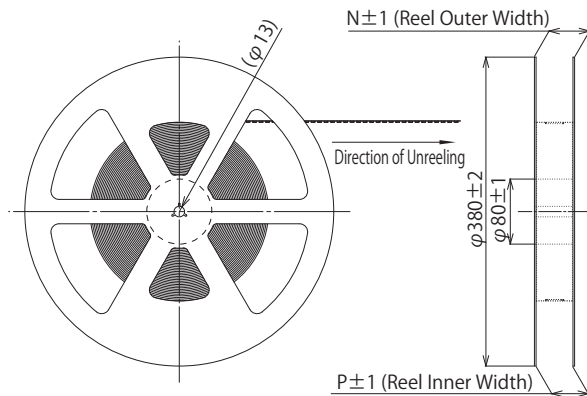
Please contact a Hirose representative for detailed information about product variations.

Packaging Specifications

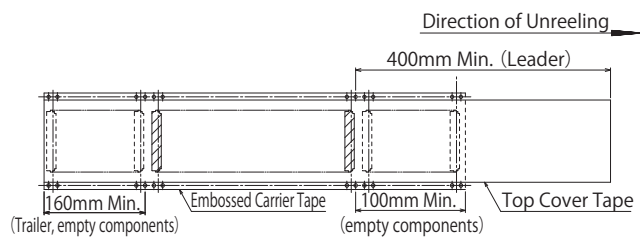
● Embossed Carrier Tape Dimensions



● Reel Dimensions



● Leader, Trailer Dimensions



Unit : mm

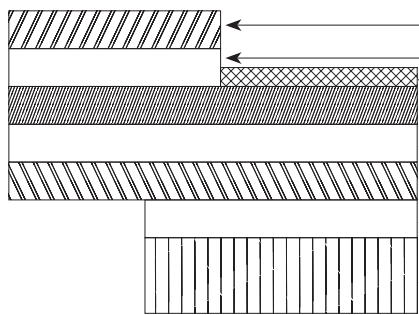
H	HRS No.	No. of Pos.	J	K	L	M	N	P
FH65-4S-0.5SH(##)	Under Planning (Note)	4	4.0	7.5	16.0	-	21.4	17.4
FH65-6S-0.5SH(##)	Under Planning (Note)	6	5.0	7.5	16.0	-	21.4	17.4
FH65-8S-0.5SH(##)	CL0580-4703-0-##	8	6.0	7.5	16.0	-	21.4	17.4
FH65-10S-0.5SH(##)	CL0580-4704-0-##	10	7.0	11.5	24.0	-	29.4	25.4
FH65-12S-0.5SH(##)	CL0580-4708-0-##	12	8.0	11.5	24.0	-	29.4	25.4
FH65-14S-0.5SH(##)	Under Planning (Note)	14	9.0	11.5	24.0	-	29.4	25.4
FH65-15S-0.5SH(##)	CL0580-4701-0-##	15	9.5	11.5	24.0	-	29.4	25.4
FH65-16S-0.5SH(##)	Under Planning (Note)	16	10.0	11.5	24.0	-	29.4	25.4
FH65-18S-0.5SH(##)	Under Planning (Note)	18	11.0	11.5	24.0	-	29.4	25.4
FH65-20S-0.5SH(##)	Under Planning (Note)	20	12.0	11.5	24.0	-	29.4	25.4
FH65-22S-0.5SH(##)	Under Planning (Note)	22	13.0	11.5	24.0	-	29.4	25.4
FH65-24S-0.5SH(##)	Under Planning (Note)	24	14.0	11.5	24.0	-	29.4	25.4
FH65-26S-0.5SH(##)	Under Planning (Note)	26	15.0	14.2	32.0	28.4	37.4	33.4
FH65-28S-0.5SH(##)	Under Planning (Note)	28	16.0	14.2	32.0	28.4	37.4	33.4
FH65-30S-0.5SH(##)	Under Planning (Note)	30	17.0	14.2	32.0	28.4	37.4	33.4
FH65-32S-0.5SH(##)	Under Planning (Note)	32	18.0	14.2	32.0	28.4	37.4	33.4
FH65-34S-0.5SH(##)	CL0580-4700-0-##	34	19.0	20.2	44.0	40.4	49.4	45.4
FH65-36S-0.5SH(##)	Under Planning (Note)	36	20.0	20.2	44.0	40.4	49.4	45.4
FH65-40S-0.5SH(##)	Under Planning (Note)	40	22.0	20.2	44.0	40.4	49.4	45.4
FH65-45S-0.5SH(##)	Under Planning (Note)	45	24.5	20.2	44.0	40.4	49.4	45.4

Note : Contact positions without HRS No. are currently under planning.

Please contact a Hirose sales representative for detailed information about product variations.

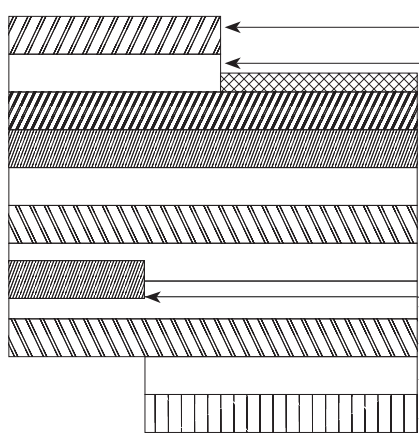
FPC/FFC Construction (Recommended Specifications)

1. Using Single-Sided FPC (FPC : Flexible Printed Circuit)



Material Name	Material	Thickness (μm)
Covering film layer	Polyimide 1mil	(25)
Cover adhesive	1/2oz	(18)
Surface treatment	0.2 μm thick gold plated over 1 to 5 μm thick nickel underplating	3
Copper foil	Cu 1oz	35
Base adhesive	Thermosetting adhesive	25
Base film	Polyimide 1mil thick	25
Reinforcement material adhesive	Thermosetting adhesive	30
Stiffener	Polyimide 7mil thick	175
Total		293

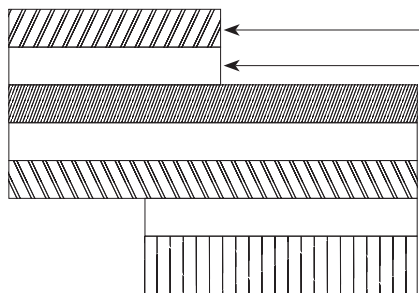
2. Using Double-Sided FPC (FPC : Flexible Printed Circuit)



Material Name	Material	Thickness (μm)
Covering film layer	Polyimide 1mil	(25)
Cover adhesive		(25)
Surface treatment	0.2 μm thick gold plated over 1 to 5 μm thick nickel underplating	3
Through-hole copper	Cu	15
Copper foil	Cu 1/2oz	18
Base adhesive	Thermosetting adhesive	18
Base film	Polyimide 1mil thick	25
Base adhesive	Thermosetting adhesive	18
Copper foil	Cu 1/2oz	(18)
Cover adhesive	Thermosetting adhesive	25
Covering layer film	Polyimide 1mil thick	25
Reinforcement material adhesive	Thermosetting adhesive	50
Stiffener	Polyimide 4mil thick	100
Total		297

Note : To prevent release of the FPC due to bending, use of double-sided FPC with copper foil on the back side is not recommended.

3. Using FFC (FFC : Flexible Flat Cable)



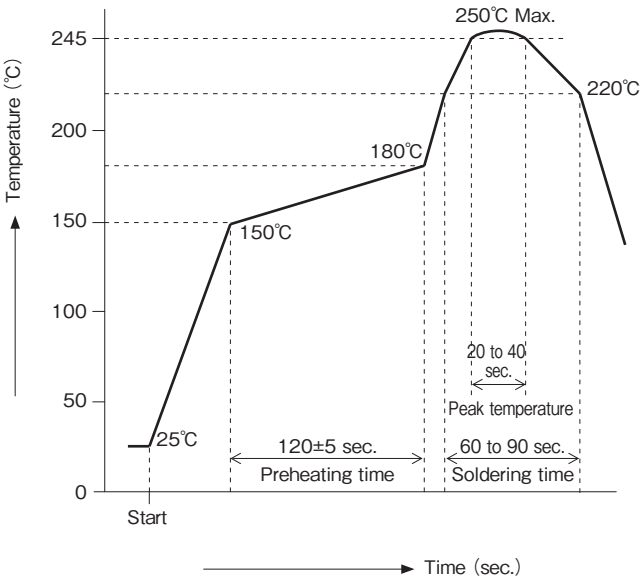
Material Name	Material	Thickness (μm)
Polyester film		(12)
Adhesive	Thermoplastic polyester	(30)
Gold plated annealed copper foil		35
Adhesive	Polyester	30
Polyester		12
Adhesive	Polyester	30
Stiffener	Polyester	188
Total		295

Note : Typical thickness tolerance is about $\pm 20 \mu m$

4. Precautions

1. This specification is a recommendation for the construction of the FH65 Series FPC and FFC ($t = 0.3 \pm 0.05mm$).
2. For details about the construction, please contact the FPC/FFC manufacturers.

Temperature Profile



Applicable Conditions

Reflow Method : IR/Hot air

Reflow Environment : Room air

Solder : Paste type Sn/3.0Ag/0.5Cu
(M705-GRN360-K2-V made by Senju Metal Industry Co.)

Test PCB : PCB material and size
Glass epoxy 80 × 100 × 1.6mm
Land size, per recommended PCB mounting pattern.

Metal Mask : Thickness and opening size
per recommended Metal mask dimensions.

This temperature profile is based on the above conditions. It may vary depending on solder paste type, manufacturer, PCB size and mounting materials. Please use only after checking the mounting conditions.

Operation Methods of Connectors and Precautions

[Operation Method]

This connector requires delicate and careful handling due to its small design.

In order to prevent damage and contact failure etc. (incorrect mating, disconnection of FPC/FFC pattern) of connectors and FPC/FFC, please use them after following the below instructions.

The values described in the cautions vary from the product specifications.

1. Initially Delivered State

Actuator is locked in the delivered state.

[Caution]

- Do not operate the connector while it is not mounted on the board.

2. Actuator Lock Release Method (FPC/FFC not inserted)

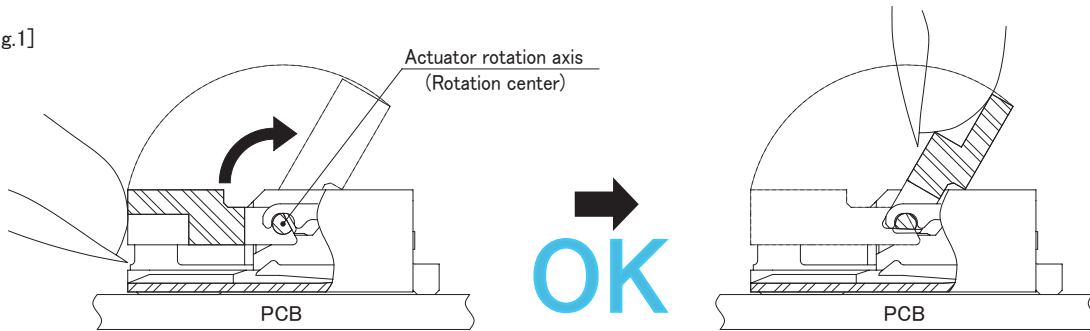
The actuator rotates at its center, as shown in the Figure below.

Operate the actuator and slowly rotate it, releasing the lock. [Fig.1]

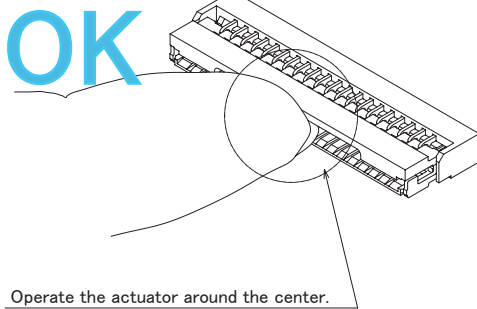
[Caution]

- Operate the actuator close to its center. [Fig.2]
- Do not operate the actuator only on one side. [Fig.3]
- Operate the actuator by hand, take care not to allow jigs or nails to get inside the connector. [Fig.4, Fig.5]
- Actuator cannot be opened wider than 120°. Do not force it to open wider than that angle. [Fig.6]
- Do not apply a strong force in the actuator slide direction. It could prevent the actuator from sliding in, as shown in the Figure. [Fig.7]
- Do not pick and raise the actuator or hook it. [Fig.8, Fig.9]

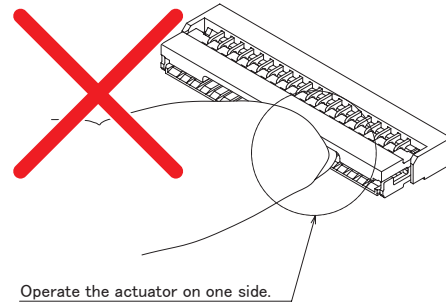
[Fig.1]



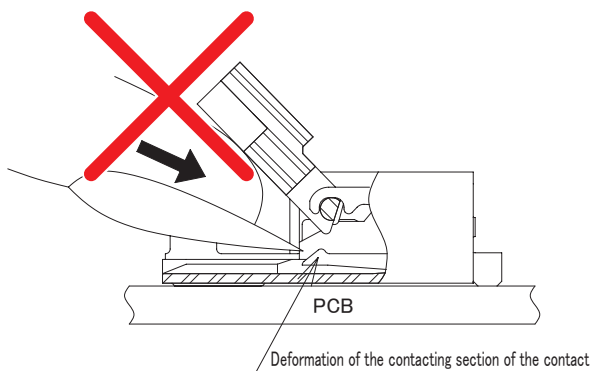
[Fig.2]



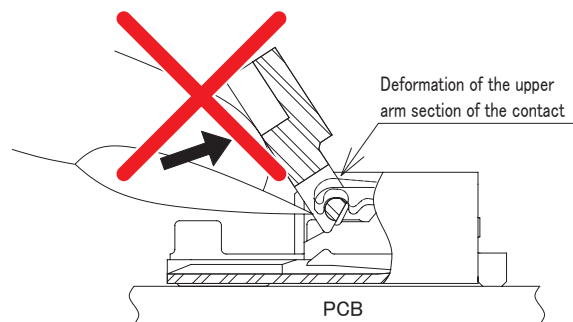
[Fig.3]



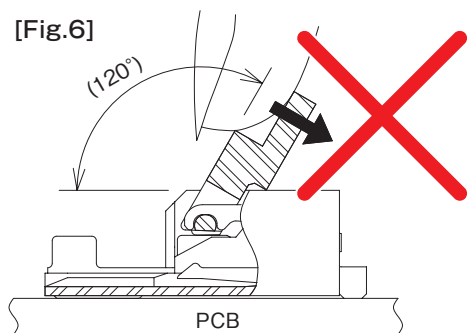
[Fig.4]



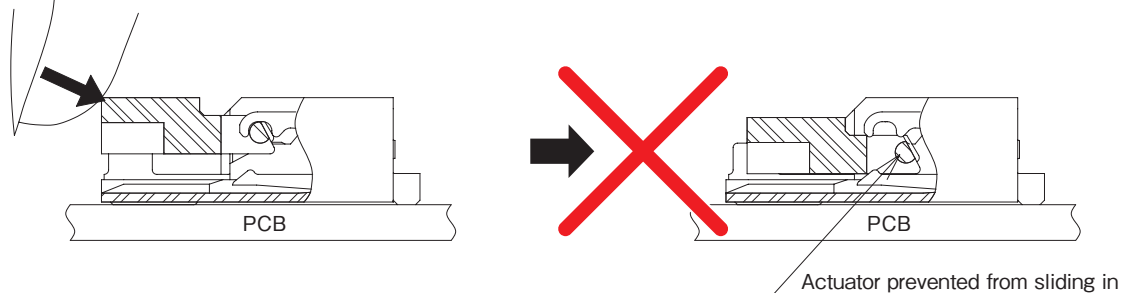
[Fig.5]



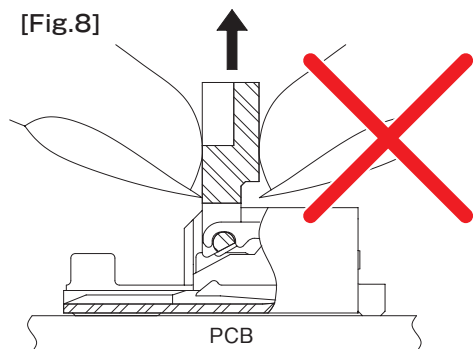
[Fig.6]



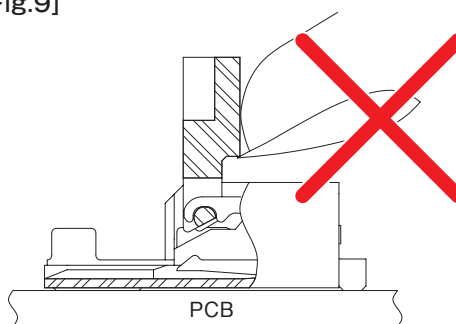
[Fig.7]



[Fig.8]



[Fig.9]



3. FPC/FFC Insertion Method

This connector uses a bottom contact point.

Additionally, this connector is equipped with retention tabs for positioning FPC/FFC.

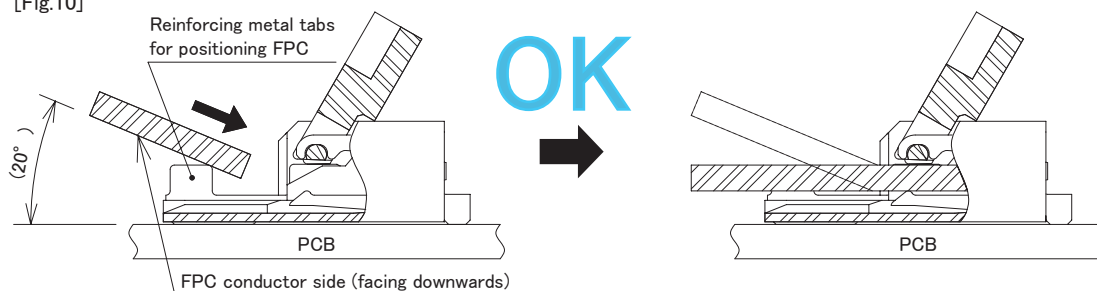
Hold FPC/FFC with the conductor side facing down,

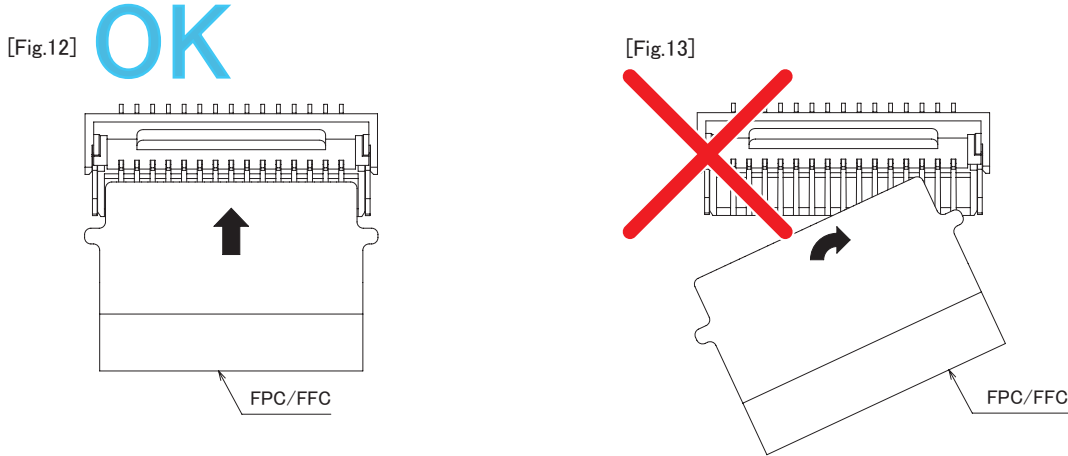
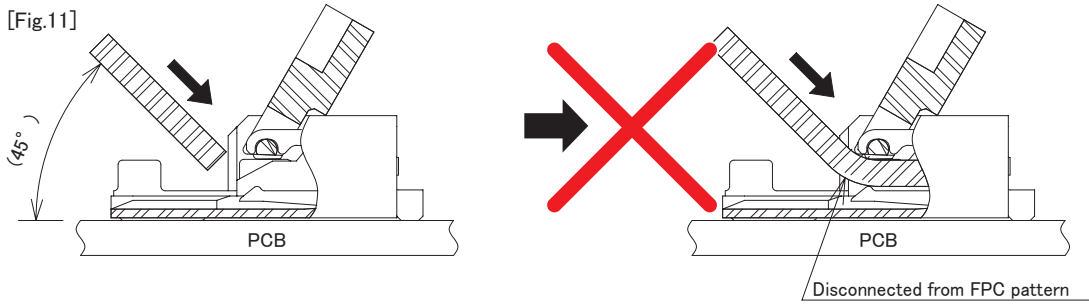
and insert FPC/FFC from above diagonally at an angle of about 20° to the board. [Fig.10]

[Caution]

- Be careful not to insert FPC/FFC with the conductor side facing upwards.
- Be sure to insert FPC/FFC to the end.
- Do not insert FPC/FFC from above diagonally at a large angle. [Fig.11]
- Insert FPC/FFC while the actuator is open. [Fig.12]
- Do not twist the FPC/FFC vertically, horizontally or diagonally. [Fig.13]

[Fig.10]





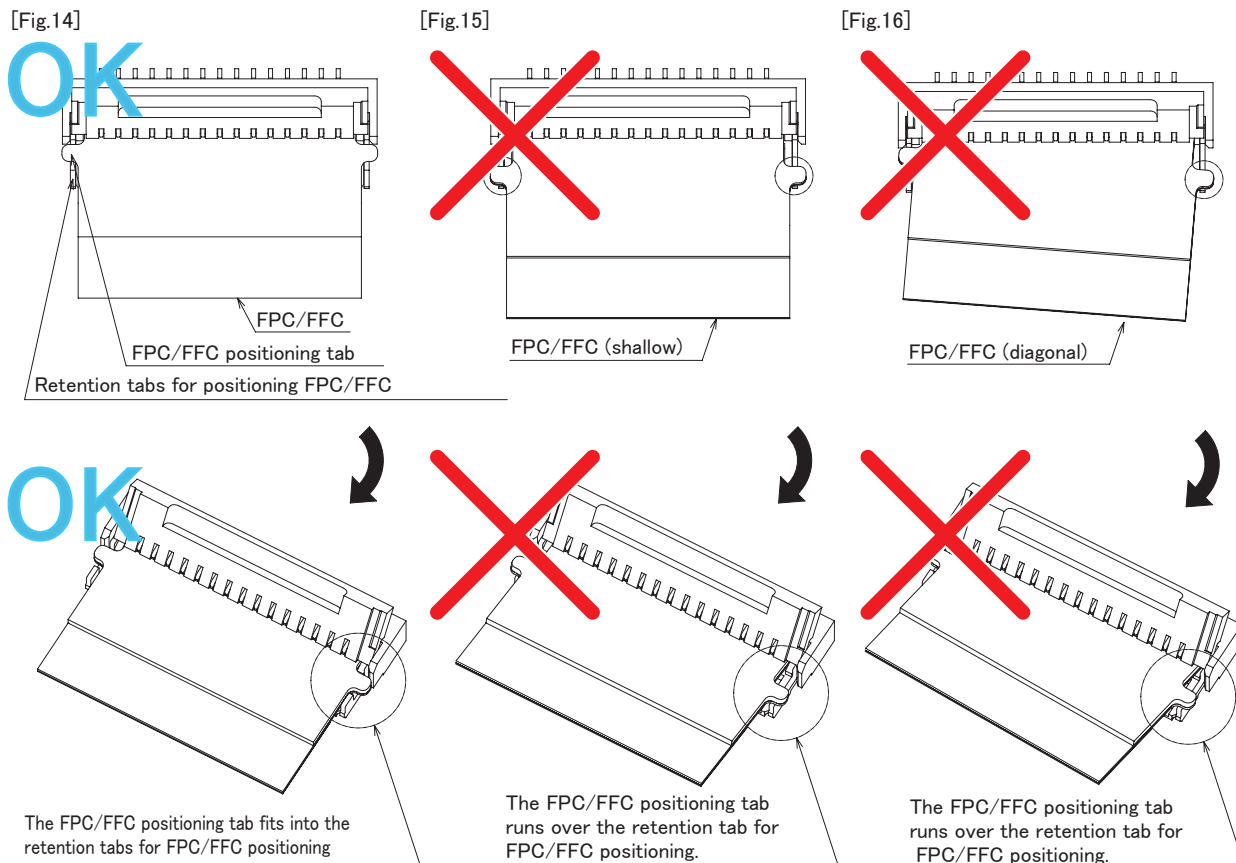
4. FPC/FFC Insertion Confirmation

This connector uses retention tabs for positioning FPC/FFC.

When insertion of FPC/FFC is complete, confirm that the FPC/FFC positioning tab is located at the place shown in the Figure. [Fig. 14]

[Caution]

- Avoid shallow insertion or insertion at a slant. [Fig. 15, Fig. 16]



5. Actuator Locking Method

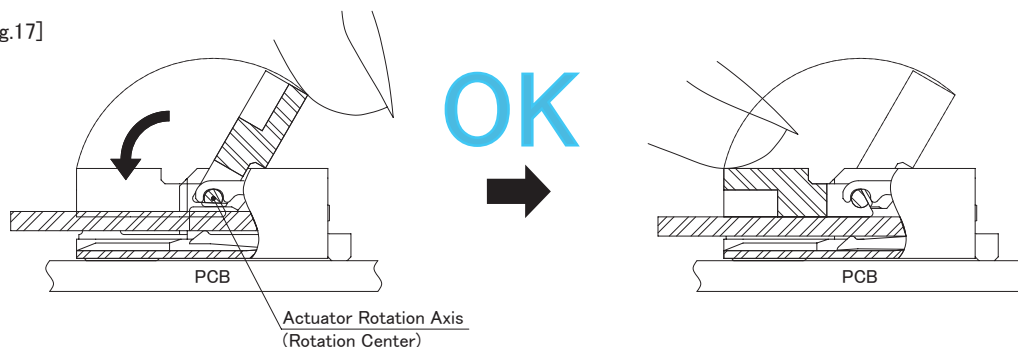
The actuator rotates at its center.

After inserting FPC/FFC correctly to the end, operate the actuator by rotating it, and then lock in place. [Fig.17]

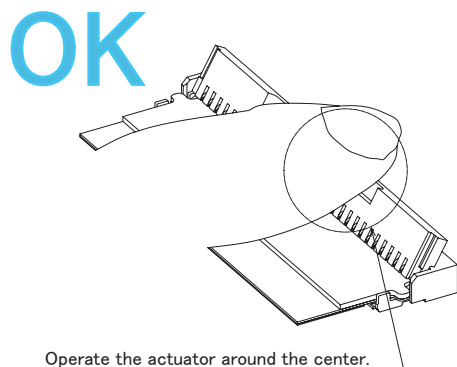
[Caution]

- Operate the actuator close to its center. [Fig.18]
- Do not operate the actuator only on one side. [Fig.19]
- Operate the actuator by hand, take care not to allow jigs or nails to get inside the connector.
- Do not operate the actuator in the direction opposite to the closing direction.
- Do not pick and raise the actuator, or hook it.
- Please check to insure the actuator is placed horizontal to the board surface when locked.

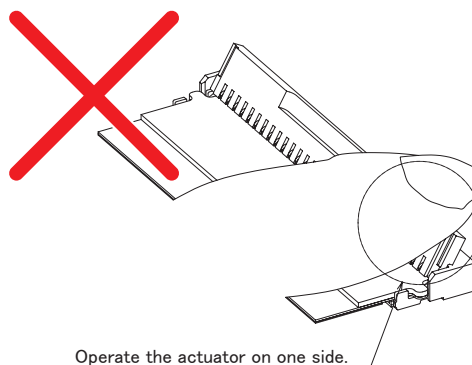
[Fig.17]



[Fig.18]



[Fig.19]



6. Check the mated state of FPC/FFC

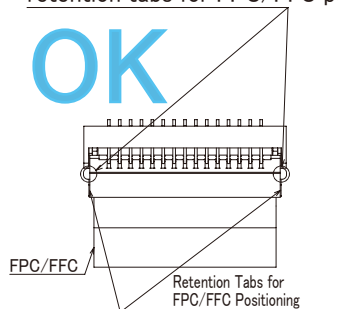
When the actuator is completely locked, visually inspect the insertion status of FPC/FFC. [Fig.20]

[Caution]

- Do not insert FPC/FFC insufficiently deep or from a diagonal direction. [Fig.21, Fig.22]

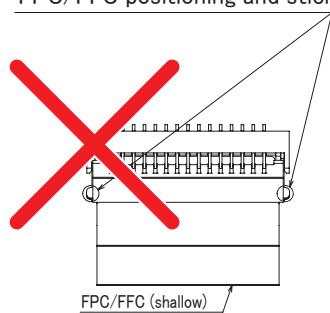
[Fig.20]

When FPC/FFC is correctly inserted, the FPC/FFC positioning tab sits in the retention tabs for FPC/FFC positioning.



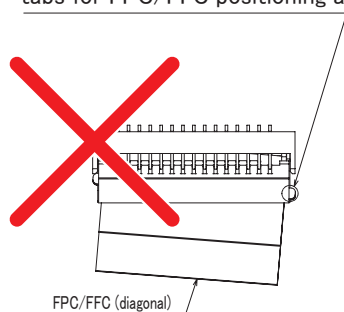
[Fig.21]

If FPC/FFC is not correctly inserted (or is not inserted deep enough), the FPC/FFC positioning tab will not sit in the retention tabs for FPC/FFC positioning and sticks out of the connector.



[Fig.22]

If FPC/FFC is not correctly inserted (or is inserted diagonally), part of the FPC/FFC positioning tab does not go in the retention tabs for FPC/FFC positioning and sticks out of the connector.



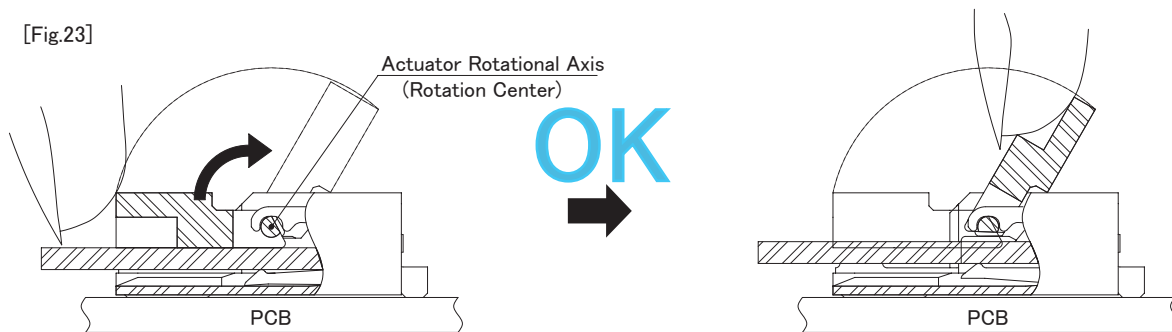
7. Actuator Lock Release Method (FPC/FFC inserted)

Slowly raise the actuator and release the lock. [Fig.23]

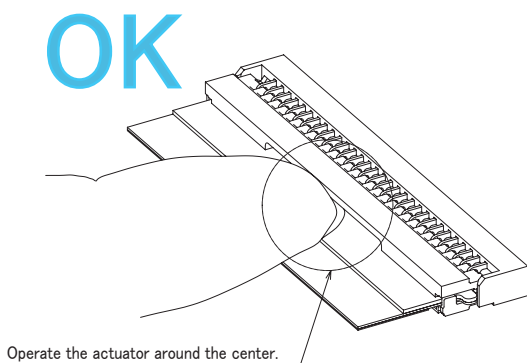
[Caution]

- Operate the actuator close to its center. [Fig.24]
- Do not operate the actuator on only one side. [Fig.25]
- Operate the actuator by hand, take care not to allow jigs or nails to get into the connector.
- Actuator cannot be opened wider than 120°. Do not try to force it open wider than that angle. [Fig.26]
- Do not pick and raise the actuator, or hook it. [Fig.27]

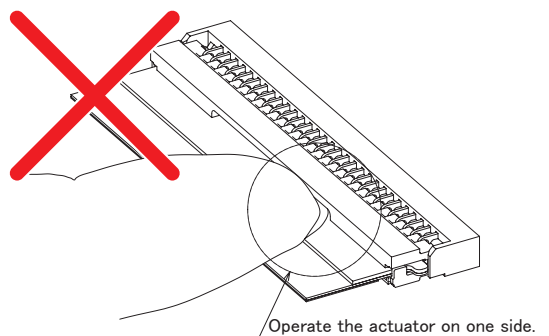
[Fig.23]



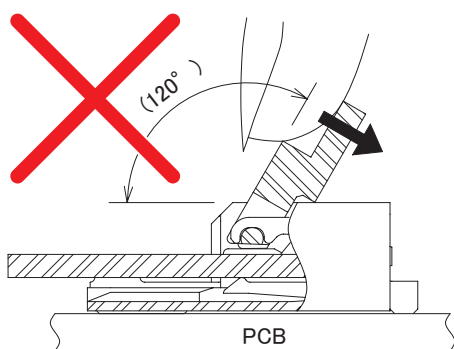
[Fig.24]



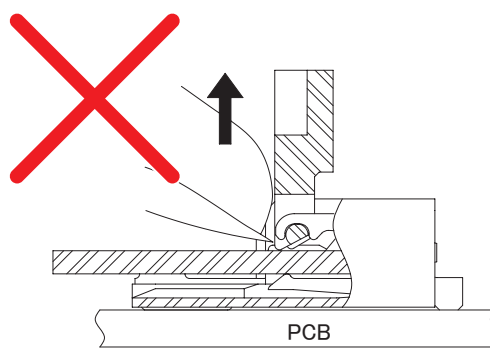
[Fig.25]



[Fig.26]



[Fig.27]



8. FPC/FFC Removal Method

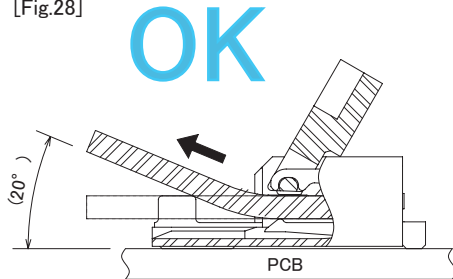
This connector uses retention tabs for FPC/FFC positioning.

