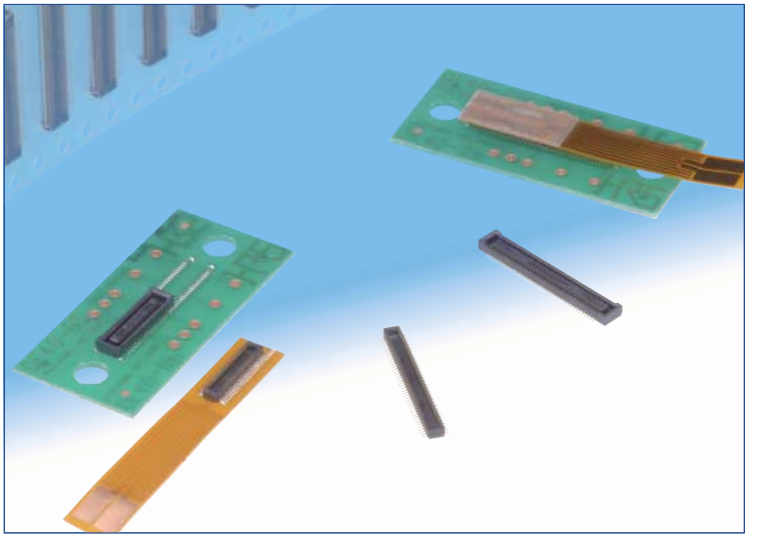
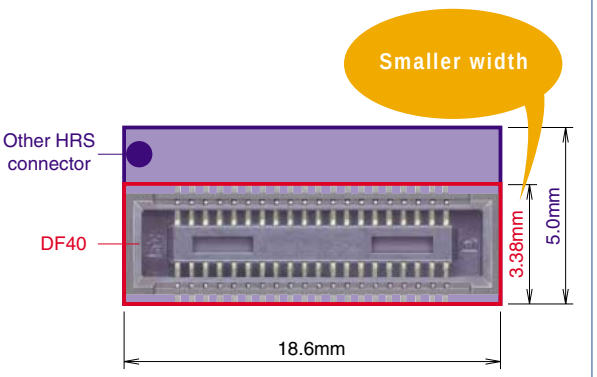
NEW

0.4 mm Contact Pitch 1.5 mm above the board Board-to-Board /Board-to-FPC Connectors

DF40 Series



Decrease in the board-occupied area



Features

1. Higher density of the board-mounted components

Extremely small board mounting pattern and low above-the-board profile makes the connectors ideally suited for small device applications.

2. High contact reliability

Despite connectors small size and low profile the contacts provide strong contact forces and long contact wipe (0.45 mm), guaranteeing reliable electrical and mechanical performance.

3. Large self-alignment distance

The connectors will self-align within 0.33 mm.

4. Confirmation of the fully mated condition

Positive “click” sensation confirms correct insertion and connection of all contacts.

5. Built-in shock absorbing feature

The protrusions and indents in the insulator bodies protect the connectors from failures when exposed to sudden impact.

6. Solder wicking prevention

Nickel-plated barriers provide protection against solder wicking into the contact areas.

7. Contact area protection

External walls protect the exposed contact areas from intrusion of flux or foreign particles.

