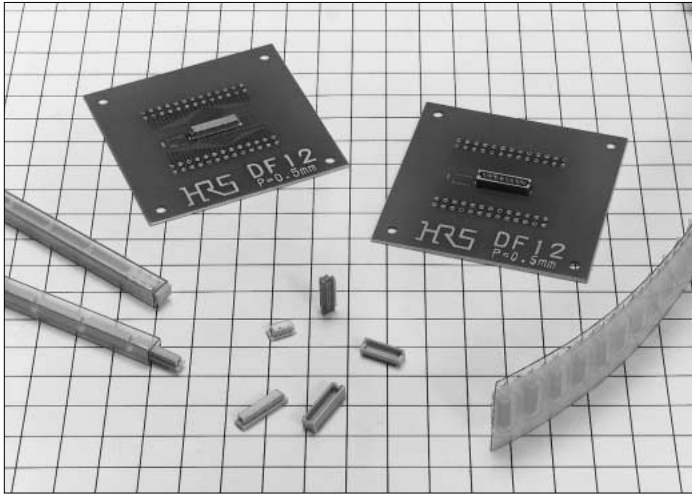


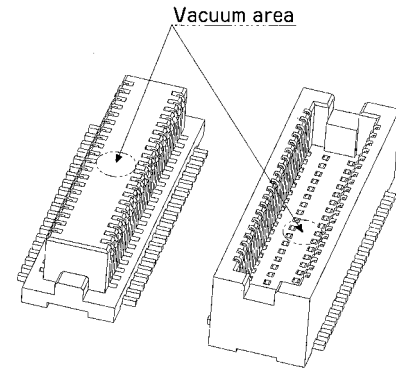
# 0.5mm Pitch SMT Board to Board Connector

## DF12 Series



### Correspond to automatic mounting

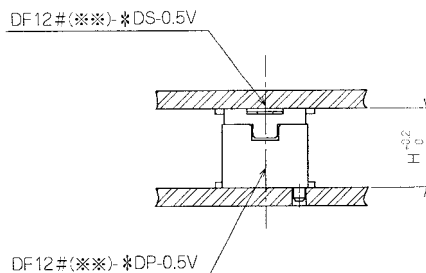
The vacuum pick-up area secures the automatic mounting machine for pick and place.



## ■Features

### 1. Broad Variations of Stacking Height

In addition to 0.5mm pitch ultra-miniature size connector, the stacking height of 3mm, 3.5mm, 4mm, and 5mm are provided.



| Header/Receptacle   | DF12#(3.0)-*DS-0.5V<br>Combination stacking height | DF12#-*DS-0.5V<br>Combination stacking height |
|---------------------|----------------------------------------------------|-----------------------------------------------|
| DF12#(3.0)-*DP-0.5V | 3.0                                                | ———                                           |
| DF12#(3.5)-VDP-0.5V | ———                                                | 3.5                                           |
| DF12#(4.0)-*DP-0.5V | ———                                                | 4.0                                           |
| DF12#(5.0)-*DP-0.5V | ———                                                | 5.0                                           |

Note 1 : (\*\*) of the product name DF12# (\*\*) indicates the stacking height.

Note 2 : The stacking height doesn't include the soldering paste thickness.

### [Stacking Height Variation]

| Stacking Height    |             | 3.0mm | 3.5mm | 4.0mm | 5.0mm |
|--------------------|-------------|-------|-------|-------|-------|
| Number of Contacts | 20 contacts | ○     | ○     | ○     | ○     |
|                    | 30 contacts | ○     | ○     | ○     | ○     |
|                    | 32 contacts | ○     | ———   | ———   | ———   |
|                    | 38 contacts | ○     | ○     | ○     | ○     |
|                    | 40 contacts | ○     | ○     | ○     | ○     |
|                    | 50 contacts | ○     | ○     | ○     | ○     |
|                    | 60 contacts | ○     | ○     | ○     | ○     |

### 2. Corresponding to Automatic Mounting

The connector has the vacuum pick-up area to enable automatic mounting with the embossed tape packaging.

