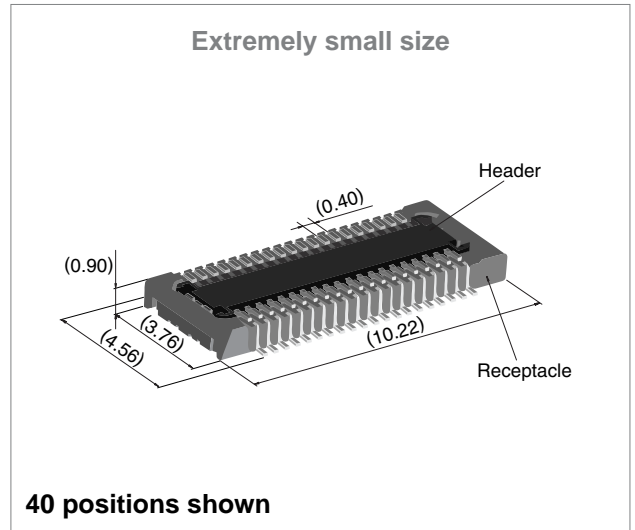


# 0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-FPC Connectors

## DF30 Series



### Overview

Continuous miniaturization and increased component density on PCB created demand for extremely low profile connectors. This series is addition of a new extremely low profile connectors to Hirose's wide range of high reliability board-to-board/board-to-FPC connection solutions.

### Features

#### 1. Contact reliability

Concentration of the contact's normal forces at the single point assures good contact wipe and electrical reliability, while confirming the fully mated condition with a definite tactile click.

#### 2. Self alignment

Recognizing the difficulties of mating extremely small connectors in limited spaces the connectors will self align in horizontal axis within 0.3 mm.

#### 3. Automatic board placement

Packaged on tape-and-reel the plug and headers have sufficiently large flat areas to allow pick-up with vacuum nozzles of automatic placement equipment.

#### 4. Variety of contact positions and styles

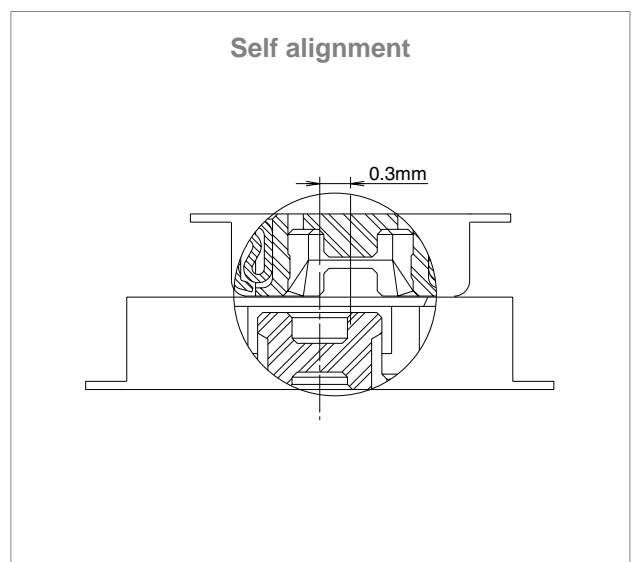
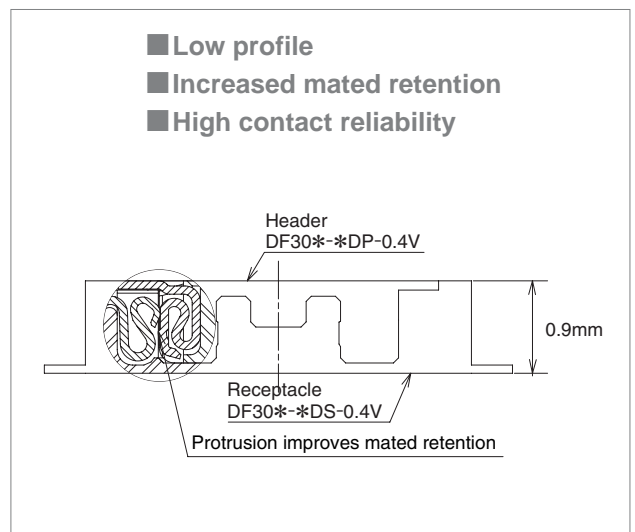
Available in standard contact positions of: 20, 22, 24, 30, 34, 40, 50, 60, 70 and 80 with and without metal fittings. Addition of metal fittings does not affect external dimensions of the connectors. Smaller contact positions are also available.