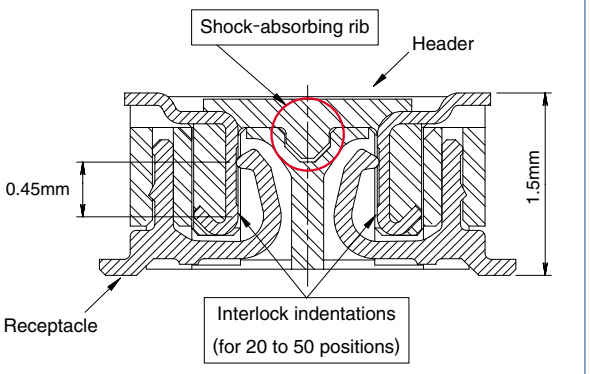
8. RoHS compliant

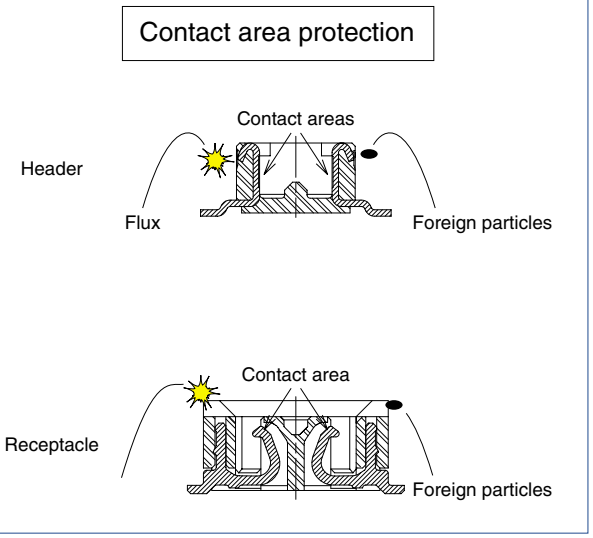
All components and materials comply with the requirements of the EU Directive 2002/95/EC.

Applications

Cellular phones, Digital Video Cameras, Digital Still Cameras, portable devices and other small applications requiring reliable board-to-board or FPC-to-board connections.

High contact reliability – Effective connection wipe of 0.45 mm





■Product Specifications

Ratings	Current rating 0.3A Voltage rating 30V AC, DC	Operation temperature range -35℃ to +85℃ (Note 1) Operation humidity range RH 20% to 80%	Storage temperature range -10℃ to +60℃ (Note 2) Storage humidity range RH 40% to 70% (Note 2)

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	90 mΩ max.	1mA, 20mV AC, 1 kHz
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: 90 mΩ max. IInsulation resistance: 25 MΩ min.	96 hours at +40±2℃ and humidity of 90% to 95%.
6. Temperature cycle	Contact resistance: 90 m Ω max. Insulation resistance: 50 MΩ min.	Temperature: -55→+5℃ to 35℃→+85℃→+5℃ to +35℃ Time: 30→10→30→10 (Minutes) 5 cycles
7. Durability (insertion/withdrawal)	Contact resistance: 90 mΩ max.	30 cycles
8. Resistance to soldering heat	No deformation of components affecting performance.	Reflow: At the recommended temperature profile Manual soldering: 350℃ 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.

■Materials

Product	Part	Material	Finish	Remarks
Receptacles Headers	Insulator	LCP	Color : Black	UL94V-0
	Contacts	Phosphor bronze	Gold plated	————