After unlocking the actuator, pull out the FPC/FFC diagonally at an angle of about 20° to the board. [Fig.28]

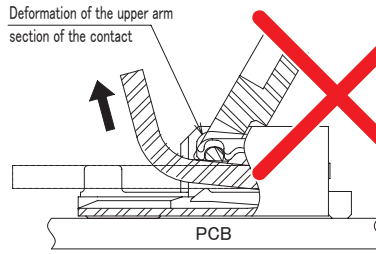
[Caution]

- Do not remove the FPC/FFC in the horizontal direction.
- Do not remove the FPC/FFC from above diagonally at a large angle. [Fig.29]
- Do not remove the FPC/FFC while the actuator is closed. [Fig.30]

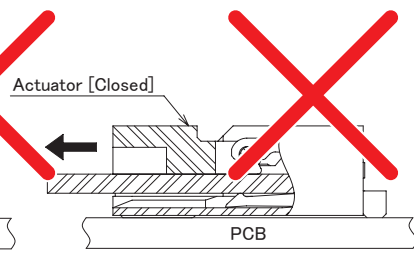
[Fig.28]



[Fig.29]



[Fig.30]



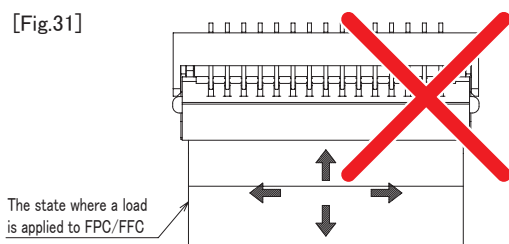
[Cautions for PCB Layout]

Depending on the routing of FPC/FFC to mate, a load may be applied to the connector, which could lead to contact failure. In order to prevent any failure, please consider the following.

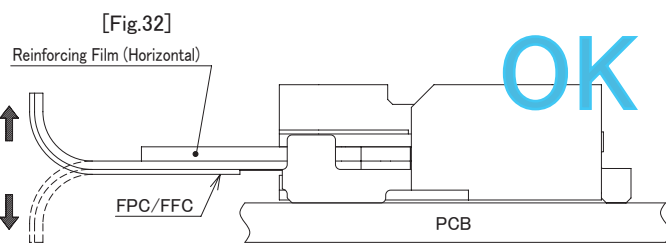
[Caution]

- Please ensure there is no load applied to the connector in the pulling, inserting or lateral direction. [Fig.31]
Please ensure that no extreme tensile force or upward force etc. is applied to the connector in the vertical direction.
- When routing FPC/FFC, please ensure that the FPC/FFC is not pulled and routing is carried out with adequate margin.
Please check that the reinforcing film is placed horizontal to the board surface. [Fig.32]
- Do not route the FPC/FFC to bend around the connector. [Fig.33]
Please take care with the FPC/FFC so that no direct force is applied to the connector section.
- Please do not place any parts under the FPC/FFC reinforcing film that will interfere with FPC/FFC. [Fig.34]
- Please confirm the recommendations of in this document for the shape of FPC/FFC.
In addition, for the flexibility of FPC/FFC, please make adjustments with the FPC/FFC manufacturer.
- When designing, please ensure there is adequate space for FPC/FFC insertion so that it is not inserted at an extreme diagonal.
In addition, a short FPC/FFC will make insertion difficult, please use adequate layout and length for FPC/FFC.
- When designing a board layout, please secure the space required for actuator closure and operation.

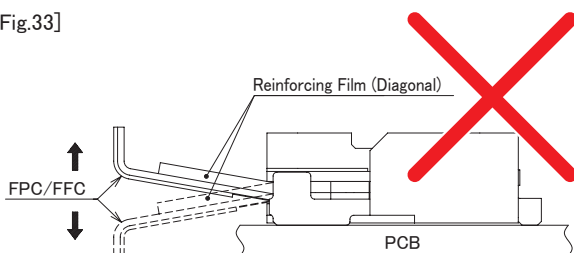
[Fig.31]



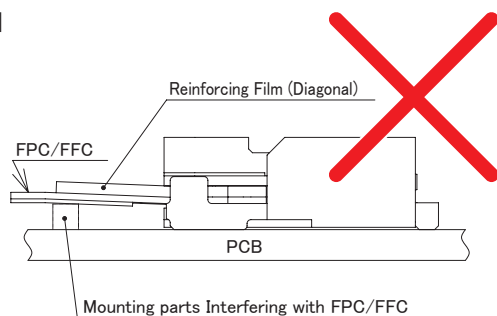
[Fig.32]



[Fig.33]



[Fig.34]



[Notes for Board Mounting]

[Caution]

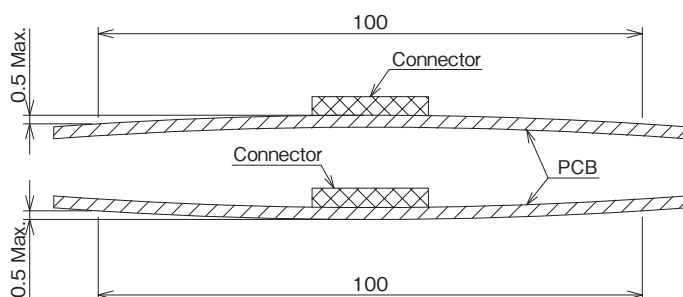
- Please confirm recommendations for mount board land shape, metal mask opening shape, and FPC/FFC shape.
- If the land is narrower than recommended, or if the metal mask opening is wider than recommended, solder (flux) wicking is more likely to occur. If there is difference from the recommendation, please use after checking the mounted state.
- The level difference between the bottom surfaces of contact lead and the mold is designed to be small. When there is silk print etc. on the bottom surface of the connector, it could push up the connector bottom surface, and cause non-sticking solder or defective fillet formation. When there is silk print etc. on the bottom surface of the connector, please use it after checking the mounted state.
- Use the reflow conditions within the specification. The mounted status may vary due to external conditions such as the type of cream solder, manufacturer, and board size. Please use after checking the mounted state.
- Please control the board warpage as much as possible. While the coplanarity of this connector is 0.1mm or less, if there is considerable board warpage, defective soldering could occur.
- When mounted on FPC/FFC, be sure to provide a reinforcing plate to make it easier to handle. A reinforcing plate of 0.3mm or thicker made of glass epoxy material is recommended.
- When you remove the emboss from the reel, or when you absorb the connector from the emboss and so on, do not apply any excessive external force to the connector before mounting. (1N or less)

[Cautions When Handling the Board After Mounting]

Please be careful of the following when handling the board after mating.

[Caution]

- Do not apply any load to the board in the assembly process, such as by dividing a multi-piece board or securing a board to the frame. Such actions may result in a load being applied to the connector and connector damage.
 - Use a board with a deflection of 0.5mm or less when the board width is 100mm.
- If the board has some deflection, it could apply a load to the connector and damage it.



[Cautions for Hand-soldering]

Note the following when performing soldering during repair, etc.

[Caution]

- Do not perform manual soldering with the FPC/FFC inserted in the connector.
- Do not apply excessive heat to the connector or let the soldering iron in contact with any parts other than the contact leads. Failure to do so may result in connector deformation or melting.
- Do not supply excessive solder (flux).

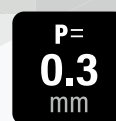
If excessive solder (flux) is applied to the contacts solder or flux may adhere to the contacts or the rotating portion of the actuator, resulting in poor contact or poor actuator rotation. Supplying excessive solder to the retention tabs may result in actuator rotation failure, causing connector damage.

FH26 Series

0.3mm Pitch, 1.0mm Height FPC Connector



Flip-Lock Pioneer **Hirose**



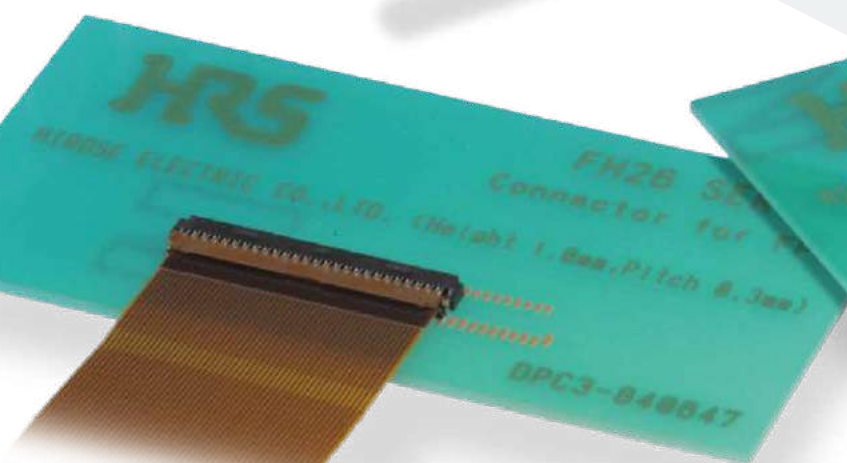
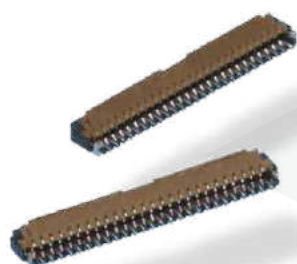
P= 0.3mm



Front Flip



Wide Variation

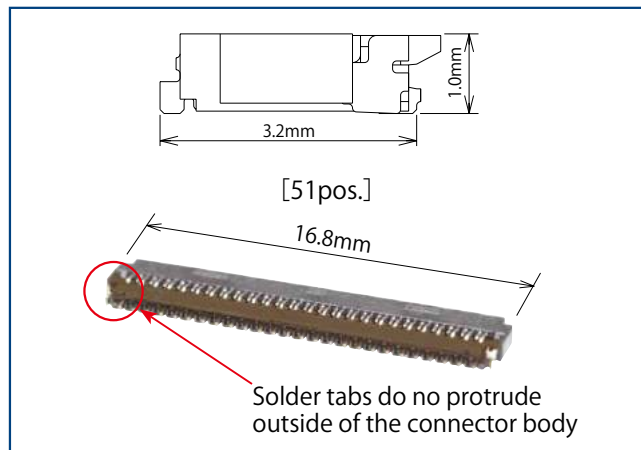


Features

1. Low-profile 0.3mm pitch FPC connector

Ultra-thin design, 1.0mm height, 3.2mm width for space-saving design.

- 30% reduction in PCB footprint
 - 40% reduction in weight
- (Compared to our 0.3mm pitch FH23 Series 51 position connector.)



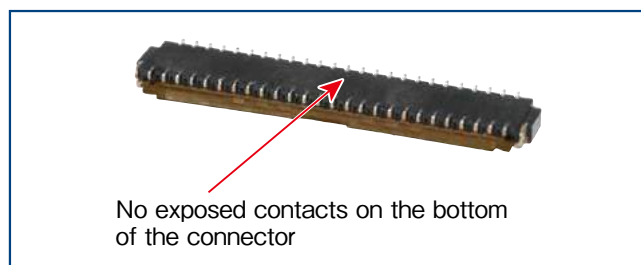
Achieve a height of 1.0mm and mated depth of 3.2mm.

2. Easy PCB Mounting

The leads are double sided and have a 0.6mm mounting lead pitch to simplify mounting.

3. No pattern prohibited area on bottom of connector (Overmolding design)

The bottom of this connector is fully molded to eliminate contact exposure and remove any restrictions to PCB patterning and design.

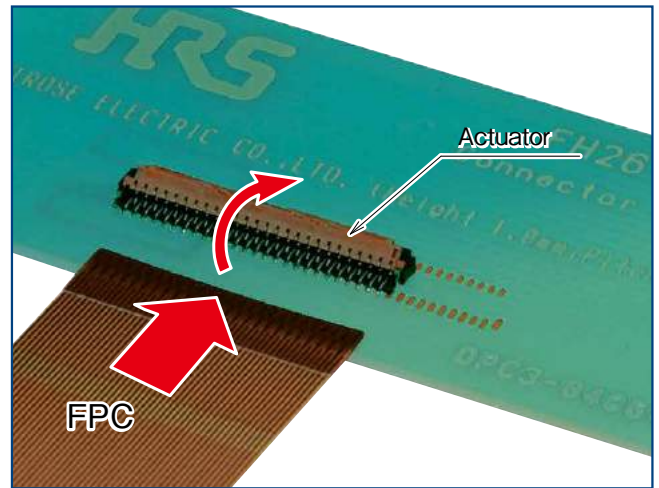


4. Superior Operability with Flip Lock

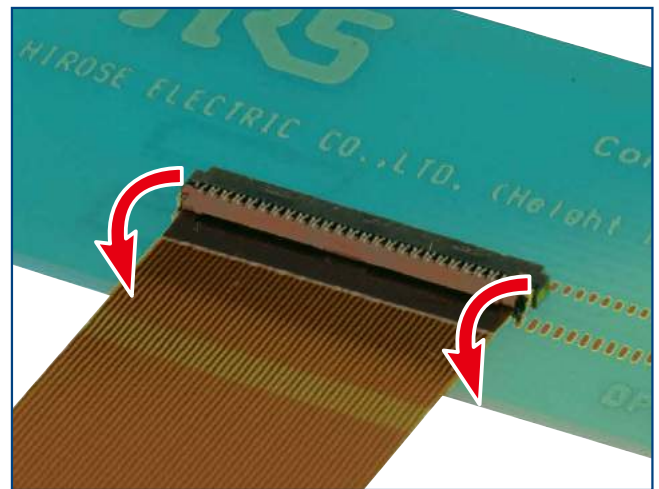
The flip lock (one-touch rotating ZIF mechanism) is easier to operate and works with a light force. A clear tactile click confirms the completion of the mating process.

5. Easy FPC insertion

The metal FPC insertion guides helps to make the FPC insertion process easier. The housing also has a damage-resistant design.



FPC Insertion



Lock Completion

6. Compatible with standard 0.2mm FPC Thickness

This connector accepts standard 0.2mm thick FPC. (The proper FPC stiffener thickness prevents FPC deformation and eases insertion and mating.)

7. Pick & Place Mounting

Offered in tape and reel packaging that is compatible with automatic machine mounting. (5,000 pieces per reel)

8. Halogen-free

All materials and substances used to produce this product comply with Halogen-free standards.

* Defined according to IEC61249-2-21

Br : 900ppm Max., Cl : 900ppm Max., Br+Cl : 1,500ppm Max.

9. Multiple packing options

The standard packaging is 5,000 pieces per reel, but it is also offered in a 500 piece reel. (The outer diameter of the reel will be $\phi 180$ mm in this case.)

Product Specifications

Rated Current (Note 1)	0.2A	Operating Temperature (Note 2)	-55 to +85°C
Rated Voltage	30V AC/DC	Storage Temperature Range (Note 3)	-10 to +50°C

Operating Humidity Range	Relative humidity 90% Max. (No condensation)	Storage Humidity Range	Relative humidity 90% Max. (No condensation)
--------------------------	---	------------------------	---

Recommended FPC	Thickness : = 0.2 ± 0.03mm Gold Plated
-----------------	--

Item	Specification	Conditions
Insulation Resistance	50M Ω Min.	100V DC
Withstanding Voltage	No flashover or insulation breakdown.	90V AC for 1 min.
Contact Resistance	100m Ω Max. Including FPC conductor resistance	1mA
Mating Durability (Insertion/ Withdrawal)	Contact resistance : 100m Ω Max. No damage, cracks, or parts dislocation.	10 cycles
Vibration	No electrical discontinuity of 1 μ s or more. Contact resistance : 100m Ω Max. No damage, cracks, or parts dislocation.	Frequency : 10 to 55 Hz, single amplitude of 0.75mm, 10 cycles, 3 directions.
Shock	No electrical discontinuity of 1 μ s. Min. Contact resistance : 100m Ω Max. No damage, cracks, or parts dislocation.	Acceleration of 981 m/s ² , 6 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis
Humidity (Steady State)	Contact resistance : 100m Ω Max. Insulation resistance : 50M Ω Min. No affect on appearance or performance.	96 hours at temperature of 40 ± 2°C and humidity of 90% to 95%.
Temperature Cycle	Contact resistance : 100m Ω Max. Insulation resistance : 50M Ω Min. No damage, cracks, or parts looseness.	Temperature : -55 °C → +15°C to +35°C → +85°C → +15°C to +35°C Time : 30 → 2 to 3 → 30 → 2 to 3 (Minutes) 5 cycles
Resistance to Soldering Heat	No deformation of components affecting performance.	Reflow : At the recommended temperature profile Manual soldering: 350°C +/-10°C for 5 ± 1 seconds

Note 1 : When passing the current through all of the contacts, use 70% of the rated current.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The term "storage" refers to products stored for long period of time prior to mounting and use. Operating temperature and humidity range applies to mounted connectors in the non-energized state during storage, shipment and transportation.

Materials / Finish

Part	Material	Finish	Remarks
Insulator	LCP	Color : Black	UL94V-0
	PA	FH26W Series : Light Brown	UL94HB
Contacts	Phosphor Bronze	Gold Plated	-
Retention Tabs		Pure Tin Reflow Plated	-

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.

FH26W - 51S - 0.3 SHW (##)

①

②

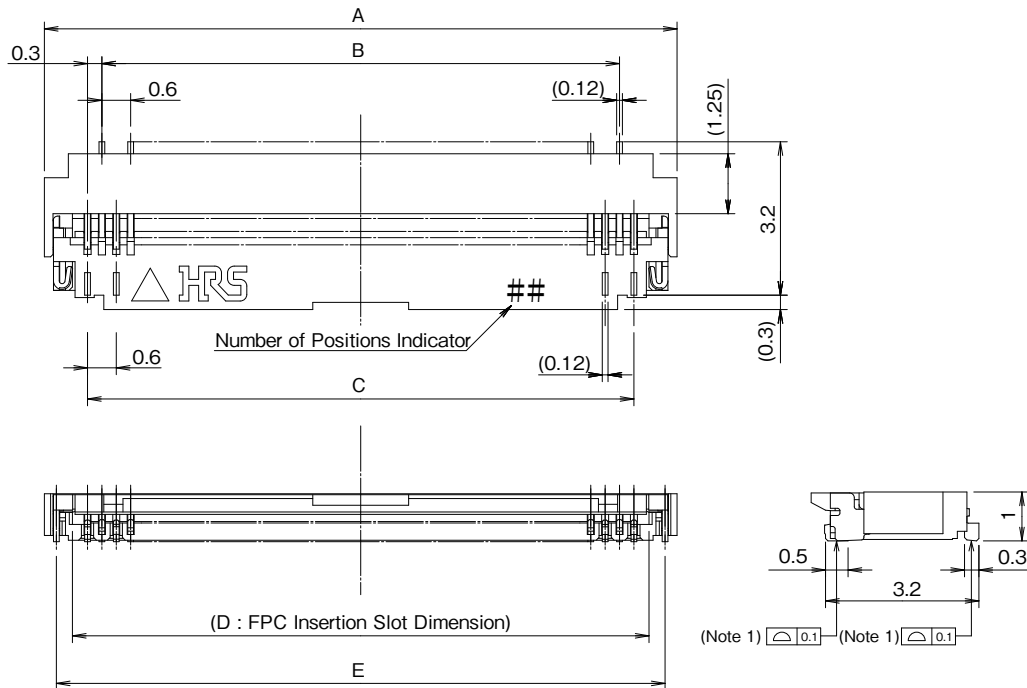
③

④

⑤

① Series Name	FH26W	④ Termination Type	SHW : SMT Horizontal Staggered Mounting Type
② No. of Pos.	13 to 71	⑤ Specifications	(60) : Gold Plating with Nickel Barrier, 5,000pcs per reel (97) : Gold Plating with Nickel Barrier, 500pcs per reel
③ Contact Pitch	0.3mm		

Connector Dimensions



Note 1 : The coplanarity of each terminal lead within specified dimension is 0.1mm Max.

Note 2 : Packaged on tape and reel only. Check packaging specification.

Note 3 : Please note a sink hole might be added for improvements. Black spots may appear on the resin but this does not affect product performance.

Note 4 : After reflow, the terminal plating may change color, however this does not represent a quality issue.

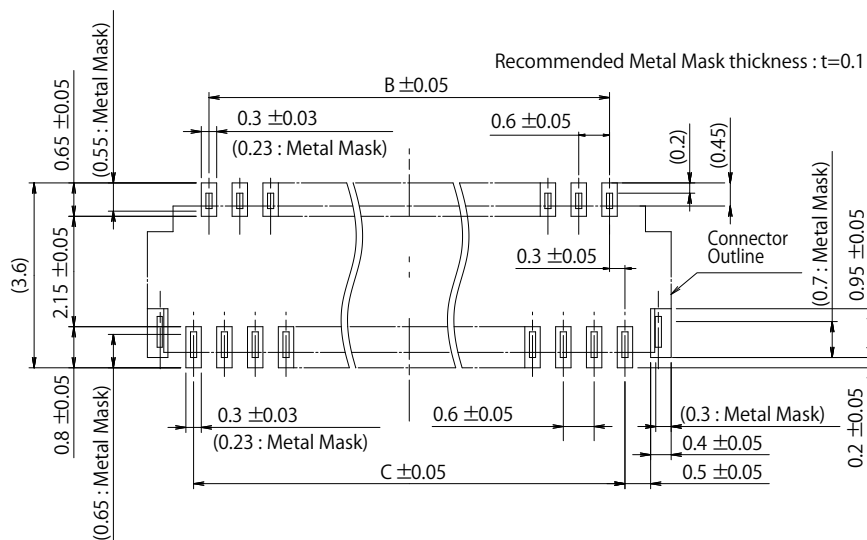
Note : Embossed tape reel packaging.

Connector Dimension Table

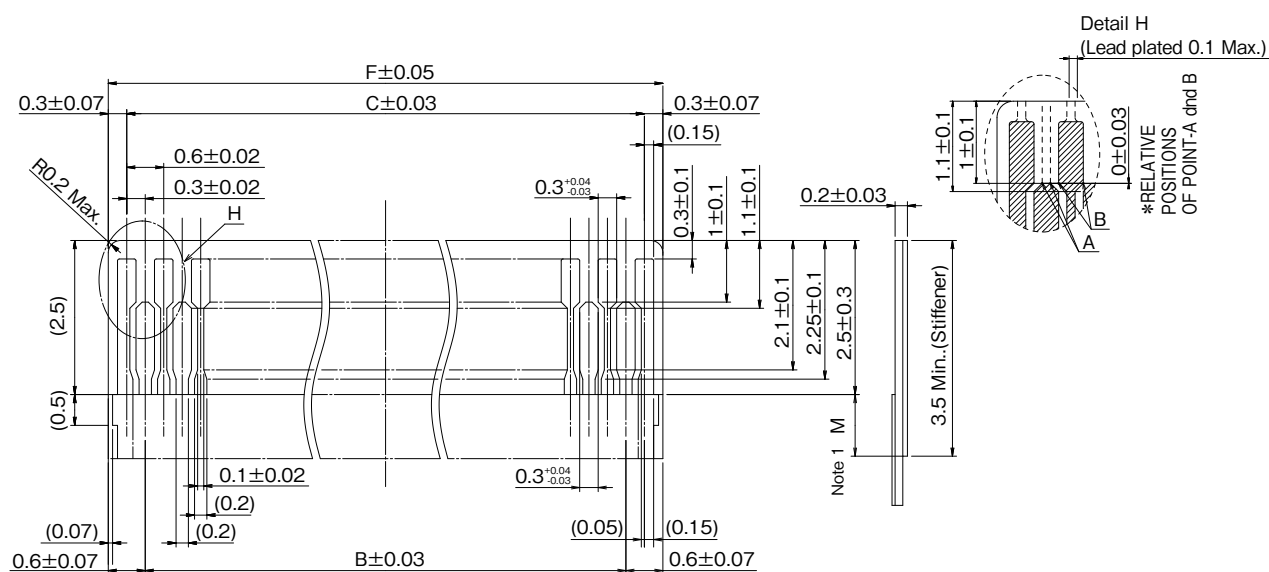
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit	
								(60)	(97)
FH26W-13S-0.3SHW(##)	CL0580-2401-1-##	13	5.4	3.0	3.6	4.23	4.9	5,000pcs per reel	500pcs per reel
FH26W-15S-0.3SHW(##)	CL0580-2402-4-##	15	6.0	3.6	4.2	4.83	5.5		
FH26W-17S-0.3SHW(##)	CL0580-2403-7-##	17	6.6	4.2	4.8	5.43	6.1		
FH26W-19S-0.3SHW(##)	CL0580-2437-9-##	19	7.2	4.8	5.4	6.03	6.7		
FH26W-21S-0.3SHW(##)	CL0580-2404-0-##	21	7.8	5.4	6.0	6.63	7.3		
FH26W-23S-0.3SHW(##)	CL0580-2405-2-##	23	8.4	6.0	6.6	7.23	7.9		
FH26W-25S-0.3SHW(##)	CL0580-2406-5-##	25	9.0	6.6	7.2	7.83	8.5		
FH26W-27S-0.3SHW(##)	CL0580-2400-9-##	27	9.6	7.2	7.8	8.43	9.1		
FH26W-29S-0.3SHW(##)	CL0580-2407-8-##	29	10.2	7.8	8.4	9.03	9.7		
FH26W-31S-0.3SHW(##)	CL0580-2408-0-##	31	10.8	8.4	9.0	9.63	10.3		
FH26W-33S-0.3SHW(##)	CL0580-2409-3-##	33	11.4	9.0	9.6	10.23	10.9		
FH26W-35S-0.3SHW(##)	CL0580-2410-2-##	35	12.0	9.6	10.2	10.83	11.5		
FH26W-37S-0.3SHW(##)	CL0580-2411-5-##	37	12.6	10.2	10.8	11.43	12.1		
FH26W-39S-0.3SHW(##)	CL0580-2412-8-##	39	13.2	10.8	11.4	12.03	12.7		
FH26W-41S-0.3SHW(##)	CL0580-2413-0-##	41	13.8	11.4	12.0	12.63	13.3		
FH26W-45S-0.3SHW(##)	CL0580-2414-3-##	45	15.0	12.6	13.2	13.83	14.5		
FH26W-51S-0.3SHW(##)	CL0580-2415-6-##	51	16.8	14.4	15.0	15.63	16.3		
FH26W-57S-0.3SHW(##)	CL0580-2417-1-##	57	18.6	16.2	16.8	17.43	18.1		
FH26W-61S-0.3SHW(##)	CL0580-2418-4-##	61	19.8	17.4	18.0	18.63	19.3		
FH26W-71S-0.3SHW(##)	CL0580-2419-7-##	71	22.8	20.4	21.0	21.63	22.3		

Recommended PCB Mounting Pattern and Metal Mask Dimensions



● Recommended FPC Dimensions



Note : If the stiffener cannot be more that 3.5mm due to the FPC design, set Dimension M to a minimum of 0.5mm.

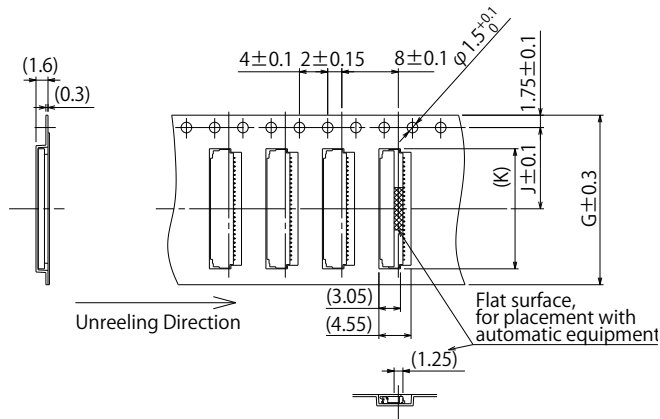
● Recommended Land Pattern, Metal Mask and FPC Dimensions Table

Unit : mm

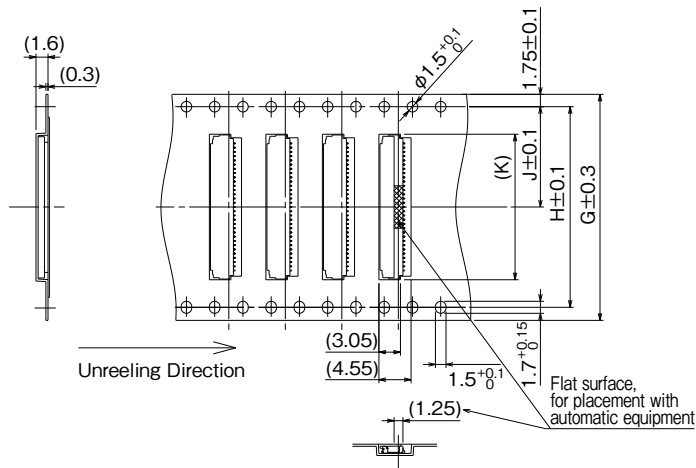
Part No.	HRS No.	No. of Pos.	B	C	F
FH26W-13S-0.3SHW(##)	CL0580-2401-1-##	13	3.0	3.6	4.2
FH26W-15S-0.3SHW(##)	CL0580-2402-4-##	15	3.6	4.2	4.8
FH26W-17S-0.3SHW(##)	CL0580-2403-7-##	17	4.2	4.8	5.4
FH26W-19S-0.3SHW(##)	CL0580-2437-9-##	19	4.8	5.4	6.0
FH26W-21S-0.3SHW(##)	CL0580-2404-0-##	21	5.4	6.0	6.6
FH26W-23S-0.3SHW(##)	CL0580-2405-2-##	23	6.0	6.6	7.2
FH26W-25S-0.3SHW(##)	CL0580-2406-5-##	25	6.6	7.2	7.8
FH26W-27S-0.3SHW(##)	CL0580-2400-9-##	27	7.2	7.8	8.4
FH26W-29S-0.3SHW(##)	CL0580-2407-8-##	29	7.8	8.4	9.0
FH26W-31S-0.3SHW(##)	CL0580-2408-0-##	31	8.4	9.0	9.6
FH26W-33S-0.3SHW(##)	CL0580-2409-3-##	33	9.0	9.6	10.2
FH26W-35S-0.3SHW(##)	CL0580-2410-2-##	35	9.6	10.2	10.8
FH26W-37S-0.3SHW(##)	CL0580-2411-5-##	37	10.2	10.8	11.4
FH26W-39S-0.3SHW(##)	CL0580-2412-8-##	39	10.8	11.4	12.0
FH26W-41S-0.3SHW(##)	CL0580-2413-0-##	41	11.4	12.0	12.6
FH26W-45S-0.3SHW(##)	CL0580-2414-3-##	45	12.6	13.2	13.8
FH26W-51S-0.3SHW(##)	CL0580-2415-6-##	51	14.4	15.0	15.6
FH26W-57S-0.3SHW(##)	CL0580-2417-1-##	57	16.2	16.8	17.4
FH26W-61S-0.3SHW(##)	CL0580-2418-4-##	61	17.4	18.0	18.6
FH26W-71S-0.3SHW(##)	CL0580-2419-7-##	71	20.4	21.0	21.6

Packaging Specification

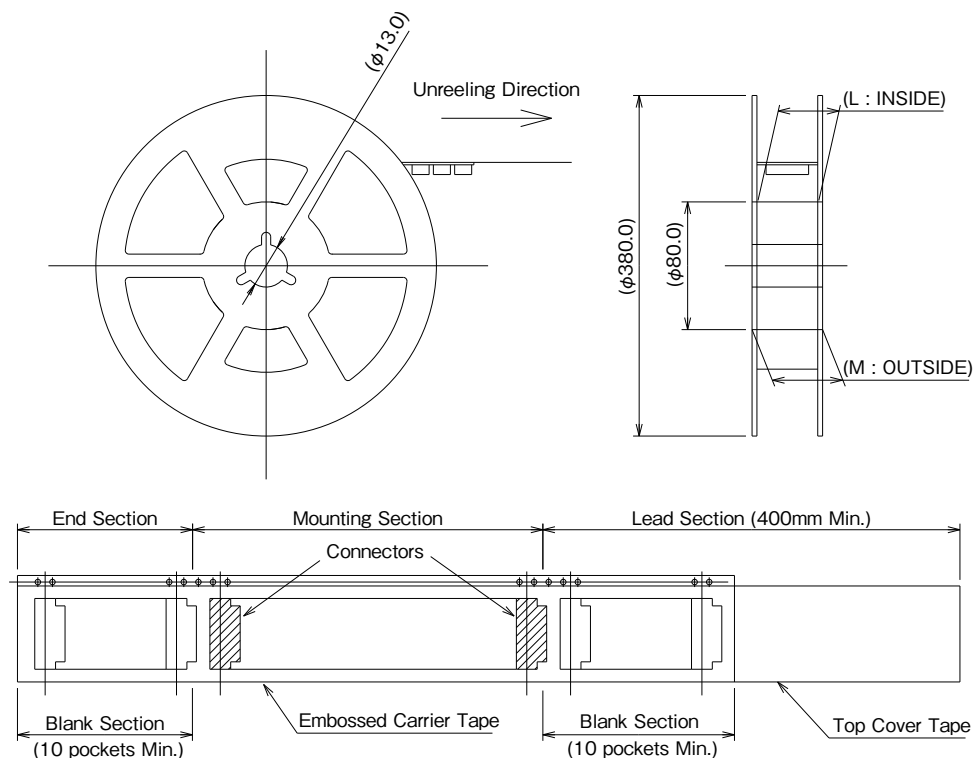
● Embossed Carrier Tape Dimensions (Tape Width 24mm Max.)



