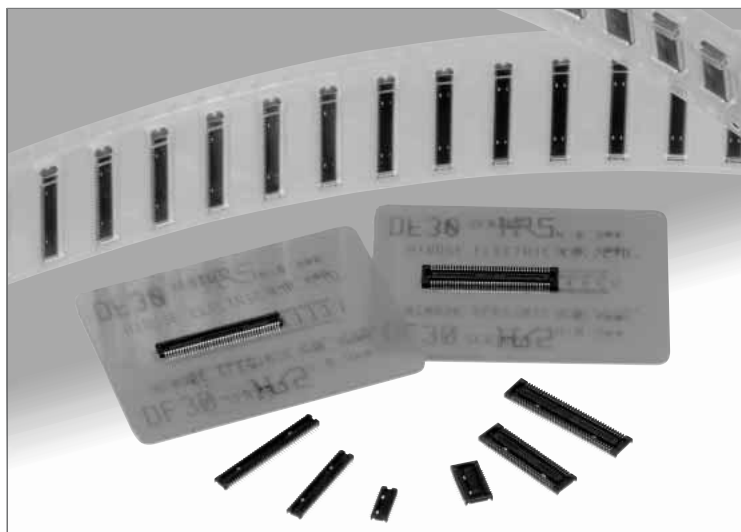
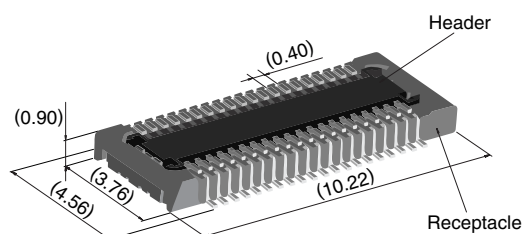


# 0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-FPC Connectors

## 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.

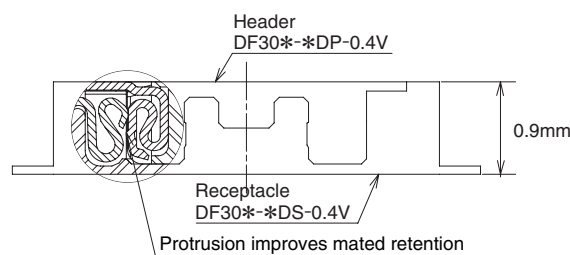
### Applications

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

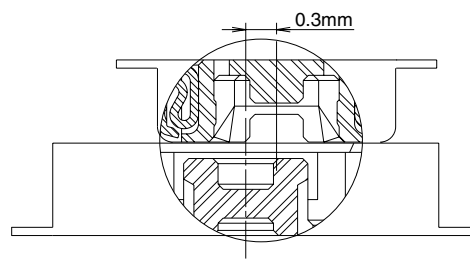
### Low profile

### Increased mated retention

### High contact reliability



### Self alignment



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

Product Specifications

|        |                                            |                                                                                                               |                                                                                                                |
|--------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Rating | Rated current 0.3A<br>Rated voltage 30V AC | Operating temperature range : -35℃ to 85℃ (Note 1)<br>Operating humidity range : Relative humidity 20% to 80% | Storage temperature range -10℃ to 60℃ (Note 2)<br>Storage humidity range Relative humidity 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                     | 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.<br>Insulation resistance: 25 MΩ min. | 96 hours at temperature of 40℃±2℃ and RH of 90% to 95%                                       |
| 6. Temperature cycle                      | Contact resistance: 100 mΩ max.<br>Insulation resistance: 50 MΩ min. | Temperature: -55℃→+5℃ to +35℃→+85℃→+5℃ to +35℃<br>Duration: 30→10→30→10(Minutes)<br>5 cycles |
| 7. Durability<br>(insertions/withdrawals) | Contact resistance: 100 mΩ max.                                      | 50 cycles(Connector for conductivity tests: 500 cycles)                                      |
| 8. Resistance to<br>soldering heat        | No deformation of components<br>affecting performance.               | Reflow: At the recommended temperature profile<br>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.  
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<br>and<br>Headers | Insulator      | LCP             | Color : Black | UL94V-0 |
|                               | Contacts       | Phosphor bronze | Gold plated   | _____   |
|                               | Metal fittings | Phosphor bronze | Tin plated    | _____   |