#### 5. Support for continuity test connector

Connectors which have increased insertion and removal durability are available for continuity tests. Contact your Hirose sales representative for details.

### Applications

Cellular phones, PDA's, mobile computers, digital cameras, digital video cameras, and other devices demanding high reliability connections in extremely limited spaces.



**DF30 Series 0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-PC Connectors**

**Product Specifications**

Rating	Rated current 0.3A Rated voltage 30V AC	Operating temperature range : -35°C to 85°C (Note 1) Operating humidity range : Relative humidity 20% to 80%	Storage temperature range -10°C to 60°C (Note 2) Storage humidity range Relative humidity 40% to 70% (Note 2)
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Item	Specification	Conditions
1. Insulation resistance	50 MΩ min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown.	100V AC / one minute
3. Contact resistance	100 mΩ max.	100 mA
4. Vibration	No electrical discontinuity of 1 μs or more	Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours, 3 axis
5. Humidity	Contact resistance: 100 mΩ max. Insulation resistance: 25 MΩ min.	96 hours at temperature of 40°C±2°C and RH of 90% to 95%
6. Temperature cycle	Contact resistance: 100 mΩ max. Insulation resistance: 50 MΩ min.	Temperature: -55°C→+5°C to +35°C→+85°C→+5°C to +35°C Duration: 30→10→30→10(Minutes) 5 cycles
7. Durability (insertions/withdrawals)	Contact resistance: 100 mΩ max.	50 cycles(Connector for conductivity tests: 500 cycles)
8. Resistance to soldering heat	No deformation of components affecting performance.	Reflow: At the recommended temperature profile Manual soldering: 350°C for 3 seconds

Note 1: Includes temperature rise caused by current flow.

Note 2: 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.

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

**Materials and Finishes**

Connectors	Component	Material	Finish	Remarks
Receptacles and Headers	Insulator	LCP	Color : Black	UL94V-0
	Contacts	Phosphor bronze	Gold plated	————
	Metal fittings	Phosphor bronze	Tin plated	————

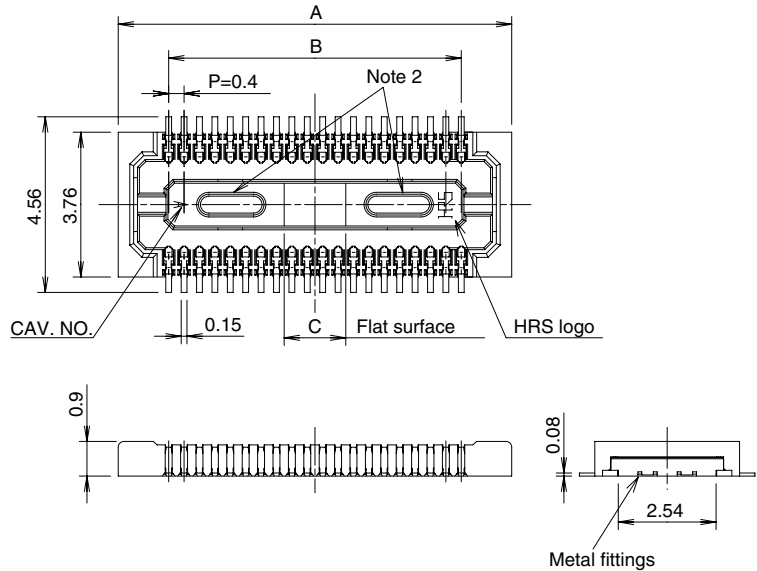
**Ordering information**

● Receptacles and Headers

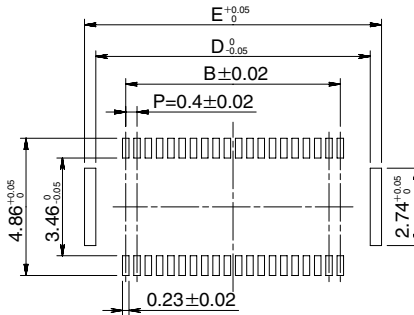
**DF30**   **FC**   **\***   **DS - 0.4**   **V**   **(\*\*)**  
 ①   ②   ③   ④   ⑤   ⑥   ⑦

① Series name: DF30	⑤ Contact pitch: 0.4 mm
② Configuration FB: With metal fittings, without bosses FC: Without metal fittings, without bosses CJ: Connector for conductivity tests	⑥ Termination section V: Straight SMT
③ Number of positions: 20, 22, 24, 30, 34, 40, 50, 60, 70, 80	⑦ Packaging (81): Embossed tape packaging (5,000 pieces per reel) (82): Embossed tape packaging (1,000 pieces per reel)
④ Connector type DS: Double row receptacle DP: Double row header	

