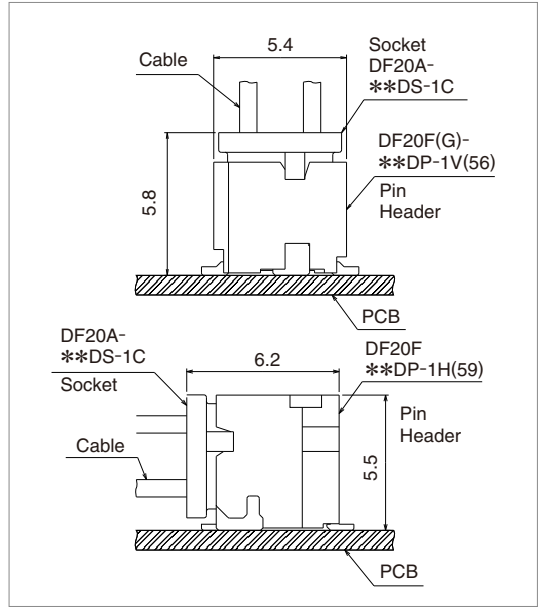
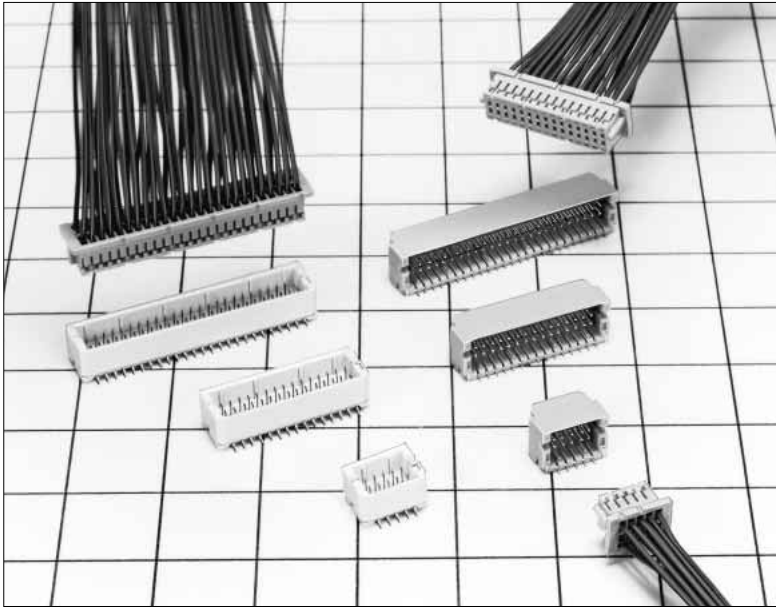


# 1mm Pitch Double Rows Low Profile Wire-to-Board Connectors

## DF20 series



### ■ Features

#### 1. Contact Pitch

1mm 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.

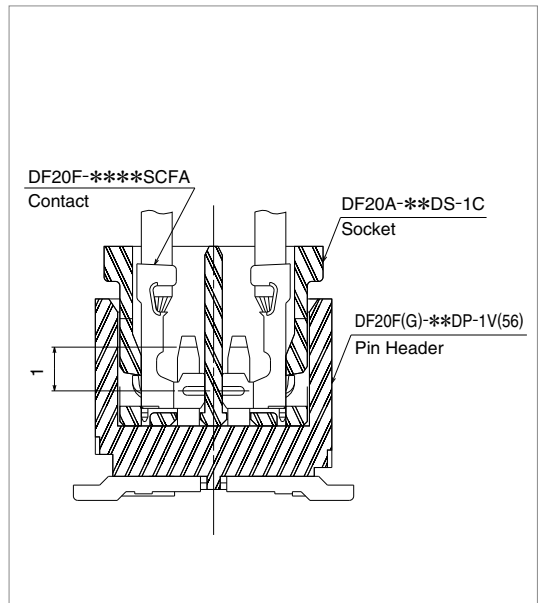
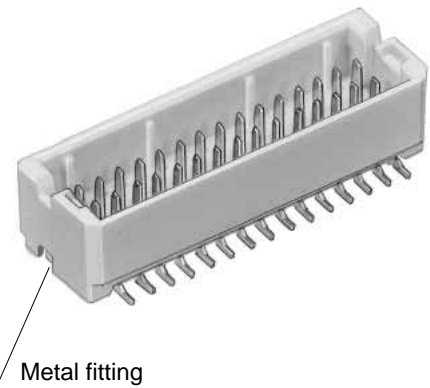
#### 4. Automatic equipment board placement

