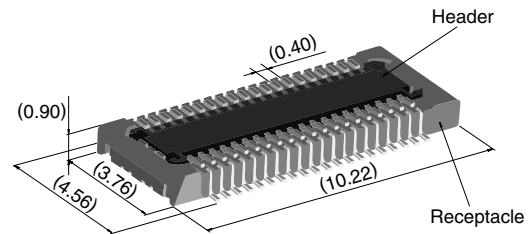


# 0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-FPC Connectors

## DF30 Series



### Extremely small size



40 positions shown

### 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.

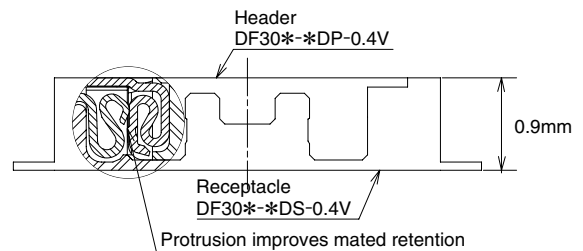
### Applications

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

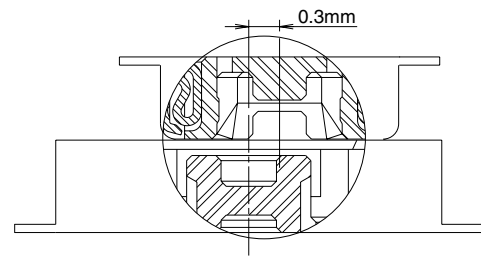
#### Low profile

#### Increased mated retention

#### High contact reliability



### Self alignment



## 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: 300°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.

## 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-copper plated	————

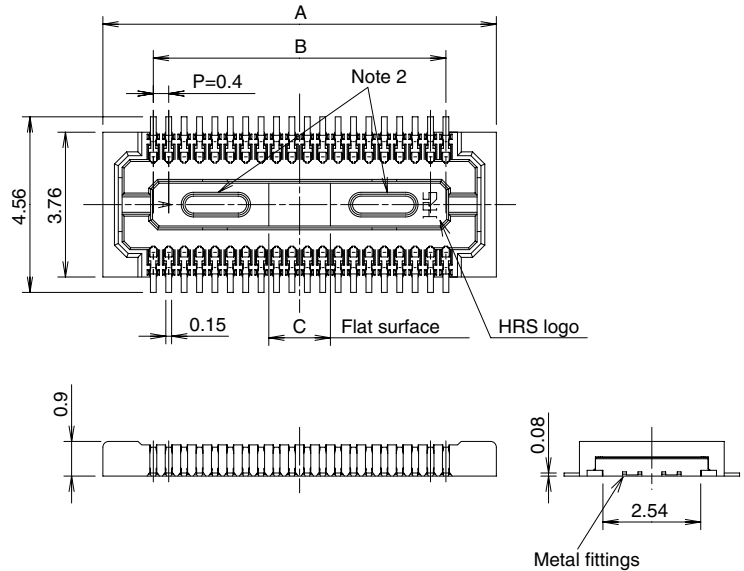
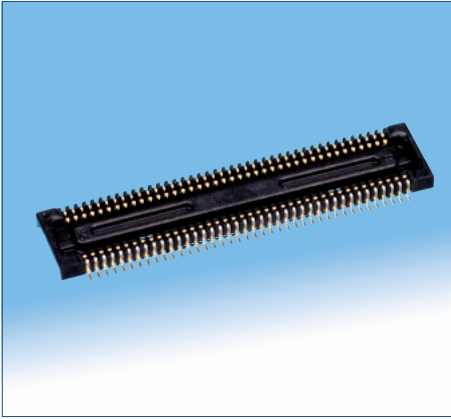
## Ordering information

### Receptacles and Headers

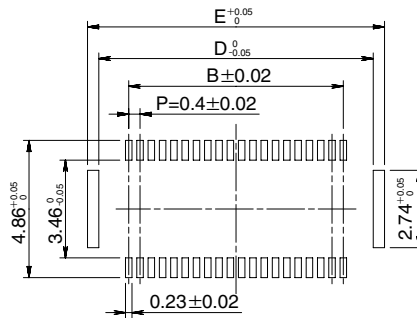
**DF30**   **FC** -   **\***   **DS - 0.4**   **V**   **(\*\*)**  
 ①   ②   ③   ④   ⑤   ⑥   ⑦

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  $\mu\text{m}$

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

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

\* Tolerances non- accumulative.