### 3. Metal Fitting Available

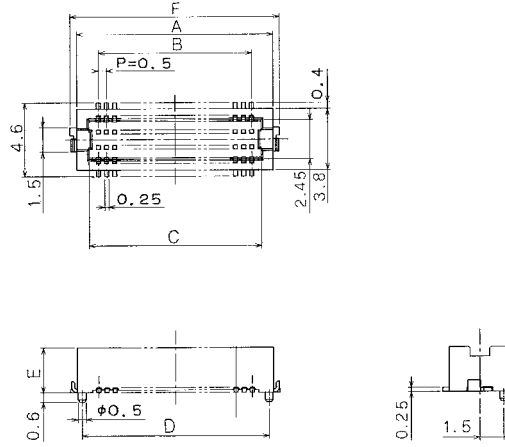
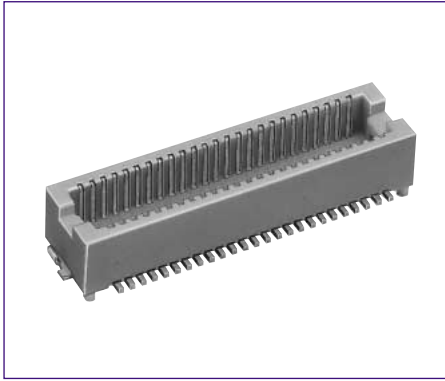
The product including the metal fitting to prevent solder peeling is provided, considering the mounting on FPC.

