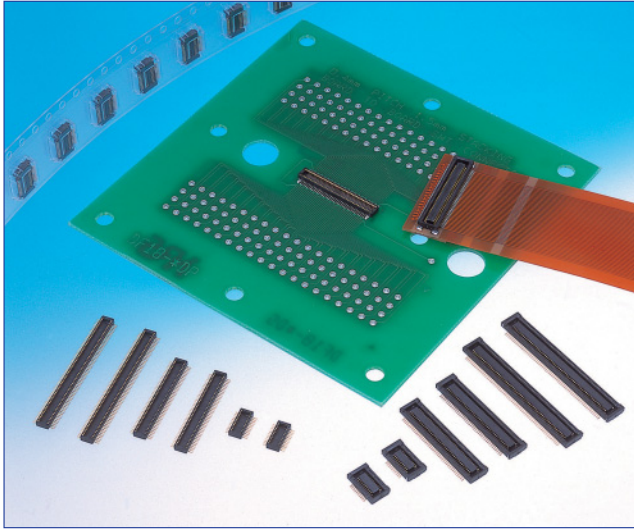


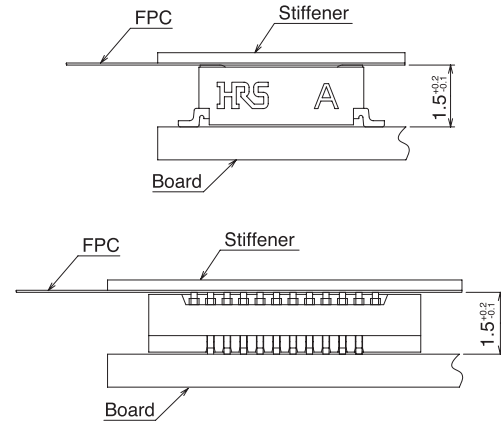
NEW

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

DF18 Series



Low profile – Board-to-board distance of 1.5 mm



■ Features

1. Allows higher mounting density of board components

Extremely small board mounting pattern and low above-the-board profile makes the connector suitable for small device applications.

2. High Contact Reliability

Despite its small size and low profile the contacts have large deflection distance, guaranteeing reliable electrical performance.

3. Good Mating Characteristics

Large lead-in distance of 0.33 mm in horizontal directions and tactile “click” confirms fully mated condition of connectors.

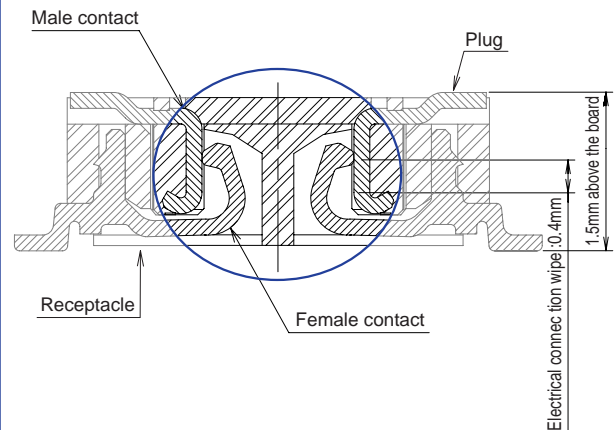
4. Optional Additional Board Retention

For applications requiring extra-strong hold of connectors to the board connectors can be ordered with optional metal hold-down.

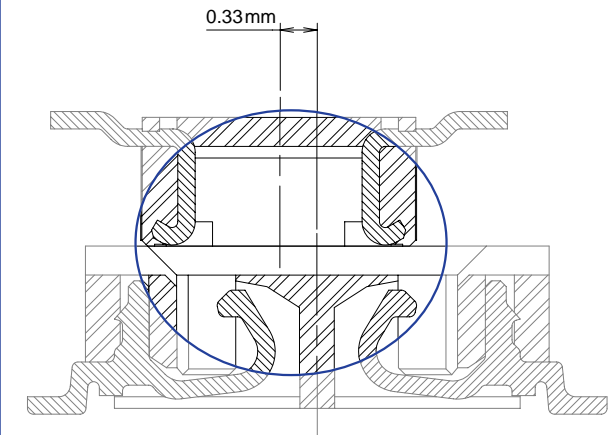
5. Automatic Board Placement

Connectors have large flat width (Plug: 1.4 mm, Receptacle: 1.44mm) to accommodate pick-up with automatic placement machines.