● Embossed Carrier Tape Dimensions (Tape Width 32mm Min.)



● Reel Dimensions



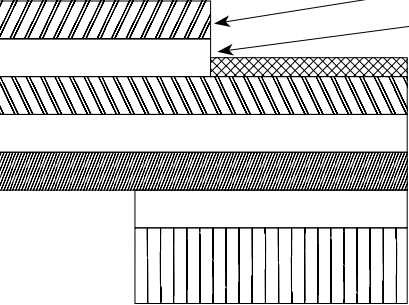
■ Packaging Dimension Table

Unit : mm

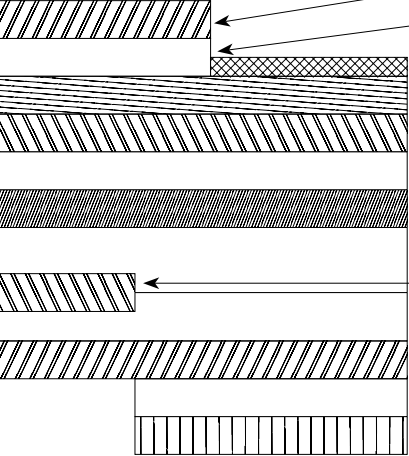
Part No.	HRS No.	No. of Pos.	G	H	J	K	L	M
FH26W-13S-0.3SHW(##)	CL0580-2401-1-##	13	16.0	-	7.5	5.6	17.4	21.4
FH26W-15S-0.3SHW(##)	CL0580-2402-4-##	15	16.0		7.5	6.2	17.4	21.4
FH26W-17S-0.3SHW(##)	CL0580-2403-7-##	17	16.0		7.5	6.8	17.4	21.4
FH26W-19S-0.3SHW(##)	CL0580-2437-9-##	19	16.0		7.5	7.4	17.4	21.4
FH26W-21S-0.3SHW(##)	CL0580-2404-0-##	21	16.0		7.5	8.0	17.4	21.4
FH26W-23S-0.3SHW(##)	CL0580-2405-2-##	23	16.0		7.5	8.6	17.4	21.4
FH26W-25S-0.3SHW(##)	CL0580-2406-5-##	25	16.0		7.5	9.2	17.4	21.4
FH26W-27S-0.3SHW(##)	CL0580-2400-9-##	27	16.0		7.5	9.8	17.4	21.4
FH26W-29S-0.3SHW(##)	CL0580-2407-8-##	29	24.0		11.5	10.4	25.4	29.4
FH26W-31S-0.3SHW(##)	CL0580-2408-0-##	31	24.0		11.5	11.0	25.4	29.4
FH26W-33S-0.3SHW(##)	CL0580-2409-3-##	33	24.0		11.5	11.6	25.4	29.4
FH26W-35S-0.3SHW(##)	CL0580-2410-2-##	35	24.0		11.5	12.2	25.4	29.4
FH26W-37S-0.3SHW(##)	CL0580-2411-5-##	37	24.0		11.5	12.8	25.4	29.4
FH26W-39S-0.3SHW(##)	CL0580-2412-8-##	39	24.0		11.5	13.4	25.4	29.4
FH26W-41S-0.3SHW(##)	CL0580-2413-0-##	41	24.0		11.5	14.0	25.4	29.4
FH26W-45S-0.3SHW(##)	CL0580-2414-3-##	45	24.0		11.5	15.2	25.4	29.4
FH26W-51S-0.3SHW(##)	CL0580-2415-6-##	51	24.0		11.5	17.0	25.4	29.4
FH26W-57S-0.3SHW(##)	CL0580-2417-1-##	57	32.0	28.4	14.2	18.8	33.4	37.4
FH26W-61S-0.3SHW(##)	CL0580-2418-4-##	61	32.0	28.4	14.2	20.0	33.4	37.4
FH26W-71S-0.3SHW(##)	CL0580-2419-7-##	71	44.0	40.4	20.2	23.0	45.4	49.4

Recommended FPC Construction

1. Using Single-sided FPC

	Material Name		Material	Thickness (μm)
	Covering film layer.		Polyimide 1 mil thick.	25
	Cover adhesive			25
	Surface treatment		1 μm to 5 μm Nickel underplated 0.2 μm Gold plated	3
	Copper foil		Cu 1oz	35
	Base adhesive		Thermosetting adhesive	25
	Base film		Polyimide 1 mil thick	25
	Reinforcement material adhesive		Thermosetting adhesive	40
	Stiffener		Polyimide 3 mil thick	75
	Total			203

2. Using Double-sided FPC

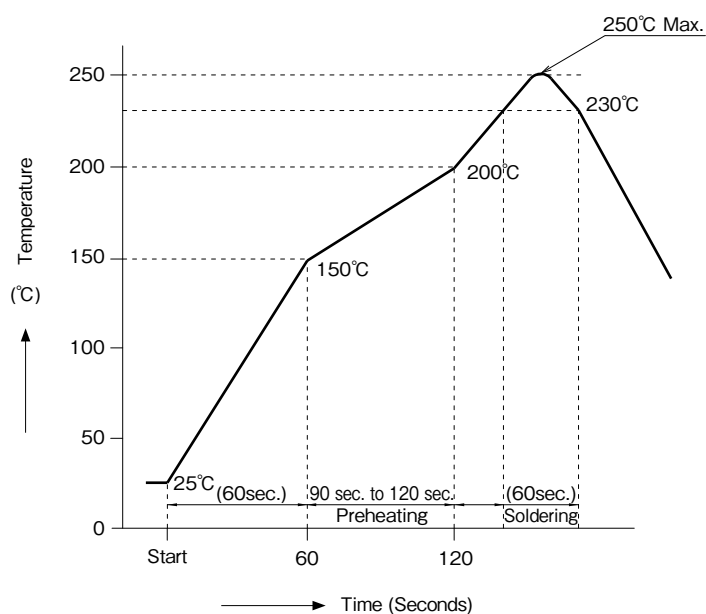
	Material Name		Material	Thickness (μm)
	Covering layer film		Polyimide 1 mil thick	25
	Cover adhesive			25
	Surface treatment		1 μm to 5 μm Nickel underplated 0.2 μm Gold plated	3
	Through-hole copper		Cu	15
	Copper foil		Cu 1/2oz	18
	Base adhesive		Thermosetting adhesive	18
	Base film		Polyimide 1 mil thick	25
	Base adhesive		Thermosetting adhesive	18
	Copper foil		Cu 1/2oz	18
	Cover adhesive		Thermosetting adhesive	25
	Covering layer film		Polyimide 1 mil thick	25
	Reinforcement material adhesive		Thermosetting adhesive	25
	Stiffener		Polyimide 1 mil thick	25
	Total			197

Note : To prevent release of the FPC due to bending, use of double-sided FPC with copper foil on the back side is NOT RECOMMENDED.

3. Precautions

1. This specification is a recommendation for the construction of the FH26 Series FPC (t=0.2±0.03).
2. For details about the construction, please contact FPC manufacturers.

Operation and Precautions



HRS test conditions

Solder Method :	Reflow, IR/hot air
Environment :	Room air
Solder Composition :	Paste, 96.5%Sn/3.0%Ag/0.5%Cu (Senju Metal Industry, Co., Ltd.'s Part Number: M705- 221CM5-32-10.5)
Test Board :	Glass epoxy 25mm × 50mm × 0.8mm thick
Land Dimensions :	0.3mm × 0.65mm, 0.3mm × 0.8mm
Metal Mask :	0.23 × 0.55 × 0.1mm thick, 0.23 × 0.65 × 0.1mm thick

The temperature profiles are based on the above conditions.

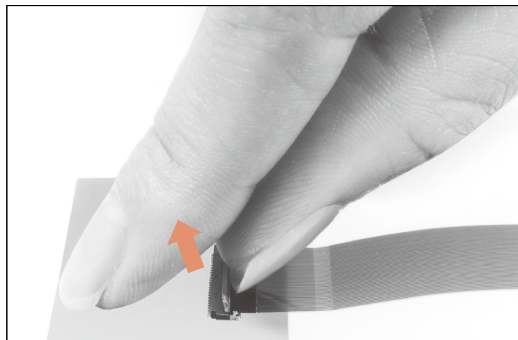
In individual applications the actual temperature may vary depending on solder paste type, volume/thickness and board size/thickness. Consult your solder paste and equipment manufacturer for specific recommendations.

Operation and Precautions

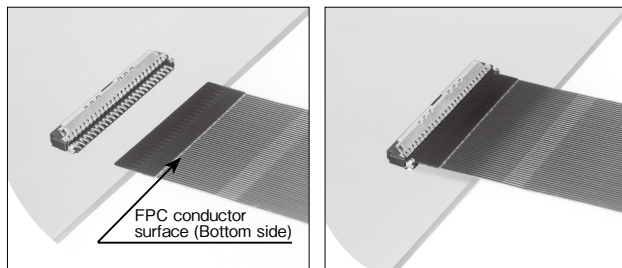
[Operation]

1.FPC insertion procedure.

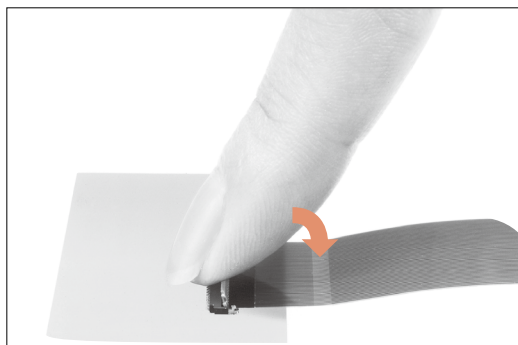
①Lift the actuator upward to unlock. (Lock release) The actuator flips open easily when operated with a finger.



②Fully insert the FPC in the connector parallel to mounting surface, with the exposed conductive traces facing down.

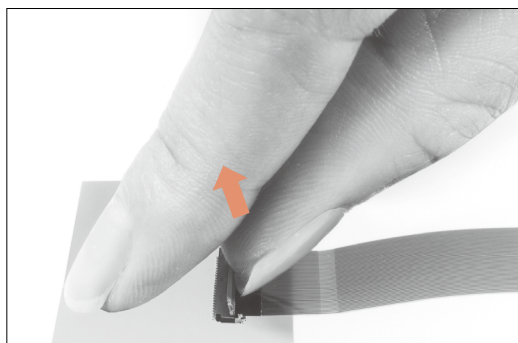


③Rotate the actuator downward until firmly closed. If the FPC is not fully inserted or is extremely misaligned remove the FPC as described in 2- ② . Reoperate starting from 1- ① . Make sure to secure the connector during locking.



2.FPC Removal

①Lift up the actuator. Remove the FPC after releasing the lock.



[Precautions]

This connector needs to be handled with care due to its thin, small design.

[Precautions When Mounting to PCB]

- Acceptable amount of PCB warpage

PCB warpage should be kept to a minimum. The maximum coplanarity of this connector is 0.1mm, but excessive warpage may result in solder failure.

- FPC Specifications

Stiffeners can be used to improve the rigidity of the FPC. We recommend using a glass epoxy with a thickness of 0.3mm or more.

- Load to the Connector

Do not apply any excessive force (0.5N Max.) or mate/unmate the connectors until they are mounted, failure to follow this precaution can lead to deformation or damage to the connectors. Inserting the FPC prior to mounting is not recommended either.

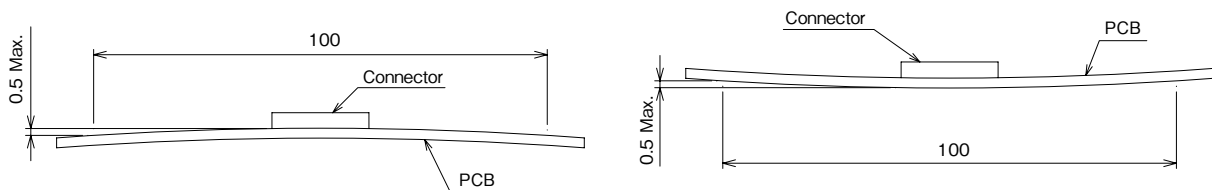
[Precautions for Handling the PCB After Mounting]

- Applied force to the PCB

Do not place any excessive force on the PCB after connector mounting as this may damage the connectors. (e.g., When separating the PCB into multiple boards or installing fastening screws onto the PCB)

- PCB Bending

PCBs with a width of 100mm should not be bent more than 0.5mm Max. (Please refer to the diagrams below.) PCB bending places an extra load onto the connector and may lead to damage or malfunction.



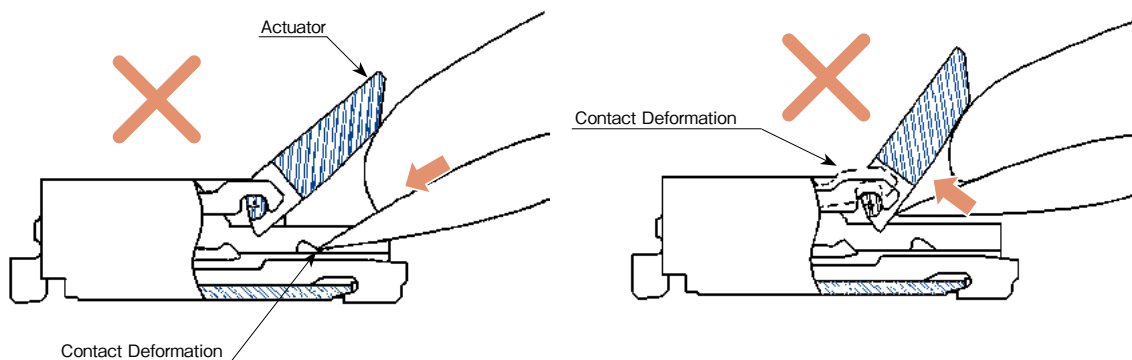
[Precautions When Inserting or Coupling FPC]

Pay attention to the following points when inserting FPC.

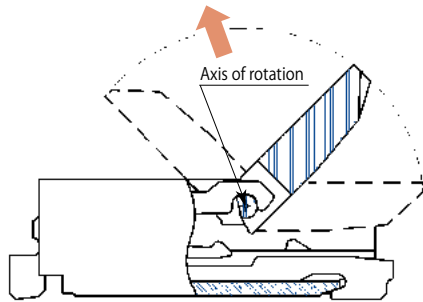
- Actuator Operation

① Do not apply excessive force when opening the actuator prior to FPC insertion.

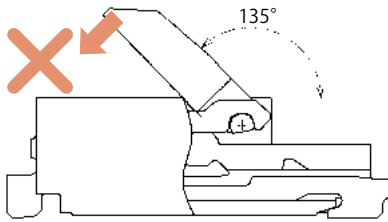
When opening make sure that the force is applied only to the actuator itself. Avoid touching the contacts.



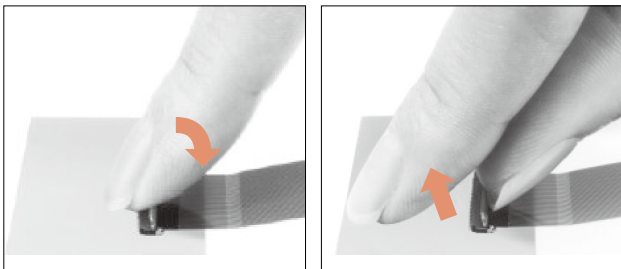
② Rotational Axis



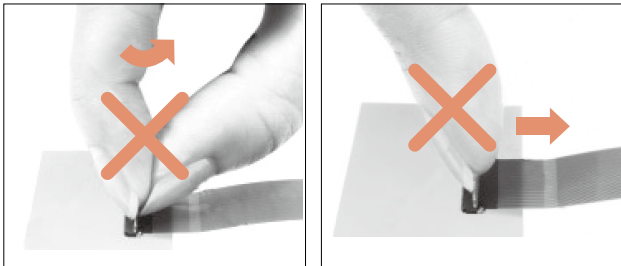
- ③ The actuator is designed to rotate up to 135° so do not apply excessive force to rotate it further. Applying excessive force may result in the lock lever coming off or damage to the connector.



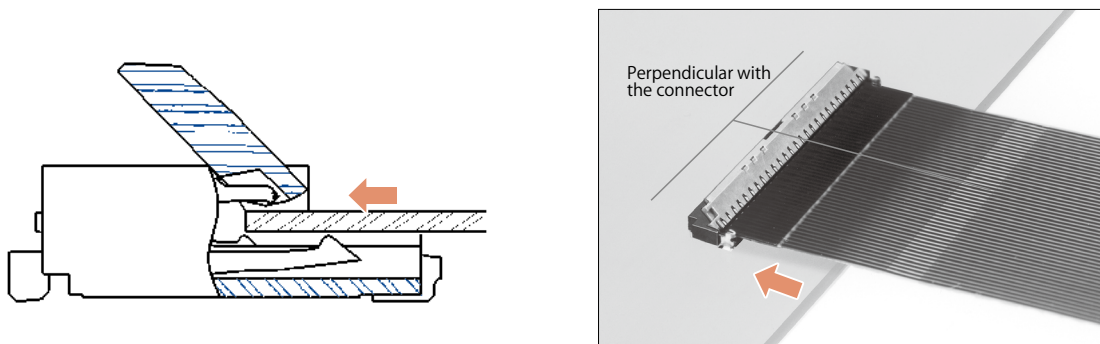
- ④ When operating the actuator, do so at the center portion.



- ⑤ As illustrated, do not attempt removal or repositioning of the actuator. (Do not do any operation other than the axis rotation described in ②.)



● FPC Insertion①



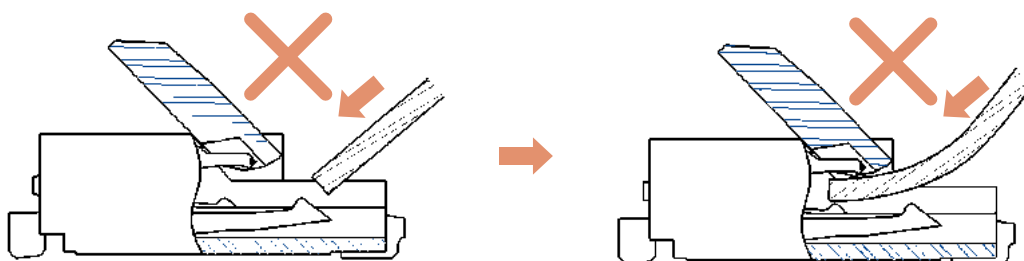
The FPC should be aligned parallel with the board surface and perpendicular with the connector (as shown), then completely inserted.

To assure correct electrical and mechanical connection do not insert the FPC at an angle. Inserting the FPC at an angle may result in a short circuit due to pitch misalignment, or the corners of the FPC may get caught and deform the contacts. Since this is a ZIF connector with 0.35mm effective mating length (HRS recommended FPC nominal size), do not pull out the FPC after insertion when operating the actuator.

● FPC Insertion②

Do not insert the FPC at any angle from above.

As illustrated, angled insertion may result in FPC bending, pattern breakage or incomplete mating resulting in conduction failure.



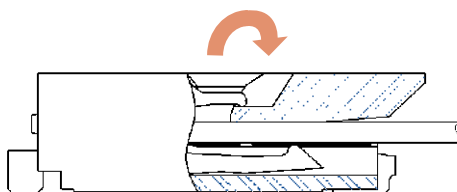
Note 1 : To avoid inserting the FPC at an angle, secure sufficient FPC insertion space at the time of board layout. Insertion will be difficult when the FPC is too short.

Note 2 : Contact the FPC manufacturer for information about the bending specifications.

● Confirming Locking Status

When locked the actuator should be level with respect to the board surface as illustrated below.

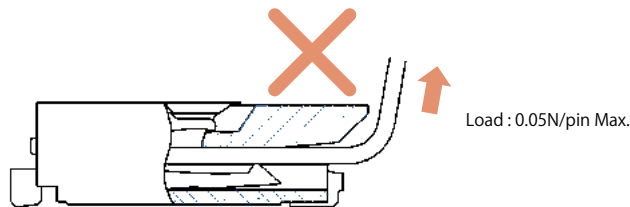
Do not press against the actuator when is fully closed. Max force applied to the fully closed actuator should not exceed 1N.



[Precautions for Routing the FPC after FPC Insertion]

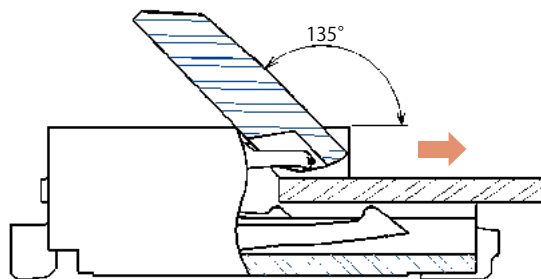
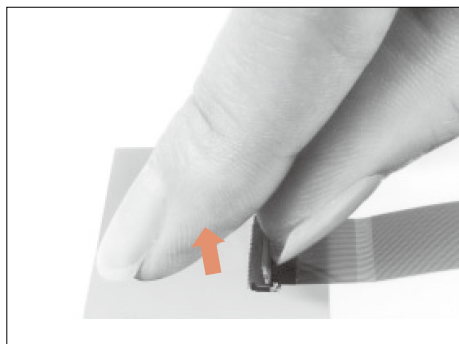
● FPC Load

Do not apply force in excess of 0.05N/pin Max. in the upward direction (as illustrated). Excessive force may result in the connector unlocking or FPC damage. Secure the FPC when a continuous load will be applied. Do not bend the FPC too close to the actuator.



[FPC Removal]

Rotate the actuator to the open position (maximum open angle of 135°). Carefully withdraw the FPC.



[Other Precautions]]

● Hand Soldering Precautions

When hand soldering:

- ① Do not perform reflow or hand soldering with the FPC inserted in the connector.
- ② Do not apply excessive heat or touch the soldering iron anywhere other than the connector leads.
- ③ Do not use excessive amount of solder or flux compounds.

Operation of the actuator and contacts may be affected by excessive amounts of solder or flux compounds. Applying too much solder on the retention tabs may hinder the rotation of the actuator and result in connector damage.

While taking in consideration

Specifications mentioned in this catalog are reference values.

When considering to order or use this product, please confirm the "Drawing" and "Product Specifications" sheets.

Use an appropriate cable when using the connector in combination with cables.

If considering usage of a non-specified cable, please contact your sales representative.

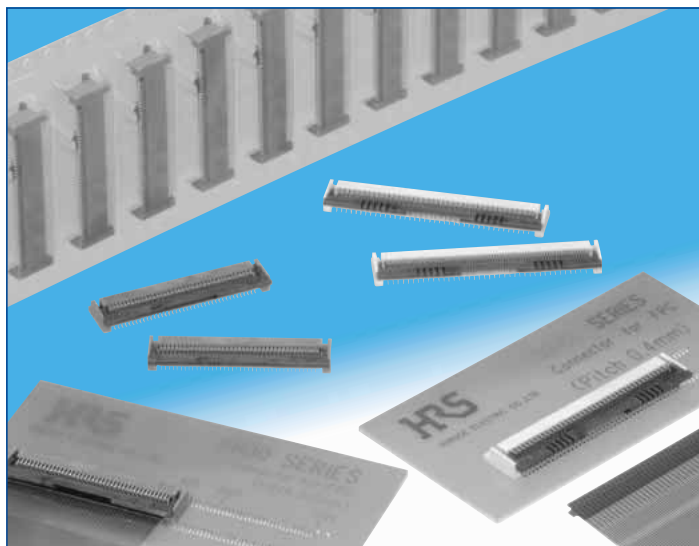
If assembly process is done by jigs & tools which are not identified by Hirose assurance will not be given.

Please consult with your Hirose sales representative if you are planning to use the product for any of the following applications. (Automotive, medical, public infrastructure, aerospace/defense, etc.)

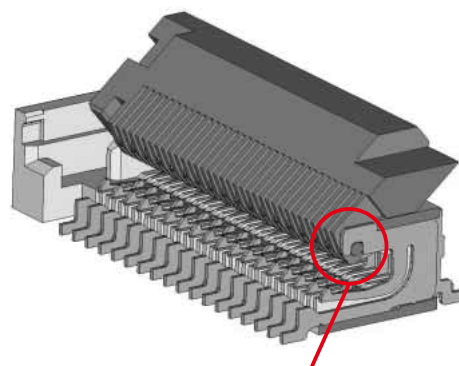
Hirose will consider the validity of the warranty depending on the conditions.

0.3 or 0.4 mm pitch, 3 mm above the board, Flip-Lock actuator, Flexible Printed Circuit ZIF connectors

FH30 Series



Strong actuator construction



Enclosed shaft of the actuator prevents it from dislocation

■ Features

1. Strong actuator retention

Actuator will not be dislodged when operating under harsh conditions.

2. Rotating Flip-Lock actuator

Rotating actuator permits easy insertion and retention of the FPC.

Tactile sensation confirms complete FPC insertion and reliable mechanical and electrical connection.

3. FPC position hold

Tabs on each side of the FPC assure correct placement and hold in the connector prior to closing of the actuator.

4. Accepts standard FPC thickness

0.3mm thick standard Flexible Printed Circuit (FPC) can be used.

5. Easy solderability on the PC board

The soldering leads are on 0.6 mm or 0.8 mm pitch, exiting on the front and back of the connector.

6. Board placement with automatic equipment

Flat upper surface and tape and reel packaging facilitate vacuum pick-up and placement. Standard reel packaging contains 1000 connectors.

7. Conductive traces on the PCB can run under the connector

No exposed contacts on the bottom of the connector.

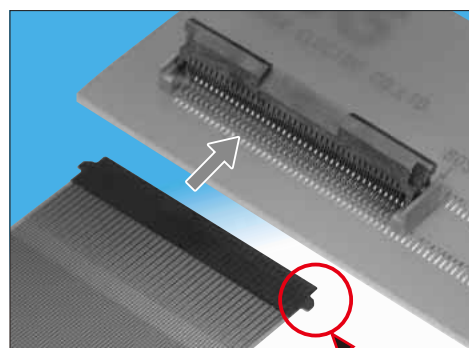
8. Halogen-free*

* As defined by IEC61249-2-21

Br-900ppm maximum, Cl-900ppm maximum,

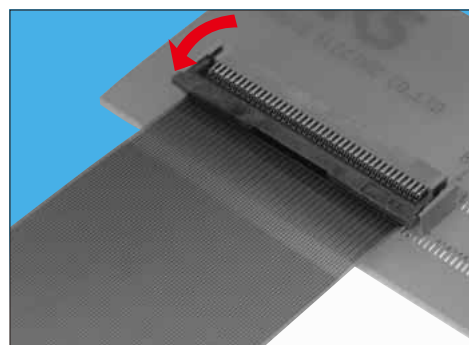
Cl + Br combined-1,500ppm maximum

Simple FPC insertion



FPC positioning tab

Lock



Product Specifications

Ratings		0.3 mm pitch	0.4 mm pitch	Operating temperature range -40 to +85°C (Note 2)	Storage temperature range -10 to +50°C (Note 3)
	Current rating(Note 1)	0.15 A	0.3 A	Operating humidity range Relative humidity 90% max.	Storage humidity range Relative humidity 90% max.
	Voltage rating	30 Vrms AC	50 Vrms AC	(No condensation)	(No condensation)

Recommended FPC	Thickness: 0.3±0.05, Gold plated contact pads
-----------------	---

Item	Specification	Conditions
1. Insulation resistance	500 MΩ min.	100 V DC
2. Withstanding voltage	No flashover or insulation breakdown	0.3 mm pitch: 90 Vrms AC / 1 minute 0.4mm pitch: 150 Vrms AC / 1 minute
3. Contact resistance	150 mΩ max. * Including FPC conductor resistance	1 mA AC
4. Durability	Contact resistance: 150 mΩ max. No damage, cracks, or parts dislocation	20 cycles
5. Vibration	No electrical discontinuity of 1μs or longer Contact resistance: 150 mΩ max. No damage, cracks, or parts dislocation	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm 10 cycles in each of the 3 directions
6. Shock	No electrical discontinuity of 1μs or longer Contact resistance: 150 mΩ max. No damage, cracks, or parts dislocation	Acceleration of 981m/s ² , 6 ms duration, sine half-wave, 3 cycles in each of the 3 axis
7. Humidity (Steady state)	Contact resistance: 150 mΩ max. Insulation resistance: 50MΩ min. No damage, cracks, or parts dislocation	96 hours at 40°C and humidity of 90 to 95%
8. Temperature cycle	Contact resistance: 150 mΩ max. Insulation resistance: 50MΩ min. No damage, cracks, or parts dislocation	Temperature: -40°C → +15°C to 35°C → +85°C → +15°C to 35°C Time: -30 → 2 to 3 → +30 → +2 to 3 5 cycles
9. Resistance to soldering heat	No deformation of components affecting performance.	Reflow: At the recommended temperature profile Manual soldering: 350°C for 5 seconds

Note1: When passing the current through all of the contacts, use 70% of the rated current.

Note2: Includes temperature rise caused by current flow.

Note3: The term "storage" refers to products stored for a long period prior to mounting and use.

The operating temperature and humidity range covers the non-conducting condition of connectors after installation on a board.

Materials

Part	Material	Finish	Remarks
Insulator	LCP	FH30 series Color:Gray	UL94V-0
		FH30M series Color:Beige	
Contacts	Phosphor bronze	Gold plated	—

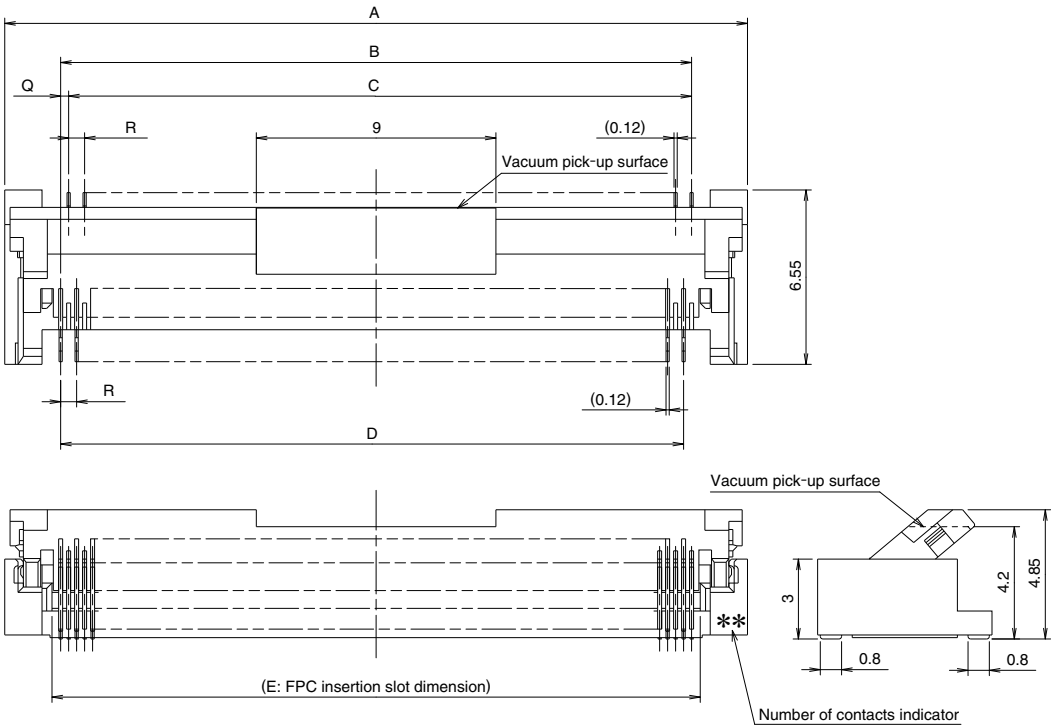
Ordering information

FH 30 M - 80S - 0.3 SHW (05)

① ② ③ ④ ⑤ ⑥ ⑦

① Series name	: FH
② Series No.	: 30
③ Blank	: 0.3mm pitch
M	: 0.4 mm pitch
④ Number of contacts	: FH30 series 60, 80, 90 FH30M series 80, 96
⑤ Contact pitch	: 0.3 mm, 0.4 mm
⑥ Contact type	: SHW(SMT horizontal staggered mounting)
⑦ Plating specifications	: (05)...Gold plated (98)...Gold plated, 500 pieces/reel

■Dimensions



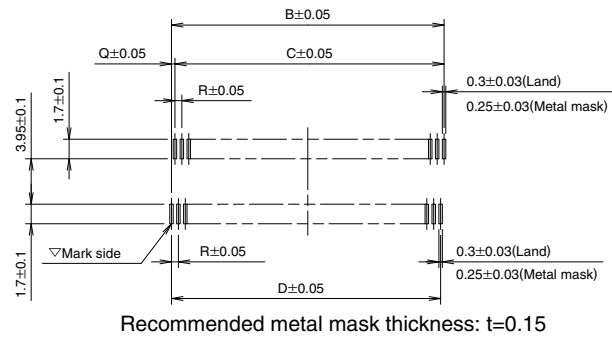
- Notes 1: The coplanarity of each terminal lead is within 0.1.
2: Packaged on tape and reel only. Check packaging specification.
3: Slight variations in color of the plastic compounds do not affect form ,fit or function of the connector.
4: After reflow, the terminal plating may change color, however this does not represent a quality issue.