## ■ Receptacles (with metal fittings)



## ◆ Recommended PCB mounting pattern



Recommended solder paste thickness: 120  $\mu$ m

[Specification number -\*\*, (\*\*)]

(81): Embossed tape packaging (5,000 pieces per reel)

(82): Embossed tape packaging (1,000 pieces per reel)

Part Number	CL No.	Number of contacts	A	B	C	D	E	RoHS
DF30FB-20DS-0.4V(**)	CL684-1098-3-**-	20	6.22	3.6	1.2	5.72	6.52	YES
DF30FB-22DS-0.4V(**)	CL684-1099-6-**-	22	6.62	4.0	1.2	6.12	6.92	
DF30FB-24DS-0.4V(**)	CL684-1100-3-**-	24	7.02	4.4	1.2	6.52	7.32	
DF30FB-30DS-0.4V(**)	CL684-1101-6-**-	30	8.22	5.6	1.2	7.72	8.52	
DF30FB-34DS-0.4V(**)	CL684-1102-9-**-	34	9.02	6.4	1.36	8.52	9.32	
DF30FB-40DS-0.4V(**)	CL684-1103-1-**-	40	10.22	7.6	1.6	9.72	10.52	
DF30FB-50DS-0.4V(**)	CL684-1104-4-**-	50	12.22	9.6	2.0	11.72	12.52	
DF30FB-60DS-0.4V(**)	CL684-1105-7-**-	60	14.22	11.6	2.4	13.72	14.52	
DF30FB-70DS-0.4V(**)	CL684-1106-0-**-	70	16.22	13.6	2.8	15.72	16.52	
DF30FB-80DS-0.4V(**)	CL684-1107-2-**-	80	18.22	15.6	3.2	17.72	18.52	

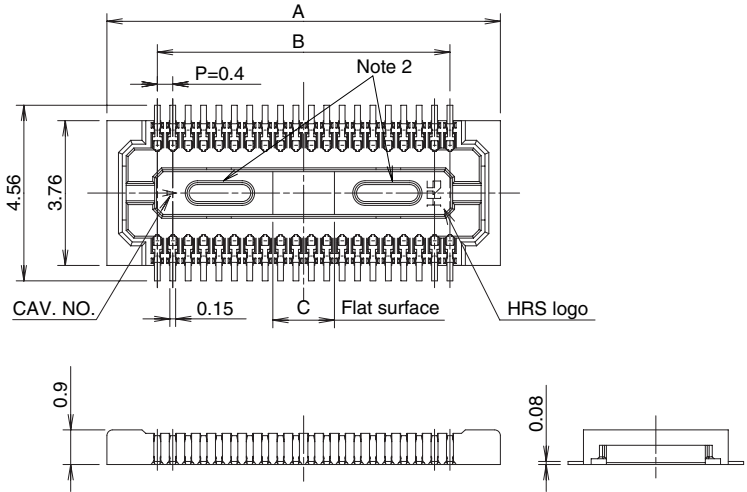
Unit: mm

Note 1: Order by number of reels.

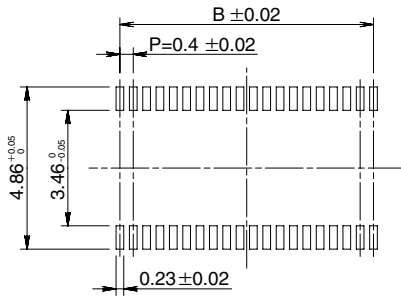
Note 2: Receptacles with 24 or fewer contacts positions will not have recessed areas.

DF30 Series 0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-PC Connectors

## ■ Receptacles (without metal fittings)



## ◆ Recommended PCB mounting pattern



Recommended solder paste thickness: 120  $\mu\text{m}$

[Specification number] -\*\*, (\*\*)  
 (81): Embossed tape packaging (5,000 pieces per reel)  
 (82): Embossed tape packaging (1,000 pieces per reel)