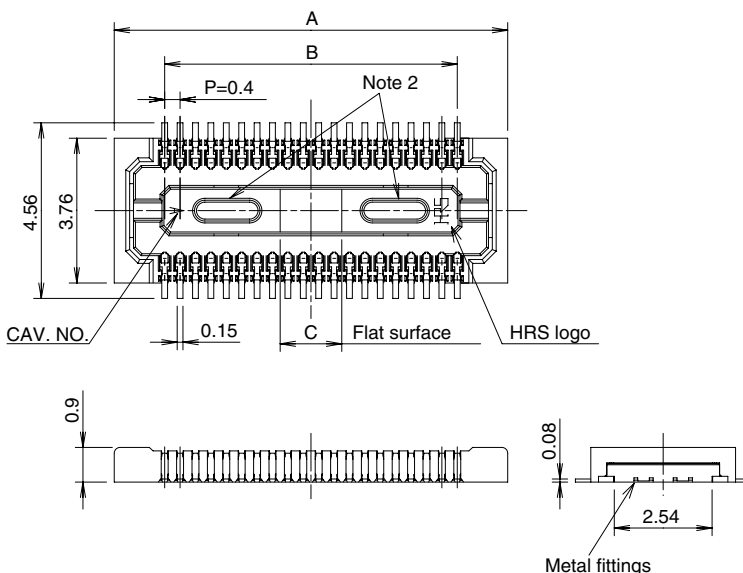
Ordering information

Receptacles and Headers

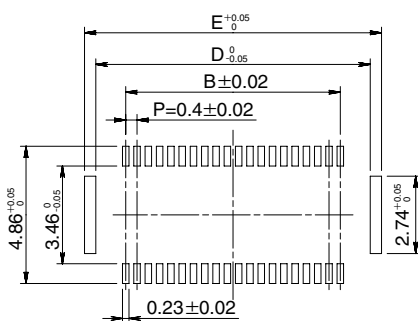
DF30    FC    \*    DS - 0.4    V    (\*\*)   
 ①       ②       ③       ④       ⑤       ⑥       ⑦

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

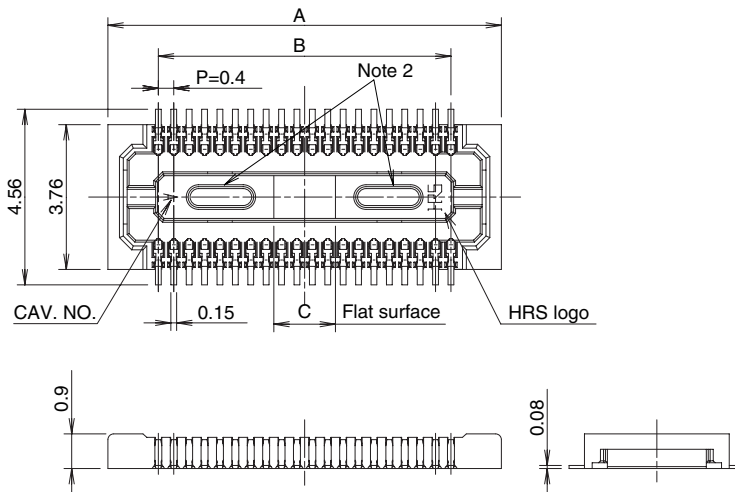
| Unit: mm             |                  |                    |       |      |      |       |       | RoHS |
|----------------------|------------------|--------------------|-------|------|------|-------|-------|------|
| Part Number          | CL No.           | Number of contacts | A     | B    | C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

Note 1: Order by number of reels.