All dimensions: mm

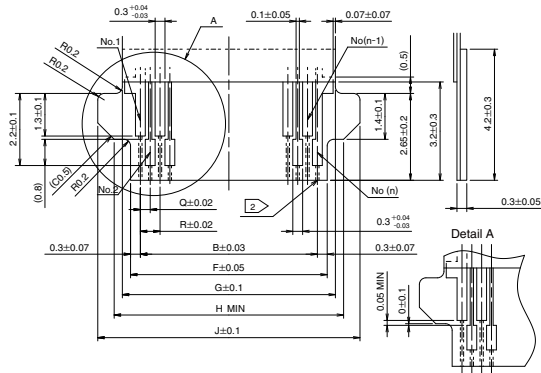
Part Number	CL No.	Number of Contacts	FPC contact pitch	A	B	C	D	E	Q	R
FH30-60S-0.3SHW(05)	580-0105-8-05	60	0.3	21.9	17.7	17.4	17.4	18.35	0.3	0.6
FH30-80S-0.3SHW(05)	580-0100-4-05	80	0.3	27.9	23.7	23.4	23.4	24.35	0.3	0.6
FH30-90S-0.3SHW(05)	580-0106-0-05	90	0.3	30.9	26.7	26.4	26.4	27.35	0.3	0.6
FH30M-80S-0.4SHW(05)	580-0102-0-05	80	0.4	35.8	31.6	31.2	31.2	32.25	0.4	0.8
FH30M-96S-0.4SHW(05)	580-0103-2-05	96	0.4	42.2	38	37.6	37.6	38.65	0.4	0.8

Tape and reel packaging (1,000 pieces/reel, 500 pieces/reel).
Order by number of reels.

■Recommended PCB mounting pattern and metal mask dimensions



■Recommended FPC Dimensions



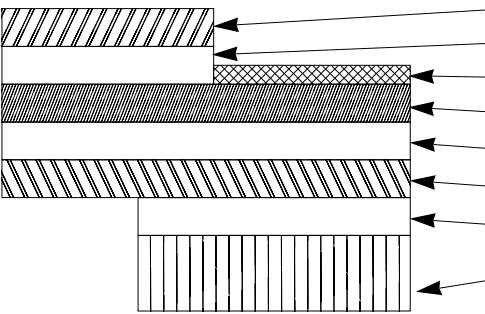
Note ① : Conductor width shall be 0.1 ± 0.05 if FPC has plating bars.

All dimensions: mm

Part Number	CL No.	Number of Contacts	FPC contact pitch	B	C	D	F	G	H	J	Q	R
FH30-60S-0.3SHW(05)	580-0105-8-05	60	0.3	17.7	17.4	17.4	18.3	18.8	19.3	20.3	0.3	0.6
FH30-80S-0.3SHW(05)	580-0100-4-05	80	0.3	23.7	23.4	23.4	24.3	24.8	25.3	26.3	0.3	0.6
FH30-90S-0.3SHW(05)	580-0106-0-05	90	0.3	26.7	26.4	26.4	27.3	27.8	28.3	29.3	0.3	0.6
FH30M-80S-0.4SHW(05)	580-0102-0-05	80	0.4	31.6	31.2	31.2	32.2	32.7	33.2	34.2	0.4	0.8
FH30M-96S-0.4SHW(05)	580-0103-2-05	96	0.4	38	37.6	37.6	38.6	39.1	39.6	40.6	0.4	0.8

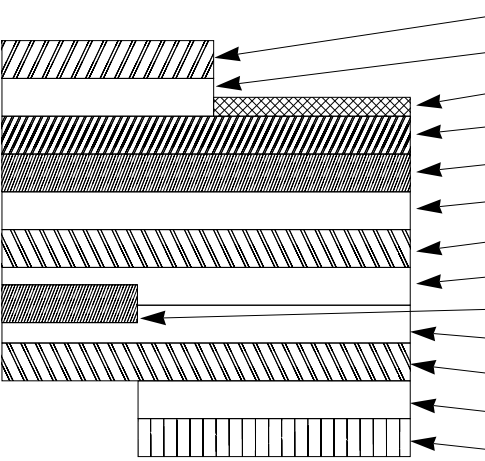
■FH30 Series Recommended FPC Construction

1. Using Single-sided FPC



Material Name	Material	Material Thickness (μm)
Covering film layer	Polyimide 1 mil thick	(25)
Cover adhesive		(25)
Surface treatment	0.2μm thick gold plated over 1 to 5μm thick nickel underplating	3
Copper foil	Cu 1oz	35
Base adhesive	Thermosetting adhesive	25
Base film	Polyimide 1 mil thick	25
Reinforcement material adhesive	Thermosetting adhesive	30
Stiffener	Polyimide 7 mil thick	175
Total		293

2. Using Double-sided FPC



Material Name	Material	Material Thickness (μm)
Covering layer film	Polyimide 1 mil thick	(25)
Cover adhesive		(25)
Surface treatment	0.2μm thick gold plated over 1 to 5μm thick nickel underplating	3
Through-hole copper	Cu	15
Copper foil	Cu 1/2oz	18
Base adhesive	Thermosetting adhesive	18
Base film	Polyimide 1 mil thick	25
Base adhesive	Thermosetting adhesive	18
Copper foil	Cu 1/2oz	(18)
Cover adhesive	Thermosetting adhesive	25
Covering film layer	Polyimide 1 mil thick	25
Reinforcement material adhesive	Thermosetting adhesive	50
Stiffener	Polyimide 4 mil thick	100
Total		297

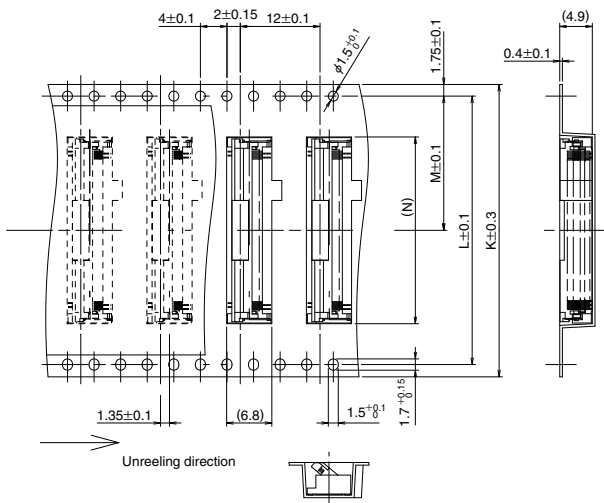
* To prevent release of the FPC due to it's bending, use of the double-sided FPC with copper foil on the back side is NOT RECOMMENDED.

3. Precautions

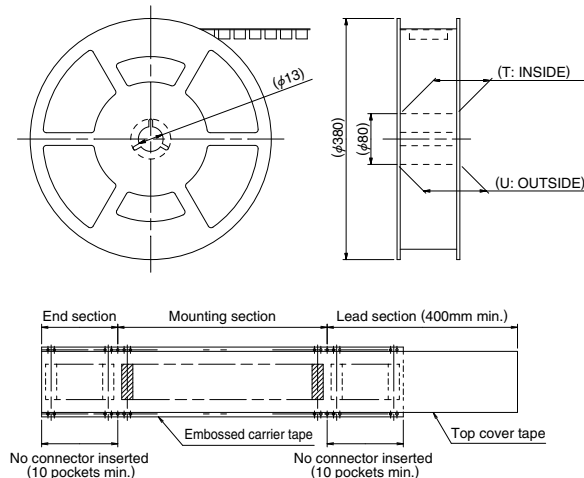
1. This specification is a recommendation for the construction of the FH30 Series FPC ($t=0.3\pm0.05$).
2. For details about the construction, please contact the FPC manufacturers.

■ Packaging Specifications

● Embossed Carrier Tape Dimensions



● Reel Dimensions



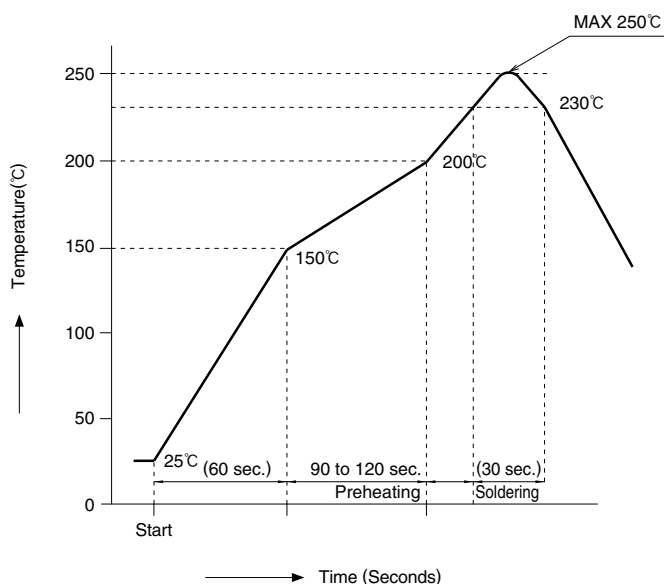
All dimensions: mm

Part Number	CL No.	Number of Contacts	K	L	M	N	T	U
FH30-60S-0.3SHW(05)	580-0105-8-05	60	44	40.4	20.2	22.1	45.4	49.4
FH30-80S-0.3SHW(05)	580-0100-4-05	80	44	40.4	20.2	28.1	45.4	49.4
FH30-90S-0.3SHW(05)	580-0106-0-05	90	44	40.4	20.2	31.1	45.4	49.4
FH30M-80S-0.4SHW(05)	580-0102-0-05	80	56	52.4	26.2	36	57.4	61.4
FH30M-96S-0.4SHW(05)	580-0103-2-05	96	56	52.4	26.2	42.4	57.4	61.4

Tape and reel packaging (1,000 pieces/reel).

■ Temperature Profile

● Using Lead-free Solder Paste



HRS test condition

Solder method	:Reflow, IR/hot air
Environment	:Room air
Solder composition	:Paste, 96.5%Sn/3.0%Ag/0.5%Cu (Senju Metal Industry, Co., Ltd.'s Part Number:M705-221CM5-32-10.5)
Test board	:Glass epoxy FH30:45×80×1.6mm thick FH30M:70×130×1.6mm thick
Land dimensions	:0.3mm×1.7mm
Metal mask	:0.15mm thick 0.25mm×1.7mm

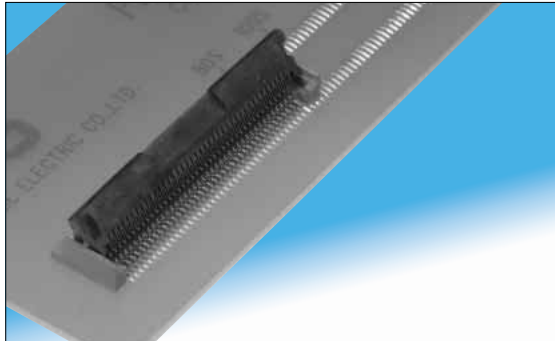
The temperature profiles shown are based on the above conditions.

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.

■ Operation and Precautions

Operation and Precautions

- ① Install on the PC board with the actuator open.



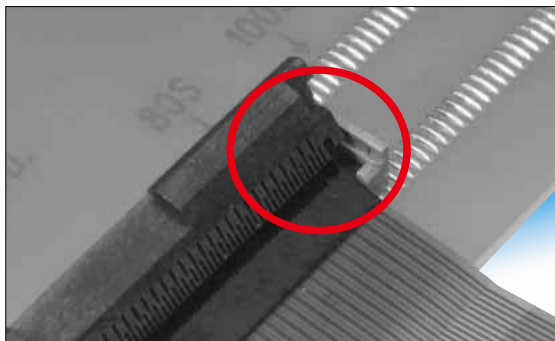
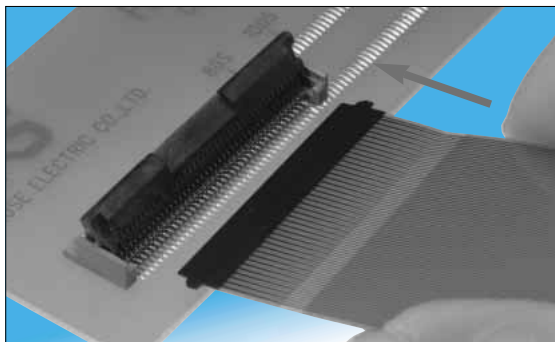
- ② FPC Insertion

Orient the FPC with the contact pads facing down. Insert in the connector at an angle, assuring that the positioning tabs are placed in the corresponding positioning tab areas on both sides of the insulator body.

Lower the FPC to a position parallel to the mounting surface.

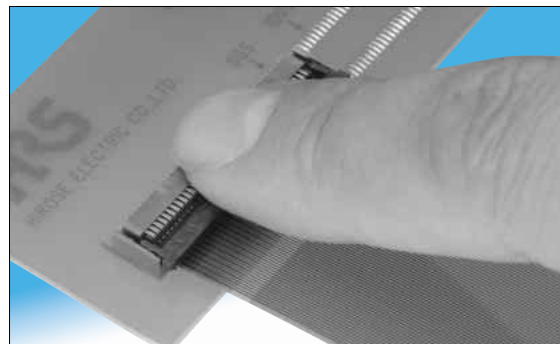
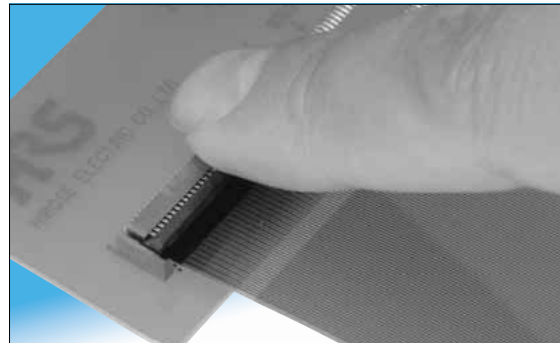
Verify the correct position by slightly pulling horizontally on the FPC.

Positioning tab area (each side)



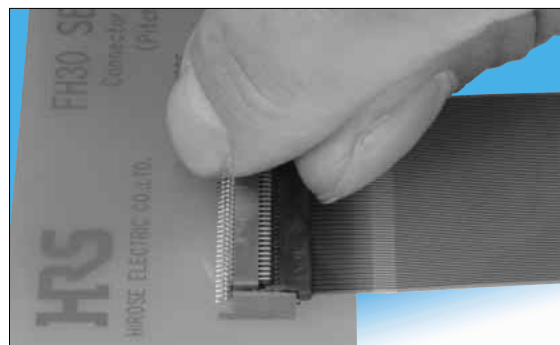
Positioning part

- ③ Actuator closing after the FPC is fully inserted. Rotate the actuator down to a full stop, pushing it at the center.



- ④ Removing the FPC

Carefully rotate the actuator up, lifting it at the center. Lift the FPC slightly to clear the positioning tabs and withdraw it from the connector.

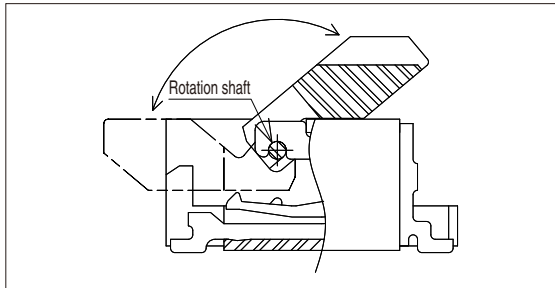


■Precautions

Operation and Precautions

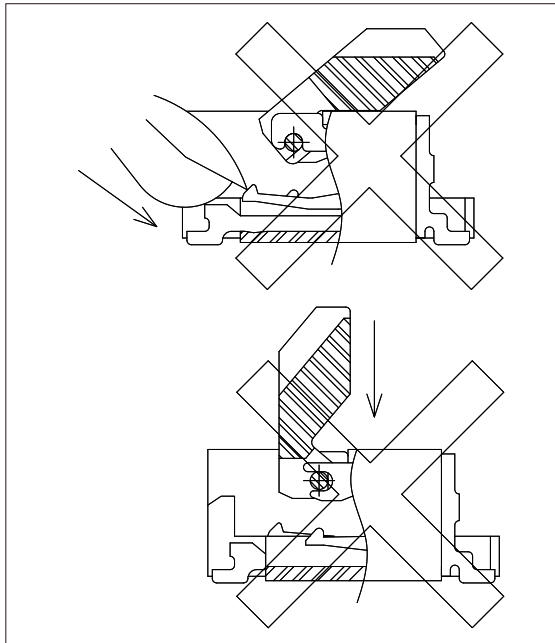
① Actuator operation

The actuator rotates at the center of its shaft, as illustrated in the figure below.



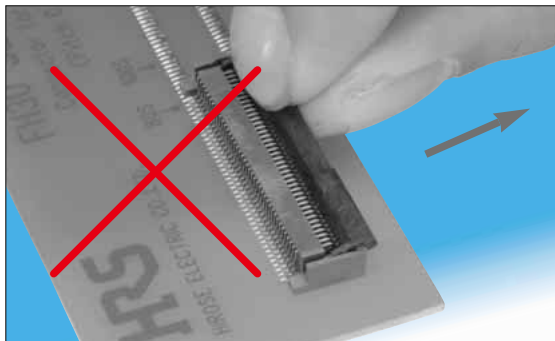
Be careful not to apply excessive force when operating the actuator from the open position (before the FPC has been inserted).

Exercise care not to touch the contacts with fingernails or any other object.



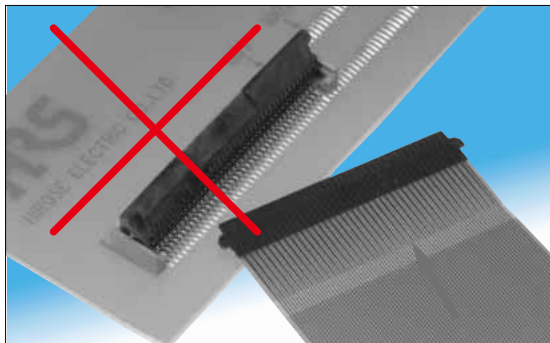
During the closing of the actuator do not pull up or push on it directly down.

Do not grasp the actuator and pull on it (photograph below).

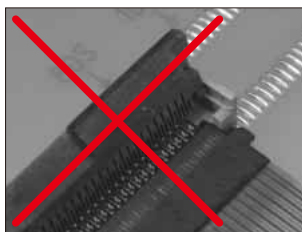


② FPC Insertion and closing of the actuator.

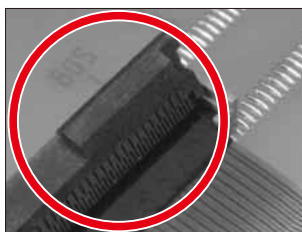
Do not insert the FPC on an angle as illustrated in the photograph below.



Properly insert the FPC positioning tabs into the corresponding areas on both sides of the insulator body.

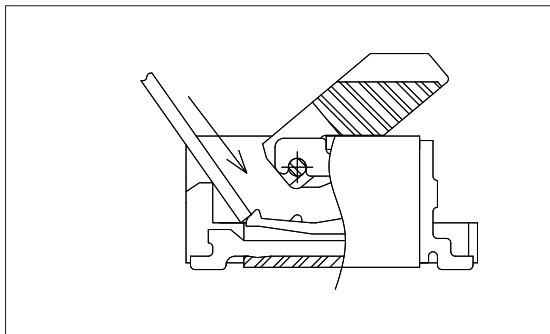


Incorrect FPC insertion



Correct FPC insertion

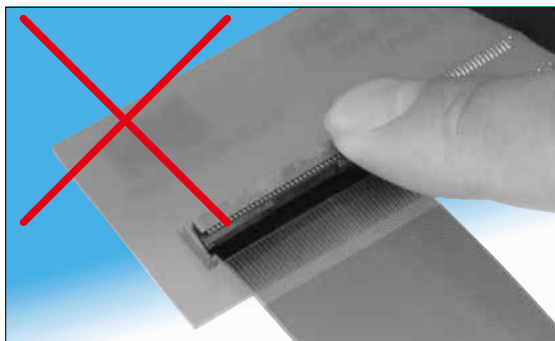
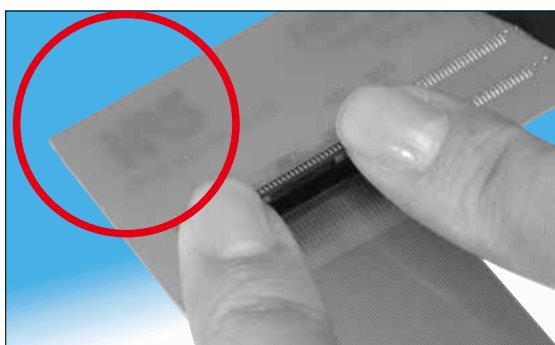
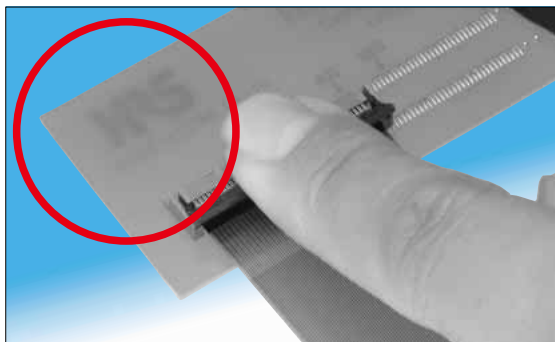
③ Make sure that the FPC does not rub against the insertion slot or the contacts, as illustrated on the figure below.



Operation and Precautions

Closing of the actuator.

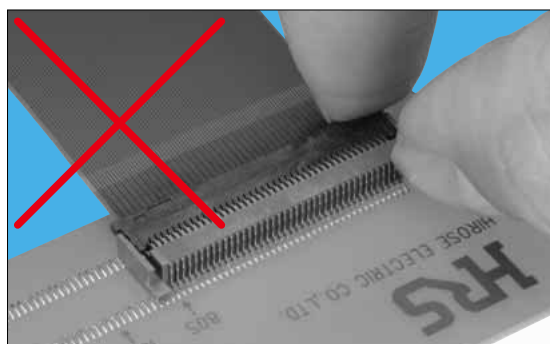
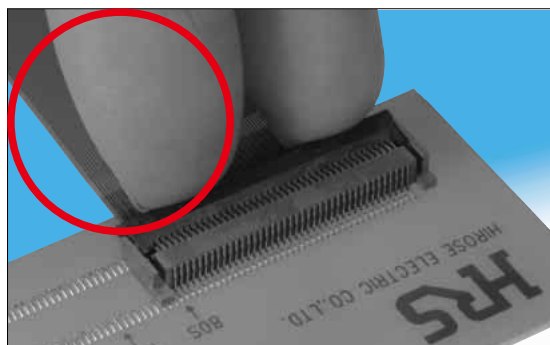
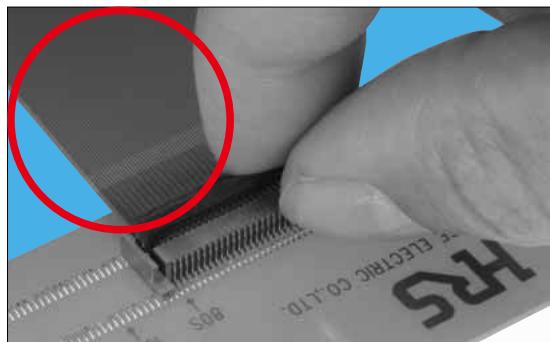
Rotate down pushing it at the center or evenly at each end, as shown on the photographs below. Do not push at one end only.



④ Opening of the actuator

Rotate up, lifting it at the center or evenly at each end of the actuator.

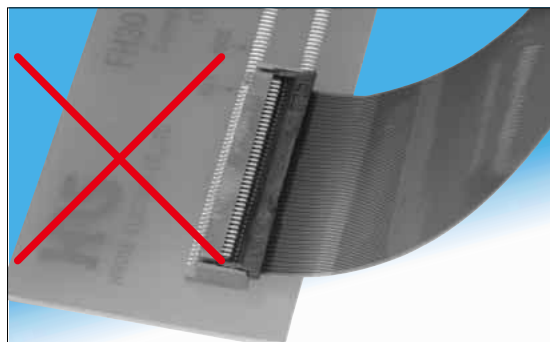
Do not lift at one end only.



⑤ Forces to the FPC after insertion and closing of the actuator.

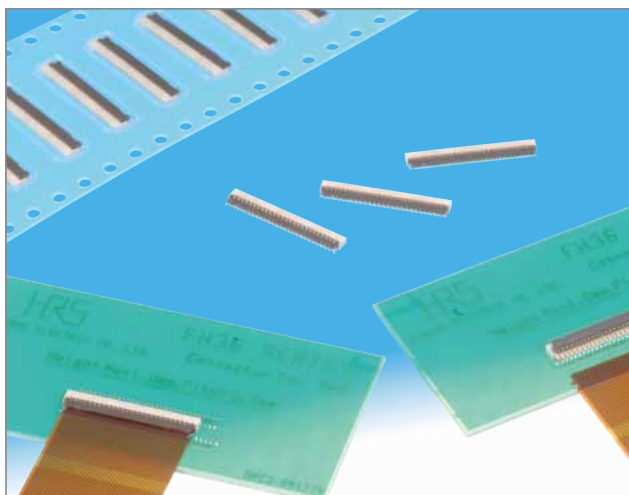
Do not apply upward pull-force to the FPC close to the connector.

If a need arise to route the FPC upward, assure that it is NOT transferring any forces to the closed actuator.



0.3 mm Pitch, 1.0 mm above the board Flexible Printed Circuit ZIF Connectors

FH36 Series



■ Features

1. Low-profile and light weight

Weight: Reduced approximately 30%
Board footprint: Reduced approximately 15%
(As compared with Hirose Electric's FH26 Series connectors (51 positions))

2. Easy solderability on the PC board

The soldering leads are on 0.6 mm pitch, exiting on front and back of the connector.

3. Conductive traces on the PCB can run under the connector

No exposed contacts on the bottom of the connector.

4. Easy FPC insertion and reliable electrical connection

Proven Flip Lock actuator allows easy insertion of FPC and provides a tactile sensation when fully closed, confirming complete electrical and mechanical connection.

5. FPC position hold

Tabs on each side of the FPC assure correct placement and hold in the connector prior to closing of the actuator.

6. Accepts standard FPC thickness

0.2mm thick standard Flexible Printed Circuit (FPC) can be used. This is the only ultra-low profile ZIF connector using standard FPC.

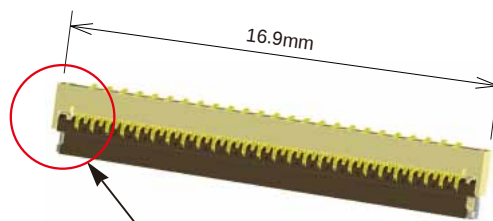
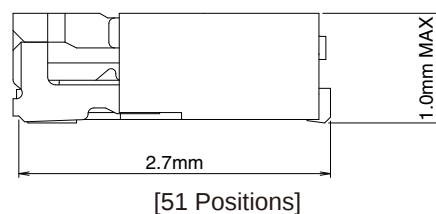
7. Board placement with automatic equipment

Flat upper surface and tape and reel packaging facilitate vacuum pick-up and placement. Standard reel packaging contains 5,000 connectors.

8. Halogen-free * (FH36W Series)

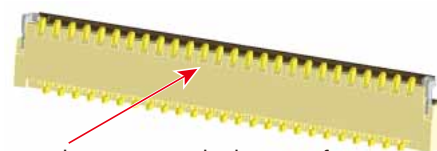
*As defined by IEC61249-2-21
Br-900ppm maximum, Cl-900ppm maximum,
Cl + Br combined-1,500ppm maximum

●Space saving (51 positions shown)



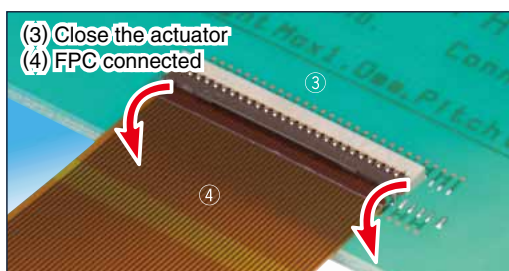
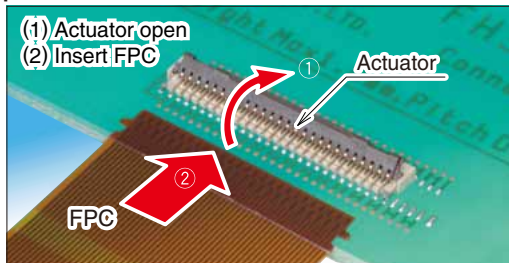
Metal fittings do not protrude outside of the connector body

●Can be mounted over conductive traces

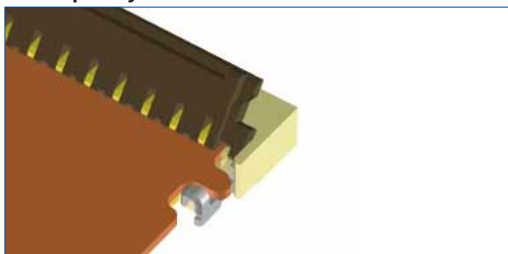


No exposed contacts on the bottom of the connector

●Operation



●FPC temporary hold



■ Specifications

Rating	Current rating	0.2 A DC (Note 1)	Operating temperature range	-55 to +85°C (Note 2)	Storage temperature range	-10 to +50°C (Note 3)
	Voltage rating	30 Vrms AC	Operating humidity range	Relative humidity 90% max. (No condensation)	Storage humidity range	Relative humidity 90% max. (No condensation)

Recommended FPC	Thickness: 0.2±0.03mm Gold plated
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Item	Specification	Conditions
1. Insulation resistance	50 MΩ min	100 V DC
2. Withstanding voltage	No flashover or insulation breakdown	90 Vrms AC / one minute
3. Contact resistance	100 mΩ max. * Including FPC conductor resistance	1 mA
4. Durability	Contact resistance: 100 mΩ max. No damage, cracks, or parts dislocation	10 cycles
5. Vibration	No electrical discontinuity of 1 μs or longer Contact resistance: 100 mΩ max. No damage, cracks, or parts dislocation	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm 10 cycles in each of the 3 directions
6. Shock	No electrical discontinuity of 1 μs or longer Contact resistance: 100 mΩ max. No damage, cracks, or parts dislocation	Acceleration of 981m/s ² , 6 ms duration, sine half-wave, 3 cycles in each of the 3 axis
7. Humidity (Steady state)	Contact resistance: 100 mΩ max. Insulation resistance: 50 MΩ min. No damage, cracks, or parts dislocation	96 hours at a temperature of 40°C and humidity of 90 to 95%
8. Temperature cycle	Contact resistance: 100 mΩ max. Insulation resistance: 50 MΩ min. No damage, cracks, or parts dislocation	Temperature: -55°C → +15°C to +35°C → +85°C → +15°C to +35°C Time: 30 → 2 to 3 → 30 → 2 to 3 minutes 5 cycles
9. Resistance to soldering heat	No deformation of components affection performance.	1) Reflow: At the recommended temperature profile. 2) Manual soldering: 350°C ± 10°C for 5 seconds

Note 1: When passing the current through all of the contacts, use 70% of the rated current.

Note 2: Includes temperature rise caused by current flow.

Note 3: The term "storage" refers to products stored for a long period prior to mounting and use.

The operating temperature and humidity range covers the non-conducting condition of installed connectors in storage, shipment or during transportation.