## ■Applications

Mobile phone, LCD(Liquid Crystal Display), MO(Optical Disk), Note PC



## Header With metal fitting



[Specific No.] – \*\*, (\*\*)  
(81): Gold plating embossed tape packaging

Unit: mm

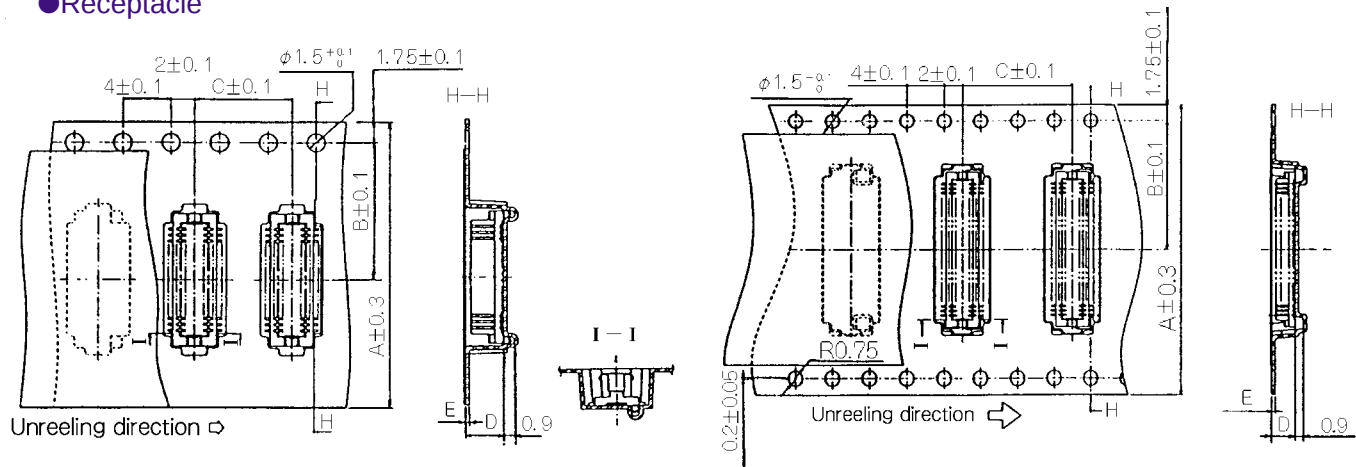
### ●Stacking Height: 3.5~5mm Product

| Product No.                | HRS No.          | Number of Contacts | A    | B    | C    | D    | E   | F    | Remarks                            |
|----------------------------|------------------|--------------------|------|------|------|------|-----|------|------------------------------------|
| DF12 (3.5)-20DP-0.5V (**)  | CL537-0028-7- ** | 20                 | 7.2  | 4.5  | 5.7  | 6.6  | 2.8 | 8.0  | With metal fitting<br>With boss    |
| DF12 (3.5)-30DP-0.5V (**)  | CL537-0030-9- ** | 30                 | 9.7  | 7.0  | 8.2  | 9.1  |     | 10.5 |                                    |
| DF12 (3.5)-36DP-0.5V (**)  | CL537-0031-1- ** | 36                 | 11.2 | 8.5  | 9.7  | 10.6 |     | 12.0 |                                    |
| DF12 (3.5)-40DP-0.5V (**)  | CL537-0032-4- ** | 40                 | 12.2 | 9.5  | 10.7 | 11.6 |     | 13.0 |                                    |
| DF12 (3.5)-50DP-0.5V (**)  | CL537-0034-0- ** | 50                 | 14.7 | 12.0 | 13.2 | 14.1 |     | 15.5 |                                    |
| DF12 (3.5)-60DP-0.5V (**)  | CL537-0036-5- ** | 60                 | 17.2 | 14.5 | 15.7 | 16.6 |     | 18.0 |                                    |
| DF12 (4.0)-20DP-0.5V (**)  | CL537-0053-4- ** | 20                 | 7.2  | 4.5  | 5.7  | 6.6  | 3.3 | 8.0  |                                    |
| DF12 (4.0)-30DP-0.5V (**)  | CL537-0055-0- ** | 30                 | 9.7  | 7.0  | 8.2  | 9.1  |     | 10.5 |                                    |
| DF12 (4.0)-36DP-0.5V (**)  | CL537-0056-2- ** | 36                 | 11.2 | 8.5  | 9.7  | 10.6 |     | 12.0 |                                    |
| DF12 (4.0)-40DP-0.5V (**)  | CL537-0057-5- ** | 40                 | 12.2 | 9.5  | 10.7 | 11.6 |     | 13.0 |                                    |
| DF12 (4.0)-50DP-0.5V (**)  | CL537-0059-0- ** | 50                 | 14.7 | 12.0 | 13.2 | 14.1 |     | 15.5 |                                    |
| DF12 (4.0)-60DP-0.5V (**)  | CL537-0061-2- ** | 60                 | 17.2 | 14.5 | 15.7 | 16.6 |     | 18.0 |                                    |
| DF12 (5.0)-20DP-0.5V (**)  | CL537-0153-9- ** | 20                 | 7.2  | 4.5  | 5.7  | 6.6  | 4.3 | 8.0  |                                    |
| DF12 (5.0)-30DP-0.5V (**)  | CL537-0155-4- ** | 30                 | 9.7  | 7.0  | 8.2  | 9.1  |     | 10.5 |                                    |
| DF12 (5.0)-36DP-0.5V (**)  | CL537-0156-7- ** | 36                 | 11.2 | 8.5  | 9.7  | 10.6 |     | 12.0 |                                    |
| DF12 (5.0)-40DP-0.5V (**)  | CL537-0157-0- ** | 40                 | 12.2 | 9.5  | 10.7 | 11.6 |     | 13.0 |                                    |
| DF12 (5.0)-50DP-0.5V (**)  | CL537-0159-5- ** | 50                 | 14.7 | 12.0 | 13.2 | 14.1 |     | 15.5 |                                    |
| DF12 (5.0)-60DP-0.5V (**)  | CL537-0161-7- ** | 60                 | 17.2 | 14.5 | 15.7 | 16.6 |     | 18.0 |                                    |
| DF12B (3.5)-20DP-0.5V (**) | CL537-0328-0- ** | 20                 | 7.2  | 4.5  | 5.7  | —    | 2.8 | 8.0  | With metal fitting<br>Without boss |
| DF12B (3.5)-30DP-0.5V (**) | CL537-0330-2- ** | 30                 | 9.7  | 7.0  | 8.2  | —    |     | 10.5 |                                    |
| DF12B (3.5)-36DP-0.5V (**) | CL537-0331-5- ** | 36                 | 11.2 | 8.5  | 9.7  | —    |     | 12.0 |                                    |
| DF12B (3.5)-40DP-0.5V (**) | CL537-0332-8- ** | 40                 | 12.2 | 9.5  | 10.7 | —    |     | 13.0 |                                    |
| DF12B (3.5)-50DP-0.5V (**) | CL537-0334-3- ** | 50                 | 14.7 | 12.0 | 13.2 | —    |     | 15.5 |                                    |
| DF12B (3.5)-60DP-0.5V (**) | CL537-0336-9- ** | 60                 | 17.2 | 14.5 | 15.7 | —    |     | 18.0 |                                    |
| DF12B (4.0)-20DP-0.5V (**) | CL537-0353-8- ** | 20                 | 7.2  | 4.5  | 5.7  | —    | 3.3 | 8.0  |                                    |
| DF12B (4.0)-30DP-0.5V (**) | CL537-0355-3- ** | 30                 | 9.7  | 7.0  | 8.2  | —    |     | 10.5 |                                    |
| DF12B (4.0)-36DP-0.5V (**) | CL537-0356-6- ** | 36                 | 11.2 | 8.5  | 9.7  | —    |     | 12.0 |                                    |
| DF12B (4.0)-40DP-0.5V (**) | CL537-0357-9- ** | 40                 | 12.2 | 9.5  | 10.7 | —    |     | 13.0 |                                    |
| DF12B (4.0)-50DP-0.5V (**) | CL537-0359-4- ** | 50                 | 14.7 | 12.0 | 13.2 | —    |     | 15.5 |                                    |
| DF12B (4.0)-60DP-0.5V (**) | CL537-0361-6- ** | 60                 | 17.2 | 14.5 | 15.7 | —    |     | 18.0 |                                    |
| DF12B (5.0)-20DP-0.5V (**) | CL537-0378-9- ** | 20                 | 7.2  | 4.5  | 5.7  | —    | 4.3 | 8.0  |                                    |
| DF12B (5.0)-30DP-0.5V (**) | CL537-0380-0- ** | 30                 | 9.7  | 7.0  | 8.2  | —    |     | 10.5 |                                    |
| DF12B (5.0)-36DP-0.5V (**) | CL537-0381-3- ** | 36                 | 11.2 | 8.5  | 9.7  | —    |     | 12.0 |                                    |
| DF12B (5.0)-40DP-0.5V (**) | CL537-0382-6- ** | 40                 | 12.2 | 9.5  | 10.7 | —    |     | 13.0 |                                    |
| DF12B (5.0)-50DP-0.5V (**) | CL537-0384-1- ** | 50                 | 14.7 | 12.0 | 13.2 | —    |     | 15.5 |                                    |
| DF12B (5.0)-60DP-0.5V (**) | CL537-0386-7- ** | 60                 | 17.2 | 14.5 | 15.7 | —    |     | 18.0 |                                    |

