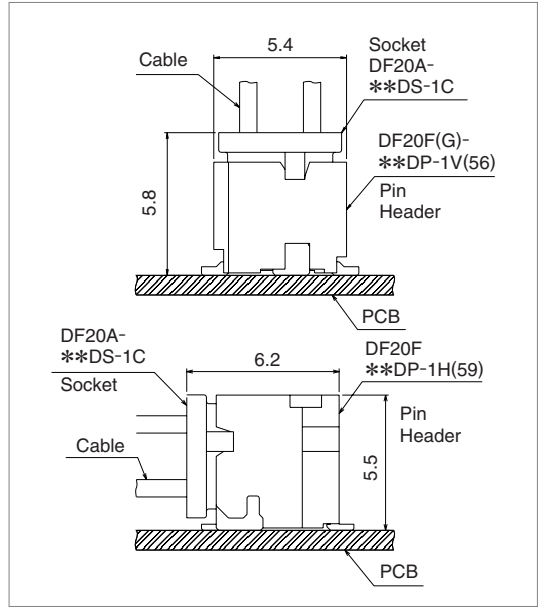
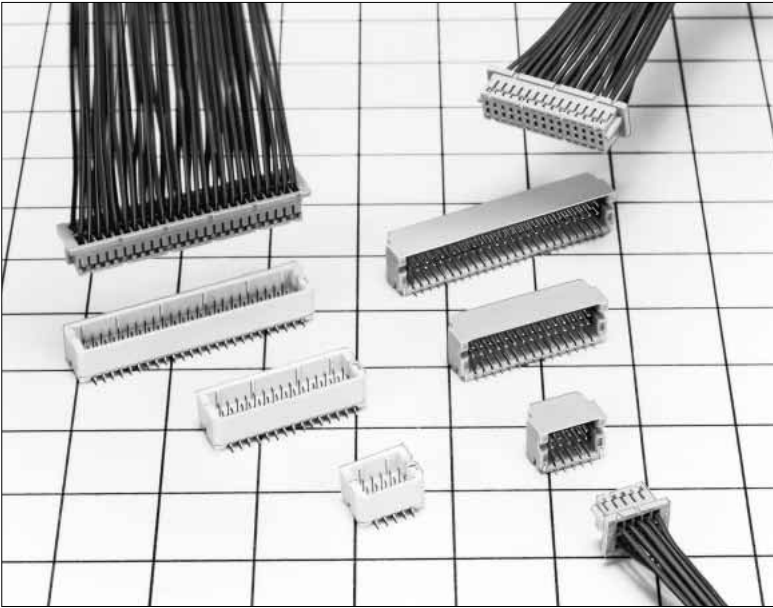


1 mm Pitch Double Rows Low Profile Board-to-Cable Connectors

DF20 series



■ Features

1. Contact Pitch

1 mm contact pitch allows reliable solder and cable termination.

2. Reliable electrical connection wipe

Effective electrical connection is assured with a 1mm wipe of mating contacts.

3. Narrower external width and length

Redesigned metal fittings decreased the overall length of the board-mount receptacle and permit end-to-end mounting of several connectors.

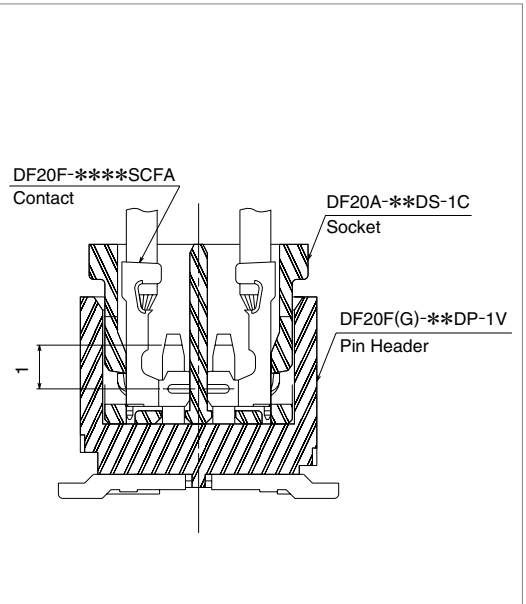
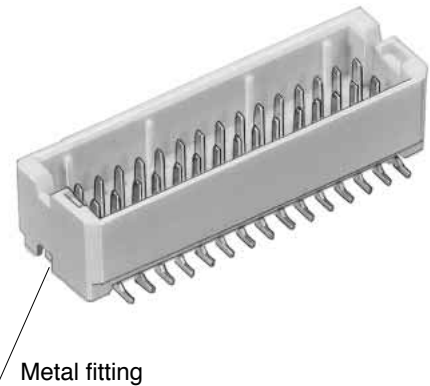
4. Automatic equipment board placement