■ Materials

Part	Material	Finish	Remarks
Insulator	LCP	Color: Beige	UL94V-0
Actuator	PA	FH36 series: Dark brown	
		FH36W series: Light brown	UL94HB
Contacts	Phosphor bronze	Gold plating	_____
Metal fittings		Pure tin reflow plating	_____

■ Ordering information

FH 36 W - 51S - 0.3 SHW (50)

①

②

③

④

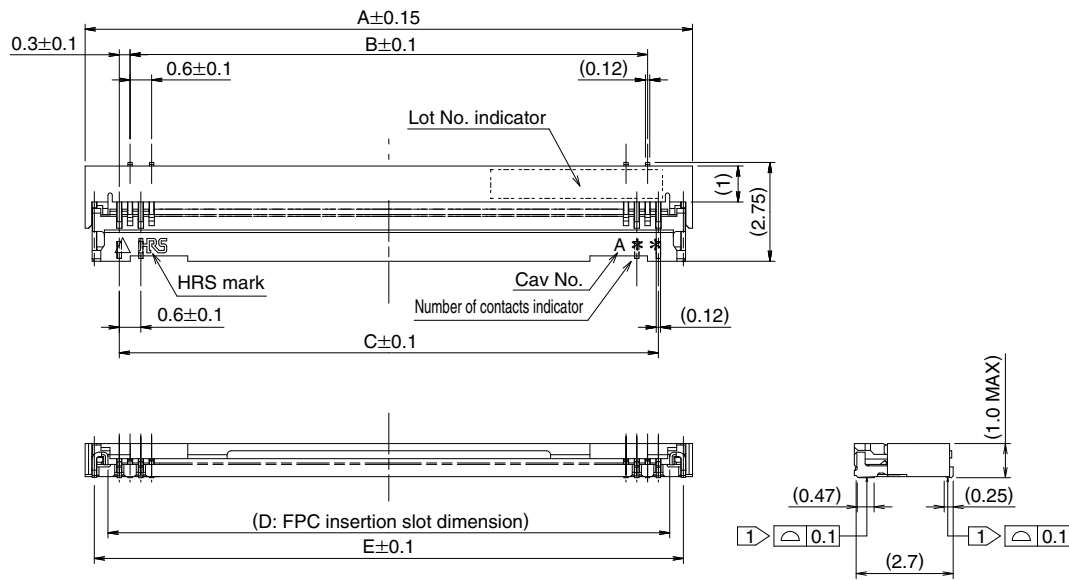
⑤

⑥

⑦

① Series name : FH	④ Number of positions : 11 to 61
② Series No. : 36	⑤ Contact pitch : 0.3mm
③ Blank :Standard W :Halogen-free (Flame retardance UL94HB).	⑥ Termination type: SMT horizontal staggered mounting type
	⑦ specifications (50)...Gold plating with nickel barrier 5,000 pieces/reel (99)...Gold plating with nickel barrier 500 pieces/reel

Connector Dimensions



Note ①: The coplanarity of each terminal lead is within 0.1.

Note 2 : Packaged on tape and reel only. Check packaging specification.

Note 3 : Slight discoloration in color of the plastic compounds does not affect form, fit or function of the connector.

Note 4 : After reflow, the terminal plating may change color, however this does not represent a quality issue.

All dimensions: mm

Part Number	CL No.	Number of contacts	A	B	C	D	E
FH36-15S-0.3SHW(50)	580-1618-8-50	15	6.1	3.6	4.2	4.83	5.59
FH36-17S-0.3SHW(50)	580-1606-9-50	17	6.7	4.2	4.8	5.43	6.19
FH36-19S-0.3SHW(50)	580-1607-1-50	19	7.3	4.8	5.4	6.03	6.79
FH36-25S-0.3SHW(50)	580-1619-0-50	25	9.1	6.6	7.2	7.83	8.59
FH36-29S-0.3SHW(50)	580-1613-4-50	29	10.3	7.8	8.4	9.03	9.79
FH36-33S-0.3SHW(50)	580-1615-0-50	33	11.5	9	9.6	10.23	10.99
FH36-35S-0.3SHW(50)	580-1604-3-50	35	12.1	9.6	10.2	10.83	11.59
FH36-45S-0.3SHW(50)	580-1617-5-50	45	15.1	12.6	13.2	13.83	14.59
FH36-51S-0.3SHW(50)	580-1601-5-50	51	16.9	14.4	15	15.63	16.39
FH36-61S-0.3SHW(50)	580-1600-2-50	61	19.9	17.4	18	18.63	19.39
FH36W-11S-0.3SHW(50)	580-1625-3-50	11	4.9	2.4	3	3.63	4.39
FH36W-15S-0.3SHW(50)	580-1623-8-50	15	6.1	3.6	4.2	4.83	5.59
FH36W-17S-0.3SHW(50)	580-1616-2-50	17	6.7	4.2	4.8	5.43	6.19
FH36W-19S-0.3SHW(50)	580-1612-1-50	19	7.3	4.8	5.4	6.03	6.79
FH36W-23S-0.3SHW(50)	580-1614-7-50	23	8.5	6	6.6	7.23	7.99
FH36W-27S-0.3SHW(50)	580-1608-4-50	27	9.7	7.2	7.8	8.43	9.19
FH36W-31S-0.3SHW(50)	580-1609-7-50	31	10.9	8.4	9	9.63	10.39
FH36W-33S-0.3SHW(50)	580-1622-5-50	33	11.5	9	9.6	10.23	10.99
FH36W-39S-0.3SHW(50)	580-1620-0-50	39	13.3	10.8	11.4	12.03	12.79
FH36W-51S-0.3SHW(50)	580-1605-6-50	51	16.9	14.4	15	15.63	16.39
FH36W-61S-0.3SHW(50)	580-1611-9-50	61	19.9	17.4	18	18.63	19.39

Tape and reel packaging (5,000 pieces/reel, 500 pieces/reel).

Order by number of reels.

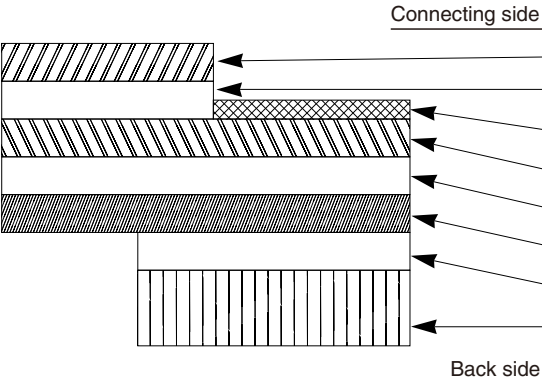
[illegible]

Part Number	CL No.	Number of contacts	B	C	F	G	H	J
FH36-15S-0.3SHW(50)	580-1618-8-50	15	3.6	4.2	6.04	5.6	4.8	4.6
FH36-17S-0.3SHW(50)	580-1606-9-50	17	4.2	4.8	6.64	6.2	5.4	5.2
FH36-19S-0.3SHW(50)	580-1607-1-50	19	4.8	5.4	7.24	6.8	6	5.8
FH36-25S-0.3SHW(50)	580-1619-0-50	25	6.6	7.2	9.04	8.6	7.8	7.6
FH36-29S-0.3SHW(50)	580-1613-4-50	29	7.8	8.4	10.24	9.8	9	8.8
FH36-33S-0.3SHW(50)	580-1615-0-50	33	9	9.6	11.44	11	10.2	10
FH36-35S-0.3SHW(50)	580-1604-3-50	35	9.6	10.2	12.04	11.6	10.8	10.6
FH36-45S-0.3SHW(50)	580-1617-5-50	45	12.6	13.2	15.04	14.6	13.8	13.6
FH36-51S-0.3SHW(50)	580-1601-5-50	51	14.4	15	16.84	16.4	15.6	15.4
FH36-61S-0.3SHW(50)	580-1600-2-50	61	17.4	18	19.84	19.4	18.6	18.4
FH36W-11S-0.3SHW(50)	580-1625-3-50	11	2.4	3	4.84	4.4	3.6	3.4
FH36W-15S-0.3SHW(50)	580-1623-8-50	15	3.6	4.2	6.04	5.6	4.8	4.6
FH36W-17S-0.3SHW(50)	580-1616-2-50	17	4.2	4.8	6.64	6.2	5.4	5.2
FH36W-19S-0.3SHW(50)	580-1612-1-50	19	4.8	5.4	7.24	6.8	6	5.8
FH36W-23S-0.3SHW(50)	580-1614-7-50	23	6	6.6	8.44	8	7.2	7
FH36W-27S-0.3SHW(50)	580-1608-4-50	27	7.2	7.8	9.64	9.2	8.4	8.2
FH36W-31S-0.3SHW(50)	580-1609-7-50	31	8.4	9	10.84	10.4	9.6	9.4
FH36W-33S-0.3SHW(50)	580-1622-5-50	33	9	9.6	11.44	11	10.2	10
FH36W-39S-0.3SHW(50)	580-1620-0-50	39	10.8	11.4	13.24	12.8	12	11.8
FH36W-51S-0.3SHW(50)	580-1605-6-50	51	14.4	15	16.84	16.4	15.6	15.4
FH36W-61S-0.3SHW(50)	580-1611-9-50	61	17.4	18	19.84	19.4	18.6	18.4

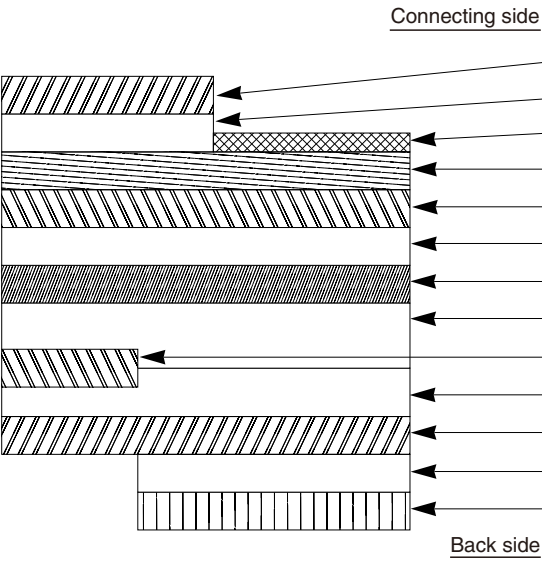
■Recommended FPC construction

●Contact FPC manufacturer for specific details.

1. Using Single-sided FPC

	Material Name	Material	Material Thickness (μm)
	Covering film layer	Polyimide 1 mil thick.	(25)
	Cover adhesive		(25)
	Surface treatment	0.2μm thick gold plated over 1 to 5μm thick nickel underplating	3
	Copper foil	Cu 10z	35
	Base adhesive	Thermosetting adhesive	25
	Base film	Polyimide 1 mil thick	25
	Reinforcement material adhesive	Thermosetting adhesive	40
	Stiffener	Polyimide 3 mil thick	75
	Total		203

2. Using Double-sided FPC

	Material Name	Material	Material Thickness (μm)
	Covering layer film	Polyimide 1 mil thick	(25)
	Cover adhesive		(25)
	Surface treatment	0.2μm thick gold plated over 1 to 5μm thick nickel underplating	3
	Through-hole copper	Cu	15
	Copper foil	Cu 1/20z	18
	Base adhesive	Thermosetting adhesive	18
	Base film	Polyimide 1 mil thick	25
	Base adhesive	Thermosetting adhesive	18
	Copper foil	Cu 1/20z	(18)
	Cover adhesive	Thermosetting adhesive	25
	Covering film layer	Polyimide 1 mil thick	25
	Reinforcement material adhesive	Thermosetting adhesive	25
	Stiffener	Polyimide 1 mil thick	25
	Total		197

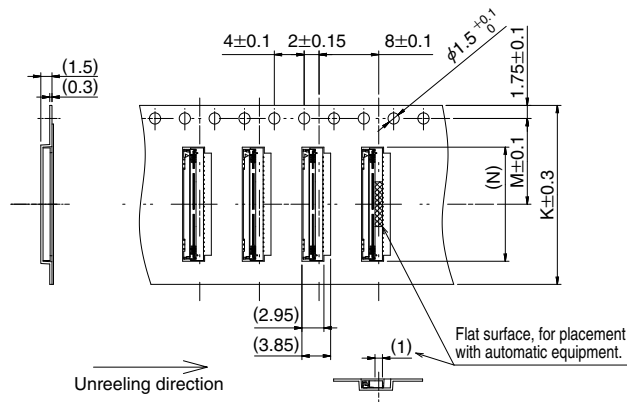
* To prevent release of the FPC due to its bending, use of the double sided FPC with copper foil on the back side is NOT RECOMMENDED.

3.Precautions

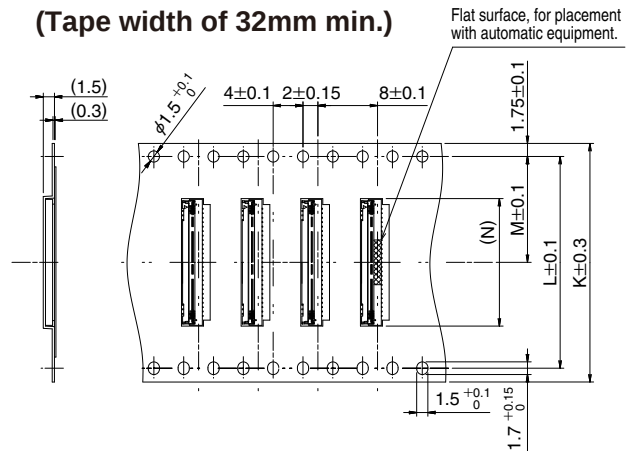
1. This specification is a recommendation for the construction of the FH36 Series FPC ($t=0.2 \pm 0.03$)
2. For details about the construction, please contact the FPC manufacturers.

■Packaging Specification

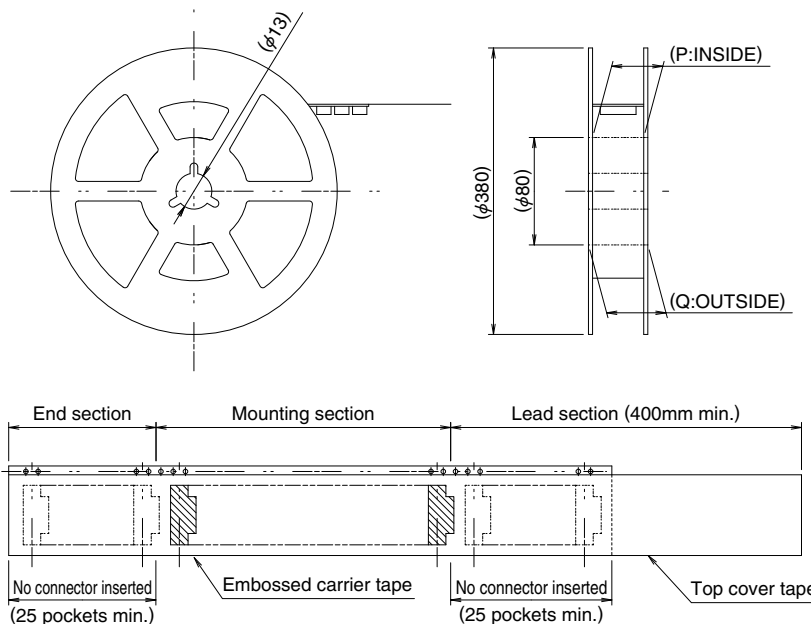
●Embossed Carrier Tape Dimensions (Tape width of 24mm max.)



●Embossed Carrier Tape Dimensions (Tape width of 32mm min.)



●Reel Dimensions

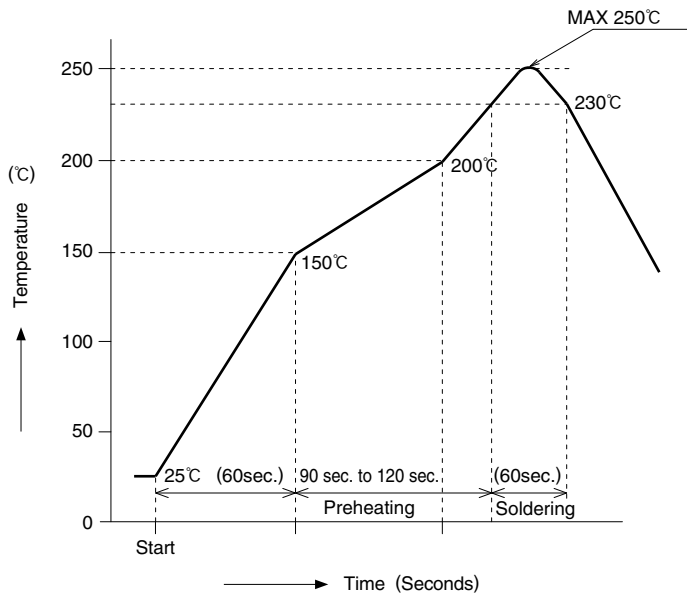


All dimensions: mm

Part Number	CL No.	Number of contacts	K	L	M	N	P	Q
FH36-15S-0.3SHW(50)	580-1618-8-50	15	16	—	7.5	6.3	17.4	21.4
FH36-17S-0.3SHW(50)	580-1606-9-50	17	16	—	7.5	6.9	17.4	21.4
FH36-19S-0.3SHW(50)	580-1607-1-50	19	16	—	7.5	7.5	17.4	21.4
FH36-25S-0.3SHW(50)	580-1619-0-50	25	24	—	11.5	9.3	25.4	29.4
FH36-29S-0.3SHW(50)	580-1613-4-50	29	24	—	11.5	10.5	25.4	29.4
FH36-33S-0.3SHW(50)	580-1615-0-50	33	24	—	11.5	11.7	25.4	29.4
FH36-35S-0.3SHW(50)	580-1604-3-50	35	24	—	11.5	12.3	25.4	29.4
FH36-45S-0.3SHW(50)	580-1617-5-50	45	24	—	11.5	15.3	25.4	29.4
FH36-51S-0.3SHW(50)	580-1601-5-50	51	32	28.4	14.2	17.1	33.4	37.4
FH36-61S-0.3SHW(50)	580-1600-2-50	61	32	28.4	14.2	20.1	33.4	37.4
FH36W-11S-0.3SHW(50)	580-1625-3-50	11	16	—	7.5	5.1	17.4	21.4
FH36W-15S-0.3SHW(50)	580-1623-8-50	15	16	—	7.5	6.3	17.4	21.4
FH36W-17S-0.3SHW(50)	580-1616-2-50	17	16	—	7.5	6.9	17.4	21.4
FH36W-19S-0.3SHW(50)	580-1612-1-50	19	16	—	7.5	7.5	17.4	21.4
FH36W-23S-0.3SHW(50)	580-1614-7-50	23	24	—	11.5	8.7	25.4	29.4
FH36W-27S-0.3SHW(50)	580-1608-4-50	27	24	—	11.5	9.9	25.4	29.4
FH36W-31S-0.3SHW(50)	580-1609-7-50	31	24	—	11.5	11.1	25.4	29.4
FH36W-33S-0.3SHW(50)	580-1622-5-50	33	24	—	11.5	11.7	25.4	29.4
FH36W-39S-0.3SHW(50)	580-1620-0-50	39	24	—	11.5	13.5	25.4	29.4
FH36W-51S-0.3SHW(50)	580-1605-6-50	51	32	28.4	14.2	17.1	33.4	37.4
FH36W-61S-0.3SHW(50)	580-1611-9-50	61	32	28.4	14.2	20.1	33.4	37.4

■Temperature Profile

●Using Lead-free Solder Paste



HRS test condition

Solder method	:Reflow, IR/hot air
Environment	:Room air
Solder composition	:Paste, 96.5%Sn/3.0%Ag/0.5%Cu (Senju Metal Industry, Co., Ltd.'s Part Number:M705-221CM5- 32-10.5)
Test board	:Glass epoxy 25mm×50mm×0.8mm thick
Land dimensions	:0.3mm×0.6mm, 0.3mm×0.8mm
Metal mask	:0.23×0.5, 0.23×0.65×0.1mm thick

The temperature profiles shown are 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.

■ Operation and Precautions

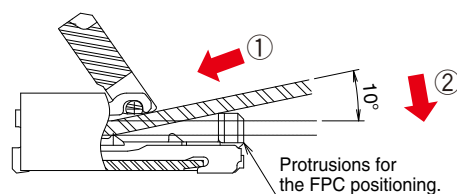
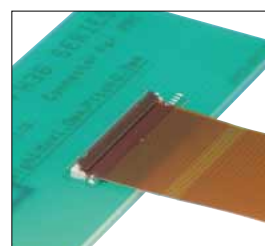
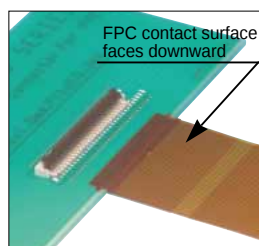
Operation

1. FPC insertion procedure. Connector installed on the board.

- ① Lift up the actuator.
Use thumb or index finger.



- ② Insert the FPC (contact surfaces facing down) at angle of approximately 10° to the board surface ①, making sure that the FPC positioning tabs clear the protrusions on both sides of the connector. Lower the FPC down ②, parallel to the board surface.

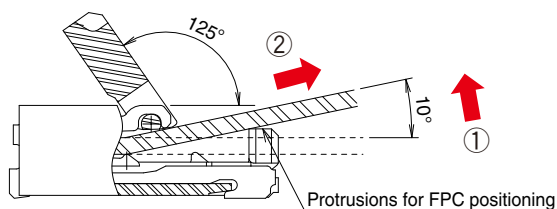
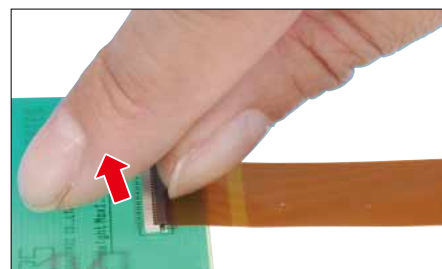


- ③ Rotate down the actuator until firmly closed.



2. FPC removal

- ① Lift up the actuator
Pull up the FPC at an angle of approximately 10° ① and then withdrew it from the connector ②.



Precautions

Exercise care when handling connectors. Follow recommendations given below.

[Precautions when mounting connectors on the PCB]

◆ Handling before mounting on PCB

Insertion of the FPC or operation of the actuator prior to mounting on the PCB is NOT RECOMMENDED.

◆ PC board warpage

Minimize the warpage as much as possible. The connector is straight within 0.1 mm max. Make sure that the mounting area flatness can accept the connector terminals without causing any failure of the solder joints.

◆ When braking the large PC board into individual boards exercise care NOT to damage the installed connectors.

◆ When attaching the boards or other components with the screws make sure that any stresses will NOT cause board deflections affecting the mounting areas of the connector.

◆ Bending of the board

For a board width of 100 mm, bending of the board must be 0.5 mm max. (Ref to Fig. 1)

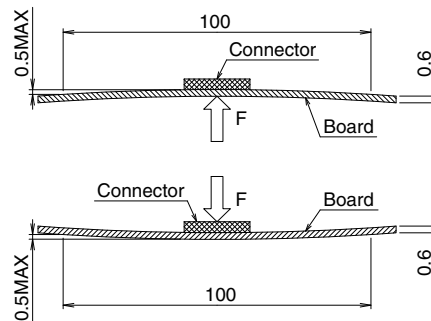


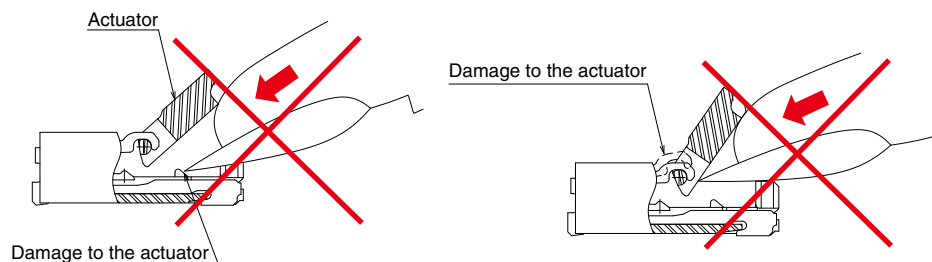
Fig. 1

[Precautions during FPC insertion and mating]

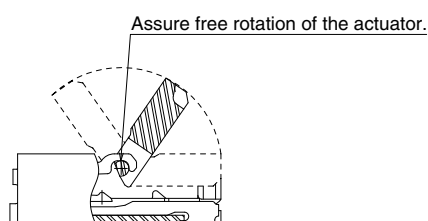
Pay attention to the following points when inserting FPC.

◆ Actuator operation

- ① Do not apply excessive force when opening the actuator prior to FPC insertion. When opening make sure that the force is applied only to the actuator itself, avoiding touching of the contacts.

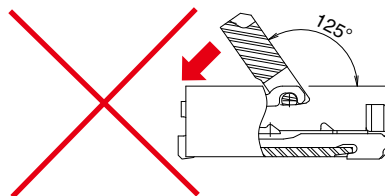


② Axis of rotation

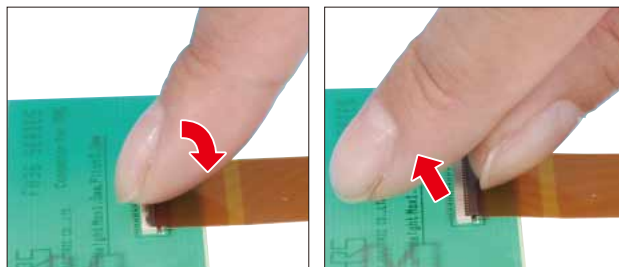


Precautions

- ③ The actuator will rotate 125°C. Do not apply force to rotate further.



- ④ When opening or closing the actuator, do so at the center section.



- ⑤ Do not grasp or lift the actuator (Fig. 2) nor insert the nail from the back of it (Fig. 3).

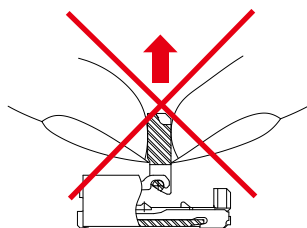


Fig. 2

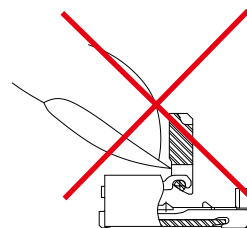
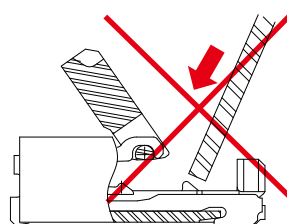
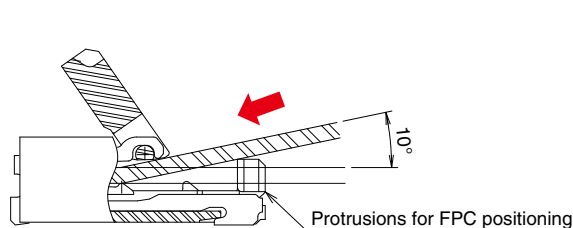


Fig. 3

◆FPC insertion

Do not insert the FPC at any high angle from above.



Precautions

As illustrated (Fig. 4) angle insertion may cause electrical discontinuity when the FPC is deflected in use.

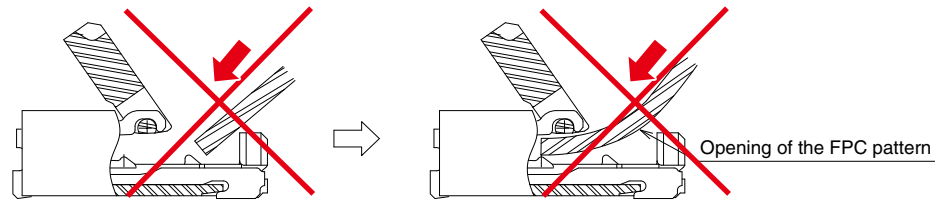


Fig. 4

- To avert insertion of the FPC at an angle, consideration should be given to securing enough insertion space when designing the board lay-out. Insertion will be difficult when the FPC is too short.
- Contact FPC manufacturer for information about the bending specifications.

◆Verification of the fully closed actuator

The FPC should be fully inserted, with its positioning tabs fully behind the protrusions on both sides of the connector's insertion slot (Fig. 5).

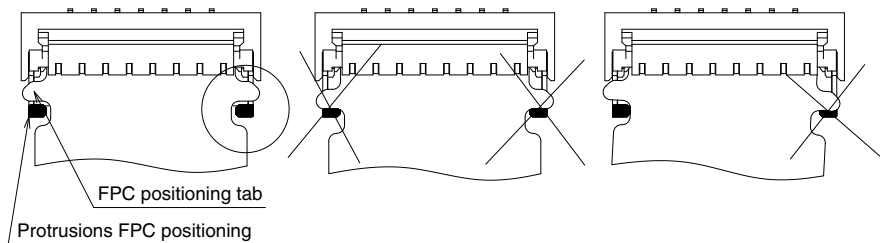


Fig. 5

[Routing of the FPC (FPC fully inserted / actuator closed)]

- ◆Do not apply any pull or upward-directed force to the FPC.
Do not make any sharp bends of FPC close to the immediate exit from the connector (Fig. 6)

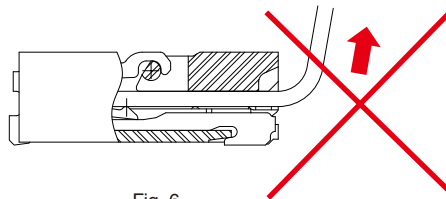


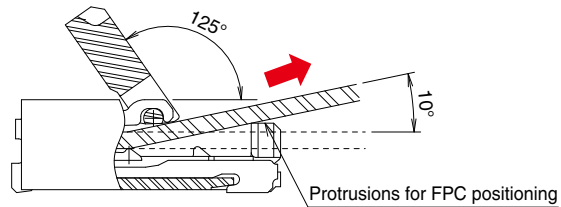
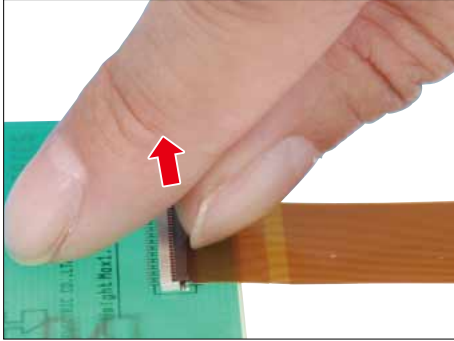
Fig. 6

Precautions

[Removing of the FPC]

◆Rotate the actuator to the fully open position (max. angle of 125°C)

Lift the FPC approximately 10°C (making sure that the positioning tabs clear the protrusions on both sides) and carefully withdraw it from the connector.



[Other Precautions]

◆Hand Soldering Precautions

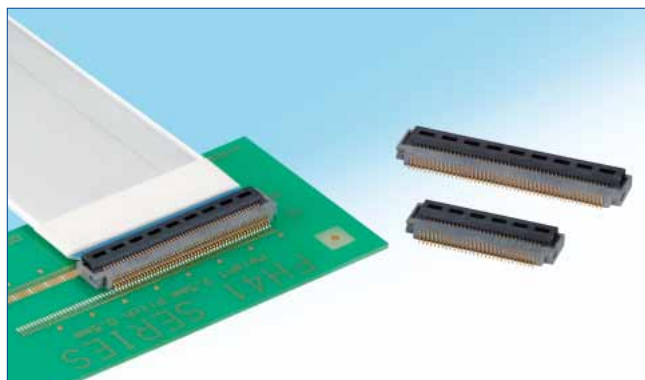
When hand soldering:

- ① Do not perform reflow or hand soldering with the FPC inserted in the connector.
- ② Do not apply excessive heat or touch the soldering iron anywhere other than the connector leads.
- ③ Do not use excessive amount of solder or flux compounds.

Operation of the actuator or contacts may be affected by excessive amounts of solder or flux com-

0.5mm Pitch, 2.5mm Height, shielded FFC Connectors for High Speed Transmissions

FH41 Series



Supports the next generation chip
V-by-One® HS* by THine

*High speed serial interface
technology for picture transmission



■Features

1. Accepts impedance matched shielded FFC

The FH41 Series is equipped with a ground terminal and can be used with impedance matched shielded FFC.

2. Impedance matched terminal design

The signal terminal is designed for impedance control and is capable of handling high speed transmissions.

3. Highly reliable and secure structure

The design of the FH41 series follows in the footsteps of another popular Hirose connector, the FH28 series. The FFC positioning mechanism and rugged structure combine to prevent accidental unlocking and produce a secure connection.

4. Simplified operations with a flip lock system

The flip lock design allows a smoother simpler FFC operation. It requires less force to rotate the actuator and delivers a tactile click to reinforce that the lock has secured the connection.

5. Suitable for automatic pick-n-place mounting

Offered in tape and reel packaging that is compatible with automatic machine mounting. (2,500 pcs/reel)

6. Halogen free

All materials and substances used to produce this product comply with Halogen-free standards.

*Standards by IEC 61249-2-21. Br : 900 ppm or lower,
Cl : 900 ppm or lower, Br+Cl : 1,500 ppm or lower

Dimensions: 68 positions

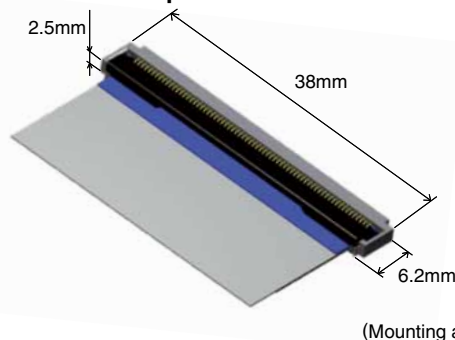


Fig.1

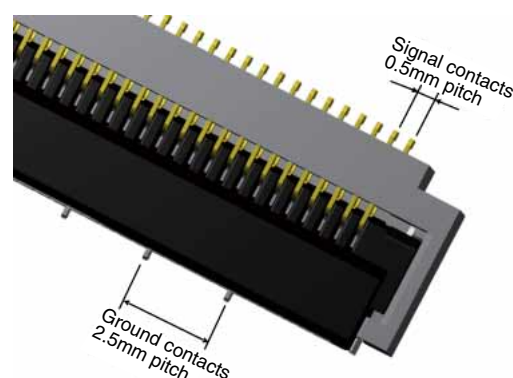


Fig.2

- Uses the same FFC that the FH48 Series (vertical connection) uses.