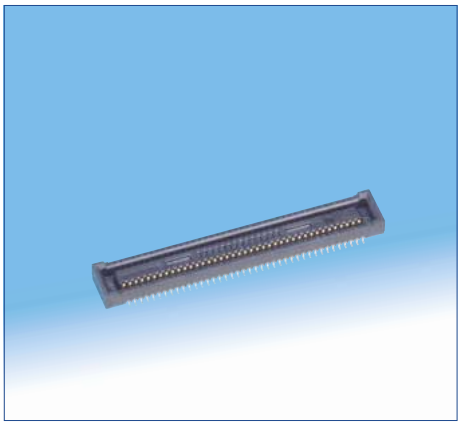
■Ordering information

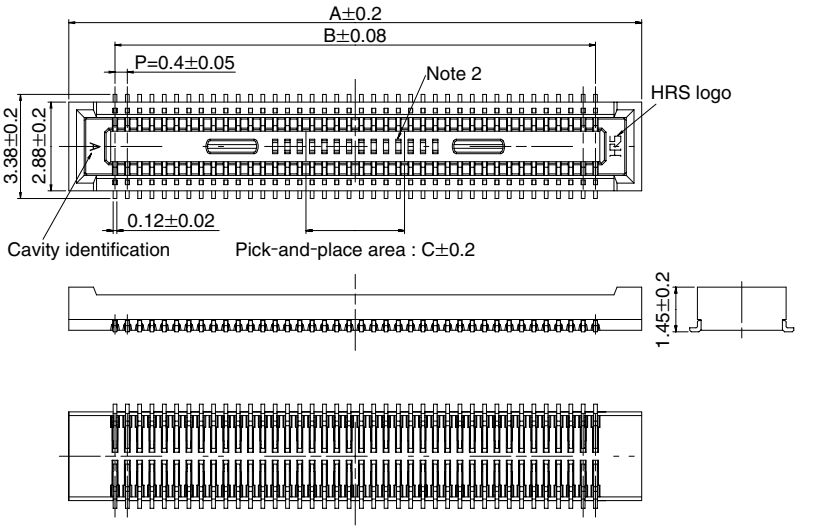
●Receptacles and Headers

DF40 C - ＊ DS - 0.4 V (＊＊)
❶ ❷ ❸ ❹ ❺ ❻ ❼

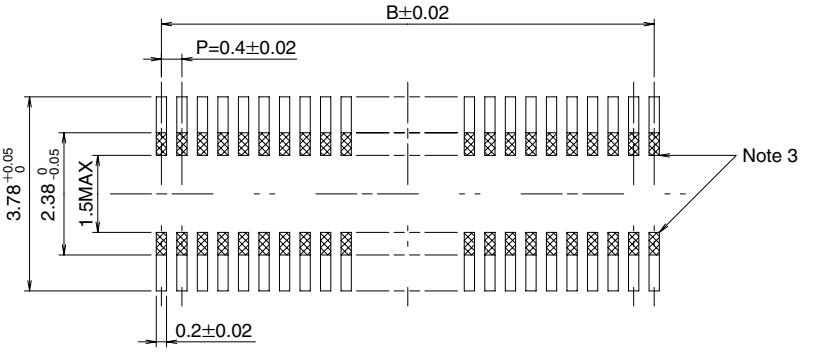
❶ Series name: DF40	❺ Contact pitch: 0.4 mm
❷ Configuration C: Without metal fittings, without bosses	❻ Terminal type V: SMT vertical mount
❸ Number of positions: 20, 24, 30, 40, 50, 60, 70, 80	❼ Packaging (51): Embossed tape packaging (5,000 pieces per reel)
❹ Connector type DS: Receptacle DP: Header	

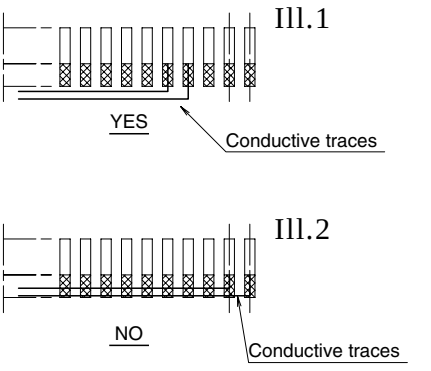
■Receptacles





◆Recommended PCB mounting pattern





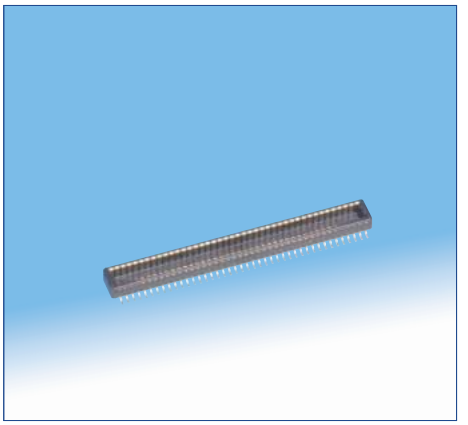
[Specification number]
(51): Embossed tape packaging (5,000 pieces per reel)