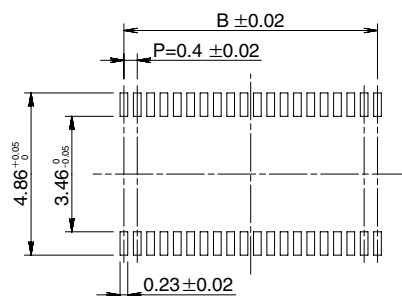
Note 2: Receptacles with 24 or fewer contacts positions will not have recessed areas.

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

### ■Receptacles (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)

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

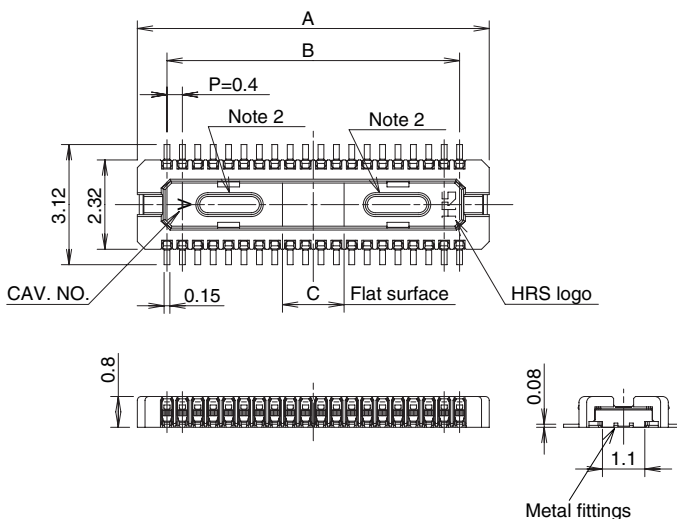
Unit: mm

| 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  |      |

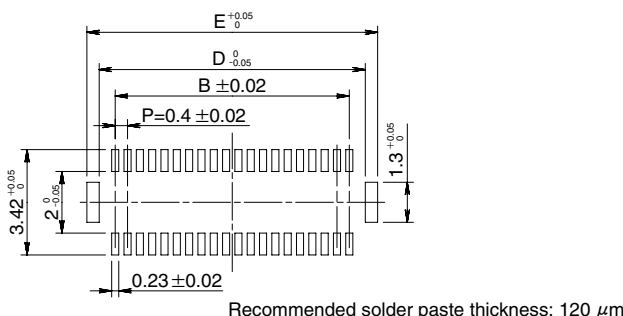
Note 1: Order by number of reels.

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)

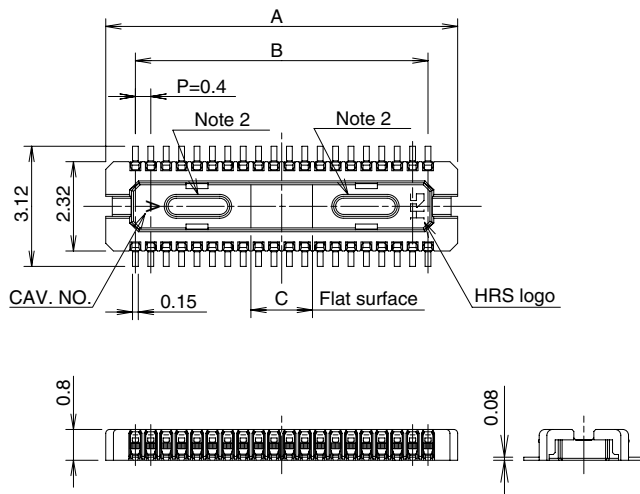
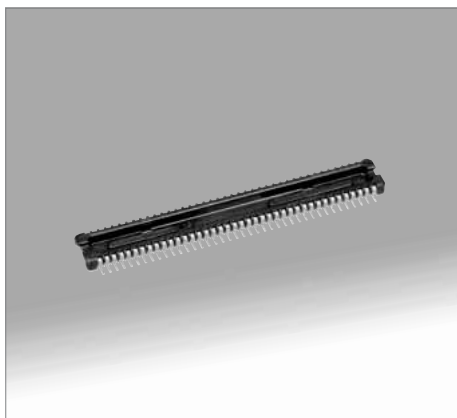
| Unit: mm             |                  |                    |       |      |      |       |       | RoHS |
|----------------------|------------------|--------------------|-------|------|------|-------|-------|------|
| Part Number          | CL No.           | Number of contacts | A     | B    | C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

Note 1: Order by number of reels.