- Shielded FFC

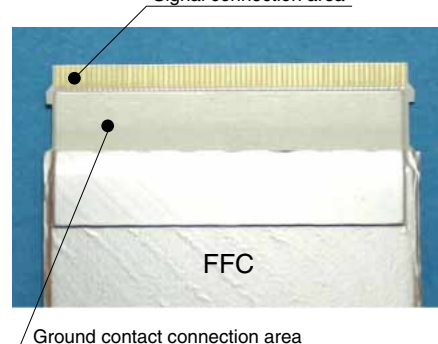


Fig.3

Product Specifications

Rating	Rated current 0.5A (Note 1) Rated voltage AC 50Vrms	Operating temperature range: -40 to +105°C (Note 2) Operating humidity range: Relative humidity of 90% or lower (no dew condensation)	Storage temperature range: -10 to +50°C (Note 3) Storage humidity range: Relative humidity of 90% or lower (no dew condensation)
Applicable FPC and FFC terminal specifications	t= 0.3 ±0.05, gold plating (GND plate: t= 0.5 ±0.05, tin plating)		
Items	Specifications	Conditions	
1. Insulation resistance	Minimum of 500MΩ	Measured at DC 100V.	
2. Withstanding voltage	No flashover or insulation damage	AC 150Vrms for 1 minute	
3. Contact resistance	Maximum of 100mΩ *Incl. FFC conductor resistance	Measured at 1mA.	
4. Repeated motions Durability	Contact resistance : Maximum of 100mΩ No damaged, cracked or loose parts.	20 mating cycles	
5. Vibration resistance	No electrical discontinuity for more than 1μs Contact resistance : Maximum of 100mΩ No damaged, cracked or loose parts.	Frequency 10 to 55Hz with half amplitude 0.75mm in 3 directions, 10 cycles each.	
6. Impact resistance	No electrical discontinuity for more than 1μs Contact resistance : Maximum of 100mΩ No damaged, cracked or loose parts.	Acceleration : 981m/s ² , duration time : 6ms, with half sine waves in 3 directions, three times each.	
7. Humidity resistance in ordinary conditions	Contact resistance : Maximum of 100mΩ Insulation resistance : Minimum of 50MΩ No damaged, cracked or loose parts.	Left for 96 hours at temperature 40°C, humidity 90 to 95%	
8. Temperature cycle	Contact resistance : Maximum of 100mΩ Insulation resistance : Minimum of 50MΩ No damaged, cracked or loose parts.	Temperature : -40°C → +15°C to +35°C → +105°C → +15°C to +35°C Time : 30 → 2 to 3 → 30 → 2 to 3 min. 5 cycles in the above conditions	
9. Solder heat resistance	No deformation of components or no significant looseness of contacts, etc.	Reflow : Recommended temperature profile Manual soldering : 350 ±5°C for 5 sec.	

Note 1 : When energizing rated current to all contacts, use 70% of rated current.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The term "storage" here refers to products stored for a long period prior to board mounting and use. The operating temperature and humidity range covers the non-energized condition of connectors after board mounting and the temporary storage.

Materials / Finish

Parts	Materials	Color/Finish	Remarks
Insulating parts	LCP	Gray	UL94V-0
		Black	
Terminal	Phosphor bronze	Gold plating	—
Metal parts	Phosphor bronze (plating material)	Pure tin reflow plating	

Product number structure

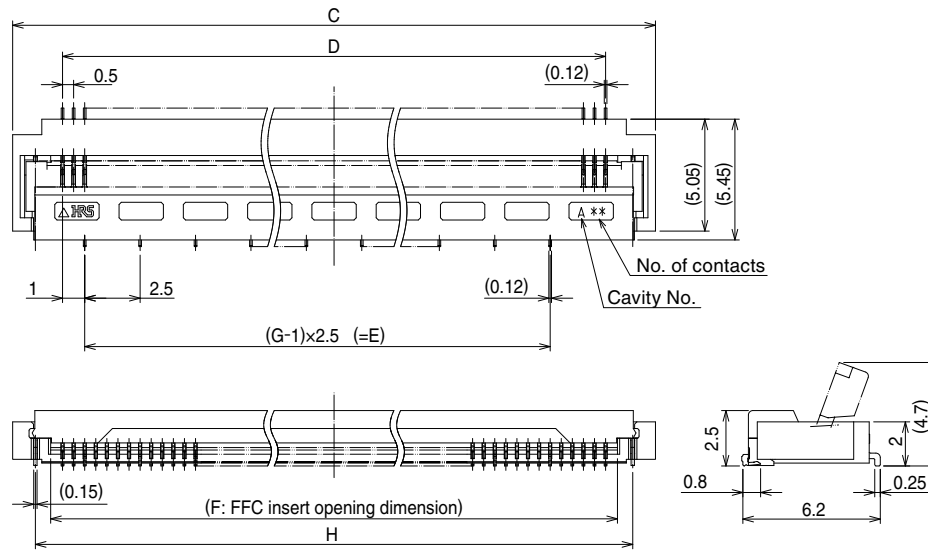
Refer to the chart below when determining the product specifications from the product number.
Please select from the product numbers listed in this catalog when placing orders.

FH 41 - 50S - 0.5 SH (05)

① ② ③ ④ ⑤ ⑥

① Series name : FH	⑤ Terminal shape SH...SMT horizontal implementation type
② Series number : 41	⑥ Plating specifications : (05)...Gold plating (Except 50, 68 contacts) (28)...Gold plating (50, 68 contacts)
③ Number of contacts : 15 to 68	
④ Contact pitch : 0.5mm	

■Connector dimension drawing



Note 1 : The coplanarity of the metal fittings and the contacts are a maximum of 0.1mm.

Note 2 : Packaged on tape and reel only. Check packaging specification.

Note 3 : Recesses may be added to the part structure to improve the molding characteristics. Black marks may appear in the mold resin, but they will not negatively affect the performance of these connectors.

Note 4 : The color of the plating may change after the reflow process, but it will not negatively affect the performance of these connectors.

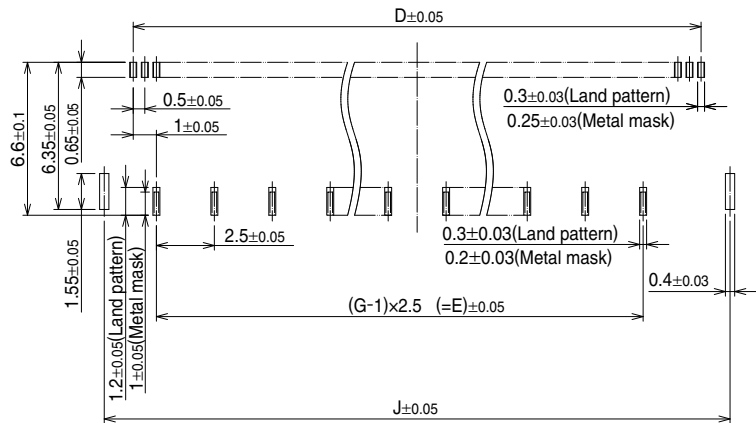
■Connector dimension table

Unit : mm

Part No.	HRS No.	No. of contacts	Number of ground contacts : G	C	D	E	F	H
FH41-15S-0.5SH(05)	580-2222-2 05	15	3	11.5	7	5	8.07	9.45
FH41-20S-0.5SH(05)	580-2221-0 05	20	4	14	9.5	7.5	10.57	11.95
FH41-28S-0.5SH(05)	580-2208-1 05	28	5	18	13.5	10	14.57	15.95
FH41-30S-0.5SH(05)	580-2218-5 05	30	6	19	14.5	12.5	15.57	16.95
FH41-31S-0.5SH(05)	580-2216-0 05	31	6	19.5	15	12.5	16.07	17.45
FH41-40S-0.5SH(05)	580-2205-3 05	40	8	24	19.5	17.5	20.57	21.95
FH41-50S-0.5SH(28)	580-2204-0 28	50	10	29	24.5	22.5	25.57	26.95
FH41-60S-0.5SH(05)	580-2223-0 05	60	12	34	29.5	27.5	30.57	31.95
FH41-68S-0.5SH(28)	580-2202-5 28	68	13	38	33.5	30	34.57	35.95

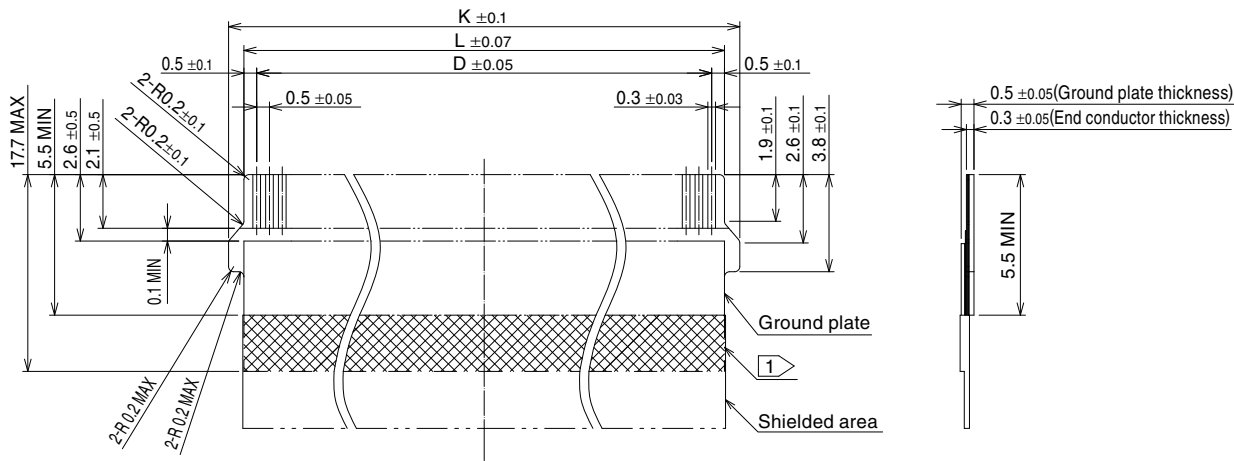
Note 1 : This embossed packaged product is sold by full reel quantities of 2,500 pcs/reel. Please place orders in full reel quantities.

◆Recommended PCB layout and metal mask dimension diagram



Recommended metal mask thickness : t= 0.1

◆Recommended FFC dimension drawing



Note : 1 Please overlap shield plate on ground plate

◆Recommended land, metal mask and FFC dimension table

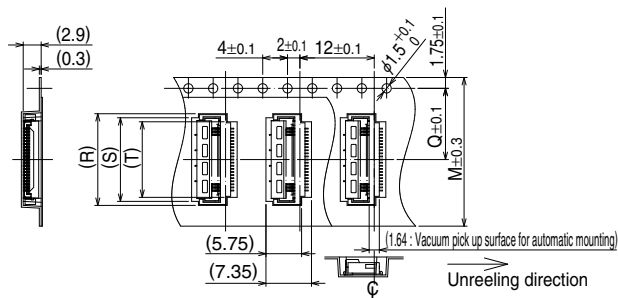
Unit : mm

Part No.	HRS No.	No. of contacts	Number of ground contacts : G	J	K	L
FH41-15S-0.5SH(05)	580-2222-2 05	15	3	9.5	9.2	8
FH41-20S-0.5SH(05)	580-2221-0 05	20	4	12	11.7	10.5
FH41-28S-0.5SH(05)	580-2208-1 05	28	5	16	15.7	14.5
FH41-30S-0.5SH(05)	580-2218-5 05	30	6	17	16.7	15.5
FH41-31S-0.5SH(05)	580-2216-0 05	31	6	17.5	17.2	16
FH41-40S-0.5SH(05)	580-2205-3 05	40	8	22	21.7	20.5
FH41-50S-0.5SH(28)	580-2204-0 28	50	10	27	26.7	25.5
FH41-60S-0.5SH(05)	580-2223-0 05	60	12	32	31.7	30.5
FH41-68S-0.5SH(28)	580-2202-5 28	68	13	36	35.7	34.5

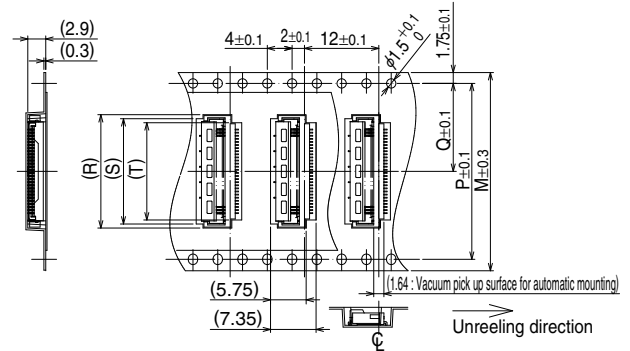
◆ Packaging Specifications

● Embossed carrier tape dimension

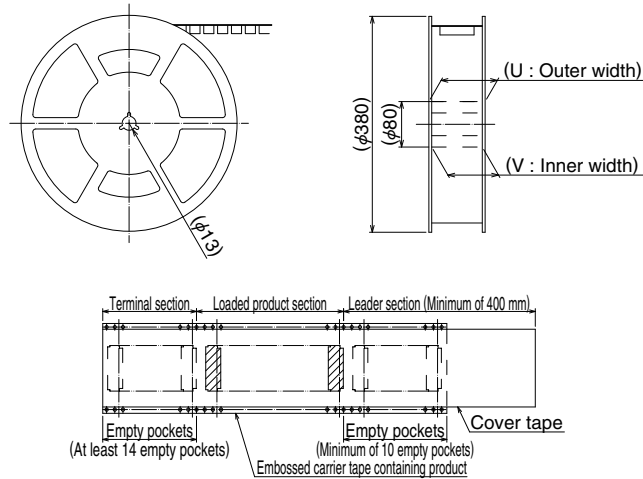
(Tape width: Maximum of 24mm)



(Tape width: Minimum of 32mm)



● Reel dimensions

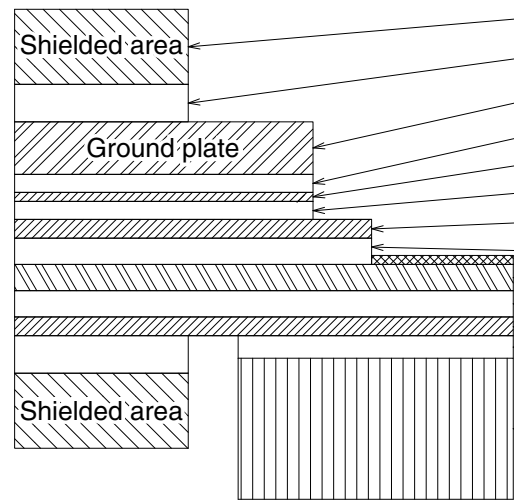


◆ Packaging Specification Dimensions

Unit : mm

Part No.	HRS No.	No. of contacts	Number of ground contacts : G	M	P	Q	R	S	T	U	V
FH41-15S-0.5SH(05)	580-2222-2 05	15	3	24	-	11.5	11.8	10.5	9.2	29.4	25.4
FH41-20S-0.5SH(05)	580-2221-0 05	20	4		-		14.3	13.5	12.2		
FH41-28S-0.5SH(05)	580-2208-1 05	28	5	32	28.4	14.2	18.3	17	15.7	37.4	33.4
FH41-30S-0.5SH(05)	580-2218-5 05	30	6				19.3	18	16.7		
FH41-31S-0.5SH(05)	580-2216-0 05	31	6	44	40.4	20.2	19.8	18.5	17.2	49.4	45.4
FH41-40S-0.5SH(05)	580-2205-3 05	40	8				24.3	23	21.7		
FH41-50S-0.5SH(28)	580-2204-0 28	50	10	56	52.4	26.2	29.3	28	26.7	61.4	57.4
FH41-60S-0.5SH(05)	580-2223-0 05	60	12				34.3	33	31.7		
FH41-68S-0.5SH(28)	580-2202-5 28	68	13				38.3	37	35.7		

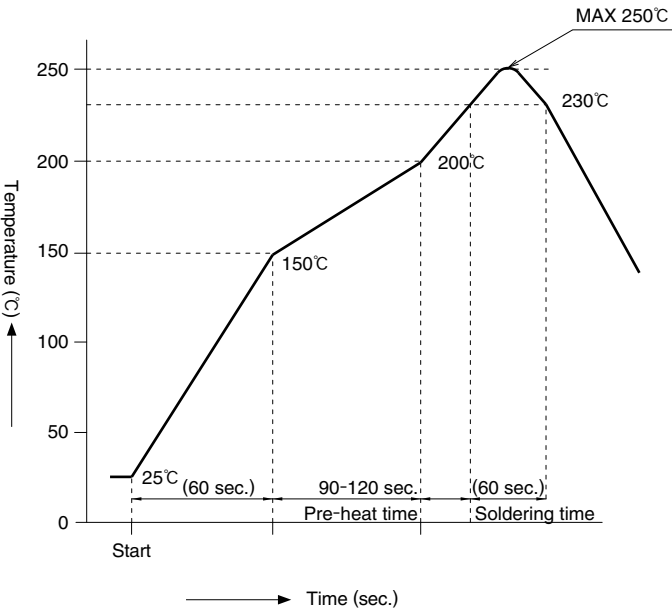
◆FH41 Series FFC materials configuration (recommended specifications)



Material name	Materials	Total Thickness at Ground Plate (μm)	Total Thickness at End Conductor (μm)
Shielding Material			
Conductive Adhesive	Polyester Type		
Copper Foil (Tin plating)		70	1
Adhesive	Acrylic Type	24	1
Base Film	Polyester Type	12	1
Adhesive	Acrylic Type	24	1
Insulation Layer	Polyester Type	25	
Adhesive	Polyester Type	35	
Soft Copper Foil (Nickel Under Plating + Gold Plating)		35	35
Adhesive	Polyester Type	35	35
Insulation Layer	Polyester Type	25	25
Adhesive	Polyester Type	30	30
Stiffener	Polyester Type	188	188
Total		503	313

1 Contact us with inquiries on how to change the specifications and thickness configurations.

◆Recommended Soldering Profile



Application conditions

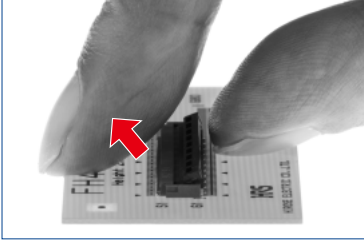
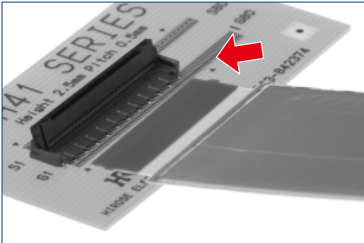
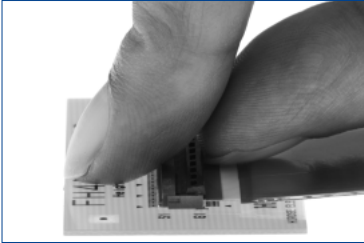
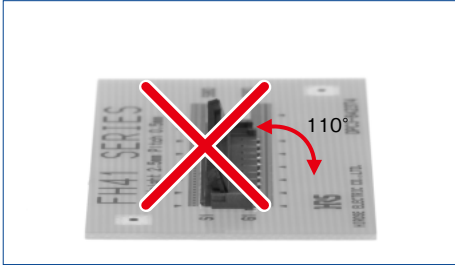
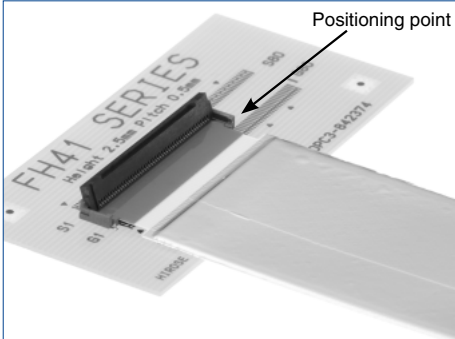
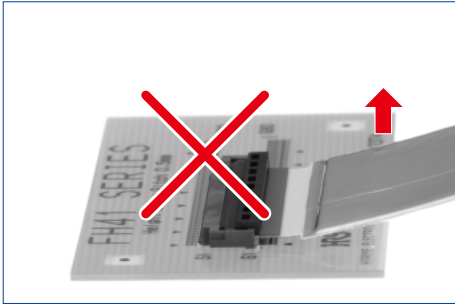
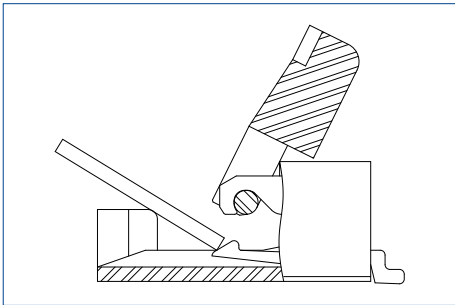
Reflow type : Reflow with far-infrared ray and hot air combined
 Reflow furnace atmosphere: Air
 Solder : Cream type Sn/3.0 Ag/0.5 Cu
 (Senju Metal Industry, M705-221CM5-42-10.5)
 Test board : Board material and size
 Glass epoxy 30×60×0.8mm
 Land dimension 0.3×0.65, 0.3×1.2mm
 Metal mask : Thickness 0.1mm
 Opening dimensions 0.25×0.65, 0.2×1mm

This temperature profile shall be used under the above application conditions.

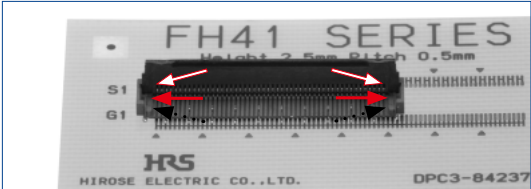
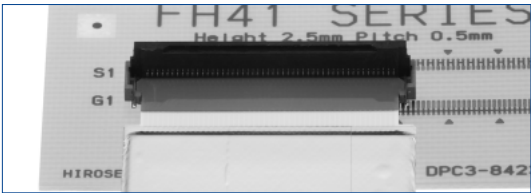
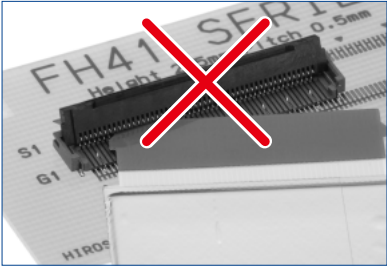
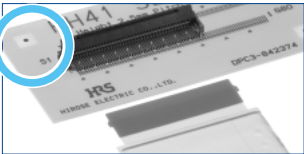
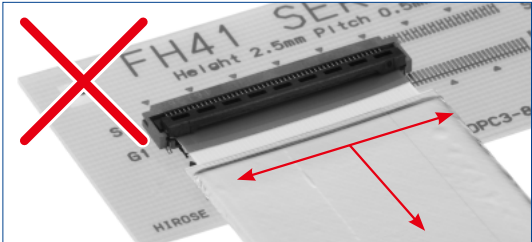
This temperature profile is based on the conditions provided above.

Please check the mounting conditions before use, conditions such as solder paste types, manufacturer, PCB size and any other soldering materials may alter the performance of such materials.

◆ Connector handling and precautions

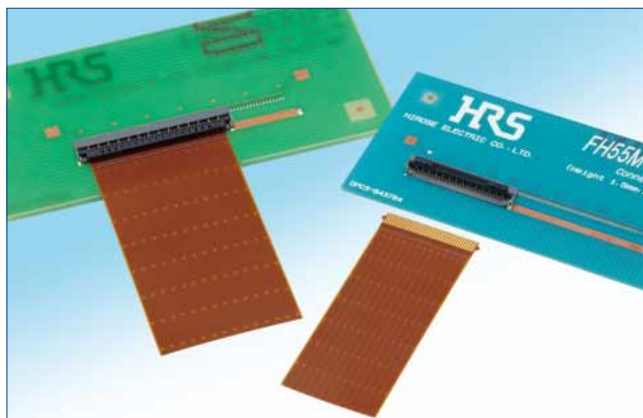
Connector handling	Precautions for use
1. Insertion of FFC ① Rotate the actuator upward to unlock it. The actuator can be easily operated with the use of a thumb nail or index finger.  ② Insert the FFC into the connector with the conductive traces facing down. The FFC should be inserted at a slight oblique angle relative to the mounting surface, for more directions please refer to the next page.  ③ Rotate the actuator down until it is firmly closed.  2. FFC removal ① Rotate the actuator upwards to release the lock, then lift up the FFC and remove it from the connector. 	① The FH41 series actuator was designed to open up to a maximum angle of 110°, forcing the actuator past this point will damage or detach it. Do not apply excessive force when rotating the actuator.  ② Insert the FFC correctly into the opening, failing to do so can lead to disconnection or conduction failure.  ③ The connector's design is not resistant against upward pulling forces. The FFC should be fixed so that the pull force is not transmitted to the connector.  ④ Be careful not to scrape the FFC on the housing of the connector during insertion, this action can lead to damaged contacts, terminal deformation, FFC conductor defects and other failures. 

◆Precautions for inserting and mating FFC with positioning tabs

Handling	Precautions for use
1. Insertion position Insert the cable so that the positioning tabs lay in the gap, which is indicated by the two →, between the mold wall on the both sides of the cable insert opening indicated by ···▶ and the guide wall that is on the inside of the connector indicated by ⇨.	2.FFC must not over lap Do not close the actuator until the FFC has been placed into its correct position. If it is sitting on the guides and the actuator closes onto it, it can cause damage and alter its performance.
 	Cable over lapping on the left guide.  Cable over lapping on the right guide.  Correct insertion 
2. Precautions for insertion and mating ❶Do not insert the cable diagonally, the corners of the cable might get hooked on the connector which can damage the contacts.	Do not close the actuator if the cable is not in its correct position or if it is still on top of the guides.
Insertion from a skewed direction 	
Recommended mating 	If the lock is closed with the cable running over the guide, do not move the cable. In this case, open the actuator first and re-insert the cable to the position explained in “1. Insertion position.” In the event that the lock is closed and the cable was not in its correct position, do not try to move the cable. Release the lock immediately and open the actuator back up, remove and re-position the cable as explained previously in “1. Insertion position.”
	Prevent the actuator from closing and moving in various directions with the cable running over the guide. If the cable is misplaced and the actuator is closed, do not move the cables back and forth after the actuator has been locked. 
❶Insert the cable straight into the opening at a slight angle to ensure a complete connection.	
❷Rotate the actuator down to close the actuator.	

0.4/0.5mm Pitch, 1.5mm Height Lower Contact, Front Flip for High-Speed Transmission

FH55/FH55M Series



Dimensions : 40 pos

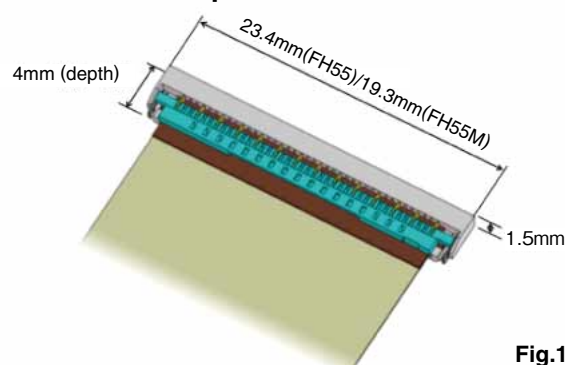


Fig.1

■ Features

1. High-Speed Transmission(10⁺ Gbps) FPC Connectors

Capable of transmitting high-speed differential signals by arranging signal contacts (S) and ground contacts (G) in the sequence of GSSG. (10⁺ Gbps) (The GSSG layout utilizes differential signals, but the contacts can also be designated for other uses other than differential signals.)

2. Impedance Matched-Contact Design

The signal contacts were designed with impedance control in mind and to realize superior high-speed transmission feature.(Fig.2)

3. Fully Enclosed Molded Structure (Over molding Structure)

Board space under the connector can be utilized in patterning since the bottom of the connector is covered with resin and enhances PCB flexibility.

4. Flip-Lock System Provides Reliability and FPC Security

The Flip-lock (one-touch rotational lock) ZIF structure allows for a reliable and simple to secure FPC connection operation. Utilizing a clear clicking feeling at the time of locking prevents an incomplete lock.

5. Easy FPC insertion

The FPC guiding system utilizes guide tabs that enable a temporary hold while FPC is inserted and accurately determines mating location all while ensuring a consistent connection.

6. Compatible with 0.3mm Thick FPC

This connector utilizes 0.3mm thick FPC, which is the standard thickness of a 0.5mm pitch connector (Appropriate stiffness with reinforcing board prevents FPC deformation, preventing troubles at times of insertion and mating).

7. Automatic Mounting Option Available

Emboss packaging makes automatic mounting possible (5,000 pcs/reel).

8. Halogen-free

Chlorine and bromine are not used in amounts that exceed the standard values in these connectors.

* Defined according to IEC 61249-2-21

Br : 900ppm or below ; Cl : 900ppm or below ; Br + Cl : 1,500ppm or below

FH55 differential impedance
50 ps rise time (20-80%)

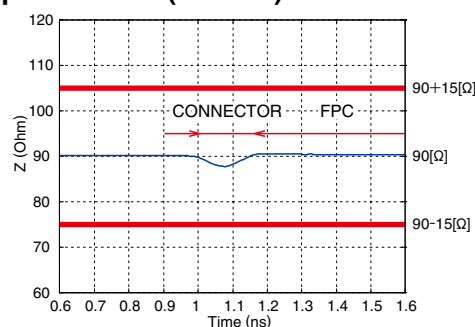


Fig.2

FH55 eye diagram (5 Gbps)

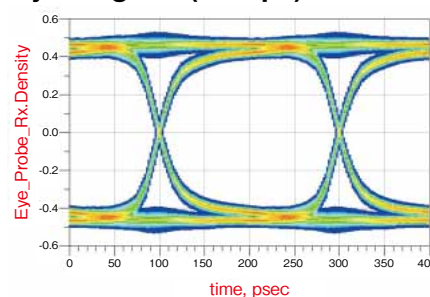


Fig.3

FPC Insertion

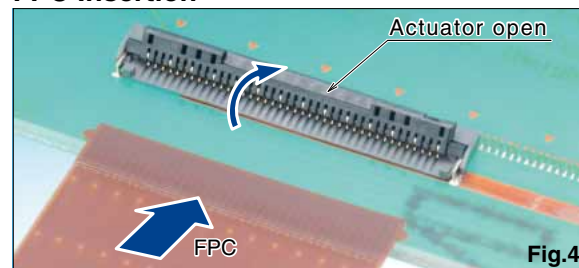


Fig.4

Locked



Fig.5

Product Specifications

Ratings	Current rating	0.5A (0.5mm pitch products)(Note 1) 0.4A (0.4mm pitch products)(Note 1)	Operating temperature range	-55 to +85°C (Note 2)	Storage temperature range	-10 to +50°C (Note 3)
	Voltage rating	AC 50V rms (0.5mm pitch products) AC 40V rms (0.4mm pitch products)	Operating humidity range	RH 90% or less (no condensation)	Storage humidity range	RH 90% or less (no condensation)

Suitable FPC/FFC contact specifications	t = 0.3 ± 0.03 gold-plated
---	----------------------------

Items	Specifications	Conditions
1. Insulation Resistance	500MΩ min	Measured at DC 100V
2. Withstanding Voltage	No flashover or breakdown	AC 150Vrms applied for 1 minute
3. Contact Resistance	100mΩ max * Including FPC conductor resistance	Measured at 1mA
4. Repeat Performance	100mΩ max No breakage, cracking, or loosening to parts	20 times
5. Vibration Resistance	No electric outage of 1μ or greater Contact resistance : 100mΩ max No breakage, cracking, or loosening to parts	10 cycles in each of three directions at frequency 10-55 Hz, half amplitude 0.75mm
6. Shock Resistance	No electric outage of 1μ or greater Contact resistance : 100mΩ max No breakage, cracking, or loosening to parts	Acceleration of 981m/s ² ; duration 6ms, sine half-wave, 3 cycles in each of the 3 axes each in both directions
7. Humidity Resistance in Steady State	Contact Resistance : 100mΩ max Insulation Resistance : 50MΩ min No breakage, cracking, or loosening to parts	96 hours at temperature 40°C and humidity 90-95%
8. Temperature Cycle	Contact Resistance : 100mΩ max Insulation Resistance : 50MΩ min No breakage, cracking, or loosening to parts	Temperature : -55°C → +15°C to +35°C → +85°C → +15° to +35°C Time : 30 → 2 to 3 → 30 → 2 to 3 minutes 5 cycles with the above conditions
9. Solder Heat Resistance	No marked instability in contacts, or appearance of deformation.	1) Reflow : Peak temperature MAX 250°C, 230°C or greater for 60 seconds 2) Soldering iron : 350±10°C for 5 seconds

Note 1 : Use at 70% of the current rating when all pins are energized with current rating.

Note 2 : Temperature rise at the time of electrification is included.

Note 3 : The term "storage" refers to the long-term storage condition of unused products before board mounting. The operating temperature and humidity ranges apply to non-energized state after board mounting.