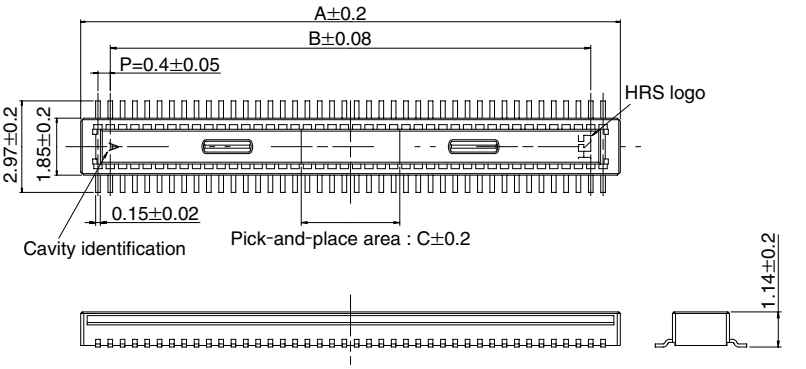
Unit: mm

Part number	CL No.	Number of contacts	A	B	C	RoHS
DF40C-20DS-0.4V(51)	684-4005-9-51	20	6.6	3.6	1.0	YES
DF40C-24DS-0.4V(51)	684-4006-1-51	24	7.4	4.4	1.2	
DF40C-30DS-0.4V(51)	684-4007-4-51	30	8.6	5.6	1.5	
DF40C-40DS-0.4V(51)	684-4008-7-51	40	10.6	7.6	3.2	
DF40C-50DS-0.4V(51)	684-4009-0-51	50	12.6	9.6	3.2	
DF40C-60DS-0.4V(51)	684-4004-6-51	60	14.6	11.6	3.2	
DF40C-80DS-0.4V(51)	684-4002-0-51	80	18.6	15.6	3.2	

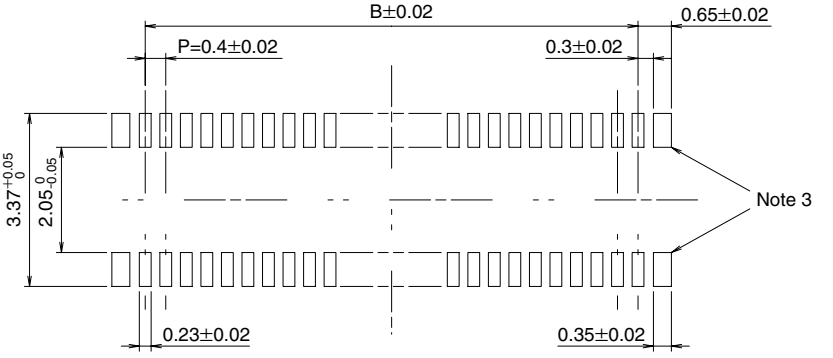
Note 1: Order by number of reels.
Note 2: Connectors with 60 or 80 contacts may have several recessed areas in this location. Pick-and-place operation will NOT be affected.
Note 3: No conductive traces through the areas indicated by ▨.
Refer to Ill.1 and Ill.2. for specific restrictions and exception to the above requirement.
Note 4: This connector is NOT polarized.

■Header





◆Recommended PCB mounting pattern



[Specification number]
(51): Embossed tape packaging (5,000 pieces per reel)