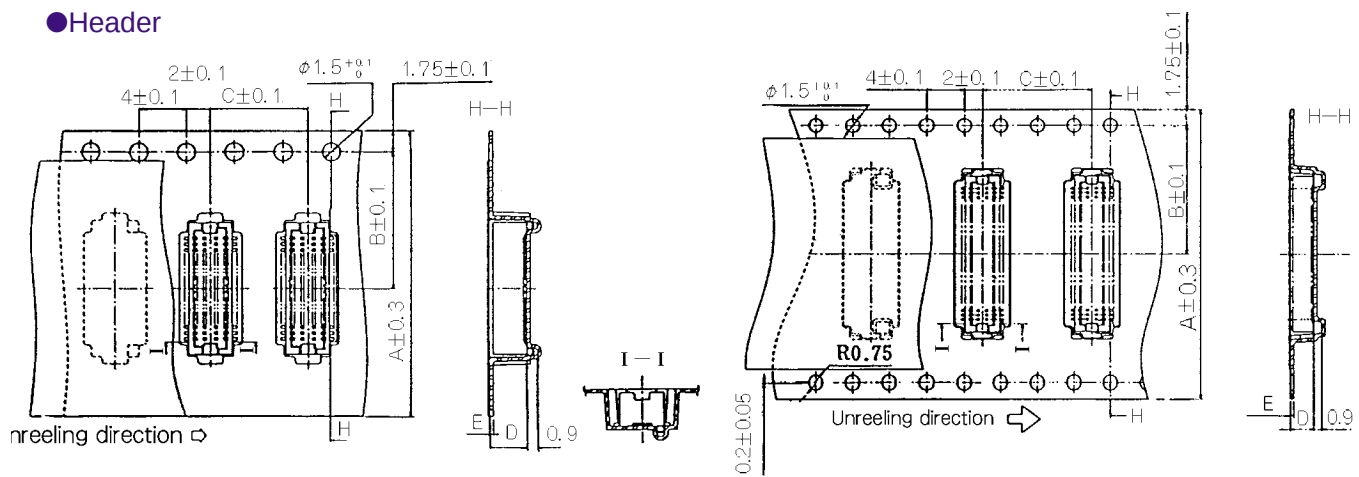
Note : Please order the embossed tape packaging product per reel. (1000 pcs./reel)