High Contact Reliability – Effective connection wipe of 0.4 mm



Self-alignment distance: 0.33 mm



■ Applications

Digital video cameras, Digital still cameras, cellular phones, miniature displays, cameras portable equipment and other applications requiring small reliable board-to-board and FPC-to-Board connections.

Product Specifications

| | | | | | | |
|--------|----------------|--------|-----------------------------|-------------------------|---------------------------|-------------------------|
| Rating | Current rating | 0.3A | Operating temperature range | -35°C to +85°C (Note 1) | Storage temperature range | -10°C to +60°C (Note 2) |
| | Voltage rating | 30V AC | Operating humidity range | 40°C to 80°C (Note 2) | Storage humidity range | 40°C to 70°C (Note 2) |

| Item | Specification | Conditions |
|---------------------------------------|---|--|
| 1. Insulation resistance | 50 M ohms min. | 100 V DC |
| 2. Withstanding voltage | No flashover or insulation breakdown. | 100 V AC / one minute |
| 3. Contact resistance | 60 m ohms max. | 1 mA AC, 20mv max., 1KHz |
| 4. Vibration | No electrical discontinuity of 1 ms or more. | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours / 3 axis. |
| 5. Humidity | Contact resistance: 60 m ohms max. Insulation resistance: 25 M ohms min. | 96 hours at temperature of 40±2°C and humidity of 90 to 95% |
| 6. Temperature cycle | Contact resistance: 60 m ohms max. Insulation resistance: 50 M ohms min. | Temperature: -55°C--> +15°C to +35°C--> +85°C--> +15°C to +35°C Duration: 30 --> 2 to 3 --> 30 --> 2 to 3 (Minutes) 5 cycles |
| 7. Durability (insertion/ withdrawal) | Contact resistance: 60 m ohms max. | 50 cycles |
| 8. Resistance to soldering heat | No deformation of any component. No affect on contacts. | 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

| Product | Part | Material | Finish | Remarks |
|----------------------|----------------|--------------|--------------|---------|
| Receptacles Plugs | Insulator | LCP | Color: Black | UL94V-0 |
| | Contacts | Copper alloy | Gold plated | - |
| | Metal fittings | Brass | Tin plated | - |

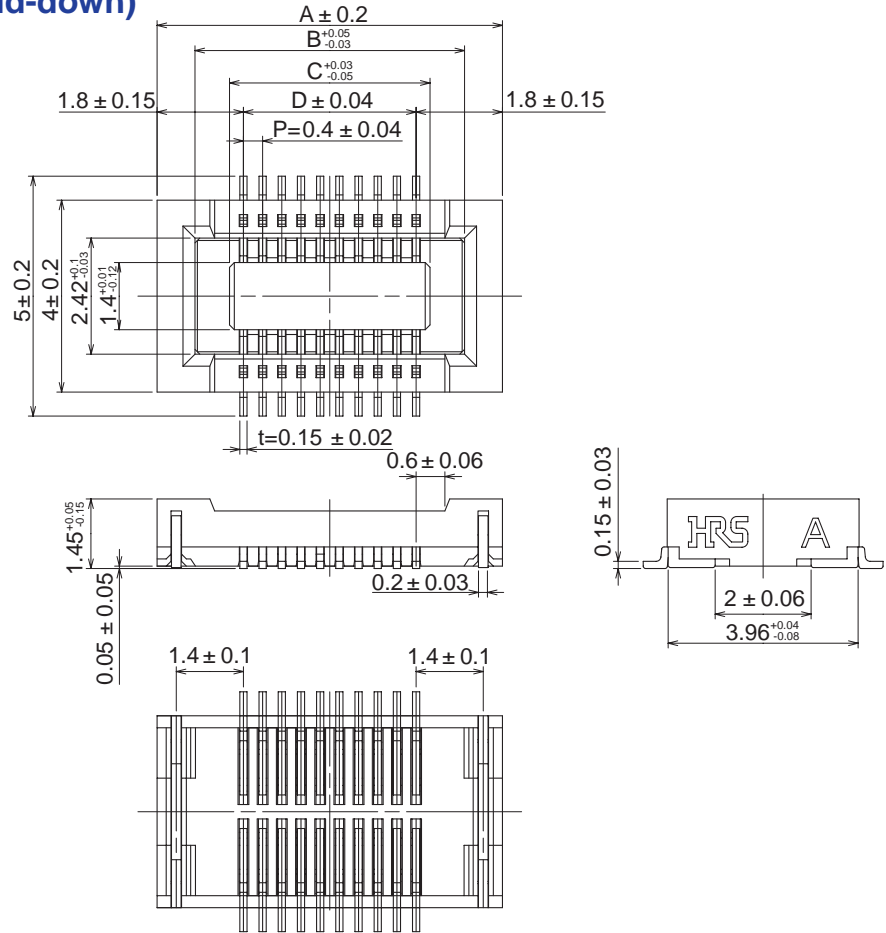
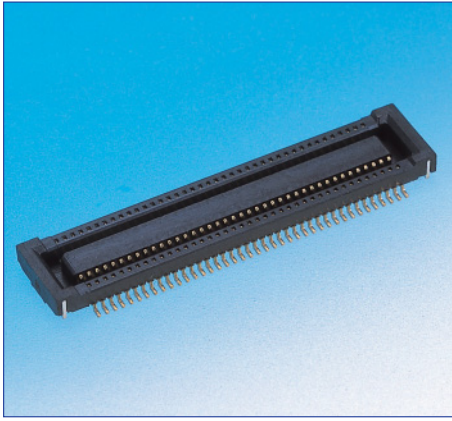
Ordering Information