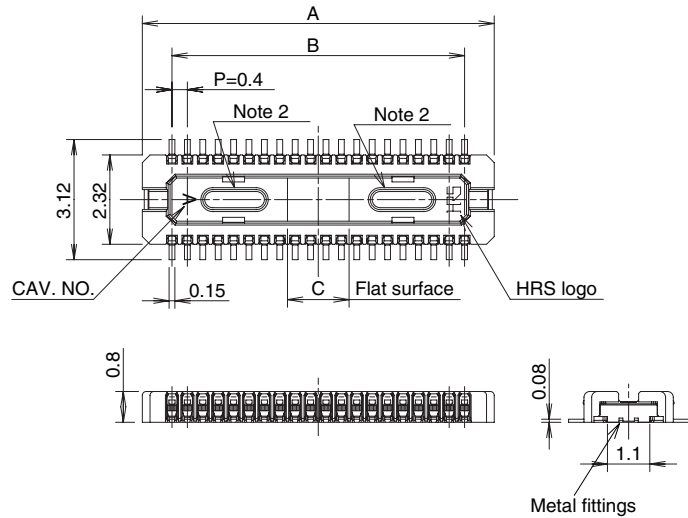
Unit: mm

Part Number	CL No.	Number of contacts	A	B	C	RoHS
DF30FC-20DS-0.4V(**)	CL684-1109-8-**	20	6.22	3.6	1.2	YES
DF30FC-22DS-0.4V(**)	CL684-1110-7-**	22	6.62	4.0	1.2	
DF30FC-24DS-0.4V(**)	CL684-1111-0-**	24	7.02	4.4	1.2	
DF30FC-30DS-0.4V(**)	CL684-1112-2-**	30	8.22	5.6	1.2	
DF30FC-34DS-0.4V(**)	CL684-1113-5-**	34	9.02	6.4	1.36	
DF30FC-40DS-0.4V(**)	CL684-1078-6-**	40	10.22	7.6	1.6	
DF30FC-50DS-0.4V(**)	CL684-1114-8-**	50	12.22	9.6	2.0	
DF30FC-60DS-0.4V(**)	CL684-1082-3-**	60	14.22	11.6	2.4	
DF30FC-70DS-0.4V(**)	CL684-1115-0-**	70	16.22	13.6	2.8	
DF30FC-80DS-0.4V(**)	CL684-1116-3-**	80	18.22	15.6	3.2	

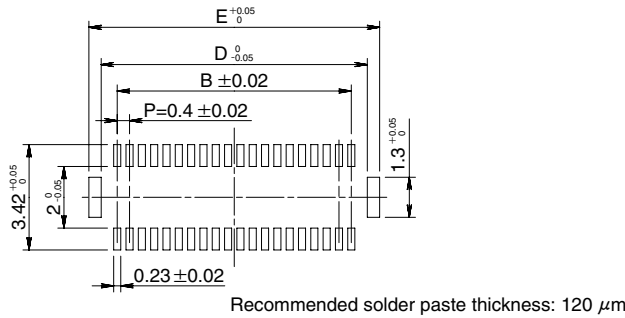
Note 1: Order by number of reels.

Note 2: Receptacles with 24 or fewer contacts positions will not have recessed areas.

## Header (with metal fittings)



## Recommended PCB mounting pattern



[Specification number -\*\*, (\*\*)  
 (81): Embossed tape packaging (5,000 pieces per reel)  
 (82): Embossed tape packaging (1,000 pieces per reel)

Part Number	CL No.	Number of contacts	A	B	C	D	E	RoHS
DF30FB-20DP-0.4V(**)	CL684-1129-5-**-	20	5.14	3.6	1.2	4.64	5.44	YES
DF30FB-22DP-0.4V(**)	CL684-1130-4-**-	22	5.54	4.0	1.2	5.04	5.84	
DF30FB-24DP-0.4V(**)	CL684-1131-7-**-	24	5.94	4.4	1.2	5.44	6.24	
DF30FB-30DP-0.4V(**)	CL684-1132-0-**-	30	7.14	5.6	1.2	6.64	7.44	
DF30FB-34DP-0.4V(**)	CL684-1133-2-**-	34	7.94	6.4	1.36	7.44	8.24	
DF30FB-40DP-0.4V(**)	CL684-1134-5-**-	40	9.14	7.6	1.6	8.64	9.44	
DF30FB-50DP-0.4V(**)	CL684-1135-8-**-	50	11.14	9.6	2.0	10.64	11.44	
DF30FB-60DP-0.4V(**)	CL684-1074-5-**-	60	13.14	11.6	2.4	12.64	13.44	
DF30FB-70DP-0.4V(**)	CL684-1075-8-**-	70	15.14	13.6	2.8	14.64	15.44	
DF30FB-80DP-0.4V(**)	CL684-1136-0-**-	80	17.14	15.6	3.2	16.64	17.44	