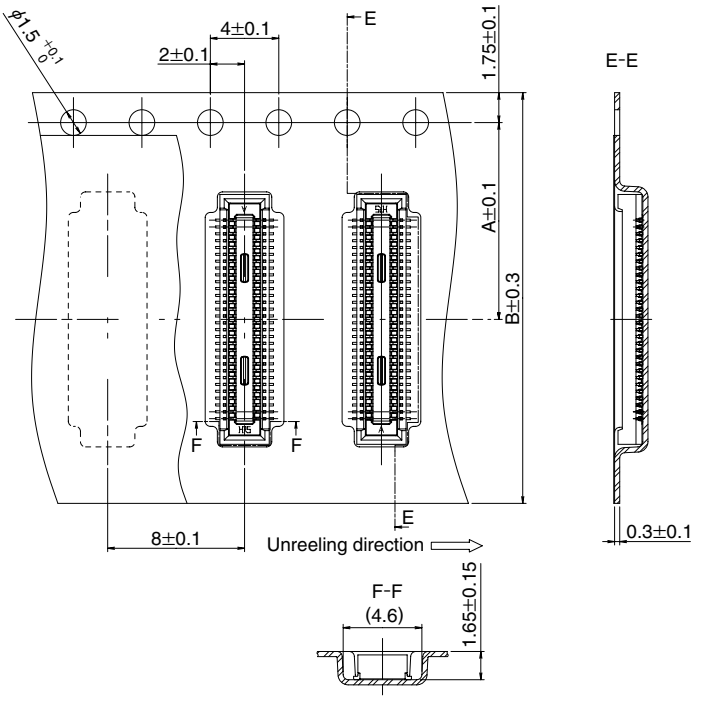
Unit: mm

Part number	CL No.	Number of contacts	A	B	C	RoHS
DF40C-20DP-0.4V(51)	684-4010-9-51	20	5.52	3.6	1.0	YES
DF40C-24DP-0.4V(51)	684-4011-1-51	24	6.32	4.4	1.2	
DF40C-30DP-0.4V(51)	684-4012-4-51	30	7.52	5.6	1.5	
DF40C-40DP-0.4V(51)	684-4013-7-51	40	9.52	7.6	3.2	
DF40C-50DP-0.4V(51)	684-4014-0-51	50	11.52	9.6	3.2	
DF40C-60DP-0.4V(51)	684-4003-3-51	60	13.52	11.6	3.2	
DF40C-80DP-0.4V(51)	684-4001-8-51	80	17.52	15.6	3.2	

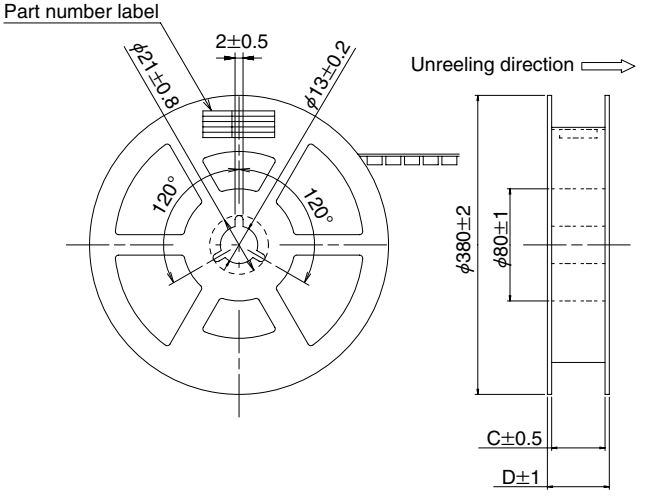
Note 1: Order by number of reels.
Note 2: 60 or 80 positions connectors will not have small interlock indentations in the contact areas.
Note 3: The contacts in each of the 4 corners serve as metal solder brackets only and should NOT be used for current carrying.
Note 4: Location of the HRS logo and cavity identification mark may differ from what is shown.
Note 5: This connector is not polarized.