Receptacles / Plugs

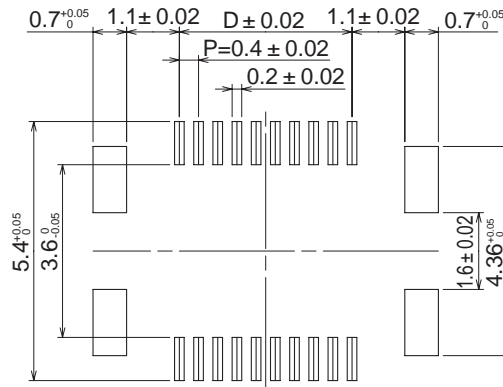
DF18 **C** — ***** **DS** — **0.4** **V** (******)
① ② ③ ④ ⑤ ⑥ ⑦

| | | |
|--|--|---|
| ① Series name: DF18 | ③ Number of Contacts: 20, 30, 40, 50, 60, 70, 80, 100, 120 | ⑥ Terminal type V: SMT vertical mounting type |
| ② Hold-down bracket type B: With metal hold-down, (receptacles only) C: With added hold-down contacts D: With added hold-down contacts, increased Removal Force Type(receptacle only) E: With added hold-down contacts, increased Removal Force Type(receptacle only) | ④ Connector type DS: Double-row receptacle DP: Double-row plug ⑤ Contact pitch 0.4 mm | ⑦ Packaging type (51): Plug, embossed tape packaging (2,000 pieces per reel) (81): Receptacle, embossed tape packaging (2,000 pieces per reel) |

■ Receptacles (with metal hold-down)