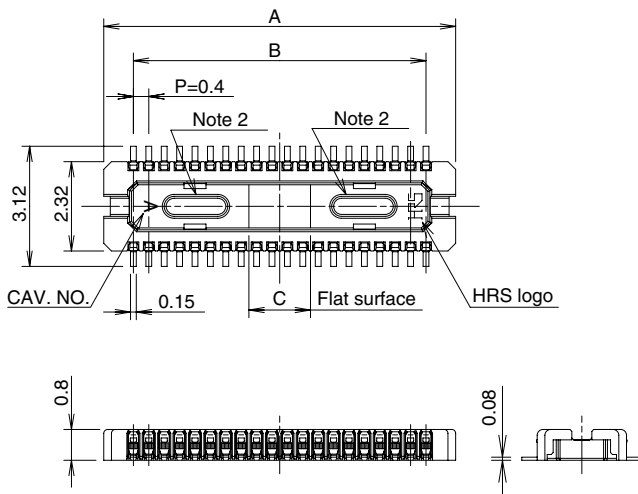
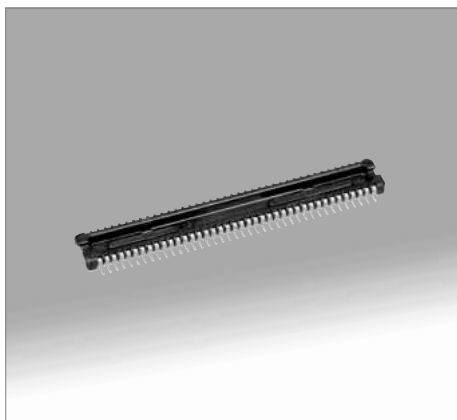
Unit: mm

Note 1: Order by number of reels.

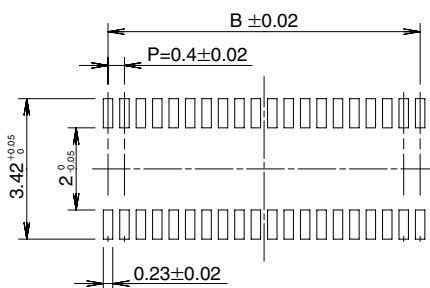
Note 2: Headers with 24 or fewer contacts positions will not have protruding areas.

DF30 Series 0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-PC Connectors

## ■ Header (without metal fittings)



## ◆ Recommended PCB mounting pattern



Recommended solder paste thickness: 120 μm

[Specification number] -\*\*, (\*\*)  
 (81): Embossed tape packaging (5,000 pieces per reel)  
 (82): Embossed tape packaging (1,000 pieces per reel)

Unit: mm

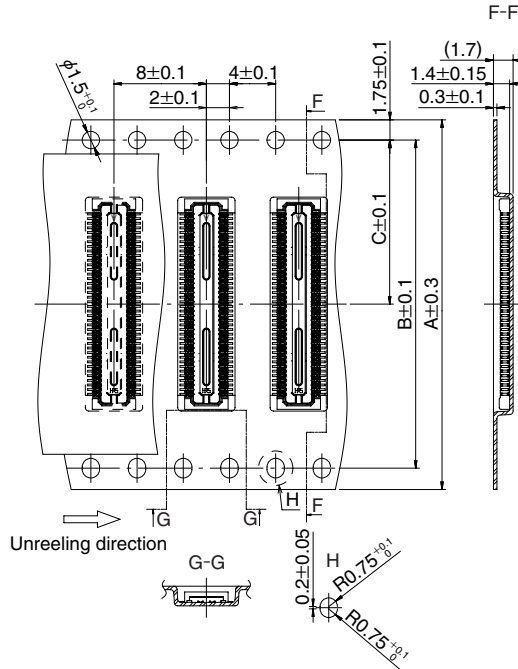
Part Number	CL No.	Number of contacts	A	B	C	RoHS
DF30FC-20DP-0.4V(**)	CL684-1138-6-**	20	5.14	3.6	1.2	YES
DF30FC-22DP-0.4V(**)	CL684-1139-9-**	22	5.54	4.0	1.2	
DF30FC-24DP-0.4V(**)	CL684-1140-8-**	24	5.94	4.4	1.2	
DF30FC-30DP-0.4V(**)	CL684-1141-0-**	30	7.14	5.6	1.2	
DF30FC-34DP-0.4V(**)	CL684-1142-3-**	34	7.94	6.4	1.36	
DF30FC-40DP-0.4V(**)	CL684-1079-9-**	40	9.14	7.6	1.6	
DF30FC-50DP-0.4V(**)	CL684-1143-6-**	50	11.14	9.6	2.0	
DF30FC-60DP-0.4V(**)	CL684-1083-6-**	60	13.14	11.6	2.4	
DF30FC-70DP-0.4V(**)	CL684-1077-3-**	70	15.14	13.6	2.8	
DF30FC-80DP-0.4V(**)	CL684-1144-9-**	80	17.14	15.6	3.2	

Note 1: Order by number of reels.