Straight type pin headers are supplied with a 5.4mm 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



### 1mm Pitch, Double Rows



## Product Specifications

Rating	Rated current	28 AWG : 1A 30 AWG : 0.9A 32 AWG : 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

Note 1 : Includes temperature rise caused by current flow.

Note 2 : 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.

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 / Finish

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	Tin-Copper plating	—

## Product Number Structure

Refer to the chart below when determining the product specifications from the product number.

Please select from the product numbers listed in this catalog when placing orders.

### 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	⑤ Contact pitch: 1 mm
③ Number of contacts : 10, 20, 30, 40, 50	⑥ Type of housing, header C: Crimp housing V: Straight SMT header H: Right angle SMT header

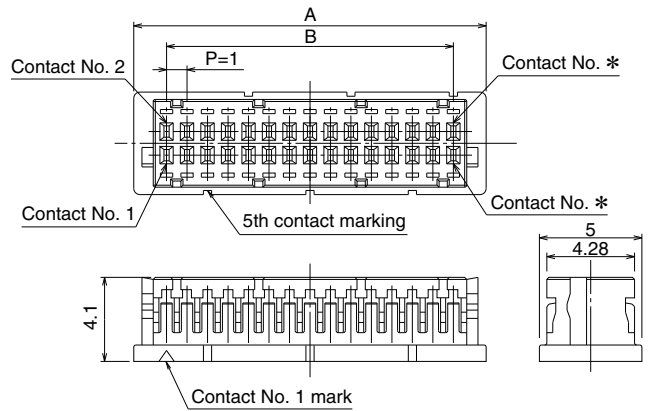
### Contacts

**DF20 F - 2830 SCF A ( \* \* )**

① ② ③ ④

F	② Contact & packaging type SCF : Socket contact reel	④ Packaging Specifications 04 : 1 reel = 10,000 pieces 44 : 1 reel = 20,000 pieces
① Applicable wire size 2830 : 28 to 30 AWG 3032 : 30 to 32 AWG	③ Plating type A : Gold plating	

### Double Row Socket



Unit : mm

Part No.	HRS No.	No. 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]-\*, (\*\*)  
Blank : Bag packaging (100 pcs / pack)

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

### Socket Crimp Contacts

Part No.	HRS 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(**) (Note 2)	686-0051-7 **				

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

#### ●Applicable Wire (Tin plated solid soft conductor)

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

#### ●Recommended wire

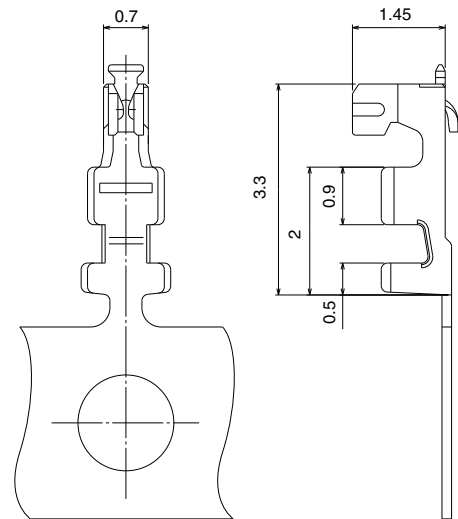
UL1571(thin type) (Note 2)

#### ●Strip length

1.2 to 1.9mm

Note 1 : When using other than the recommended wire, contact your nearest Hirose representative.