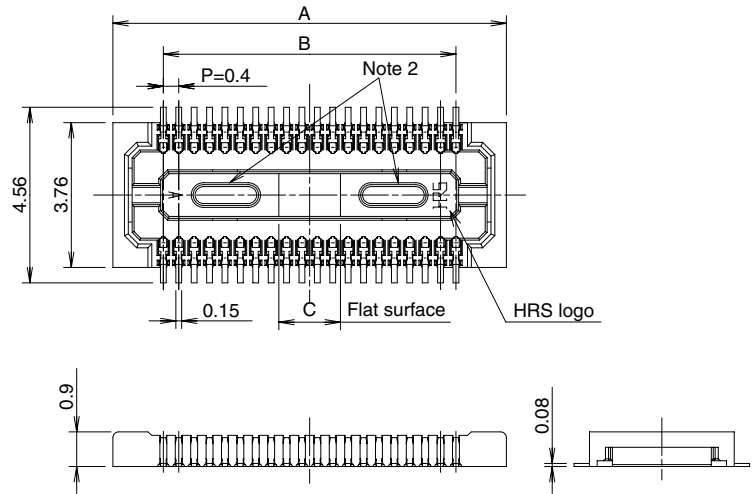
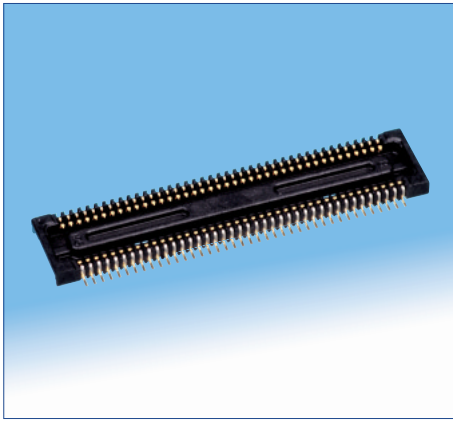
Unit: mm

Part Number	CL No.	Number of contacts	A	B	C	D	E
DF30FB-20DS-0.4V(**)	CL684-1098-3-**	20	6.22	3.6	1.2	5.72	6.52
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

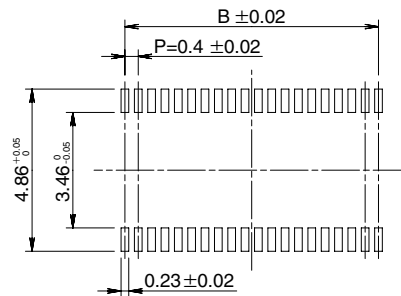
Note 1: Order by number of reels.

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

## ■ 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)

\* Tolerances non- accumulative.