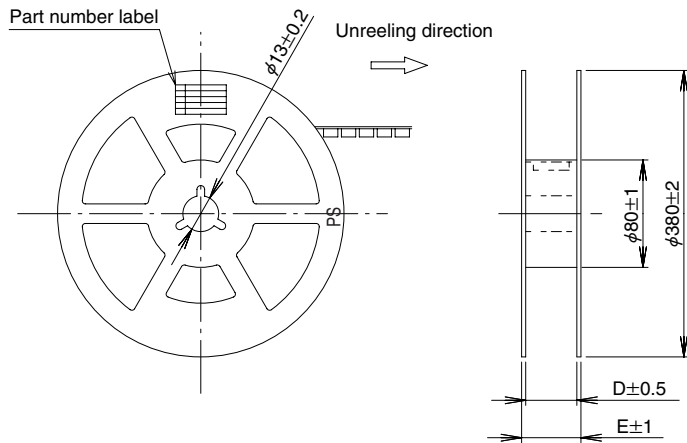
Note 2: Headers with 24 or fewer contacts positions will not have protruding areas.

## ◆ Packaging Specification

### ● Embossed Carrier Tape Dimensions - Receptacle



### ● Reel Dimensions



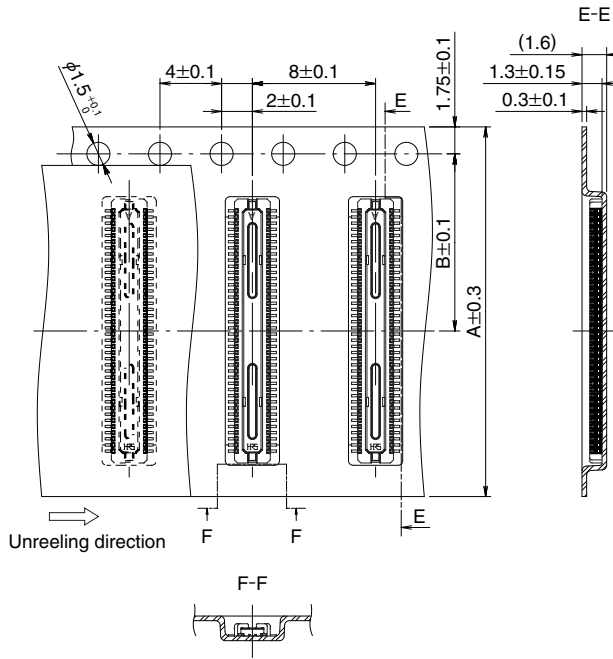
Unit: mm

Part Number	A	B	C	D	E
DF30#-20DS-0.4V(**)	16.0	—	7.5	17.5	21.5
DF30#-22DS-0.4V(**)	16.0	—	7.5	17.5	21.5
DF30#-24DS-0.4V(**)	16.0	—	7.5	17.5	21.5
DF30#-30DS-0.4V(**)	16.0	—	7.5	17.5	21.5
DF30#-34DS-0.4V(**)	16.0	—	7.5	17.5	21.5
DF30#-40DS-0.4V(**)	24.0	—	11.5	25.5	29.5
DF30#-50DS-0.4V(**)	24.0	—	11.5	25.5	29.5
DF30#-60DS-0.4V(**)	24.0	—	11.5	25.5	29.5
DF30#-70DS-0.4V(**)	24.0	—	11.5	25.5	29.5
DF30#-80DS-0.4V(**)	32.0	28.4	14.2	33.5	37.5

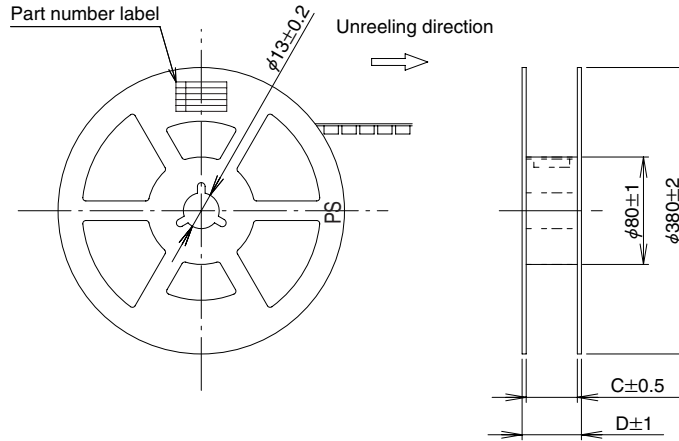
Embossed tape 32mm or wider will have perforated feed holes on two sides.