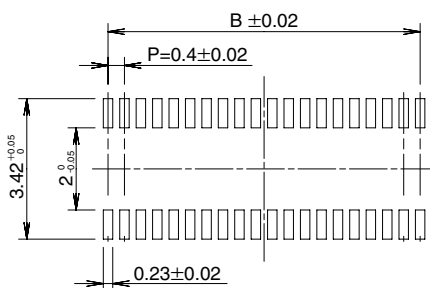
Note 2: Headers with 24 or fewer contacts positions will not have protruding areas.

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

### 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)

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

Unit: mm

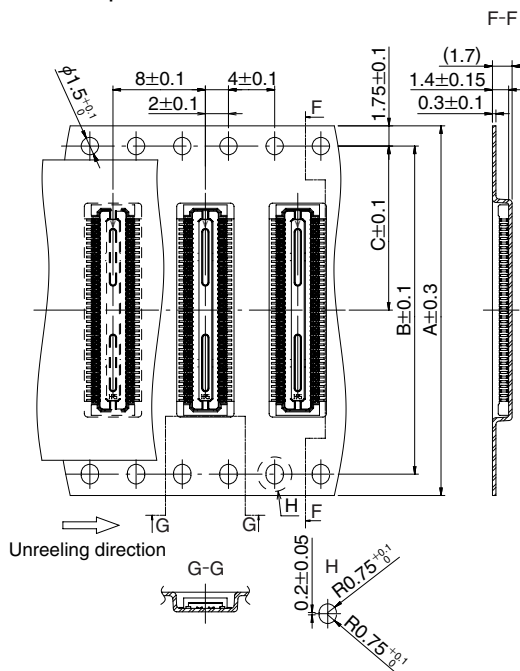
| Part Number          | CL No.           | Number of contacts | A     | B    | C    | RoHS |
|----------------------|------------------|--------------------|-------|------|------|------|
| DF30FC-20DP-0.4V(**) | CL684-1138-6-**- | 20                 | 5.14  | 3.6  | 1.2  | YES  |
| DF30FC-22DP-0.4V(**) | 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.

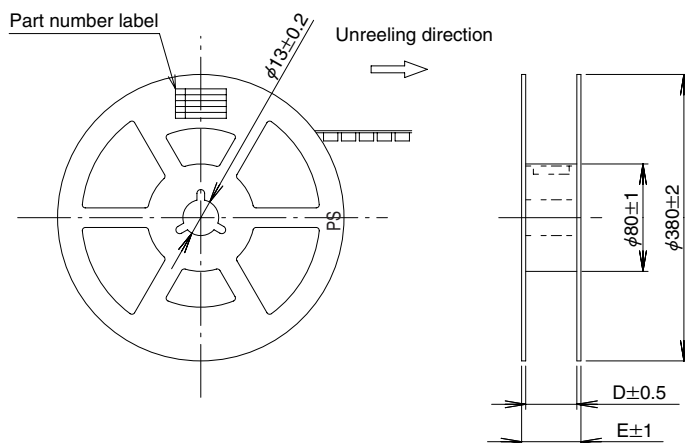
Note 2: Headers with 24 or fewer contacts positions will not have protruding areas.