Straight type pin headers are supplied with a 5.4 mm X 4.6mm flat platform to allow vacuum pick-up and placement on the board.

5. Product variations

- (1) Available with 10, 20, 30, 40, and 50 contacts.
- (2) Pin headers are available in two types: with or without board positioning bosses.
- (3) Depending on specific application pin headers can be ordered in straight or right angle types.

Narrower external width and length



■ Applications

Notebook PC, small office automation equipment, small consumer devices, portable devices.

Any application requiring low profile reliable board-to-cable connection with a AWG #28, AWG#30, AWG#32 conductors.

1mm Pitch, Double Rows



Product Specifications

| | | | | | | |
|--------|---------------|---|-----------------------------|--------------------------|---------------------------|------------------------|
| Rating | Rated current | AWG#28 : 1A AWG#30 : 0.9A AWG#32 : 0.7A | Operating temperature range | -35°C to 85°C (Note 1,2) | Storage temperature range | -10°C to 60°C (Note 2) |
| | Rated voltage | 100V AC | Operating humidity range | 40% to 80% | Storage humidity range | 40% to 70% |

| Item | Specifications | Conditions |
|---|--|--|
| 1. Insulation resistance | 500MΩ min. | Measured at 100V DC |
| 2. Withstanding voltage | No flashover or insulation breakdown | Conduction of 300V AC applied for 1 minute |
| 3. Contact resistance | 30MΩ max. | Measure at 100mA. |
| 4. Insertion-Extraction force (per contact) | 0.2 N Min., 2 N Max. | Measured with a steel pin of 0.2 ±0.005 thickness |
| 5. Vibration | No electrical discontinuity of 1μs min. | Frequency of 10 to 55 Hz, single amplitude of 0.75 mm, in 3 directions for 2hours |
| 6. Humidity | Contact resistance of 30mΩ max., insulation resistance of 100MΩ min. | Temperature of 40±2°C, humidity of 90% to 95%, left standing for 96 hours |
| 7. Temperature cycle | Contact resistance of 30mΩ max, insulation resistance of 500MΩ min. | (-55°C:30min → 5°C to 35°C: 2 to 3min → 85°C:30min → 5°C to 35°C:2 to 3min) for 5 cycles |
| 8. Mechanical operation | Contact resistance of 30mΩ max. | 50 cycles |
| 9. Resistance to Soldering heat | No deformation of the insulator parts that will affect performance | Reflow: At the recommended temperature profile, manual solder: Soldering iron temperature of 300°C for 3 seconds |

Note1: Includes temperature rise caused by current flow.

Note2: The term "storage" refers to products stored for long periods of time prior to mounting and use.

Operating temperature range and Humidity range covers non-conducting conditions of installed connectors in storage, shipment or transportation.