DF30 Series 0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-PC Connectors

● Embossed Carrier Tape Dimensions - Header



● Reel Dimensions

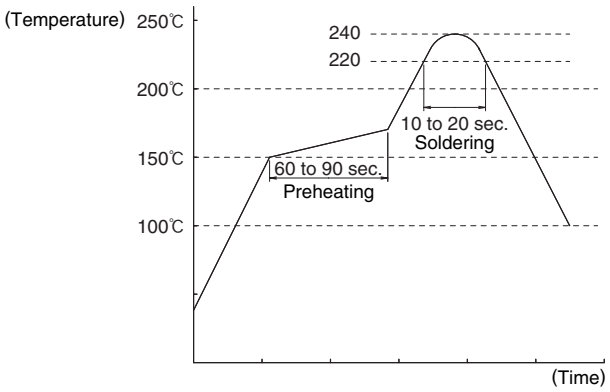


Unit: mm

Part Number	A	B	C	D
DF30#-20DP-0.4V(**)	16.0	7.5	17.5	21.5
DF30#-22DP-0.4V(**)	16.0	7.5	17.5	21.5
DF30#-24DP-0.4V(**)	16.0	7.5	17.5	21.5
DF30#-30DP-0.4V(**)	16.0	7.5	17.5	21.5
DF30#-34DP-0.4V(**)	16.0	7.5	17.5	21.5
DF30#-40DP-0.4V(**)	16.0	7.5	17.5	21.5
DF30#-50DP-0.4V(**)	24.0	11.5	25.5	29.5
DF30#-60DP-0.4V(**)	24.0	11.5	25.5	29.5
DF30#-70DP-0.4V(**)	24.0	11.5	25.5	29.5
DF30#-80DP-0.4V(**)	24.0	11.5	25.5	29.5

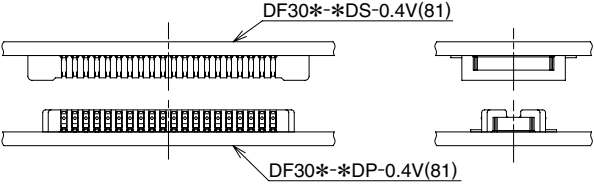
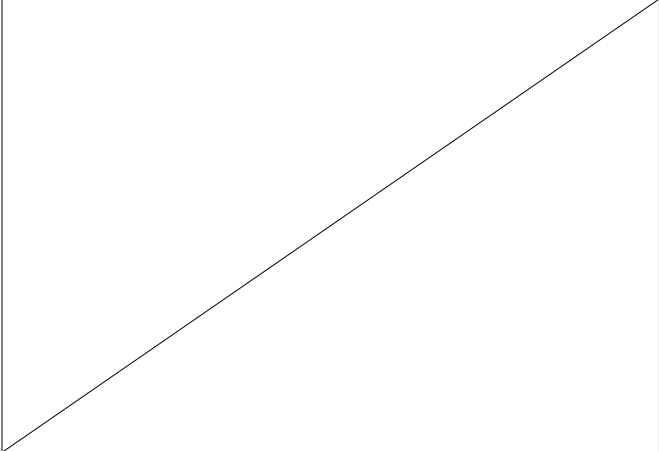
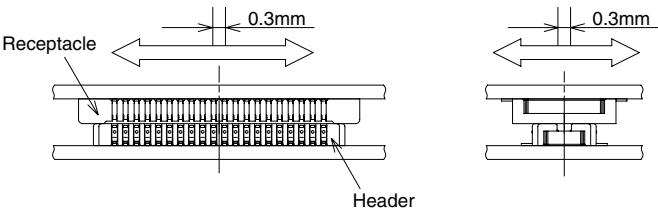
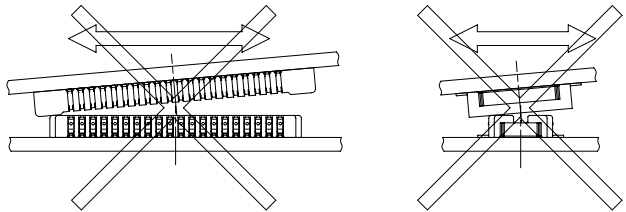
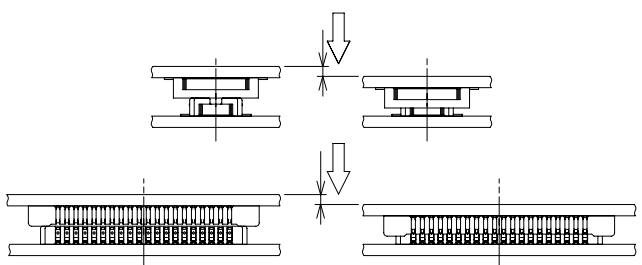