◆ PCB mounting pattern

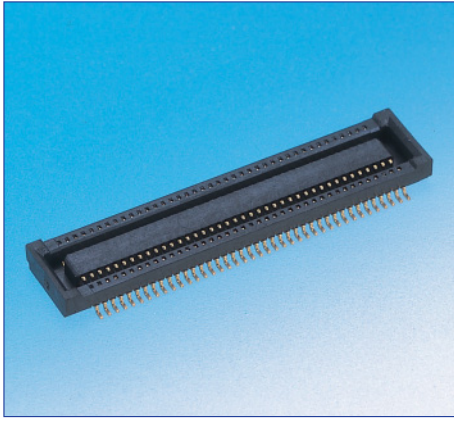


Unit: mm

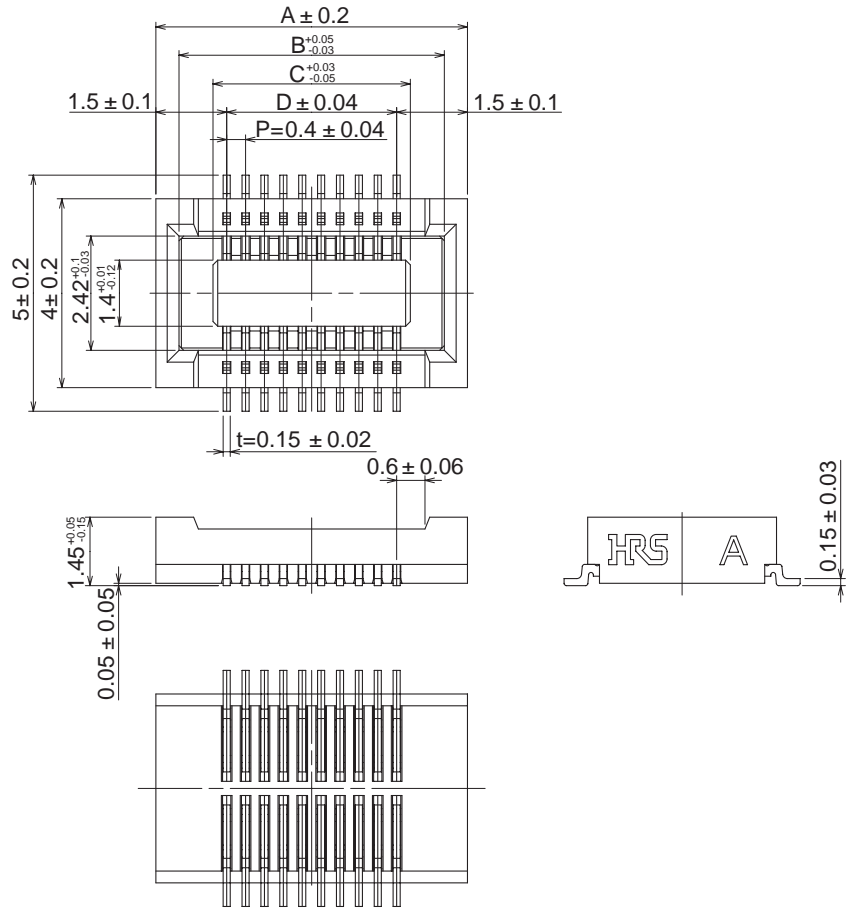
| Part Number | CL No. | Number of Contacts | A | B | C | D |
|------------------------|--------------------------------|--------------------|-------|-------|-------|-------|
| DF18B - 20DS-0.4V (81) | 684-0021-3-81 | 20 | 7.20 | 5.62 | 4.18 | 3.60 |
| DF18B - 30DS-0.4V (81) | 684-0022-6-81 | 30 | 9.20 | 7.62 | 6.18 | 5.60 |
| DF18B - 40DS-0.4V (81) | 684-0023-9-81 | 40 | 11.20 | 9.62 | 8.18 | 7.60 |
| DF18B - 50DS-0.4V (81) | 684-0005-7-81 | 50 | 13.20 | 11.62 | 10.18 | 9.60 |
| DF18B - 60DS-0.4V (81) | 684-0006-0-81 | 60 | 15.20 | 13.62 | 12.18 | 11.60 |
| DF18B - 70DS-0.4V (81) | 684-0024-1-81 | 70 | 17.20 | 15.62 | 14.18 | 13.60 |
| DF18B - 80DS-0.4V (81) | Reserved for product expansion | 80 | 19.20 | 17.62 | 16.18 | 15.60 |
| DF18B-100DS-0.4V (81) | 684-0008-5-81 | 100 | 23.20 | 21.62 | 20.18 | 19.60 |
| DF18B-120DS-0.4V (81) | Reserved for product expansion | 120 | 27.20 | 25.62 | 24.18 | 23.60 |

Note: Embossed tape reel packaging(2,000 pieces/reel)
Order by the number of reels.

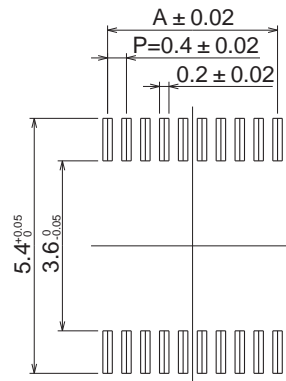
Receptacles (without metal hold-down)



Note: Please specify metal fittings when connecting rigid PCB's.