Note3: 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

| Item | Part | Material | Finish | Remarks |
|----------------|---------------|-----------------|--|---------|
| Socket | Insulator | Polyamide | Color : Beige | UL94V-0 |
| Socket contact | Contact | Phosphor bronze | Gold plating | — |
| Pin header | Insulator | Polyamide | Color : Beige | UL94V-0 |
| | Contact | Phosphor bronze | Gold plating | — |
| | Metal Fitting | Brass | V type: Solder plating H type: Tin-Copper plating (Pb free) | |

Ordering Information

Connectors

DF20 # - * DS - 1 C

① ② ③ ④ ⑤ ⑥

| | |
|---|--|
| ① Series name : DF20 | ④ Connector type DS: Double-row socket DP: Double-row pin header |
| ② Boss Type ■ Pin header F: Without boss G: With boss ■ Crimp socket: A | |
| ③ Number of contacts: 10, 20, 30, 40, 50 | ⑤ Contact pitch: 1 mm |
| | ⑥ Type of housing, header C: Crimp housing V: Straight SMT header H: Right angle SMT header |

Contacts

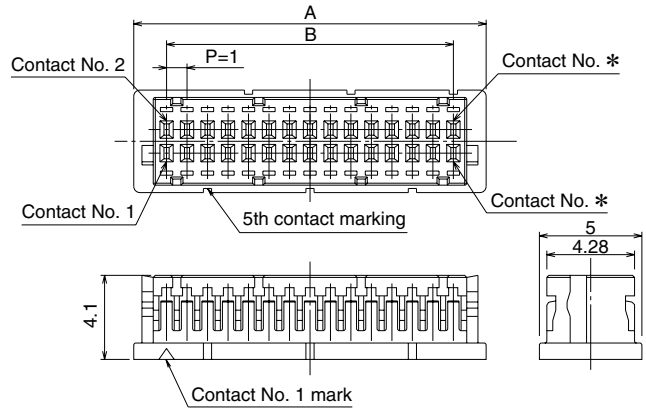
DF20 F - 2830 SCF A (* *)

① ② ③ ④ ⑤

| | | |
|--|--|---|
| ① F | ③ Contact & packaging type SCF: Socket contact reel | ⑤ Packaging Specifications Blank: 1 reel = 10,000 pieces 41: 1 reel = 20,000 pieces |
| ② Applicable wire size 2830: AWG #28 to 30 3032: AWG #30 to 32 | | |

DF20 Series 0.1 mm Pitch Double Rows Low Profile Board-to-Cable Connectors

Double Row Socket



Unit: mm

| Part Number | CL No. | Number of Contacts | A | B | RoHS |
|---------------|------------|--------------------|------|------|------|
| DF20A-10DS-1C | 686-0020-3 | 10 | 7.2 | 4.0 | YES |
| DF20A-20DS-1C | 686-0021-6 | 20 | 12.2 | 9.0 | |
| DF20A-30DS-1C | 686-0022-9 | 30 | 17.2 | 14.0 | |
| DF20A-40DS-1C | 686-0023-1 | 40 | 22.2 | 19.0 | |
| DF20A-50DS-1C | 686-0024-4 | 50 | 27.2 | 24.0 | |

[Specifications number]-*, (**)
 (59): Gold plating, embossed tape packaging

Note: Sales quantities are by the package unit (containing 100 pieces). Please order by package unit.

Socket Crimp Contacts

| Product No. | CL No. | Type of contacts | Quantity | Plating type | RoHS |
|--------------------|----------------|------------------|----------------------------------|--------------|------|
| DF20F-2830SCFA(**) | 686-0042-6-**- | Reel contacts | See specifications number column | Gold plating | YES |
| DF20F-3032SCFA(**) | 686-0043-9-**- | | | | |
| DF20F-36SCFA(**) | 686-0051-7-**- | | | | |

[Specifications number]-*, (**)
 (04): 10,000 pieces / reel
 (44): 20,000 pieces / reel

Applicable Wire (Tin plated solid soft conductor)

| Applicable Wire Size (Stranded wire conductor) | Jacket diameter |
|--|-----------------|
| AWG #28 (7/0.127 mm) | 0.5mm to 0.6 mm |
| AWG #30 (7/0.1 mm) | |
| AWG #32 (7/0.08 mm) | |

- Recommended wire: UL1571
- Strip length: 1.2 to 1.9 mm

Note: When using other than the recommended wire, contact your nearest Hirose representative.