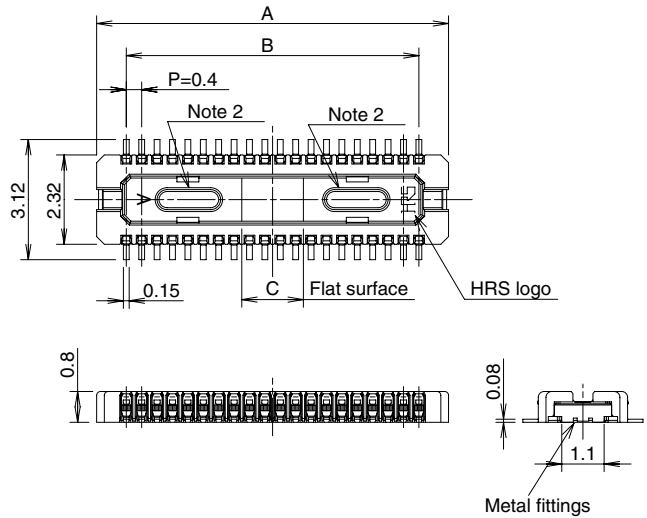
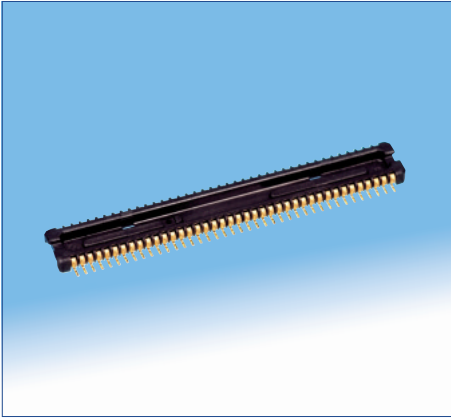
Unit: mm

Part Number	CL No.	Number of contacts	A	B	C
DF30FC-20DS-0.4V(**)	CL684-1109-8-**	20	6.22	3.6	1.2
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

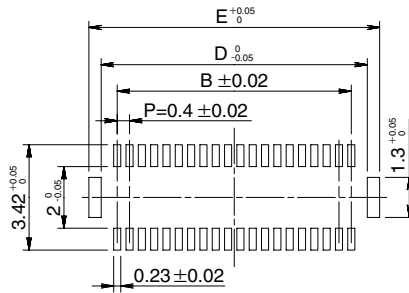
Note 1: Order by number of reels.

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

## Header (with metal fittings)



## Recommended PCB mounting pattern



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

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

\* Tolerances non- accumulative.

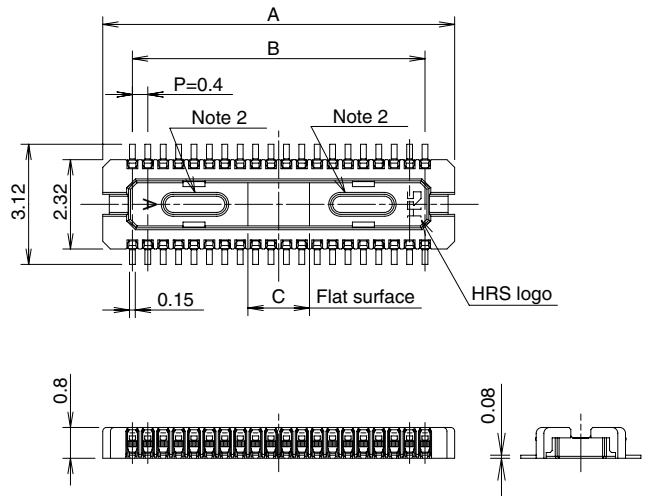
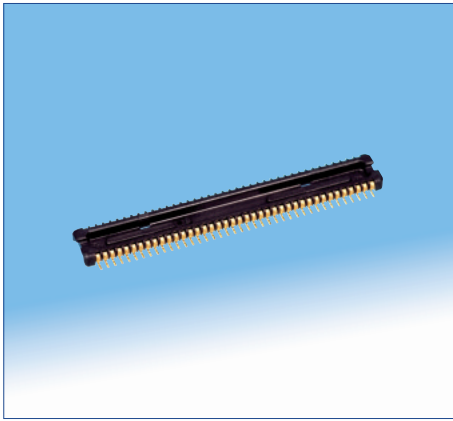
Unit: mm

Part Number	CL No.	Number of contacts	A	B	C	D	E
DF30FB-20DP-0.4V(**)	CL684-1129-5-**-	20	5.14	3.6	1.2	4.64	5.44
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

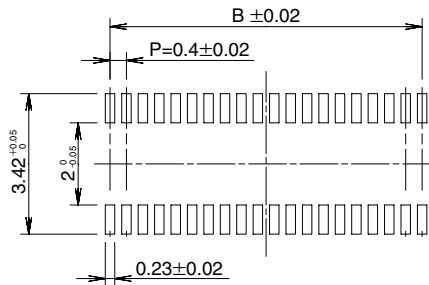
Note 1: Order by number of reels.