PCB mounting pattern

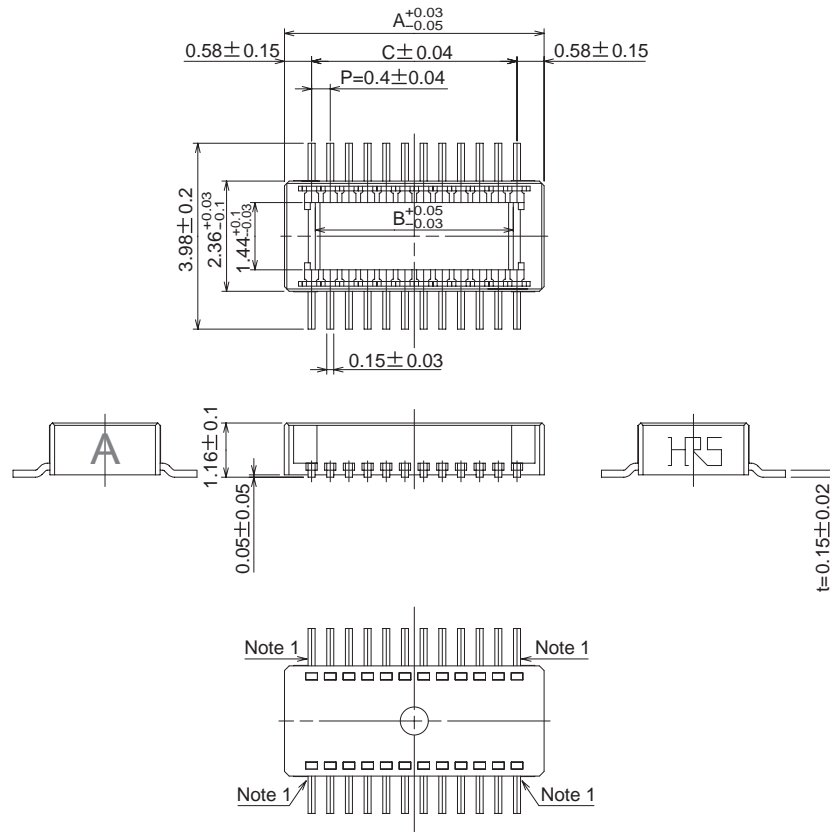
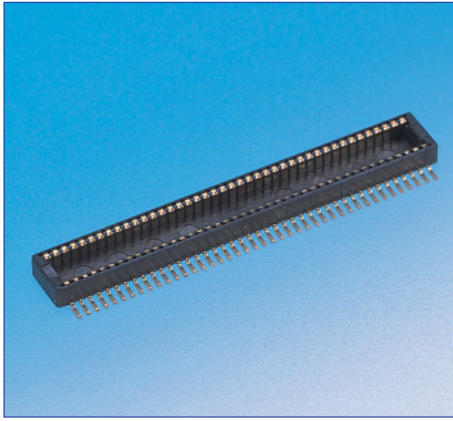


Unit: mm

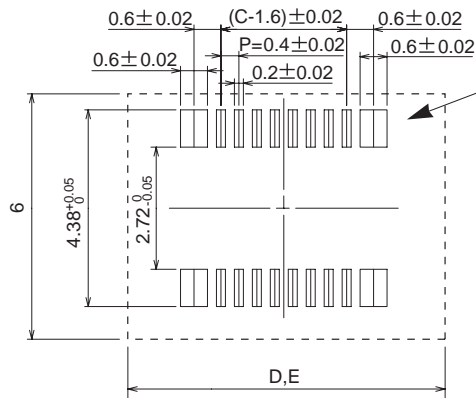
| Part Number | CL No. | Number of Contacts | A |
|------------------------|---------------|--------------------|-------|
| DF18C - 20DS-0.4V (81) | 684-0017-6-81 | 20 | 3.60 |
| DF18C - 30DS-0.4V (81) | 684-0018-9-81 | 30 | 5.60 |
| DF18C - 40DS-0.4V (81) | 684-0019-1-81 | 40 | 7.60 |
| DF18C - 50DS-0.4V (81) | 684-0001-6-81 | 50 | 9.60 |
| DF18C - 60DS-0.4V (81) | 684-0002-9-81 | 60 | 11.60 |
| DF18C - 70DS-0.4V (81) | 684-0020-0-81 | 70 | 13.60 |
| DF18C - 80DS-0.4V (81) | 684-0003-1-81 | 80 | 15.60 |
| DF18C-100DS-0.4V (81) | 684-0004-4-81 | 100 | 19.60 |
| DF18C-120DS-0.4V (81) | 684-0013-5-81 | 120 | 23.60 |

Note: Embossed tape reel packaging (2,000 pieces/reel)
Order by the number of reels.

Plugs (with metal hold-down terminals)



PCB mounting pattern



Added hold-down contacts

Note 1: The terminals located at each of the 4 corners provide additional hold to the board's mounting surface and are not part of electrical connection.

When counting the terminal leads the number of actual electrical circuits is lower by 4. Example: Connector with 24 terminal leads will have 20 actual electrical connections when mated with corresponding part.

Note 2: Please note that mounting of parts within the area of the broken lines will prevent the connector from mating.