Note 2 : Contact your Hirose sales representative when using 36 AWG.



#### ●Applicable Crimping Tools

Type	HRS No.	Part No.	Applicable contact
Applicator	901-4572-6	AP105-DF20-2830S	DF20F-2830SCFA(**) DF20F-3032SCFA(**)
Press	901-0001-0	CM-105C	—

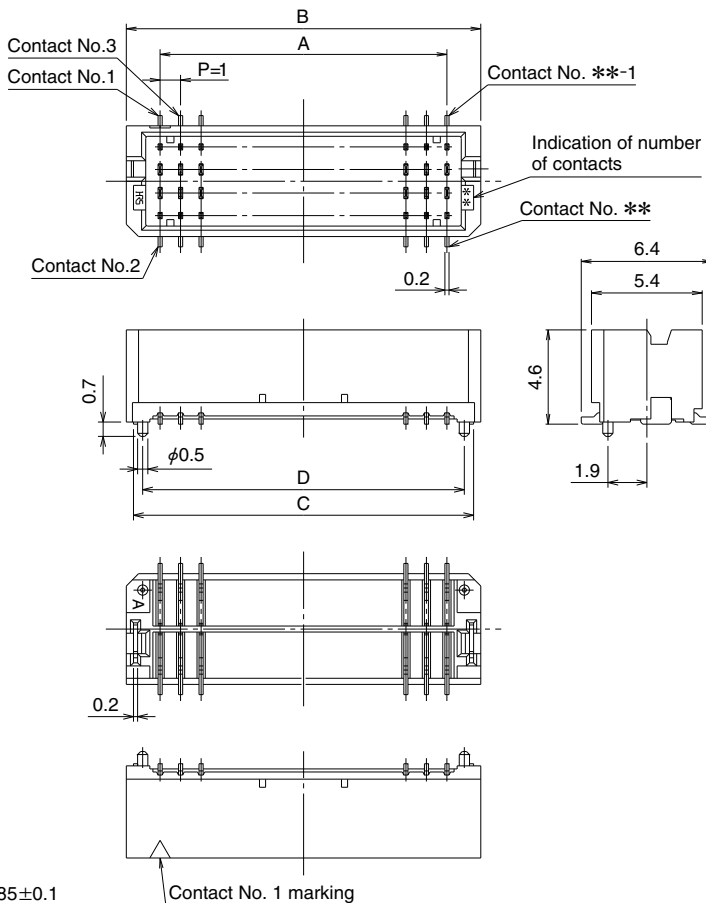
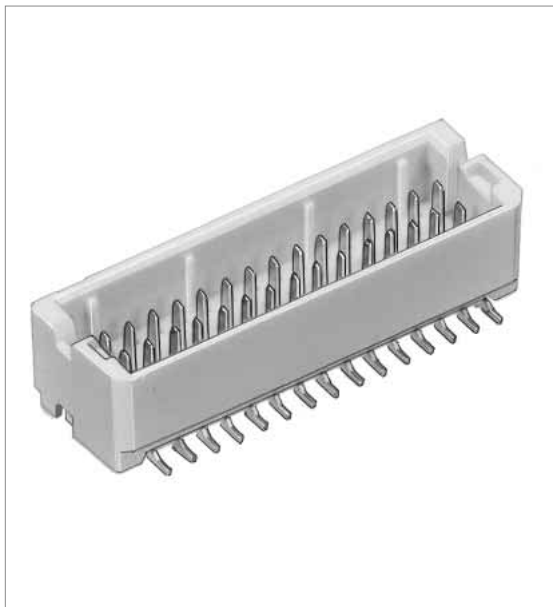
Note 1 : Hirose Electric will not be responsible for any problems caused by use of tools other than specified.