■Packaging Specification

● Embossed Carrier Tape Dimensions - Receptacle



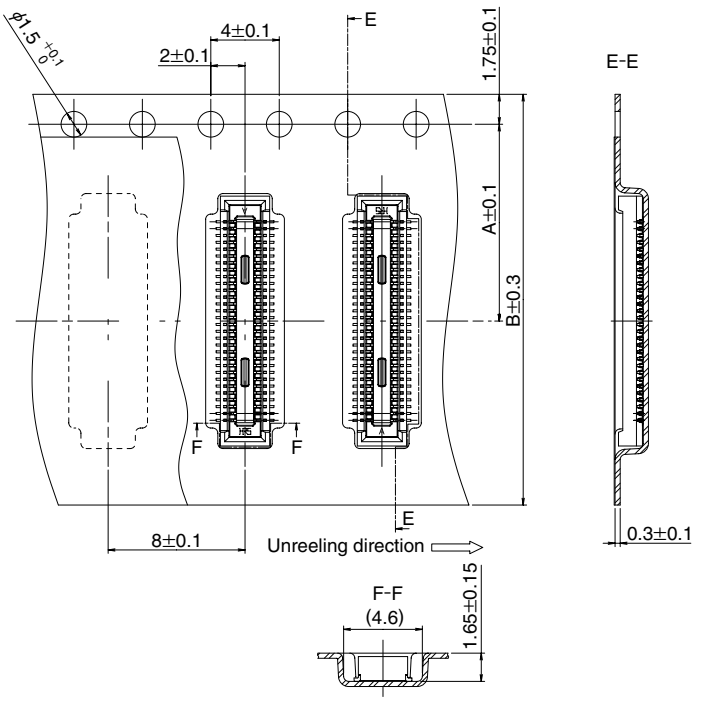
● Reel Dimensions



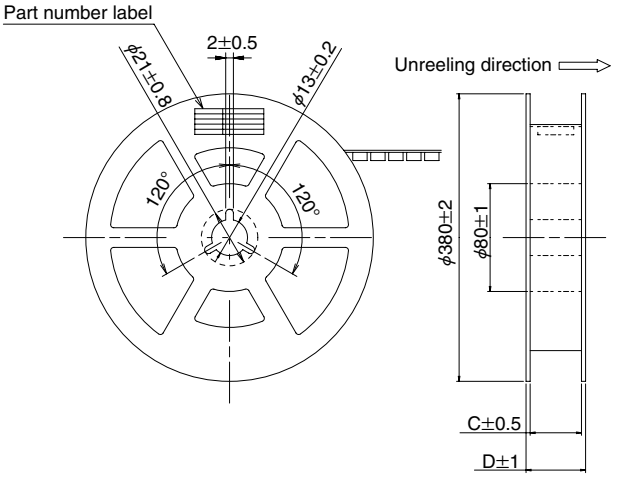
Unit: mm

Part Number	A	B	C	D
DF40C-20DS-0.4V(51)	16.0	7.5	17.5	21.5
DF40C-24DS-0.4V(51)	16.0	7.5	17.5	21.5
DF40C-30DS-0.4V(51)	24.0	11.5	25.5	29.5
DF40C-40DS-0.4V(51)	24.0	11.5	25.5	29.5
DF40C-50DS-0.4V(51)	24.0	11.5	25.5	29.5
DF40C-60DS-0.4V(51)	24.0	11.5	25.5	29.5
DF40C-80DS-0.4V(51)	32.0	14.2	33.5	37.5