D: When the corresponding connector is DF18B- *DS-0.4V (**)

E: When the corresponding connector is DF18C- *DS-0.4V (**)

Plugs (with metal hold-down terminals, increased Removal Force)

| Part Number | CL No. | Number of Contacts | A | B | C | D | E |
|----------------------|---------------|--------------------|------|------|------|------|------|
| DF18D-20DP-0.4V (51) | 684-0029-5-51 | 20 | 5.56 | 4.24 | 4.40 | 7.20 | 6.60 |
| DF18D-30DP-0.4V (51) | 684-0030-4-51 | 30 | 7.56 | 6.24 | 6.40 | 9.20 | 8.60 |

Plugs (with metal hold-down terminals, increased Removal Force)

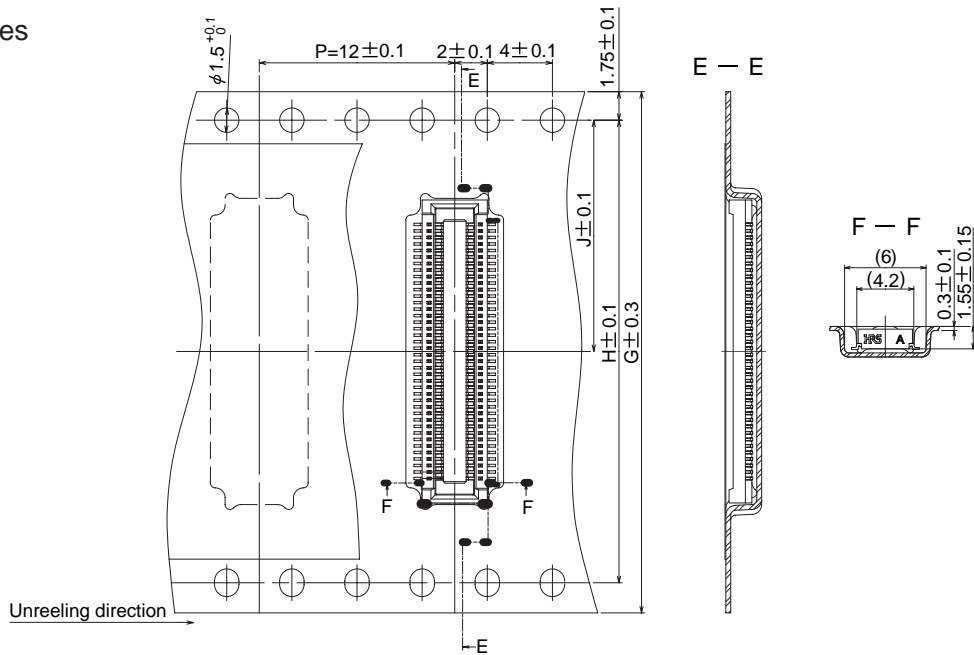
| Part Number | CL No. | Number of Contacts | A | B | C | D | E |
|----------------------|---------------|--------------------|-------|-------|-------|-------|-------|
| DF18E-40DP-0.4V (51) | 684-0031-7-51 | 40 | 9.56 | 8.24 | 8.40 | 11.20 | 10.60 |
| DF18E-50DP-0.4V (51) | 684-0032-0-51 | 50 | 11.56 | 10.24 | 10.40 | 13.20 | 12.60 |

Plugs (with metal hold-down terminals)

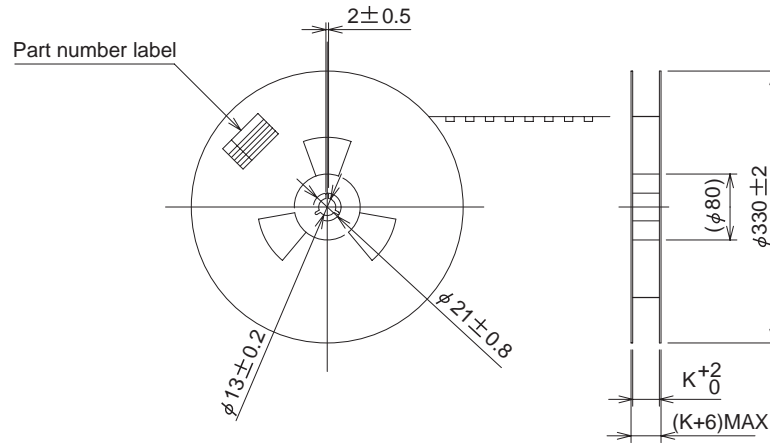
| Part Number | CL No. | Number of Contacts | A | B | C | D | E |
|------------------------|---------------|--------------------|-------|-------|-------|-------|-------|
| DF18C - 60DP-0.4V (51) | 684-0010-7-51 | 60 | 13.56 | 12.24 | 12.40 | 15.20 | 14.60 |
| DF18C - 70DP-0.4V (51) | 684-0028-2-51 | 70 | 15.56 | 14.24 | 14.40 | 17.20 | 16.60 |
| DF18C - 80DP-0.4V (51) | 684-0011-0-51 | 80 | 17.56 | 16.24 | 16.40 | 19.20 | 18.60 |
| DF18C-100DP-0.4V (51) | 684-0012-2-51 | 100 | 21.56 | 20.24 | 20.40 | 23.20 | 22.60 |
| DF18C-120DP-0.4V (51) | 684-0014-8-51 | 120 | 25.56 | 24.24 | 24.40 | 27.20 | 26.60 |