## ◆ Embossed Carrier tape Dimensions

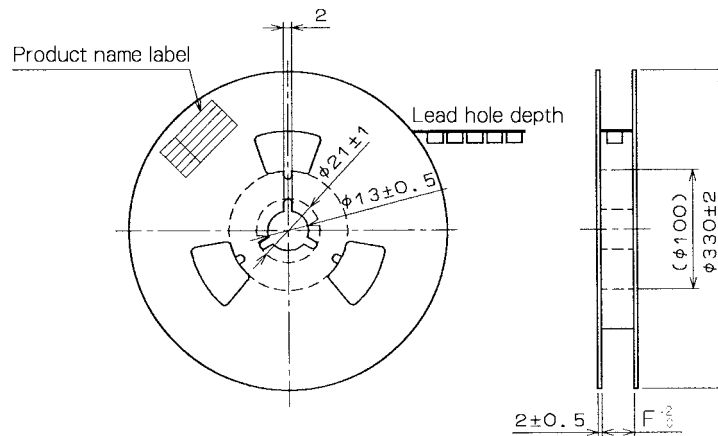
### ● Receptacle



### ● Header

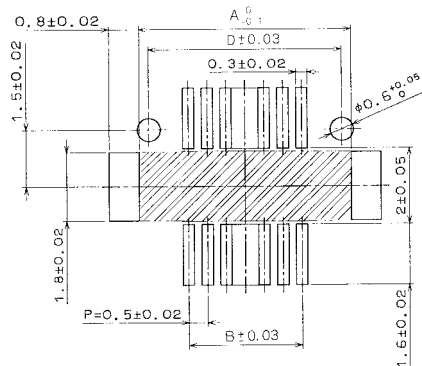


| Connector             | A    | B    | C    | D   | E    | F    | Connector             | A    | B    | C    | D   | E    | F    |
|-----------------------|------|------|------|-----|------|------|-----------------------|------|------|------|-----|------|------|
| DF12# (3.0)-20DS-0.5V | 16.0 | 7.5  | 12.0 | 2.6 | 0.38 | 16.4 | DF12# (3.5)-20DP-0.5V | 16.0 | 7.5  | 12.0 | 3.1 | 0.38 | 16.4 |
| DF12# (3.0)-30DS-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (3.5)-30DP-0.5V | 24.0 | 11.5 | 12.0 | 3.1 | 0.38 | 24.4 |
| DF12# (3.0)-32DS-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (3.5)-36DP-0.5V | 24.0 | 11.5 | 8.0  | 3.1 | 0.30 | 24.4 |
| DF12# (3.0)-36DS-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (3.5)-40DP-0.5V | 24.0 | 11.5 | 12.0 | 3.1 | 0.38 | 24.4 |
| DF12# (3.0)-40DS-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (3.5)-50DP-0.5V | 24.0 | 11.5 | 8.0  | 3.1 | 0.30 | 24.4 |
| DF12# (3.0)-50DS-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (3.5)-60DP-0.5V | 32.0 | 14.2 | 12.0 | 3.1 | 0.38 | 32.4 |
| DF12# (3.0)-60DS-0.5V | 32.0 | 14.2 | 12.0 | 2.6 | 0.38 | 32.4 | DF12# (4.0)-20DP-0.5V | 16.0 | 7.5  | 12.0 | 3.6 | 0.38 | 16.4 |
| DF12# (3.0)-20DP-0.5V | 16.0 | 7.5  | 12.0 | 2.6 | 0.38 | 16.4 | DF12# (4.0)-30DP-0.5V | 24.0 | 11.5 | 12.0 | 3.6 | 0.38 | 24.4 |
| DF12# (3.0)-30DP-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (4.0)-36DP-0.5V | 24.0 | 11.5 | 8.0  | 3.6 | 0.30 | 24.4 |
| DF12# (3.0)-32DP-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (4.0)-40DP-0.5V | 24.0 | 11.5 | 12.0 | 3.6 | 0.38 | 24.4 |
| DF12# (3.0)-36DP-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (4.0)-50DP-0.5V | 24.0 | 11.5 | 8.0  | 3.6 | 0.30 | 24.4 |
| DF12# (3.0)-40DP-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (4.0)-60DP-0.5V | 32.0 | 14.2 | 12.0 | 3.6 | 0.38 | 32.4 |
| DF12# (3.0)-50DP-0.5V | 24.0 | 11.5 | 12.0 | 2.6 | 0.38 | 24.4 | DF12# (5.0)-20DP-0.5V | 16.0 | 7.5  | 12.0 | 4.6 | 0.38 | 16.4 |
| DF12# (3.0)-60DP-0.5V | 32.0 | 14.2 | 12.0 | 2.6 | 0.38 | 32.4 | DF12# (5.0)-30DP-0.5V | 24.0 | 11.5 | 12.0 | 4.6 | 0.38 | 24.4 |
| DF12#-20DS-0.5V       | 16.0 | 7.5  | 12.0 | 3.1 | 0.38 | 16.4 | DF12# (5.0)-36DP-0.5V | 24.0 | 11.5 | 12.0 | 4.6 | 0.38 | 24.4 |
| DF12#-30DS-0.5V       | 24.0 | 11.5 | 12.0 | 3.1 | 0.38 | 24.4 | DF12# (5.0)-40DP-0.5V | 24.0 | 11.5 | 12.0 | 4.6 | 0.38 | 24.4 |
| DF12#-36DS-0.5V       | 24.0 | 11.5 | 8.0  | 3.1 | 0.30 | 24.4 | DF12# (5.0)-50DP-0.5V | 24.0 | 11.5 | 8.0  | 4.6 | 0.30 | 24.4 |
| DF12#-40DS-0.5V       | 24.0 | 11.5 | 12.0 | 3.1 | 0.38 | 24.4 | DF12# (5.0)-60DP-0.5V | 32.0 | 14.2 | 12.0 | 4.6 | 0.38 | 32.4 |
| DF12#-50DS-0.5V       | 24.0 | 11.5 | 8.0  | 3.1 | 0.30 | 24.4 |                       |      |      |      |     |      |      |
| DF12#-60DS-0.5V       | 32.0 | 14.2 | 12.0 | 3.1 | 0.38 | 32.4 |                       |      |      |      |     |      |      |