Applicable Crimping Tools

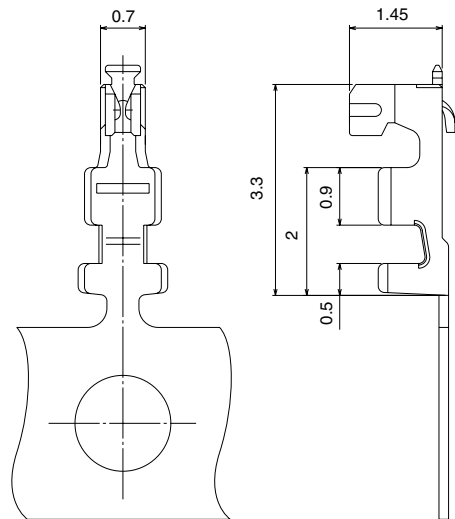
| Type | CL No. | Product No. |
|------------|------------|------------------|
| Applicator | 901-4572-6 | AP105-DF20-2830S |
| Press | 901-0005-4 | CM-105 |

Note 1: Hirose Electric will not be responsible for any problems caused by use of tools other than specified.

Note 2: The manual crimping tool can be also used for cutting-off individual contacts from the reel.

Note 3: Customers that already have DF13 Series Hirose's press units and applicators will be able to use them for DF20 Series crimp terminations by replacing of only crimper and anvil.

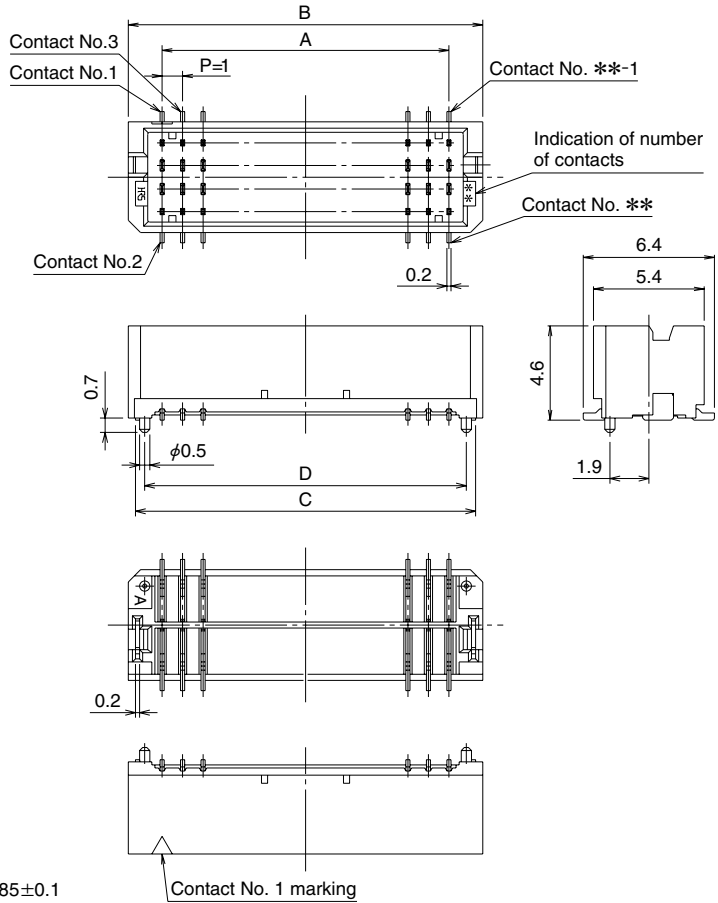
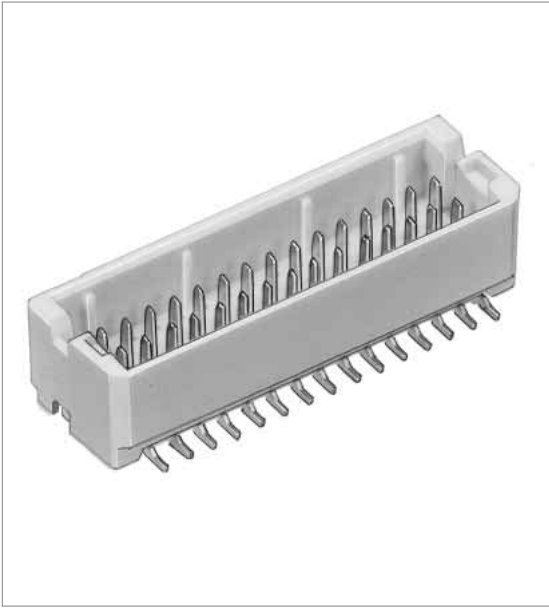
Note 4: The crimping tool for the DF20F-3032SCFA can also be used with the DF20F-2830SCFA.