Note 2 : Please conduct crimping work according to the "Crimping work standards" and "Crimp condition table".

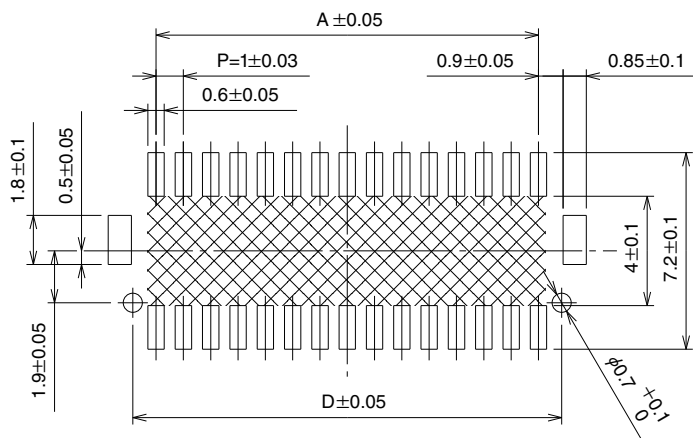
### Replacement Parts List for Applicator

Type	Part No.	HRS 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.

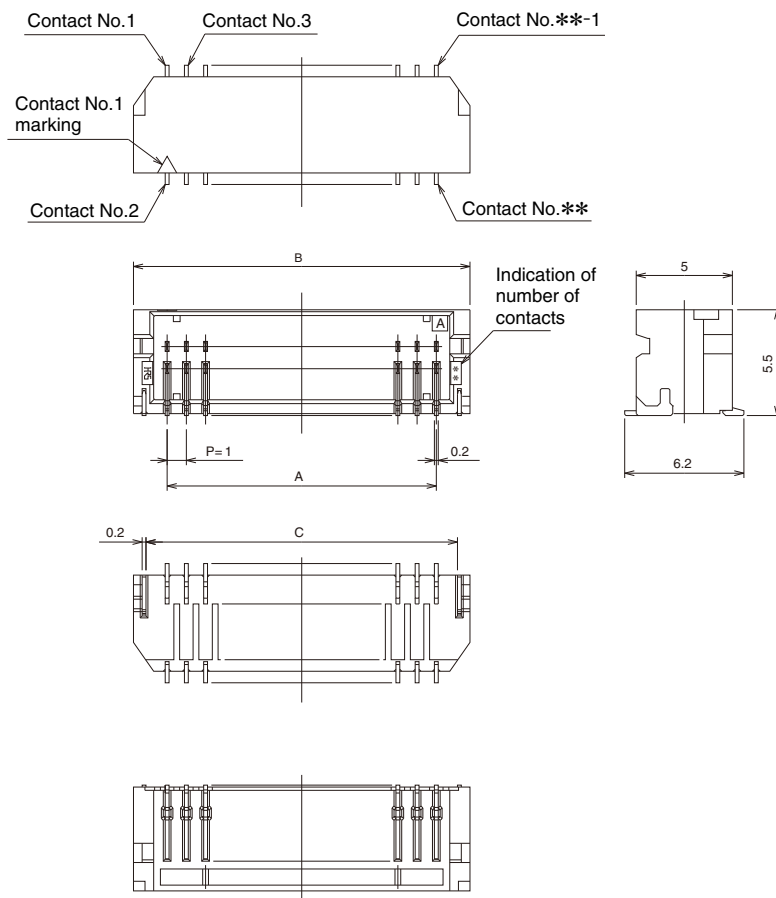
Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	Remarks	RoHS
DF20F -10DP-1V(56)	686-0032-2 56	10	4.0	7.3	6.6	—	Without boss	YES
DF20F -20DP-1V(56)	686-0033-5 56	20	9.0	12.3	11.6	—		
DF20F -30DP-1V(56)	686-0034-8 56	30	14.0	17.3	16.6	—		
DF20F -40DP-1V(56)	686-0035-0 56	40	19.0	22.3	21.6	—		
DF20F -50DP-1V(56)	686-0036-3 56	50	24.0	27.3	26.6	—		
DF20G-10DP-1V(56)	686-0037-6 56	10	4.0	7.3	6.6	5.7	With boss	
DF20G-20DP-1V(56)	686-0038-9 56	20	9.0	12.3	11.6	10.7		
DF20G-30DP-1V(56)	686-0039-1 56	30	14.0	17.3	16.6	15.7		
DF20G-40DP-1V(56)	686-0040-0 56	40	19.0	22.3	21.6	20.7		
DF20G-50DP-1V(56)	686-0041-3 56	50	24.0	27.3	26.6	25.7		