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

## ■ Header (without metal fittings)



## ◆ Recommended PCB mounting pattern



Recommended solder paste thickness: 120  $\mu$ m

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

\* Tolerances non- accumulative.

Unit: mm

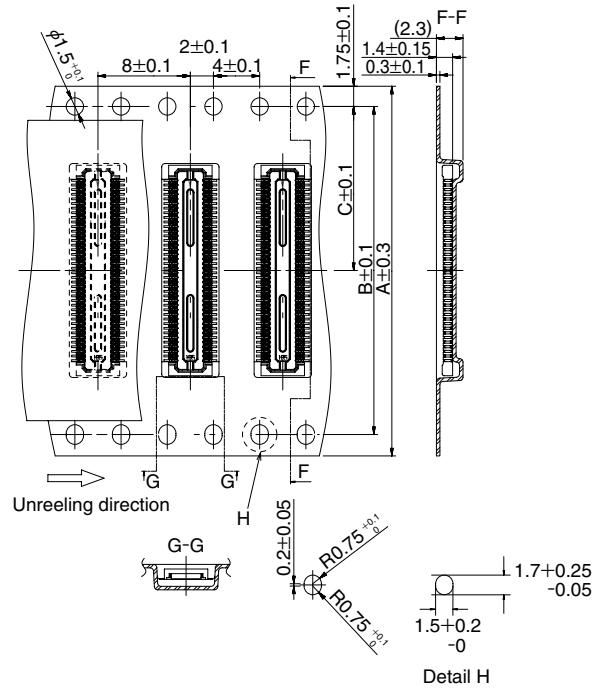
Part Number	CL No.	Number of contacts	A	B	C
DF30FC-20DP-0.4V(**)	CL684-1138-6-**	20	5.14	3.6	1.2
DF30FC-22DP-0.4V(**)	CL684-1139-9-**	22	5.54	4.0	1.2
DF30FC-24DP-0.4V(**)	CL684-1140-8-**	24	5.94	4.4	1.2
DF30FC-30DP-0.4V(**)	CL684-1141-0-**	30	7.14	5.6	1.2
DF30FC-34DP-0.4V(**)	CL684-1142-3-**	34	7.94	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.

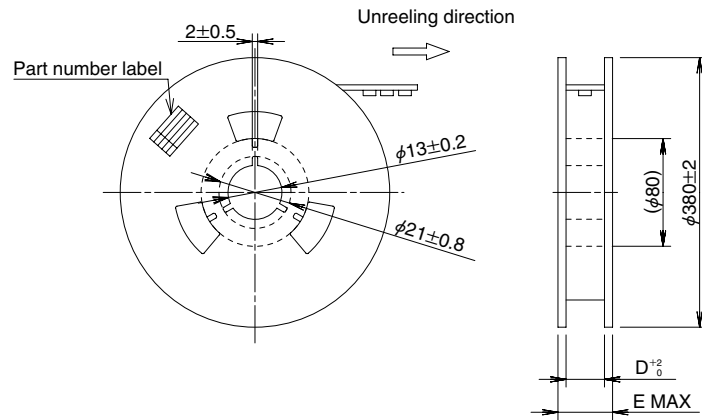
Note 2: Headers with 24 or fewer contacts positions will not have protruding areas.