◆ Embossed Carrier Tape Dimensions

● Receptacles



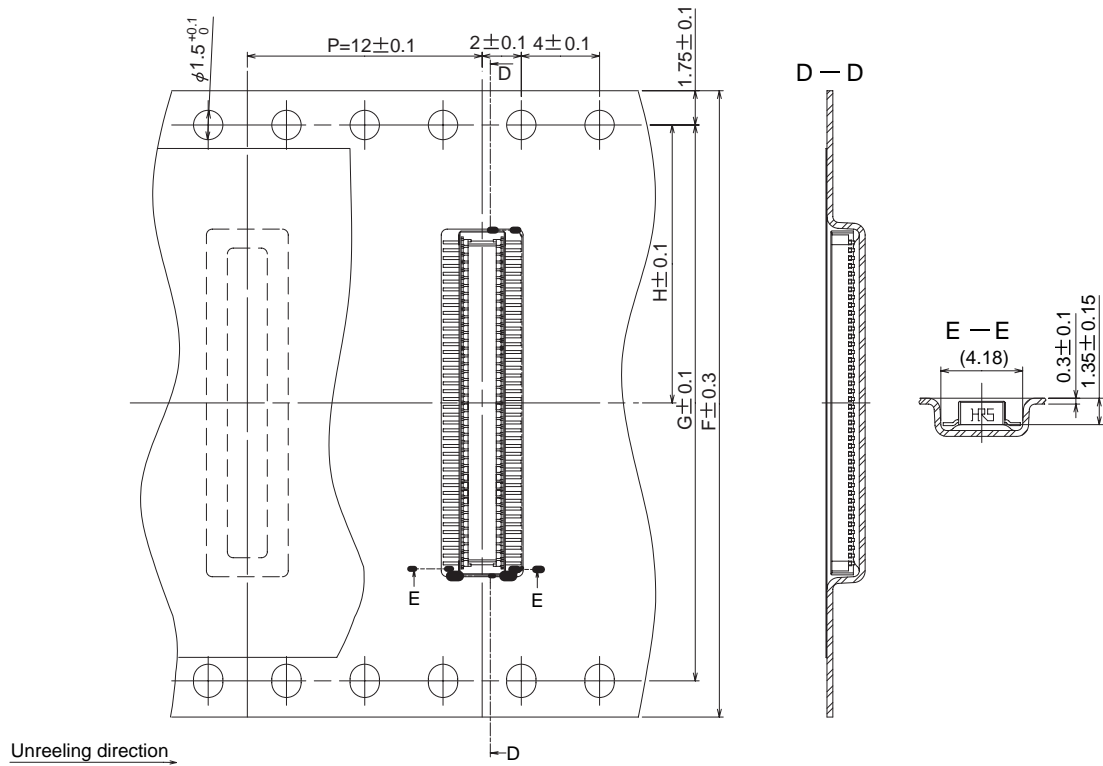
● Reel dimensions



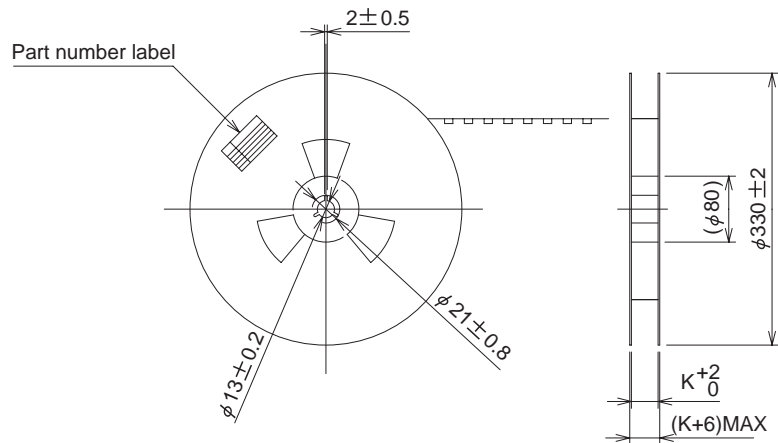
| Part Number | G | H | J | K |
|-------------------|------|------|------|------|
| DF18B - 20DS-0.4V | 16.0 | - | 7.5 | 16.4 |
| DF18C - 20DS-0.4V | | | | |
| DF18B - 30DS-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18C - 30DS-0.4V | 16.0 | - | 7.5 | 16.4 |
| DF18B - 40DS-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18C - 40DS-0.4V | | | | |
| DF18B - 50DS-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18C - 50DS-0.4V | | | | |
| DF18B - 60DS-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18C - 60DS-0.4V | | | | |
| DF18B - 70DS-0.4V | 32.0 | 28.4 | 14.2 | 32.4 |
| DF18C - 70DS-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18B - 80DS-0.4V | 32.0 | 28.4 | 14.2 | 32.4 |
| DF18C - 80DS-0.4V | | | | |
| DF18B-100DS-0.4V | 44.0 | 40.4 | 20.2 | 44.4 |
| DF18C-100DS-0.4V | | | | |
| DF18B-120DS-0.4V | 44.0 | 40.4 | 20.2 | 44.4 |
| DF18C-120DS-0.4V | | | | |

Note: Bottom side feed holes are added to embossed tape when $G = 32.0$ or greater.

● Plugs



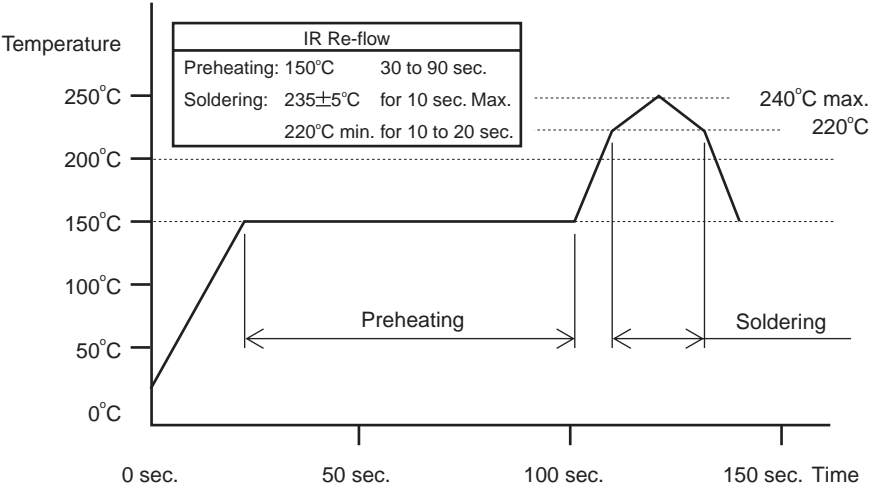
● Reel dimensions



| Part Number | F | G | H | K |
|-------------------|------|------|------|------|
| DF18D - 20DP-0.4V | 16.0 | - | 7.5 | 16.4 |