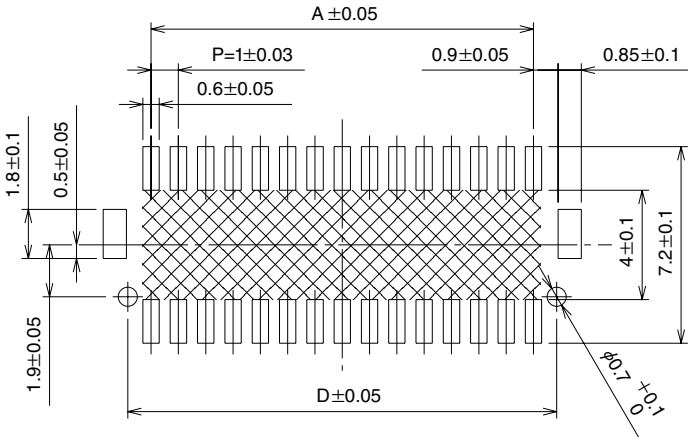
Replacement Parts List for Applicator

| Type | Product No. | CL No. |
|---------------------------------|----------------------|---------------|
| Insulation crimper | AP105-DF20-2830S(61) | 901-4572-6-61 |
| Wire crimper | AP105-DF20-2830S(62) | 901-4572-6-62 |
| Insulation anvil and wire anvil | AP105-DF20-2830S(63) | 901-4572-6-63 |

Double Row Straight Pin header



PCB Footprints



Note 1: Shaded area must be free of any electrically conductive traces to avoid contact with soldered pin header terminations.

Note 2: Required only for pin headers supplied with the positioning boss.

Unit: mm

| Part Number | CL No. | No. of contacts | A | B | C | D | Remarks | RoHS |
|--------------------|-----------------|-----------------|------|------|------|------|--------------|------|
| DF20F -10DP-1V(56) | CL686-0032-2-56 | 10 | 4.0 | 7.3 | 6.6 | — | Without boss | YES |
| DF20F -20DP-1V(56) | CL686-0033-5-56 | 20 | 9.0 | 12.3 | 11.6 | — | | |
| DF20F -30DP-1V(56) | CL686-0034-8-56 | 30 | 14.0 | 17.3 | 16.6 | — | | |
| DF20F -40DP-1V(56) | CL686-0035-0-56 | 40 | 19.0 | 22.3 | 21.6 | — | | |
| DF20F -50DP-1V(56) | CL686-0036-3-56 | 50 | 24.0 | 27.3 | 26.6 | — | | |
| DF20G-10DP-1V(56) | CL686-0037-6-56 | 10 | 4.0 | 7.3 | 6.6 | 5.7 | With boss | |
| DF20G-20DP-1V(56) | CL686-0038-9-56 | 20 | 9.0 | 12.3 | 11.6 | 10.7 | | |
| DF20G-30DP-1V(56) | CL686-0039-1-56 | 30 | 14.0 | 17.3 | 16.6 | 15.7 | | |
| DF20G-40DP-1V(56) | CL686-0040-0-56 | 40 | 19.0 | 22.3 | 21.6 | 20.7 | | |
| DF20G-50DP-1V(56) | CL686-0041-3-56 | 50 | 24.0 | 27.3 | 26.6 | 25.7 | | |