## ◆ Packaging Specification

### ● Embossed Carrier Tape Dimensions - Receptacle



### ● Reel Dimensions

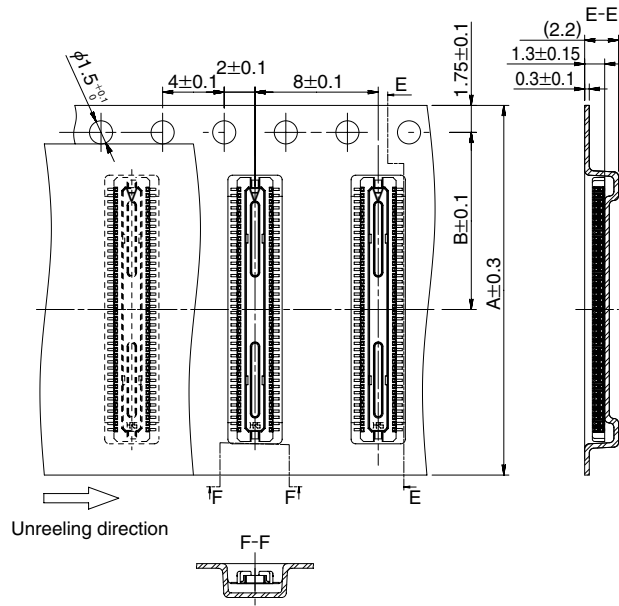


Unit: mm

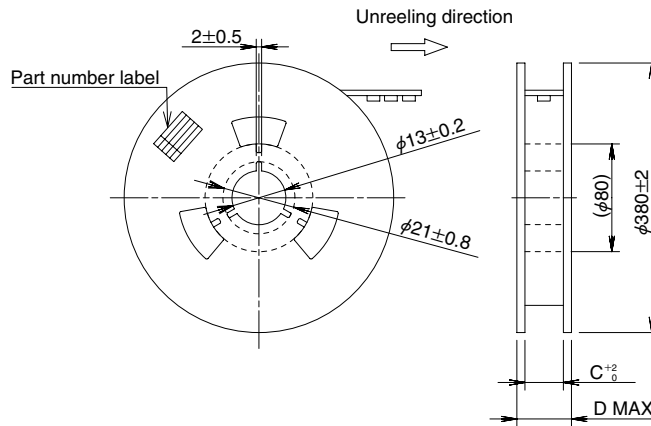
Part Number	A	B	C	D	E
DF30#-20DS-0.4V(**)	16.0	—	7.5	16.4	22.4
DF30#-22DS-0.4V(**)	16.0	—	7.5	16.4	22.4
DF30#-24DS-0.4V(**)	16.0	—	7.5	16.4	22.4
DF30#-30DS-0.4V(**)	16.0	—	7.5	16.4	22.4
DF30#-34DS-0.4V(**)	16.0	—	7.5	16.4	22.4
DF30#-40DS-0.4V(**)	24.0	—	11.5	24.4	30.4
DF30#-50DS-0.4V(**)	24.0	—	11.5	24.4	30.4
DF30#-60DS-0.4V(**)	24.0	—	11.5	24.4	30.4
DF30#-70DS-0.4V(**)	24.0	—	11.5	24.4	30.4
DF30#-80DS-0.4V(**)	32.0	28.4	14.2	32.4	38.4