Materials / Finish

Part	Materials	Color/finish	Remarks
Insulator	LCP	Gray	UL94V-0
		Black	
Contact	Phosphor bronze	Gold-plating	_____
Metal Parts	Brass	Pure tin reflow plating	

Product Number Structure

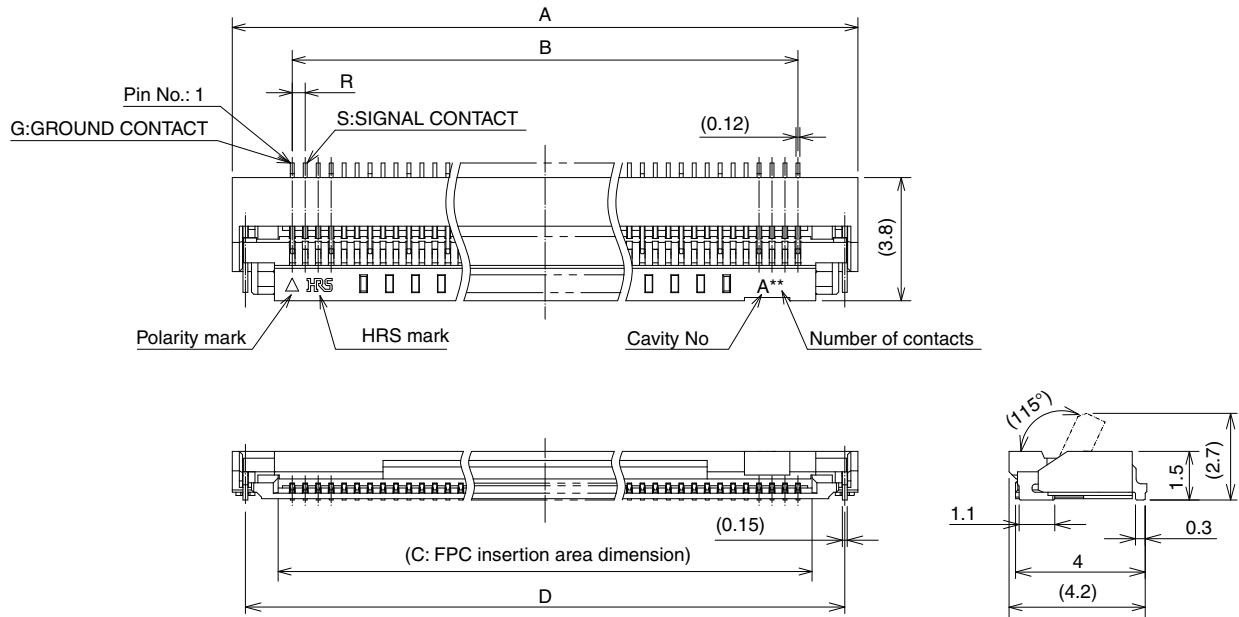
FH 55 M - 40S - 0.5 SH

① ② ③ ④ ⑤ ⑥

① Series name : FH	④ Number of contacts : 10 to 61 positions (0.5mm pitch products) 10 to 79 positions (0.4mm pitch products)
② Series No. : 55	⑤ Contact pitch : 0.5mm or 0.4mm
③ No symbol : 0.5mm pitch products M : 0.4mm pitch products	⑥ Contact Form SH : SMT horizontal mounting type

Connector dimensional drawing

●0.5mm/0.4mm pitch products



- Notes : 1. The dimensions in parentheses () are reference values.
 2. The lead co-planarity of connector and reinforcing metal part is MAX 0.1mm.
 3. This product is emboss-packaged. See the package specification diagram for details.
 4. Dimensions may be changed for sink mark prevention due to improvement, etc.
 5. Black dots, etc. may occur in mold resin but do not create a quality problem.
 6. This product is the halogen-free product. (Br content rate: 900 ppm or less ; Cl content rate : 900ppm or less; Br + Cl total content rate : 1,500ppm or less)
 7. See the table below for available pin arrangements.
 S : SIGNAL CONTACT G : GROUND CONTACT
 * Pins are arranged in the sequence of GSSG to manage high-speed differential signals ; however, all contacts can be used as signals for normal signals other than high-speed signals. Please contact our sales representative for any questions.

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Pin assignment	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S
	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	71	72	73	74	75	76	77	78	79																										
	S	S	G	S	S	G	S	S	G																										

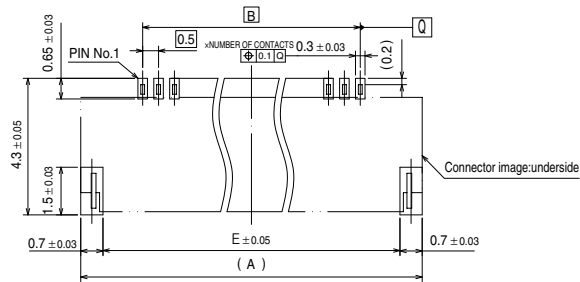
Unit : mm

Part No.	HRS No.	No. of contacts	No. of signal contacts	No. of ground contacts	A	B	C	D	R
FH55-10S-0.5SH	Under planning	10	6	4	8.4	4.5	5.57	7.59	0.5
FH55-22S-0.5SH	580-3707-7 00	22	14	8	14.4	10.5	11.57	13.59	
FH55-31S-0.5SH	580-3704-9 00	31	20	11	18.9	15	16.07	18.09	
FH55-40S-0.5SH	580-3700-8 00	40	26	14	23.4	19.5	20.57	22.59	
FH55-49S-0.5SH	Under planning	49	32	17	27.9	24	25.07	27.09	
FH55-61S-0.5SH	Under planning	61	40	21	33.9	30	31.07	33.09	
FH55M-10S-0.4SH	580-3710-0 00	10	6	4	7.3	3.6	4.47	6.49	0.4
FH55M-19S-0.4SH	Under planning	19	12	7	10.9	7.2	8.07	10.09	
FH55M-31S-0.4SH	580-3711-0 00	31	20	11	15.7	12	12.87	14.89	
FH55M-40S-0.4SH	580-3706-4 00	40	26	14	19.3	15.6	16.47	18.49	
FH55M-49S-0.4SH	Under planning	49	32	17	22.9	19.2	20.07	22.09	
FH55M-61S-0.4SH	Under planning	61	40	21	27.7	24	24.87	26.89	
FH55M-79S-0.4SH	Under planning	79	52	27	34.9	31.2	32.07	34.09	

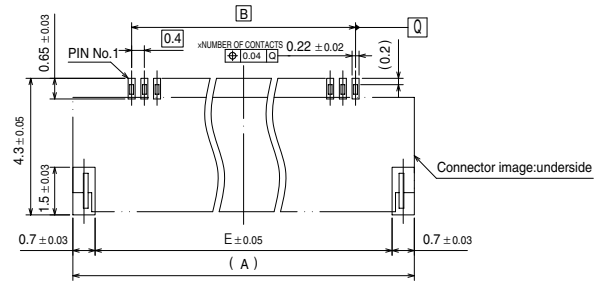
The products above without a HRS No. are currently under planning. Please contact our sales representative for questions concerning the number of contacts.

◆Recommended PCB mounting pattern

●FH55 Series

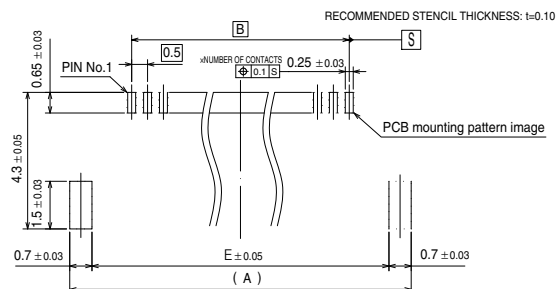


●FH55M Series

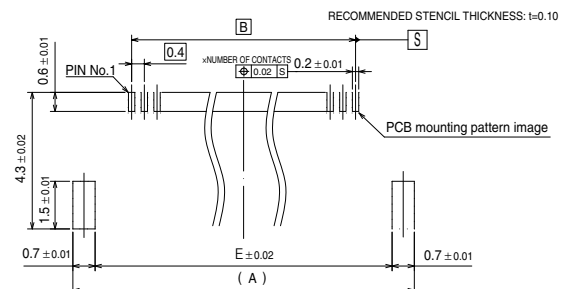


◆Recommended Stencil pattern

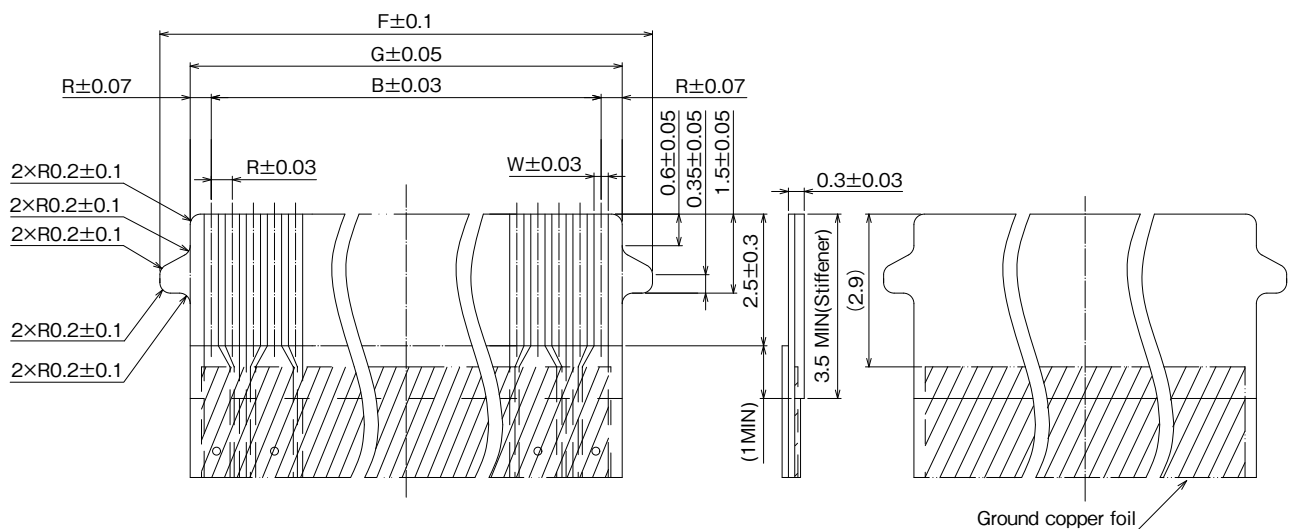
●FH55 Series



●FH55M Series



◆Recommended FPC dimensional drawing

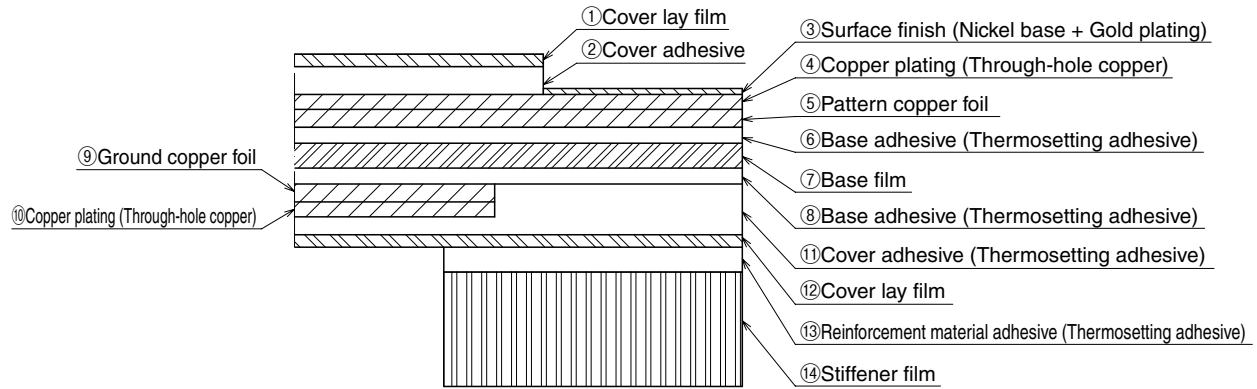


Unit : mm

Part No.	HRS No.	No. of contacts	No. of signal contacts	No. of ground contacts	E	F	G	R	W
FH55-10S-0.5SH	Under planning	10	6	4	7	6.65	5.5	0.5	0.37
FH55-22S-0.5SH	580-3707-7 00	22	14	8	13	12.65	11.5		
FH55-31S-0.5SH	580-3704-9 00	31	20	11	17.5	17.15	16		
FH55-40S-0.5SH	580-3700-8 00	40	26	14	22	21.65	20.5		
FH55-49S-0.5SH	Under planning	49	32	17	26.5	26.15	25		
FH55-61S-0.5SH	Under planning	61	40	21	32.5	32.15	31		
FH55M-10S-0.4SH	580-3710-0 00	10	6	4	5.9	5.55	4.4	0.4	0.27
FH55M-19S-0.4SH	Under planning	19	12	7	9.5	9.15	8		
FH55M-31S-0.4SH	580-3711-0 00	31	20	11	14.3	13.95	12.8		
FH55M-40S-0.4SH	580-3706-4 00	40	26	14	17.9	17.55	16.4		
FH55M-49S-0.4SH	Under planning	49	32	17	21.5	21.15	20		
FH55M-61S-0.4SH	Under planning	61	40	21	26.3	25.95	24.8		
FH55M-79S-0.4SH	Under planning	79	52	27	33.5	33.15	32		

The products above without a HRS No. are currently under planning. Please contact our sales representative for questions concerning the number of contacts.

◆FH55/FH55M Series FPC Material Constitution (Recommended Specifications)

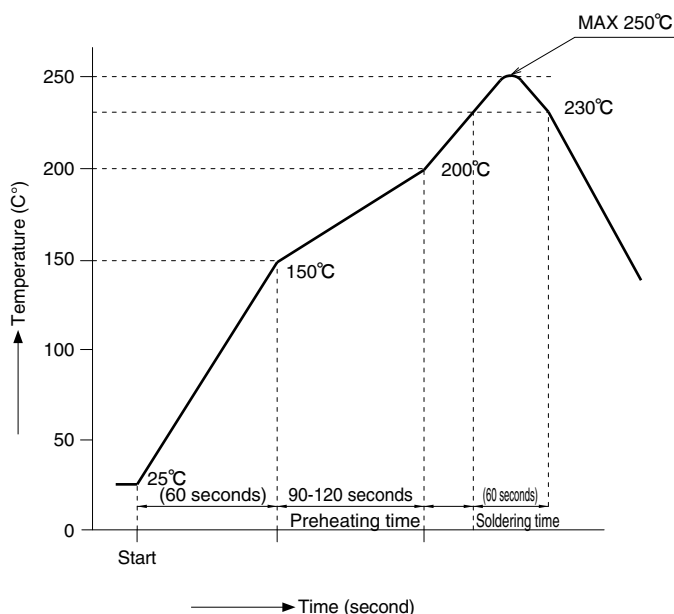


Names of Materials	Material Thickness (μm)			
	LCP 2-layer CCL	PI 2-layer CCL	PI 3-layer CCL	
① Cover lay film	12.5	12.5	12.5	②
② Cover adhesive	28	28	28	
③ Surface treatment (nickel base + gold plating)	(6)	(6)	(6)	
④ Copper plating (through-hole copper)	15	15	15	
⑤ Pattern copper foil	9	18	18	
⑥ Base adhesive	-	-	16	
⑦ Base film <②>	50	25	25	
⑧ Base adhesive	-	-	16	
⑨ Ground copper foil	9	18	18	
⑩ Copper plating (through-hole copper)	15	15	15	
⑪ Cover adhesive	28	28	28	
⑫ Cover lay film	12.5	12.5	12.5	
⑬ Reinforcement material adhesive (Thermosetting adhesive)	50	50	30	
⑭ Stiffener film	125	150	125	
Total (Mating Area Thickness: Total of ③~⑧ and ⑪~⑭)	295.5	304.5	291.5	

Notes 1 : The FPC material constitution is a reference example. Please make the thickness of FPC mating area 0.3 ± 0.03 mm by referring to this material constitution.

② It is a reference example of the base film material. LCP refers to liquid crystal polymer, and PI for polyimide.

◆Temperature Profile



Applicable Conditions

Reflow System : Far-infrared, hot-air reflow

Reflow chamber atmosphere : Air

Solder : Paste type Sn/3.0Ag/0.5 Cu (M705-221CM5-42-10.5 ; Senju Metal Industry Co., Ltd.)

Test Board : Board material and size
Glass epoxy 30 x 60 x 1.0mm
Land dimensions
Contact area: 0.3 x 0.65
Metal part area: 0.7 x 1.5mm

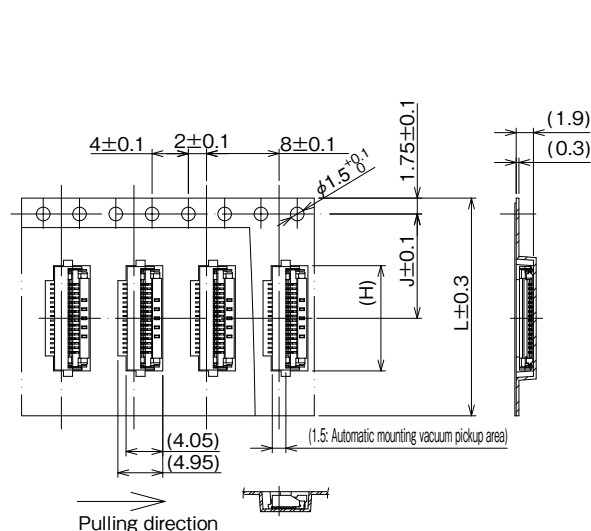
Metal Mask : Thickness 0.1 mm
Aperture Dimension
Contact area 0.25 x 0.65
Metal part area 0.7 x 1.5mm

The temperature profile shown above is based on the above applicable conditions. Due to the changing conditions such as solder paste types, manufacturers, board size and other soldering materials, please check to ensure the proper soldering conditions before use.

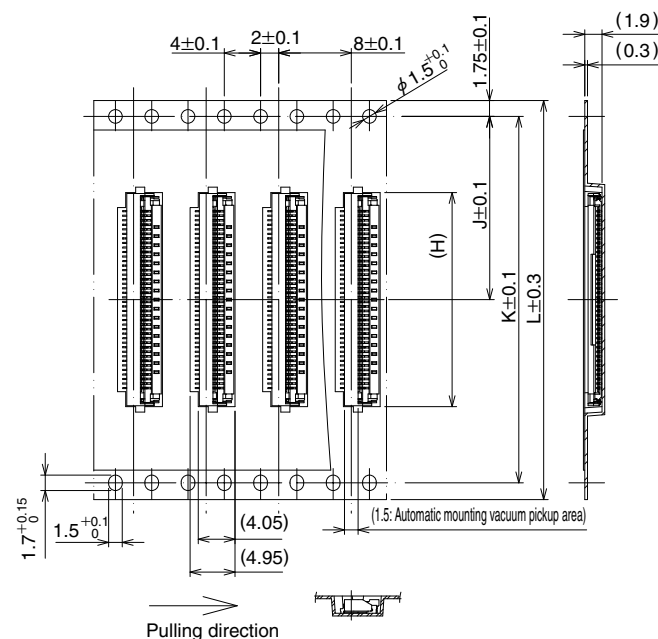
◆ Package Specifications

● Emboss carrier tape dimensional drawing

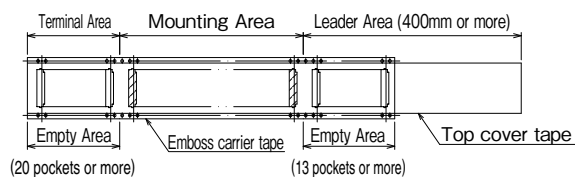
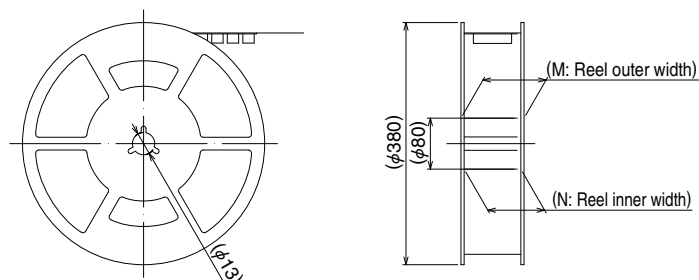
(Tape width: 24mm or less)



(Tape width: 32mm or more)



● Reel state dimensional drawing



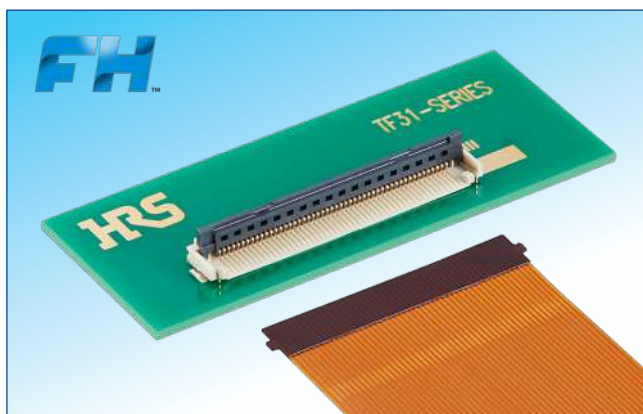
Unit : mm

Part No.	HRS No.	No. of contacts	No. of signal contacts	No. of ground contacts	H	J	K	L	M	N
FH55-10S-0.5SH	Under planning	10	6	4	8.6	11.5	—	24	29.4	25.4
FH55-22S-0.5SH	580-3707-7 00	22	14	8	14.6	11.5	—			
FH55-31S-0.5SH	580-3704-9 00	31	20	11	19.1	14.2	28.4			
FH55-40S-0.5SH	580-3700-8 00	40	26	14	23.6	20.2	40.4	44	49.4	45.4
FH55-49S-0.5SH	Under planning	49	32	17	28.1					
FH55-61S-0.5SH	Under planning	61	40	21	34.1					
FH55M-10S-0.4SH	580-3710-0 00	10	6	4	7.5	11.5	—	24	29.4	25.4
FH55M-19S-0.4SH	Under planning	19	12	7	11.1					
FH55M-31S-0.4SH	580-3711-0 00	31	20	11	15.9					
FH55M-40S-0.4SH	580-3706-4 00	40	26	14	19.5	20.2	40.4	44	49.4	45.4
FH55M-49S-0.4SH	Under planning	49	32	17	23.1					
FH55M-61S-0.4SH	Under planning	61	40	21	27.9					
FH55M-79S-0.4SH	Under planning	79	52	27	35.1	26.2	52.4	56	61.4	57.4

The products above without a HRS No. are currently under planning. Please contact our sales representative for questions concerning the number of contacts.

0.5/1.0mm Pitch, 1.75/2.0mm Height, Bottom Contact, Front Flip FPC/FFC Connector

TF31 Series



FH Flip-Lock Pioneer Hirose

Features

1. Multiple height and pitch variations available

This series offers two different contact pitches of 0.5 and 1.0mm and two heights variations of 1.75 and 2.0mm. These options give engineers the ability to choose the connector that will best fit their design. (Figure. 1)

2. FPC/FFC side catcher design

The TF31 Series incorporates Hirose's FPC/FFC side catcher technology. This design feature enables the tabbed FPC/FFC to be placed in the correct position while achieving stability and excellent FPC/FFC retention force. (Figure. 2)

3. Easy FPC/FFC insertion

The actuator is designed to open widely, to approximately 110°, providing excellent FPC/FFC insertion operability.

4. Rugged design

Each terminal is attached to the actuator, which provides support to the actuator across its entire length. This prevents the actuator from separating from the housing.

5. Prevents unintended actuator opening

The TF31 Series has an interference design that prevents the actuator from unintentionally opening.

6. Maximizes board space

The bottom surface of the connector is over-molded. This allows the PCB space under the connector to be utilized for additional PCB routing.

7. Pick & Place mounting

Offered in tape and reel packaging that is compatible with automatic machine mounting.

8. Multiple packaging options

The standard packaging is 3,000pcs/reel, but TF31 Series is also available in 500pcs/reel. (The outer diameter of the reel is ø180mm for non-standard packaging.)

9. Halogen-Free

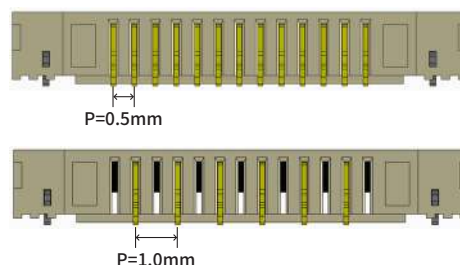
All materials and substances used to produce this product comply with Halogen-free standards.

*As defined by IEC 61249-2-21.

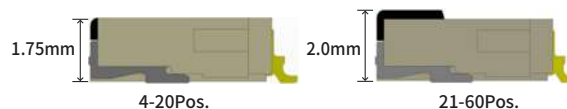
Br : 900ppm max., Cl : 900ppm max., Br+Cl : 1,500ppm max.

Multiple Height and Pitch Variations Available

Pitch variations



Height variations



Alternating Direction

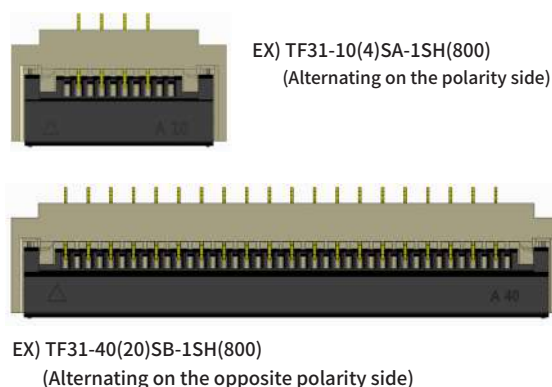


Figure.1

FPC/FFC Positioning Alignment

FPC/FFC Positioning Mechanism

Standard FPC/FFC

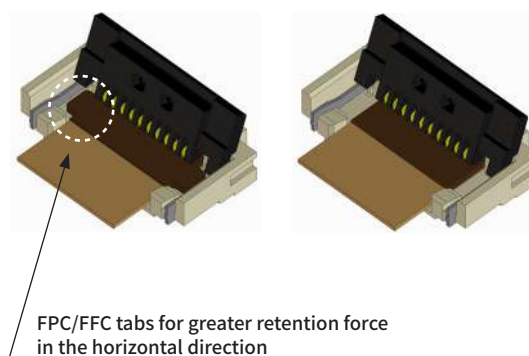


Figure.2

Product Specifications

Ratings	Rated Current : 0.5A (Note1)	Operating Temperature : -40 to +105°C (Note2) Operating Humidity Range : Relative humidity : 90% Max. (No condensation)	Storage Temperature : -10 to +50°C (Note3) Storage Humidity Range : Relative humidity : 90% Max. (No condensation)
	Rated Voltage : 50V AC rms		

Adaptive FPC/FFC contact specifications	Thickness : 0.3±0.03mm Gold plated contact traces
---	---

Items	Specifications	Conditions
1. Insulation Resistance	500MΩ Min.	100V DC
2. Withstanding Voltage	No insulation breakdown	150V AC rms for 1 min.
3. Contact Resistance	50mΩ Max. *Including FPC/FFC conductor resistance	1mA
4. Durability (Insertion/withdrawal)	Contact resistance : 50mΩ Max. No damage, cracks, or parts dislocation.	20 cycles
5. Vibration	No electrical discontinuity of 1μs or more. Contact resistance : 50mΩ Max. No damage, cracks, or parts dislocation	Frequency : 10 to 55Hz, total amplitude of 1.5mm for 2hours in 3 axis directions
6. Shock	No electrical discontinuity of 1μs or more Contact resistance : 50mΩ Max. No damage, cracks, or parts dislocation.	Acceleration : 981m/s ² , 6ms duration, Sine half-waveform, 3 cycles in each of the 3 axis.
7. Humidity (Steady state)	Contact resistance : 50mΩ Max. Insulation resistance : 50MΩ Min. No damage, cracks, or parts dislocation	96 hours at a temperature of 40°C and humidity of 90% to 95%
8. Temperature Cycle	Contact resistance : 50mΩ Max. Insulation resistance : 50MΩ Min. No damage, cracks, or parts dislocation	Temperature : -40 → +15 to +35 → +105 → +15 to +35°C Time : 30 → 2 to 3 → 30 → 2 to 3 (min.) 5 cycles
9. Resistance to Soldering Heat	No deformation of components affecting performance	Reflow : At the recommended temperature profile Manual soldering : 350±10°C for 5 seconds

Note 1 : When passing the current through all of the contacts, use 70% of the current rating.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The term "storage" refers to products stored for long period of time prior to mounting and use.

Operating temperature and humidity range covers non-conducting condition of installed connectors in storage, shipment or during transportation.

Material / Finish

Part	Material	Finish	Remarks
Insulator	LCP	Beige	UL94V-0
Actuator	LCP	Black	
Contact	Phosphor bronze	Partially Gold plated	-----
Retention Tab	Brass	Tin plated	

Product Number Structure

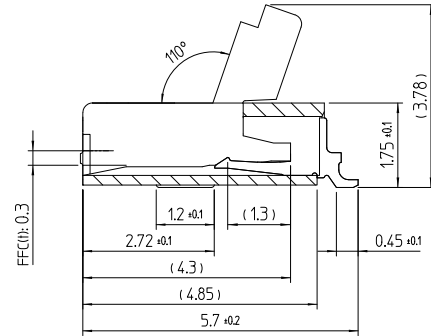
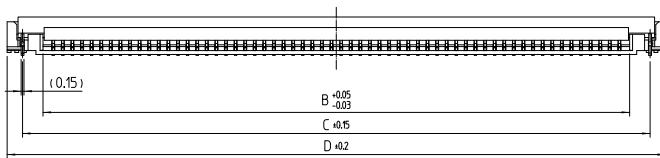
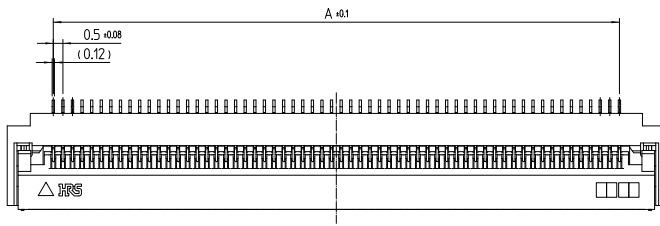
Refer to the chart below when determining the product specifications from the product number.

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

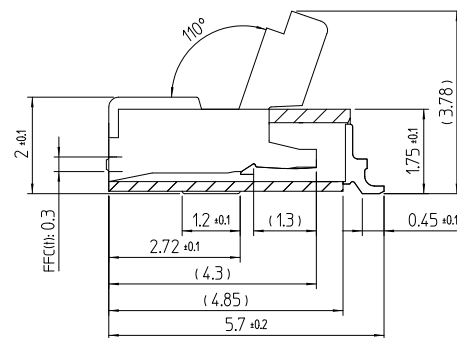
TF **31** - **##** **(##)** **S** **A** - **0.5** **SH** **(###)**
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Series Name : TF	⑥ Alternating direction : Please refer to Figure 1 on Page 1 No symbol : Standard type(all contacts loaded) A : Alternating contact type(Alternating on the polarity side) B : Alternating contact type(Alternating on the opposite polarity side)
② Series No. : 31	⑦ Contact Pitch : 0.5mm, 1mm
③ Standard Type : Number of contacts Alternating Contact Type : Mold size	⑧ Terminal Type SH : SMT horizontal mounting type
④ Standard Type : No symbol Alternating Contact Type : Number of contacts	⑨ Specification (800) : Partially Gold plated, Emboss tape packaging (3,000pcs/reel) (895) : Partially Gold plated, Emboss tape packaging (500pcs/reel)
⑤ Contact arrangement : Single(pole piece array)	

Connector Dimensions (0.5mm Pitch Product)



4-20Pos.



21-60Pos.

Note 1 : The coplanarity of each terminal lead is within 0.1mm.

Note 2 : This product is packaged and sold in tape and reel. Check the packaging specifications for details.

Note 3 : Sink mark reliefs may be added due to improvements.

Note 4 : Black spots may appear on the mold resin, but this does not affect product performance.

Additionally, the terminal plating may change color after reflow, however this does not represent a quality issue.