● Embossed Carrier Tape Dimensions - Header



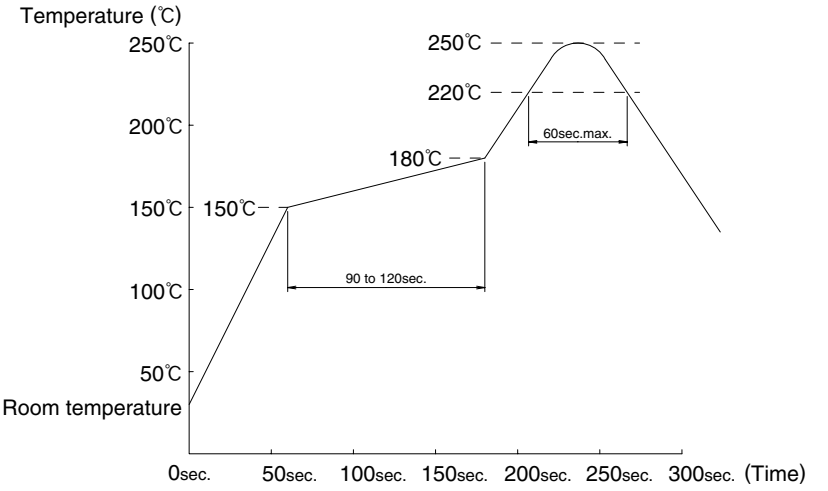
● Reel Dimensions



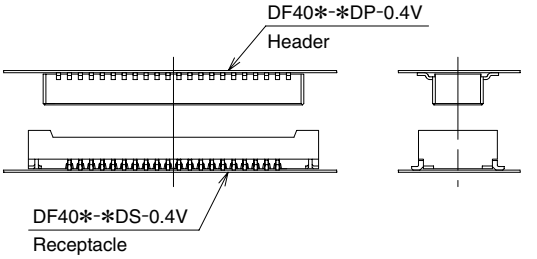
Unit: mm

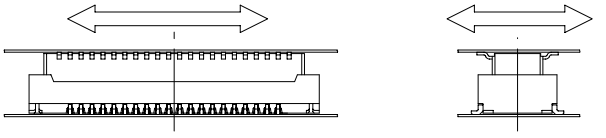
Part Number	A	B	C	D
DF40C-20DP-0.4V(51)	16.0	7.5	17.5	21.5
DF40C-24DP-0.4V(51)	16.0	7.5	17.5	21.5
DF40C-30DP-0.4V(51)	16.0	7.5	17.5	21.5
DF40C-40DP-0.4V(51)	24.0	11.5	25.5	29.5
DF40C-50DP-0.4V(51)	24.0	11.5	25.5	29.5
DF40C-60DP-0.4V(51)	24.0	11.5	25.5	29.5
DF40C-80DP-0.4V(51)	32.0	14.2	33.5	37.5

Usage Recommendations

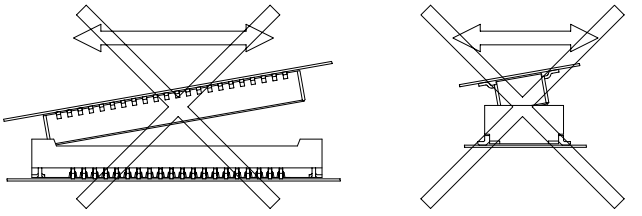
1.Recommended temperature profile	 Note 1: Up to 2 cycles of Reflow soldering are possible under the same conditions, provided that there is a return to normal temperature between the first and second cycle. Note 2: The temperature profile indicates the board surface temperature at the point of contacts with the connector terminals.
2.Recommended manual soldering	Manual soldering: 340±10℃ for 3 seconds
3.Recommended screen thickness and open area ratio (Pattern area ratio)	Thickness: 0.12 mm Open area ratio: 80%
4.Board warpage	Maximum of 0.02 mm at the connector center, with both ends of the connector as reference points.
5.Cleaning conditions	Refer to “Nylon Connector Use Handbook”.
6.Precautions	✻ 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. ■ Mated connectors should not carry weight of the board by themselves. Provide some other support of the boards. ■ 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. ■ Exercise extreme caution when mating/ un-mating when the connector is mounted on a non-rigid (flexible) substrate. ■ Do NOT pull on the flexible substrate. ■ Slight discoloration on the insulating materials will not affect form, fit or function of the connectors.

◆Handling Precautions when mating the connectors

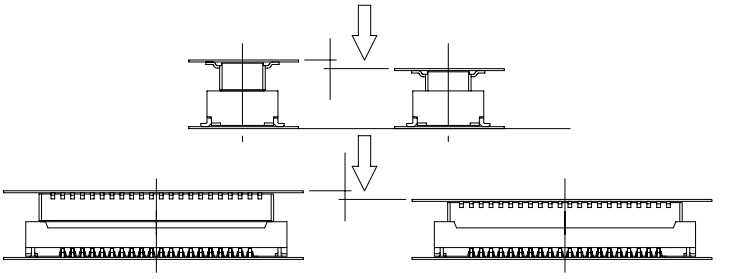




Keep the connectors parallel to each other when positioning

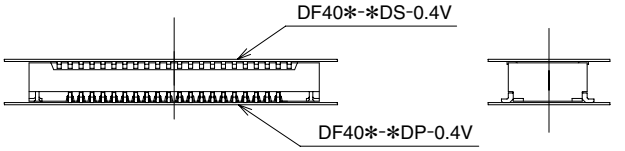
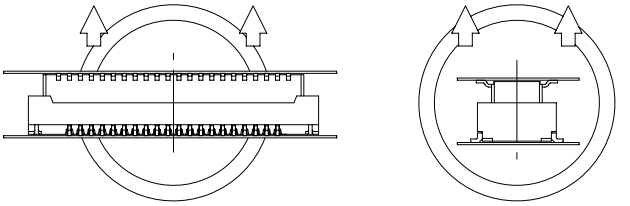
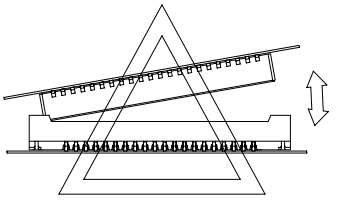
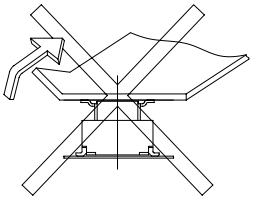


Do not attempt to mate the connectors staring at one end or side.