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

● Embossed Carrier Tape Dimensions - Header



● Reel Dimensions

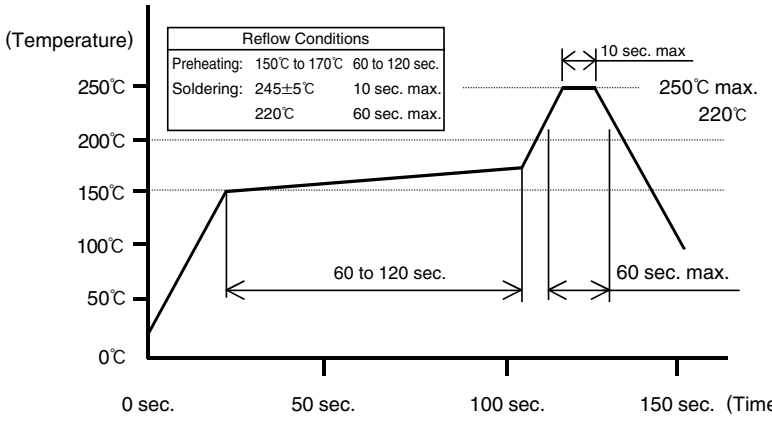


Unit: mm

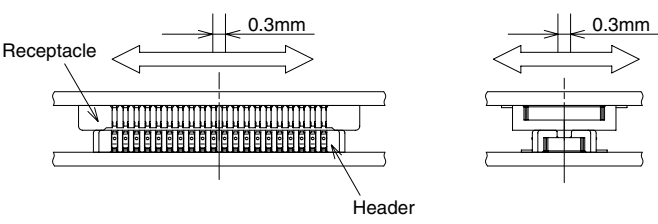
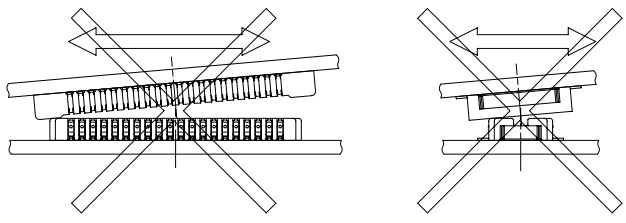
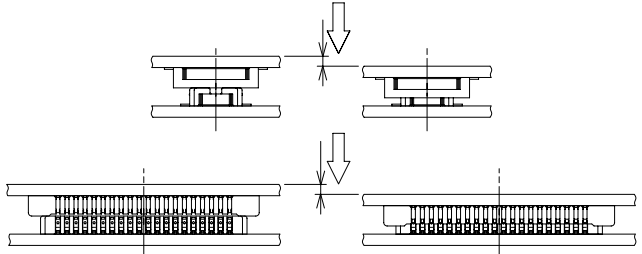
Part Number	A	B	C	D
DF30#-20DP-0.4V(**)	16.0	7.5	16.4	22.4
DF30#-22DP-0.4V(**)	16.0	7.5	16.4	22.4
DF30#-24DP-0.4V(**)	16.0	7.5	16.4	22.4
DF30#-30DP-0.4V(**)	16.0	7.5	16.4	22.4
DF30#-34DP-0.4V(**)	16.0	7.5	16.4	22.4
DF30#-40DP-0.4V(**)	16.0	7.5	16.4	22.4
DF30#-50DP-0.4V(**)	24.0	11.5	24.4	30.4
DF30#-60DP-0.4V(**)	24.0	11.5	24.4	30.4
DF30#-70DP-0.4V(**)	24.0	11.5	24.4	30.4
DF30#-80DP-0.4V(**)	24.0	11.5	24.4	30.4



## ◆ Usage Recommendations

<p>1. Recommended temperature profile</p>	 <p style="text-align: center;">(Temperature)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">Reflow Conditions</th> </tr> </thead> <tbody> <tr> <td>Preheating:</td> <td>150°C to 170°C 60 to 120 sec.</td> </tr> <tr> <td>Soldering:</td> <td>245±5°C 10 sec. max.</td> </tr> <tr> <td></td> <td>220°C 60 sec. max.</td> </tr> </tbody> </table> <p style="text-align: center;">0 sec.      50 sec.      100 sec.      150 sec. (Time)</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>	Reflow Conditions		Preheating:	150°C to 170°C 60 to 120 sec.	Soldering:	245±5°C 10 sec. max.		220°C 60 sec. max.
Reflow Conditions									
Preheating:	150°C to 170°C 60 to 120 sec.								
Soldering:	245±5°C 10 sec. max.								
	220°C 60 sec. max.								
<p>2. Recommended manual soldering</p>	<p>Manual soldering: 290±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>■ Use of fluxes is NOT recommended.</li> <li>■ Different production lots may exhibit some discoloration of the insulator material. This will not affect form, fit or function of the connectors.</li> <li>■ The connectors should not be used a sole PCB support. It is recommended to use additional means of board support.</li> </ul>								

## ◆ Handling Precautions when mating the connectors

	<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>Fully mated</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>