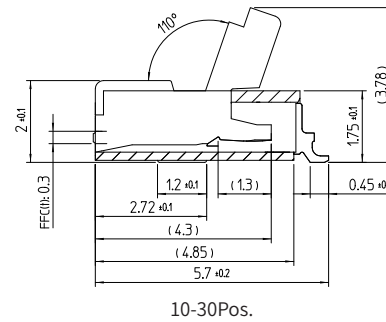
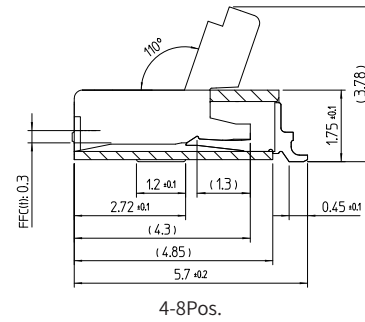
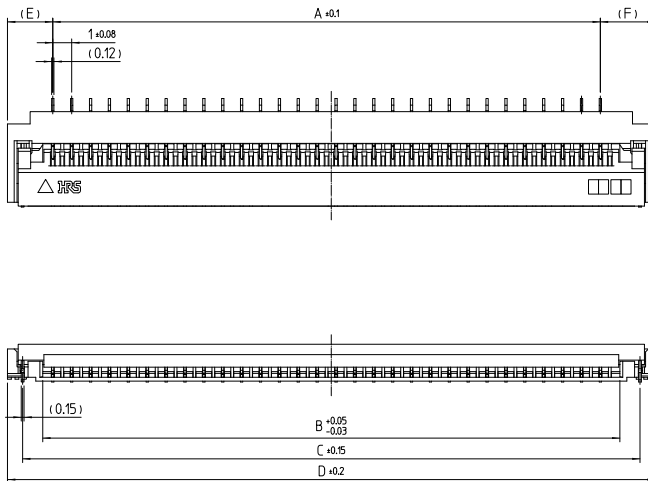
Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	Purchase Unit
TF31-4S-0.5SH(800)	480-0235-5 00	4	1.50	2.57	4.70	6.30	3,000pcs/Reel
TF31-6S-0.5SH(800)	480-0154-5 00	6	2.50	3.57	5.70	7.30	
TF31-7S-0.5SH(800)	480-0516-0 00	7	3.00	4.07	6.20	7.80	
TF31-8S-0.5SH(800)	480-0184-6 00	8	3.50	4.57	6.70	8.30	
TF31-10S-0.5SH(800)	480-0130-7 00	10	4.50	5.57	7.70	9.30	
TF31-12S-0.5SH(800)	480-0131-0 00	12	5.50	6.57	8.70	10.30	
TF31-13S-0.5SH(800)	480-0177-0 00	13	6.00	7.07	9.20	10.80	
TF31-14S-0.5SH(800)	480-0155-8 00	14	6.50	7.57	9.70	11.30	
TF31-16S-0.5SH(800)	480-0178-3 00	16	7.50	8.57	10.70	12.30	
TF31-17S-0.5SH(800)	480-0185-9 00	17	8.00	9.07	11.20	12.80	
TF31-18S-0.5SH(800)	480-0161-0 00	18	8.50	9.57	11.70	13.30	
TF31-20S-0.5SH(800)	480-0132-2 00	20	9.50	10.57	12.70	14.30	
TF31-21S-0.5SH(800)	480-0186-1 00	21	10.00	11.07	13.20	14.80	
TF31-22S-0.5SH(800)	480-0143-9 00	22	10.50	11.57	13.70	15.30	
TF31-24S-0.5SH(800)	480-0251-0 00	24	11.50	12.57	14.70	16.30	
TF31-25S-0.5SH(800)	480-0358-0 00	25	12.00	13.07	15.20	16.80	
TF31-26S-0.5SH(800)	480-0162-3 00	26	12.50	13.57	15.70	17.30	
TF31-28S-0.5SH(800)	480-0156-0 00	28	13.50	14.57	16.70	18.30	
TF31-30S-0.5SH(800)	480-0179-6 00	30	14.50	15.57	17.70	19.30	
TF31-32S-0.5SH(800)	480-0157-3 00	32	15.50	16.57	18.70	20.30	
TF31-35S-0.5SH(800)	480-0261-0 00	35	17.00	18.07	20.20	21.80	
TF31-36S-0.5SH(800)	480-0163-6 00	36	17.50	18.57	20.70	22.30	
TF31-40S-0.5SH(800)	480-0133-5 00	40	19.50	20.57	22.70	24.30	
TF31-45S-0.5SH(800)	480-0134-8 00	45	22.00	23.07	25.20	26.80	
TF31-50S-0.5SH(800)	480-0135-0 00	50	24.50	25.57	27.70	29.30	
TF31-53S-0.5SH(800)	480-0762-0 00	53	26.00	27.07	29.20	30.80	
TF31-54S-0.5SH(800)	480-0756-0 00	54	26.50	27.57	29.70	31.30	
TF31-55S-0.5SH(800)	480-0187-4 00	55	27.00	28.07	30.20	31.80	
TF31-60S-0.5SH(800)	480-0136-3 00	60	29.50	30.57	32.70	34.30	

Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	Purchase Unit
TF31-4S-0.5SH(895)	480-0235-0 95	4	1.50	2.57	4.70	6.30	500pcs/Reel
TF31-6S-0.5SH(895)	480-0154-0 95	6	2.50	3.57	5.70	7.30	
TF31-7S-0.5SH(895)	480-0516-0 95	7	3.00	4.07	6.20	7.80	
TF31-8S-0.5SH(895)	480-0184-0 95	8	3.50	4.57	6.70	8.30	
TF31-10S-0.5SH(895)	480-0130-0 95	10	4.50	5.57	7.70	9.30	
TF31-12S-0.5SH(895)	480-0131-0 95	12	5.50	6.57	8.70	10.30	
TF31-13S-0.5SH(895)	480-0177-0 95	13	6.00	7.07	9.20	10.80	
TF31-14S-0.5SH(895)	480-0155-8 95	14	6.50	7.57	9.70	11.30	
TF31-16S-0.5SH(895)	480-0178-3 95	16	7.50	8.57	10.70	12.30	
TF31-17S-0.5SH(895)	480-0185-9 95	17	8.00	9.07	11.20	12.80	
TF31-18S-0.5SH(895)	480-0161-0 95	18	8.50	9.57	11.70	13.30	
TF31-20S-0.5SH(895)	480-0132-0 95	20	9.50	10.57	12.70	14.30	
TF31-21S-0.5SH(895)	480-0186-0 95	21	10.00	11.07	13.20	14.80	
TF31-22S-0.5SH(895)	480-0143-0 95	22	10.50	11.57	13.70	15.30	
TF31-24S-0.5SH(895)	480-0251-0 95	24	11.50	12.57	14.70	16.30	
TF31-25S-0.5SH(895)	480-0358-0 95	25	12.00	13.07	15.20	16.80	
TF31-26S-0.5SH(895)	480-0162-0 95	26	12.50	13.57	15.70	17.30	
TF31-28S-0.5SH(895)	480-0156-0 95	28	13.50	14.57	16.70	18.30	
TF31-30S-0.5SH(895)	480-0179-0 95	30	14.50	15.57	17.70	19.30	
TF31-32S-0.5SH(895)	480-0157-0 95	32	15.50	16.57	18.70	20.30	
TF31-35S-0.5SH(895)	480-0261-0 95	35	17.00	18.07	20.20	21.80	
TF31-36S-0.5SH(895)	480-0163-0 95	36	17.50	18.57	20.70	22.30	
TF31-40S-0.5SH(895)	480-0133-0 95	40	19.50	20.57	22.70	24.30	
TF31-45S-0.5SH(895)	480-0134-0 95	45	22.00	23.07	25.20	26.80	
TF31-50S-0.5SH(895)	480-0135-0 95	50	24.50	25.57	27.70	29.30	
TF31-53S-0.5SH(895)	480-0762-0 95	53	26.00	27.07	29.20	30.80	
TF31-54S-0.5SH(895)	480-0756-0 95	54	26.50	27.57	29.70	31.30	
TF31-55S-0.5SH(895)	480-0187-0 95	55	27.00	28.07	30.20	31.80	
TF31-60S-0.5SH(895)	480-0136-0 95	60	29.50	30.57	32.70	34.30	

Connector Dimensions (1.0mm Pitch Product)



Note 1 : The coplanarity of each terminal lead is within 0.1mm.

Note 2 : This product is packaged and sold in tape and reel. Check the packaging specifications for details.

Note 3 : Sink mark reliefs may be added due to improvements.

Note 4 : Black spots may appear on the mold resin, but this does not affect product performance.

Additionally, the terminal plating may change color after reflow, however this does not represent a quality issue.

Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	E	F	Purchase Unit
TF31-10(4)SA-1SH(800)	480-0169-0 77	4	3.00	5.57	7.70	9.30	2.90	3.40	3,000pcs/Reel
TF31-6S-1SH(800)	480-0168-0 00	6	5.00	7.07	9.20	10.80	2.90	2.90	
TF31-8S-1SH(800)	480-0211-7 00	8	7.00	9.07	11.20	12.80	2.90	2.90	
TF31-10S-1SH(800)	480-0212-0 00	10	9.00	11.07	13.20	14.80	2.90	2.90	
TF31-12S-1SH(800)	Under planning	12	11.00	13.07	15.20	16.80	2.90	2.90	
TF31-32(16)SB-1SH(800)	480-0848-0 00	16	15.00	16.57	18.70	20.30	2.40	2.90	
TF31-17S-1SH(800)	Under planning	17	16.00	18.07	20.20	21.80	2.90	2.90	
TF31-40(20)SB-1SH(800)	480-0213-2 00	20	19.00	20.57	22.70	24.30	2.40	2.90	
TF31-22S-1SH(800)	Under planning	22	21.00	23.07	25.20	26.80	2.90	2.90	
TF31-26S-1SH(800)	480-0252-0 00	26	25.00	27.07	29.20	30.80	2.90	2.90	
TF31-27S-1SH(800)	Under planning	27	26.00	28.07	20.20	31.80	2.90	2.90	
TF31-60(30)SB-1SH(800)	480-0180-5 00	30	29.00	30.57	32.70	34.30	2.40	2.90	

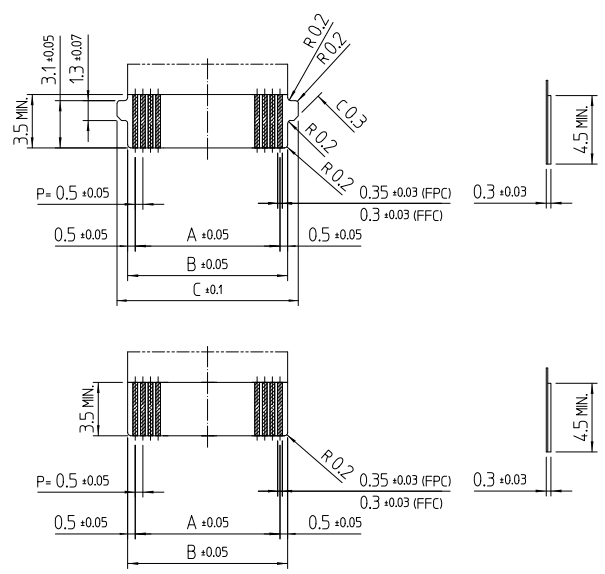
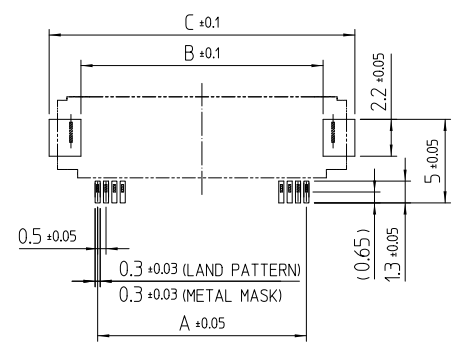
Note 5 : Contact positions without HRS No. are currently under planning.

Please contact Hirose for detailed information about product variations.

Note 6 : HRS No. with (895) specification : 500pcs/Reel is currently under planning.

◆ Recommended FPC/FFC Dimensions and Land / Metal Mask Dimensions

● 0.5mm Pitch Product

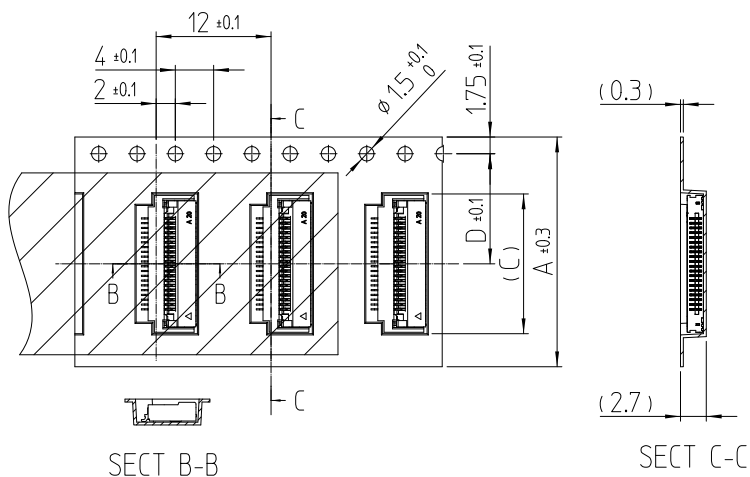
FPC/FFC Dimensions				Land / Metal Mask Dimensions			
							
Unit : mm				Unit : mm			
Part No.	A	B	C	Part No.	A	B	C
TF31-4S-0.5SH(###)	1.5	2.5	3.9	TF31-4S-0.5SH(###)	1.5	3.5	7.3
TF31-6S-0.5SH(###)	2.5	3.5	4.9	TF31-6S-0.5SH(###)	2.5	4.5	8.3
TF31-7S-0.5SH(###)	3.0	4.0	5.4	TF31-7S-0.5SH(###)	3.0	5.0	8.8
TF31-8S-0.5SH(###)	3.5	4.5	5.9	TF31-8S-0.5SH(###)	3.5	5.5	9.3
TF31-10S-0.5SH(###)	4.5	5.5	6.9	TF31-10S-0.5SH(###)	4.5	6.5	10.3
TF31-12S-0.5SH(###)	5.5	6.5	7.9	TF31-12S-0.5SH(###)	5.5	7.5	11.3
TF31-13S-0.5SH(###)	6.0	7.0	8.4	TF31-13S-0.5SH(###)	6.0	8.0	11.8
TF31-14S-0.5SH(###)	6.5	7.5	8.9	TF31-14S-0.5SH(###)	6.5	8.5	12.3
TF31-16S-0.5SH(###)	7.5	8.5	9.9	TF31-16S-0.5SH(###)	7.5	9.5	13.3
TF31-17S-0.5SH(###)	8.0	9.0	10.4	TF31-17S-0.5SH(###)	8.0	10.0	13.8
TF31-18S-0.5SH(###)	8.5	9.5	10.9	TF31-18S-0.5SH(###)	8.5	10.5	14.3
TF31-20S-0.5SH(###)	9.5	10.5	11.9	TF31-20S-0.5SH(###)	9.5	11.5	15.3
TF31-21S-0.5SH(###)	10.0	11.0	12.4	TF31-21S-0.5SH(###)	10.0	12.0	15.8
TF31-22S-0.5SH(###)	10.5	11.5	12.9	TF31-22S-0.5SH(###)	10.5	12.5	16.3
TF31-24S-0.5SH(###)	11.5	12.5	13.9	TF31-24S-0.5SH(###)	11.5	13.5	17.3
TF31-25S-0.5SH(###)	12.0	13.0	14.4	TF31-25S-0.5SH(###)	12.0	14.0	17.8
TF31-26S-0.5SH(###)	12.5	13.5	14.9	TF31-26S-0.5SH(###)	12.5	14.5	18.3
TF31-28S-0.5SH(###)	13.5	14.5	15.9	TF31-28S-0.5SH(###)	13.5	15.5	19.3
TF31-30S-0.5SH(###)	14.5	15.5	16.9	TF31-30S-0.5SH(###)	14.5	16.5	20.3
TF31-32S-0.5SH(###)	15.5	16.5	17.9	TF31-32S-0.5SH(###)	15.5	17.5	21.3
TF31-35S-0.5SH(###)	17.0	18.0	19.4	TF31-35S-0.5SH(###)	17.0	19.0	22.8
TF31-36S-0.5SH(###)	17.5	18.5	19.9	TF31-36S-0.5SH(###)	17.5	19.5	23.3
TF31-40S-0.5SH(###)	19.5	20.5	21.9	TF31-40S-0.5SH(###)	19.5	21.5	25.3
TF31-45S-0.5SH(###)	22.0	23.0	24.4	TF31-45S-0.5SH(###)	22.0	24.0	27.8
TF31-50S-0.5SH(###)	24.5	25.5	26.9	TF31-50S-0.5SH(###)	24.5	26.5	30.3
TF31-53S-0.5SH(###)	26.0	27.0	28.4	TF31-53S-0.5SH(###)	26.0	28.0	31.8
TF31-54S-0.5SH(###)	26.5	27.5	28.9	TF31-54S-0.5SH(###)	26.5	28.5	32.3
TF31-55S-0.5SH(###)	27.0	28.0	29.4	TF31-55S-0.5SH(###)	27.0	29.0	32.8
TF31-60S-0.5SH(###)	29.5	30.5	31.9	TF31-60S-0.5SH(###)	29.5	31.5	35.3

● 1.0mm Pitch Product

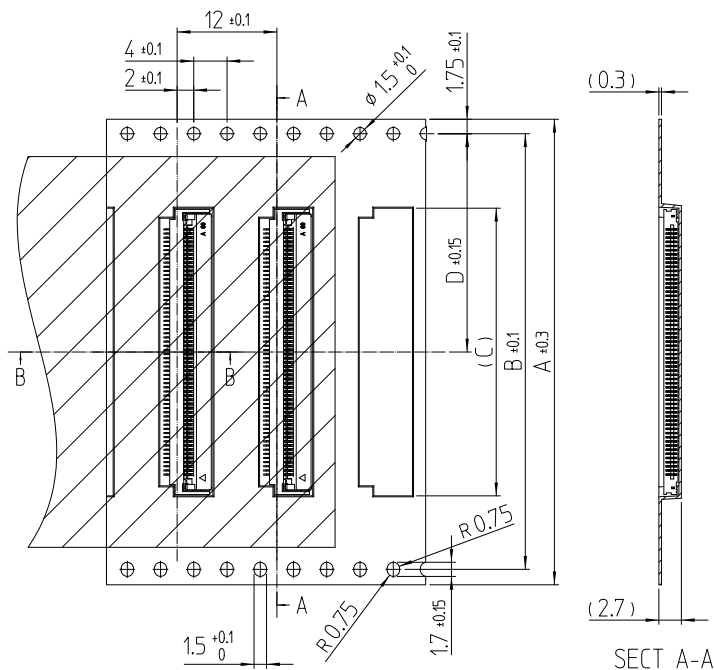
FPC/FFC Dimensions						Land / Metal Mask Dimensions					
						Recommended Metal Mask Thickness : 0.12mm					
Unit : mm						Unit : mm					
Part No.	A	B	C	D	E	Part No.	A	B	C	D	E
TF31-10(4)SA-1SH(800)	3.0	5.5	6.9	1.0	1.5	TF31-10(4)SA-1SH(800)	3.0	6.5	10.3	1.5	2.0
TF31-6S-1SH(800)	5.0	7.0	8.4	1.0	1.0	TF31-6S-1SH(800)	5.0	8.0	11.8	1.5	1.5
TF31-8S-1SH(800)	7.0	9.0	10.4	1.0	1.0	TF31-8S-1SH(800)	7.0	10.0	13.8	1.5	1.5
TF31-10S-1SH(800)	9.0	11.0	12.4	1.0	1.0	TF31-10S-1SH(800)	9.0	12.0	15.8	1.5	1.5
TF31-12S-1SH(800)	11.0	13.0	14.4	1.0	1.0	TF31-12S-1SH(800)	11.0	14.0	17.8	1.5	1.5
TF31-32(16)SB-1SH(800)	15.0	16.5	17.9	0.5	1.0	TF31-32(16)SB-1SH(800)	15.0	17.5	21.3	1.0	1.5
TF31-17S-1SH(800)	16.0	18.0	19.4	1.0	1.0	TF31-17S-1SH(800)	16.0	19.0	22.8	1.5	1.5
TF31-40(20)SB-1SH(800)	19.0	20.5	21.9	0.5	1.0	TF31-40(20)SB-1SH(800)	19.0	21.5	25.3	1.0	1.5
TF31-22S-1SH(800)	21.0	23.0	24.4	1.0	1.0	TF31-22S-1SH(800)	21.0	24.0	27.8	1.5	1.5
TF31-26S-1SH(800)	25.0	27.0	28.4	1.0	1.0	TF31-26S-1SH(800)	25.0	28.0	31.8	1.5	1.5
TF31-27S-1SH(800)	26.0	28.0	29.4	1.0	1.0	TF31-27S-1SH(800)	26.0	29.0	32.8	1.5	1.5
TF31-60(30)SB-1SH(800)	29.0	30.5	31.9	0.5	1.0	TF31-60(30)SB-1SH(800)	29.0	31.5	35.3	1.0	1.5

◆ Packaging Specification

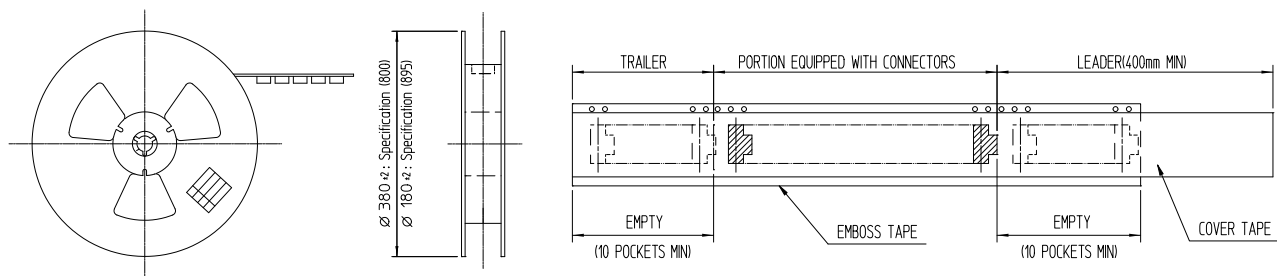
● Embossed Carrier Tape Dimensions (Tape Width 24mm Max.)



● Embossed Carrier Tape Dimensions (Tape Width 32mm Min.)



● Reel Dimensions



Note 1 : 3,000pcs / Reel (Reel Outer Diameter: $\phi 380 \pm 2$ mm), 500pcs / Reel (Reel Outer Diameter: $\phi 180 \pm 2$ mm)

Note 2 : Material

- 1) Emboss Tape : Tape width 24mm Max. : PS (Antistatic Treatment), Tape width 32mm Min. : PET (Antistatic Treatment)
- 2) Cover Tape : PET (Antistatic Treatment)

[0.5mm Pitch Product]

Unit : mm

Part No.	A	B	C	D
TF31-4S-0.5SH(###)	16	-	6.6	7.5
TF31-6S-0.5SH(###)	16	-	7.6	7.5
TF31-7S-0.5SH(###)	16	-	8.1	7.5
TF31-8S-0.5SH(###)	16	-	8.6	7.5
TF31-10S-0.5SH(###)	16	-	9.6	7.5
TF31-12S-0.5SH(###)	24	-	10.6	11.5
TF31-13S-0.5SH(###)	24	-	11.1	11.5
TF31-14S-0.5SH(###)	24	-	11.6	11.5
TF31-16S-0.5SH(###)	24	-	12.6	11.5
TF31-17S-0.5SH(###)	24	-	13.1	11.5
TF31-18S-0.5SH(###)	24	-	13.6	11.5
TF31-20S-0.5SH(###)	24	-	14.6	11.5
TF31-21S-0.5SH(###)	32	28.4	15.1	14.2
TF31-22S-0.5SH(###)	32	28.4	15.6	14.2
TF31-24S-0.5SH(###)	32	28.4	16.6	14.2
TF31-25S-0.5SH(###)	32	28.4	17.1	14.2
TF31-26S-0.5SH(###)	32	28.4	17.6	14.2
TF31-28S-0.5SH(###)	32	28.4	18.6	14.2
TF31-30S-0.5SH(###)	32	28.4	19.6	14.2
TF31-32S-0.5SH(###)	32	28.4	20.6	14.2
TF31-35S-0.5SH(###)	44	40.4	22.1	20.2
TF31-36S-0.5SH(###)	44	40.4	22.6	20.2
TF31-40S-0.5SH(###)	44	40.4	24.6	20.2
TF31-45S-0.5SH(###)	44	40.4	27.1	20.2
TF31-50S-0.5SH(###)	44	40.4	29.6	20.2
TF31-53S-0.5SH(###)	44	40.4	31.1	20.2
TF31-54S-0.5SH(###)	44	40.4	31.6	20.2
TF31-55S-0.5SH(###)	44	40.4	32.1	20.2
TF31-60S-0.5SH(###)	56	52.4	34.6	26.2

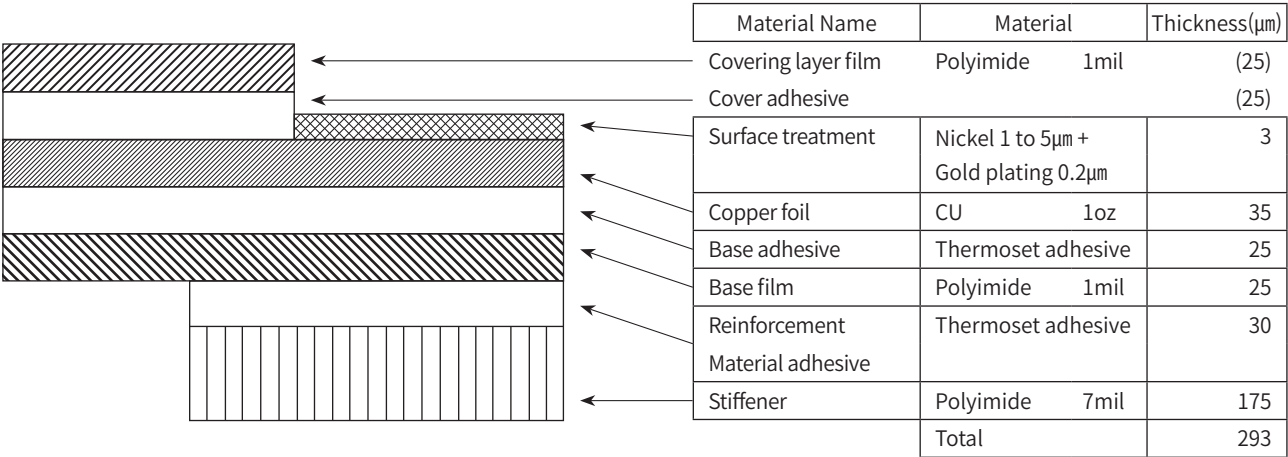
[1.0mm Pitch Product]

Unit : mm

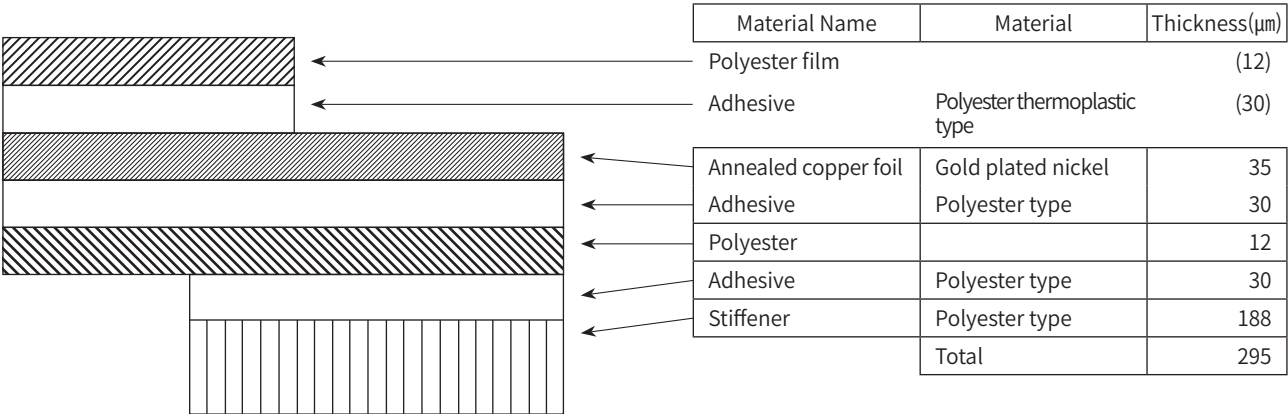
Part No.	A	B	C	D
TF31-10(4)SA-1SH(800)	16	-	9.6	7.5
TF31-6S-1SH(800)	24	-	11.1	11.5
TF31-8S-1SH(800)	24	-	13.1	11.5
TF31-10S-1SH(800)	32	28.4	15.1	14.2
TF31-12S-1SH(800)	32	28.4	17.1	14.2
TF31-17S-1SH(800)	44	40.4	22.1	20.2
TF31-32(16)SB-1SH(800)	32	28.4	20.6	14.2
TF31-40(20)SB-1SH(800)	44	40.4	24.6	20.2
TF31-22S-1SH(800)	44	40.4	27.1	20.2
TF31-26S-1SH(800)	44	40.4	31.1	20.2
TF31-27S-1SH(800)	44	40.4	32.1	20.2
TF31-60(30)SB-1SH(800)	56	52.4	34.6	26.2

◆ TF31 Series FPC/FFC Construction (Recommended Specifications)

● FPC : Flexible Printed Circuit

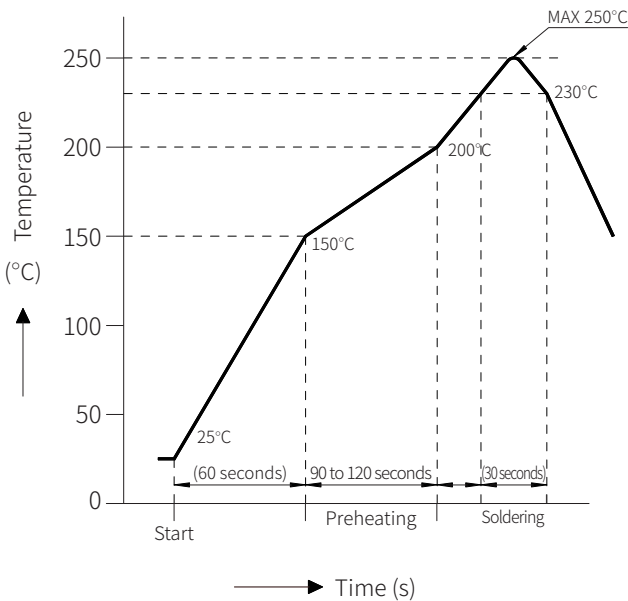


● FFC : Flexible Flat Cable



Note 1 : This specification is recommended for the component configuration of the TF31 Series FPC and FFC (t=0.3±0.03mm)
Note 2 : For details about component configuration, please contact a FPC/FFC manufacturer.

◆ Recommended Temperature Profile



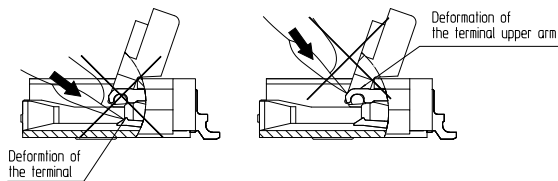
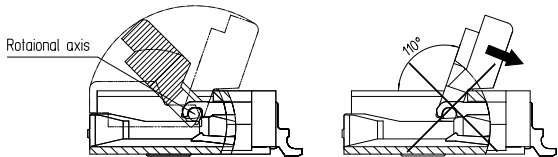
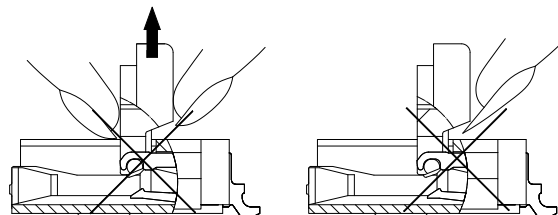
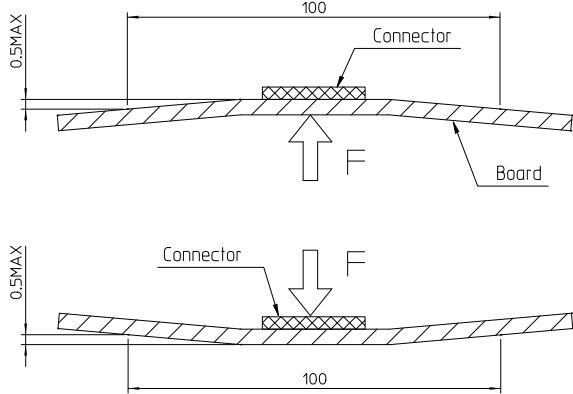
HRS Test Conditions

Reflow method : Reflow, IR/hot air
Reflow Environment : Room air
Solder Composition : Paste, 96.5%Sn/3%Ag/0.5%Cu (M705-221CM5-32-10.5 from Senju Metal Industry Co., Ltd.)

Test Board : Glass epoxy 40mm×80mm×1.6mm thick
Land Dimensions : 0.3mm×1.3mm
Metal Mask : 0.3mm×1.3mm×0.12mm thick

The temperature profile is based on the above conditions. Please check the mounting conditions before use, conditions such as solder paste types, manufacturer, PCB size and any other soldering materials may alter the performance of such materials.

Connector Operation and Precautions

Board Mounting Precautions	FPC/FFC Insertion/Mating Precautions
● Board Warpage Be sure to minimize the board warpage as much as possible. The lead co-planarity is 0.1mm or less. Excessive board warpage may result in soldering failures or co-planarity issues. ● Connector Load If the connector is not mounted onto a board, refrain from doing any of the following actions: Do not apply a force of 0.5N or more to the connector. Do not insert the FFC or operate the connector. Any of these actions may damage or break the connector.	● Actuator Operation 1. Do not apply excessive force on the actuator when releasing it from its initial position. Using a nail or finger as shown below, may result in terminal deformation.  2. The actuator rotates around the axis as shown below. Make sure to rotate the whole actuator and not just the center portion. 3. The actuator opens up to 110°. Do not force the actuator beyond this point. Doing so may result in actuator damage or breakage.  4. Operate the actuator towards the center. Operating one side only may result in actuator damage or incomplete mating. 5. Do not pull or pick at the actuator. Doing so may damage it. (Do not carry out any operation other than the actuator rotation operation described in 2.)  ● Contact Orientation This connector utilizes bottom contacts. Insert the FPC/FFC with the exposed conductors face down.
Instruction after mounting on the board	
● Board Stress It may be advisable to split larger boards into smaller sections to reduce overall board stress. Avoid placing any excess force on the board during the assembly process. When using screws to secure the boards, be sure to check for any unwanted stress that may occur from this operation as well. ● Acceptable Amount of Board Warpage A 100 mm wide board has an acceptable warp range of 0.5mm or less. (Below) Excessive amounts of warping will place stress on the connector which may result in damage and malfunction. 	

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

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
 Ноябрьск (3496)41-32-12
 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

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

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

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