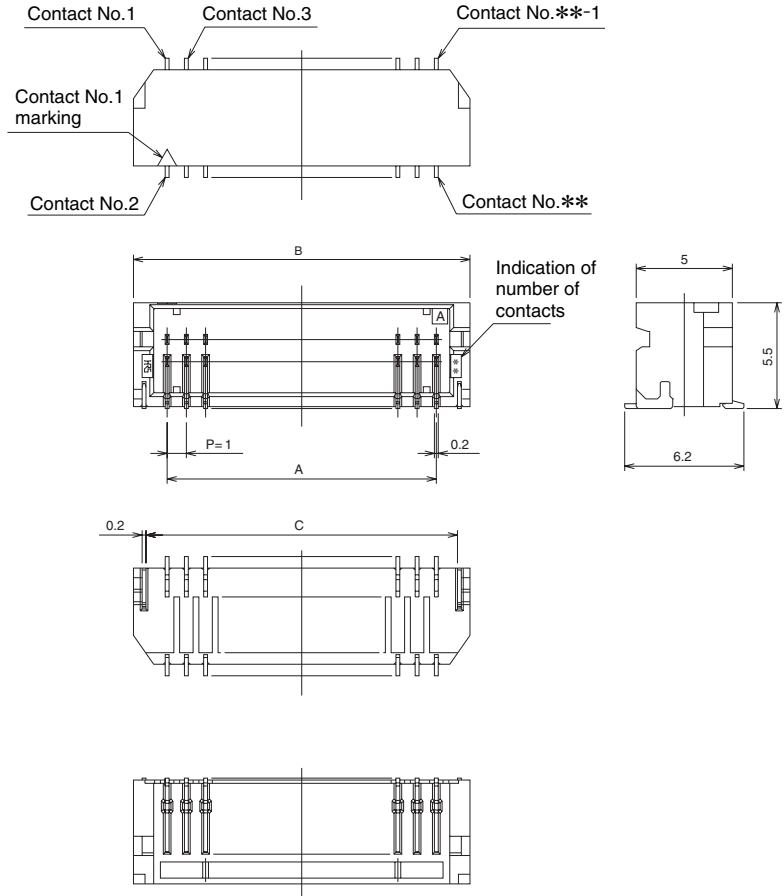
Note1: Order embossed tape packaging items by the reel. (1 reel contains 1,000 pieces)

Note2: Vacuum pick-up cap are included with embossed tape packaged connectors.

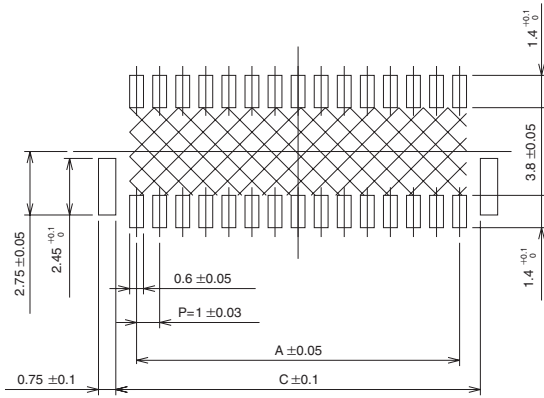
[Specifications number]-*, (**)
 (56): Gold plating, embossed tape packaging

DF20 Series 0.1 mm Pitch Double Rows Low Profile Board-to-Cable Connectors

■ Double Row Right angle Pin header



◆ PCB Footprints



Note : Shaded area must be free of any electrically conductive traces to avoid contact with soldered pin header terminations.