## ◆ Usage Recommendations

<p>1. Recommended temperature profile</p>	 <p>The graph plots Temperature (°C) on the y-axis (100 to 250) against Time on the x-axis. The profile shows a preheating phase from 100°C to 150°C (60 to 90 sec.), a soldering phase peaking at 240°C (10 to 20 sec.), and a cooling phase back to 100°C.</p> <p>Note 1: Up to 2 cycles of Reflow soldering are possible under the same conditions, provided that there is a return to normal temperature between the first and second cycle.</p> <p>Note 2: The temperature profile indicates the board surface temperature at the point of contacts with the connector terminals.</p>
<p>2. Recommended manual soldering</p>	<p>Manual soldering: 340±10°C for 3 seconds</p>
<p>3. Recommended screen thickness and open area ratio (Pattern area ratio)</p>	<p>Thickness: 0.12 mm          Opening are ratio: DS side 100%, DP side 84%</p>
<p>4. Board warpage</p>	<p>Maximum of 0.02 mm at the connector center, with both ends of the connector as reference points.</p>
<p>5. Cleaning conditions</p>	<p>Refer to "Nylon Connector Use Handbook".</p>
<p>6. Precautions</p>	<ul style="list-style-type: none"> <li>■ Due to the extremely small size of the connectors, handling it with bare hands should be avoided. Follow the recommendations given on the proceeding pages.</li> <li>■ Mating and un-mating of the connectors when not soldered on the boards is not recommended as this may cause deformation of the terminals, damage to the contacts or insulators.</li> <li>■ Mated connectors should not carry weight of the board by themselves. Provide some other support of the boards.</li> <li>■ When mating/un-mating do not twist or lift by the corners. Apply the forces evenly across the entire length and width of the connectors taking care NOT to damage or deform soldered terminations.</li> <li>■ Exercise extreme caution when mating/ un-mating when the connector is mounted on a non-rigid (flexible) substrate.</li> <li>■ Do NOT pull on the flexible substrate.</li> <li>■ Slight discoloration on the insulating materials will not affect form, fit or function of the connectors.</li> </ul>

DF30 Series 0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-PC Connectors

◆ Handling Precautions when mating the connectors

 <p>DF30*-DS-0.4V(81)</p> <p>DF30*-DP-0.4V(81)</p>	
 <p>Receptacle</p> <p>Header</p> <p>0.3mm</p> <p>0.3mm</p>	<p>Keep the connectors parallel to each other when positioning.</p>
	<p>Do not attempt to mate the connectors starting at one end or side.</p>
	<p>Press-down evenly until slight resistance is felt.              Overcoming this slight resistance will complete the mating of receptacle with the header.              A definite "click" sensation will confirm the fully mated condition.</p>

## ◆ Handling Precautions when un-mating the connectors

<p>DF30*-DS-0.4V(81) DF30*-DP-0.4V(81)</p>	<p>Fully mated</p>
<p>Receptacle Header</p>	<p>Lift even one side, keeping both boards parallel to each other.</p>
<p><b>Fig. A</b>                      <b>Fig. B</b></p>	<p>When handling circumstances prevent the connector from being kept level during un-mating, one end may be lifted separate as shown on Fig. A.          However, to utilize this procedure the connector must be mounted on a sufficiently rigid circuit board.          Any deflection of the board during this operation may result in damage to the connector or solder joints.          Do not attempt the start of the un-mating of the connectors from one side (Fig. B).</p>
	<p>When removal is from the width orientation as illustrated in the diagram to the left, damage could be caused to the connector. Do not perform removal from the width orientation.</p>

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