| DF18D - 30DP-0.4V | 16.0 | - | 7.5 | 16.4 |
| DF18E - 40DP-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18E - 50DP-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18C - 60DP-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18C - 70DP-0.4V | 24.0 | - | 11.5 | 24.4 |
| DF18C - 80DP-0.4V | 32.0 | 28.4 | 14.2 | 32.4 |
| DF18C-100DP-0.4V | 44.0 | 40.4 | 20.2 | 44.4 |
| DF18C-120DP-0.4V | 44.0 | 40.4 | 20.2 | 44.4 |

Note: Bottom side feed holes are added to embossed tape when $F = 32.0$ or greater.

◆ Usage Recommendations

| | |
|---|--|
| <p>1. Recommended temperature profile</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 (for surface mounted plug assembly).</p> |
| <p>2. Recommended soldering conditions</p> | <p>Soldering temperature: $290 \pm 10^{\circ}\text{C}$, soldering time: within 2 sec.</p> |
| <p>3. Recommended screen thickness and open area ratio (Pattern area ratio)</p> | <p>Thickness: 0.12 mm Open area ratio: 70%</p> |
| <p>4. Board warping</p> | <p>Maximum of 0.03mm at the connector center section, 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"> ■ Excessive twisting when mating/un-mating may cause damage to the connectors. ■ Specify receptacles with the metal hold-down when connecting rigid (non- flexible) printed circuit boards. |

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