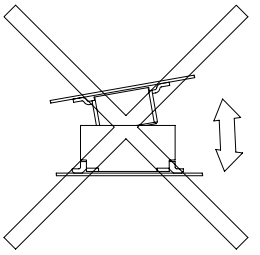
Press-down evenly until slight resistance is felt.
Overcoming this slight resistance will complete the mating receptacle with the header. A definite “click” sensation will confirm the fully mated condition.

Handling Precautions when un-mating the connectors

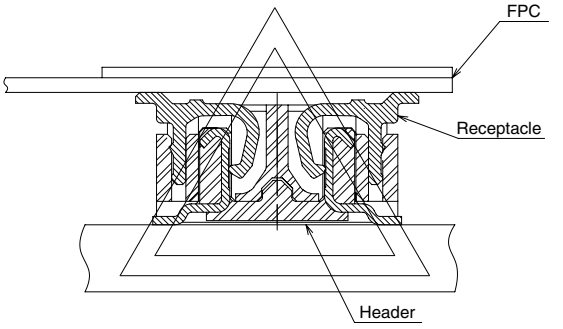
<table>
<tr>
<td> 
</td>
<td>Fully mated</td>
</tr>
<tr>
<td>  </td>
<td>Lift even one side, keeping both boards parallel to each other.</td>
</tr>
<tr>
<td> 
Pitch Orientation

Corner Orientation</td>
<td>When handling, circumstances prevent the connector from being kept level during the un-mating. One end may be lifted separate as shown.

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 connectors or solder joints.

Do not attempt the start of the un-mating of the connectors from one side or corner.</td>
</tr>
<tr>
<td> 
Width Orientation</td>
<td>When un-mating is from the width orientation, as illustrated in the diagram to the left, connector could be damaged. Do not remove from the width orientation.</td>
</tr>
</table>

Handling Precautions when un-mating the connectors



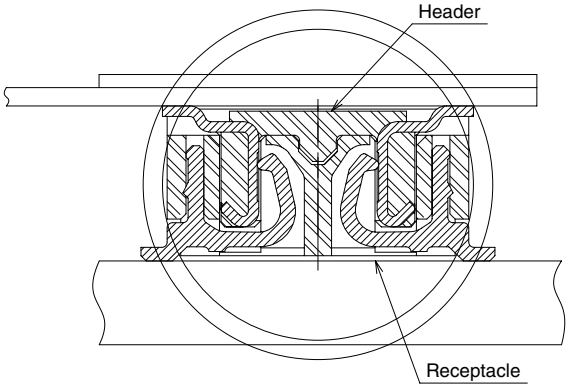
Low rigidity FPC should not be used for mounting of the receptacle.

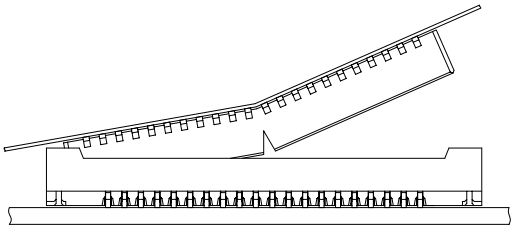
Un-mating of the connectors when the receptacle is mounted on the extremely flexible FPC can result in solder joint failure or damage to the connector itself.

It is highly recommended that the receptacle be mounted on the rigid PCB and the header on the FPC.

Contact HRS when specific application requires mounting of the receptacle on the FPC.

All published performance data is based on connectors mounted on rigid FPC and PCB.





Failure to exercise caution when un-mating connectors mounted on the non-rigid FPC may also result in connector breakage.