## ◆ Packaging Specification

### ● Embossed Carrier Tape Dimensions - Receptacle



### ● Reel Dimensions

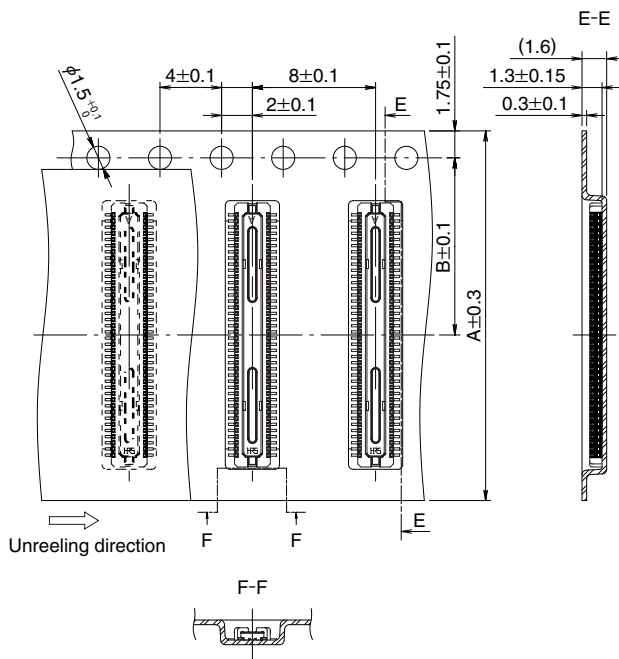


Unit: mm

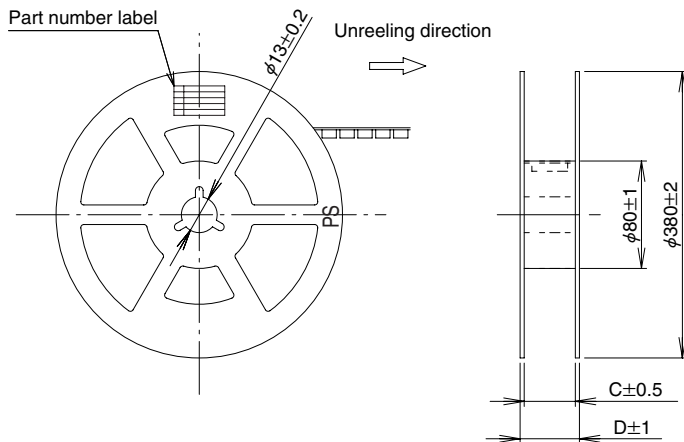
| Part Number         | A    | B    | C    | D    | E    |
|---------------------|------|------|------|------|------|
| DF30#-20DS-0.4V(**) | 16.0 | —    | 7.5  | 17.5 | 21.5 |
| DF30#-22DS-0.4V(**) | 16.0 | —    | 7.5  | 17.5 | 21.5 |
| DF30#-24DS-0.4V(**) | 16.0 | —    | 7.5  | 17.5 | 21.5 |
| DF30#-30DS-0.4V(**) | 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.