Unit: mm

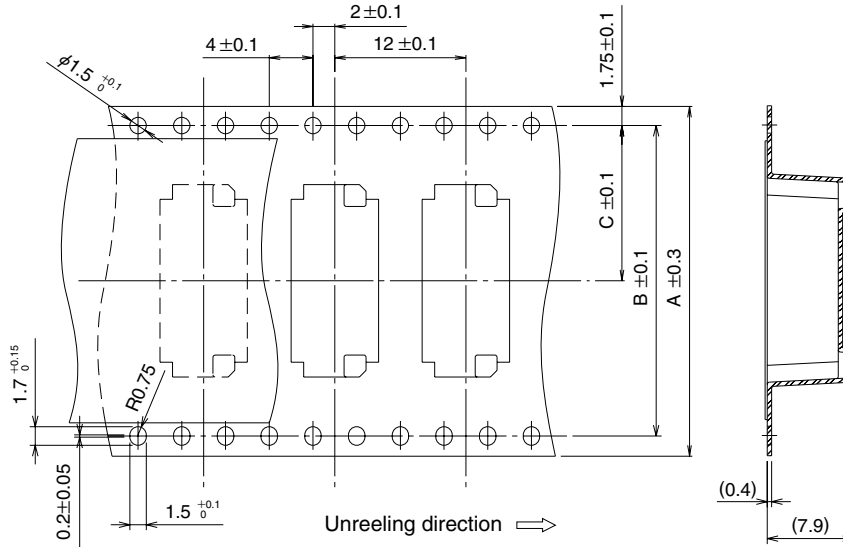
| Part Number | CL No. | No. of contacts | A | B | C | Remarks | RoHS |
|--------------------|----------------|-----------------|------|------|------|--------------|------|
| DF20F -10DP-1H(59) | 686-0027-2(59) | 10 | 4.0 | 7.5 | 6.2 | Without boss | YES |
| DF20F -20DP-1H(59) | 686-0028-5(59) | 20 | 9.0 | 12.5 | 11.2 | | |
| DF20F -30DP-1H(59) | 686-0029-8(59) | 30 | 14.0 | 17.5 | 16.2 | | |
| DF20F -40DP-1H(59) | 686-0030-7(59) | 40 | 19.0 | 22.5 | 21.2 | | |

[Specifications number]-*, (**)
 (59): Gold plating,
 embossed tape packaging

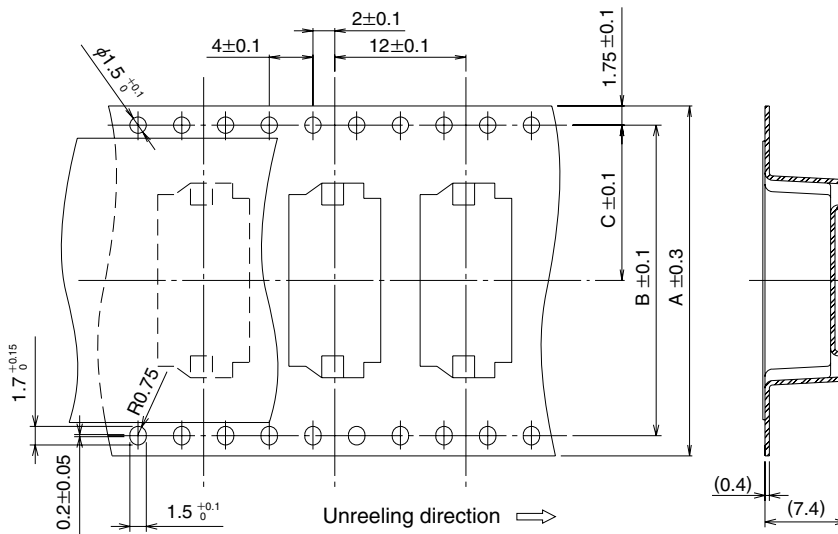
Note: Order embossed tape packaging items by the reel. (1 reel contains 1,000 pieces)