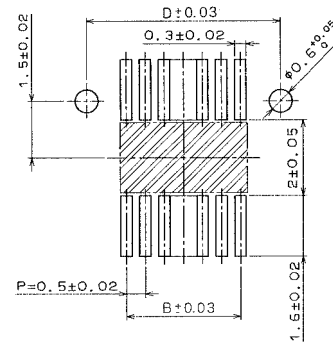


## ◆ Recommended PCB Footprints

■DF12 with metal fitting



■DF12 without metal fitting



Note 1 : Refer to A299~A304 for sides A, B, and D.

Note 2 : If the boss isn't included, the boss shown in the above figure isn't required.

Note 3 :  If the pattern is included in the shaded area, and not treated with resist, it could touch the connector contact .

## ◆Precautions for Use

|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.Recommended Temperature Profile (SMT)        | <p>Temperature</p> <p>IR reflow condition</p> <p>Preheating area 150℃ for 30~90 seconds</p> <p>Soldering area 235±5℃ for 10 seconds Max<br/>220℃ Min for 10~20 seconds</p> <p>Max 240℃<br/>220℃</p> <p>Preheating area</p> <p>Soldering area</p> <p>0 Sec 50 Sec 100 Sec 150 Sec 200 Sec Time</p> <p>Note 1 : Maximum twice action is allowed under the same condition. However, the interval between the first and second actions must be maintained at the room temperature.</p> <p>Note 2 : The temperature indicates the board surface temperature In the connector lead area.</p>                                                                                                                                                                                                                                                                         |
| 2.Recommended Manual Soldering Condition (SMT) | Soldering iron temperature: 290±10℃, Soldering time: Within 2 seconds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3.Recommended Screen Thickness (SMT)           | 0.12mm<br>When the 0.15mm thickness is used, set the metal mask open area to 85% as a target.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 4.Board Warp(SMT)                              | Maximum 0.02mm in the connector center area, based on both connector edges                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 5.Cleaning Condition                           | Refer to "Nylon Connector Instruction Manual".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 6.Cautions                                     | <ul style="list-style-type: none"> <li>■ The receptacle is designed in a structure where contacts are exposed. Touching it with bare hands would cause contact failure or electrostatic element damage.</li> <li>■ Where no board is mounted, the insertion or extraction will cause damage or contact deformation.</li> <li>■ Avoid retaining the board with the connector only, and fix the board by any other means than the connector.</li> <li>■ Excessive scoop insertion or extraction may result in damage.</li> <li>■ In the manual soldering process, don't carry out the flux coating which will cause a flux blister on the connector.</li> <li>■ The color phase of this product may be slightly different from that of the formed product according to the manufacturing lot. However, the difference doesn't affect the performance.</li> </ul> |