### ● Embossed Carrier Tape Dimensions - Header



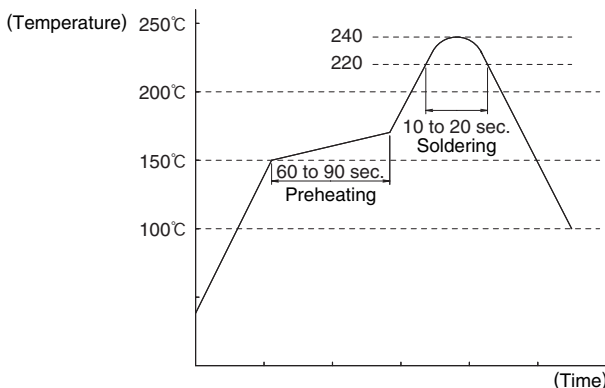
### ● Reel Dimensions



Unit: mm

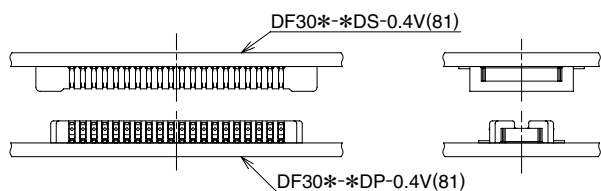
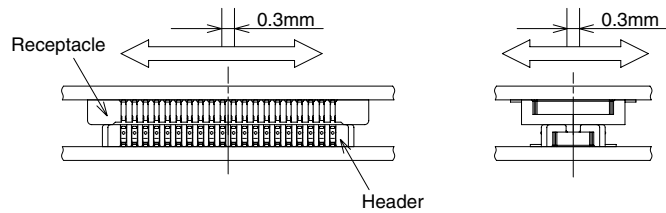
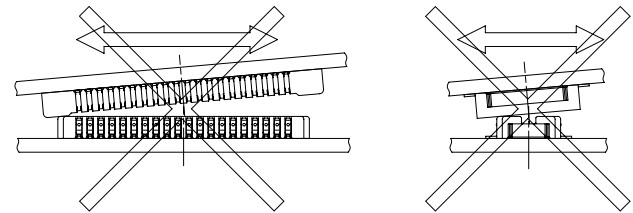
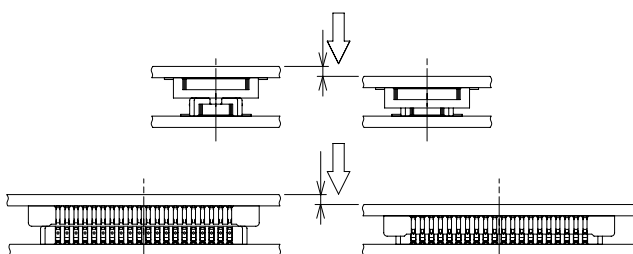
| Part Number         | A    | B    | C    | D    |
|---------------------|------|------|------|------|
| DF30#-20DP-0.4V(**) | 16.0 | 7.5  | 17.5 | 21.5 |
| DF30#-22DP-0.4V(**) | 16.0 | 7.5  | 17.5 | 21.5 |
| DF30#-24DP-0.4V(**) | 16.0 | 7.5  | 17.5 | 21.5 |
| DF30#-30DP-0.4V(**) | 16.0 | 7.5  | 17.5 | 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

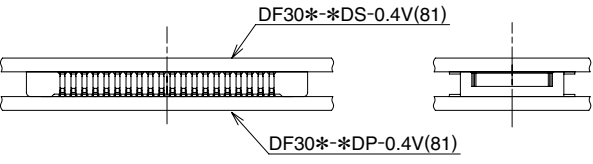
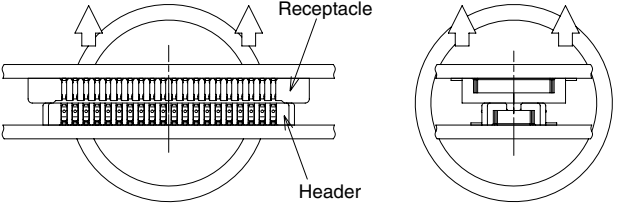
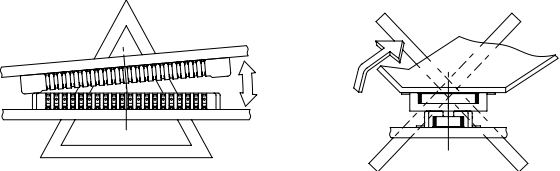
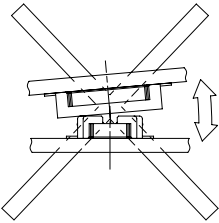
|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Recommended temperature profile                                       |  <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. Recommended manual soldering                                          | Manual soldering: 340±10°C for 3 seconds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. Recommended screen thickness and open area ratio (Pattern area ratio) | Thickness: 0.12 mm<br>Opening are ratio: DS side 100%, DP side 84%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 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                                                           | <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.<br/>Provide some other support of the boards.</li> <li>■ When mating/un-mating do not twist or lift by the corners.<br/>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-FPC 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>0.3mm</p> <p>Header</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.<br/>             Overcoming this slight resistance will complete the mating of receptacle with the header.<br/>             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.<br/>However, to utilize this procedure the connector must be mounted on a sufficiently rigid circuit board.<br/>Any deflection of the board during this operation may result in damage to the connector or solder joints.<br/>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>                                                                                                                                                                                                                                                                              |