◆ Embossed Carrier Tape Dimensions

● Straight pin header

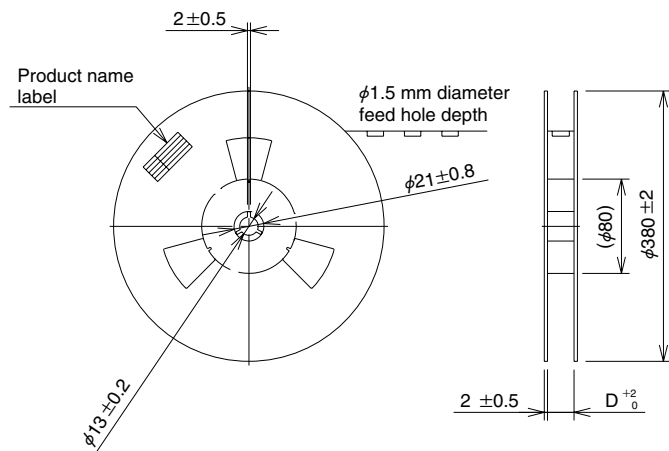


● Right angle pin header



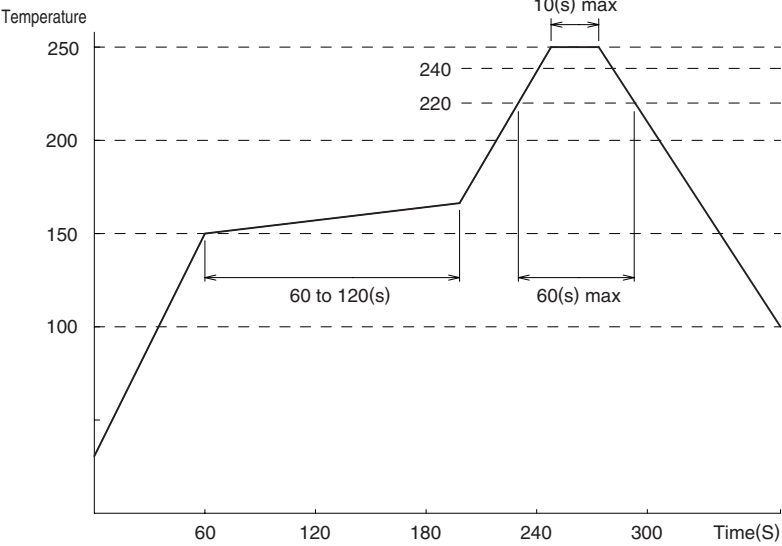
● Reel dimensions

| Part Number | No. of Contacts | A | B | C | D |
|----------------------|-----------------|----|------|------|------|
| DF20F(G)-10DP-1V(56) | 10 | 16 | — | 7.5 | 16.4 |
| DF20F(G)-20DP-1V(56) | 20 | 24 | — | 11.5 | 24.4 |
| DF20F(G)-30DP-1V(56) | 30 | 32 | 28.4 | 14.2 | 32.4 |
| DF20F(G)-40DP-1V(56) | 40 | 44 | 40.4 | 20.2 | 44.4 |
| DF20F(G)-50DP-1V(56) | 50 | 44 | 40.4 | 20.2 | 44.4 |
| DF20F - 10DP-1H(59) | 10 | 16 | — | 7.5 | 16.4 |
| DF20F - 20DP-1H(59) | 20 | 24 | — | 11.5 | 24.4 |
| DF20F - 30DP-1H(59) | 30 | 32 | 28.4 | 14.2 | 32.4 |
| DF20F - 40DP-1H(59) | 40 | 44 | 40.4 | 20.2 | 44.4 |



DF20 Series 1 mm Pitch Double Rows Low Profile Board-to-Cable Connectors

◆ Usage recommendation

| | |
|--|--|
| <p>1. Recommended Soldering Temperature Profile for IR Reflow.</p> | <p style="text-align: center;">DF20F-1DP-1H(59)</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. Note 2: The temperature indicates the board surface temperature at the points of contacts with the connector terminals.</p> |
| <p>2. Recommended Manual Soldering Conditions</p> | <p>Soldering temperature: 290°C ±10°C, Soldering time: within 3 sec.</p> |
| <p>3. Recommended Solder Screen Thickness</p> | <p>0.15mm</p> |
| <p>4. Board Warping</p> | <p>Maximum of 0.03 mm 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. Wiring Termination Conditions</p> | <p>Refer to "Nylon Connector Use Handbook." Crimp contacts should be handled with care as not to cause any deformation or damage affecting the performance or termination.</p> |
| <p>7. Mating / un-mating precautions</p> | <p>Excessive twisting and pulling on wires during mating/un-mating should be avoided as it may cause damage to connectors.</p> |