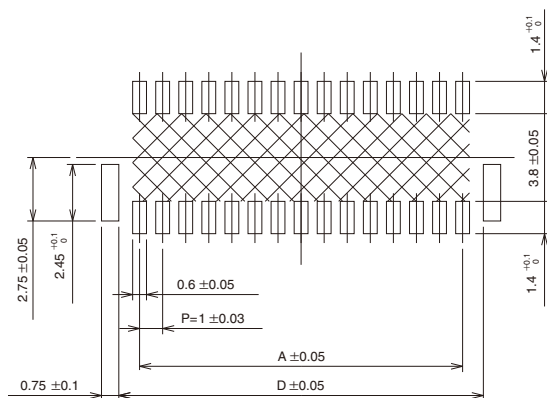
Note 1 : Order embossed tape packaging items by the reel. (1 reel contains 1,000 pieces)  
 Note 2 : Vacuum pick-up cap are included with embossed tape packaged connectors.

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

## 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

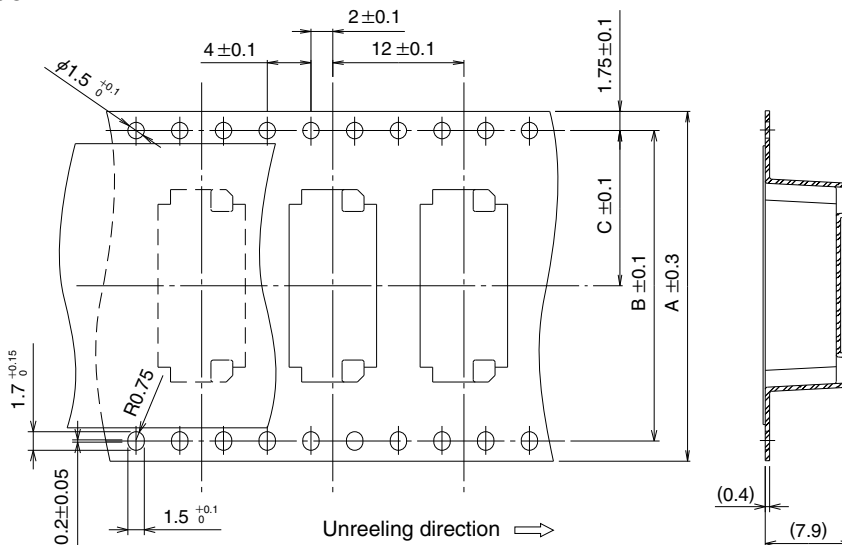
Part No.	HRS No.	No. of contacts	A	B	C	D	Remarks	RoHS
DF20F -10DP-1H(59)	686-0027-2(59)	10	4.0	7.5	6.2	5.8	Without boss	YES
DF20F -20DP-1H(59)	686-0028-5(59)	20	9.0	12.5	11.2	10.8		
DF20F -30DP-1H(59)	686-0029-8(59)	30	14.0	17.5	16.2	15.8		
DF20F -40DP-1H(59)	686-0030-7(59)	40	19.0	22.5	21.2	20.8		

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

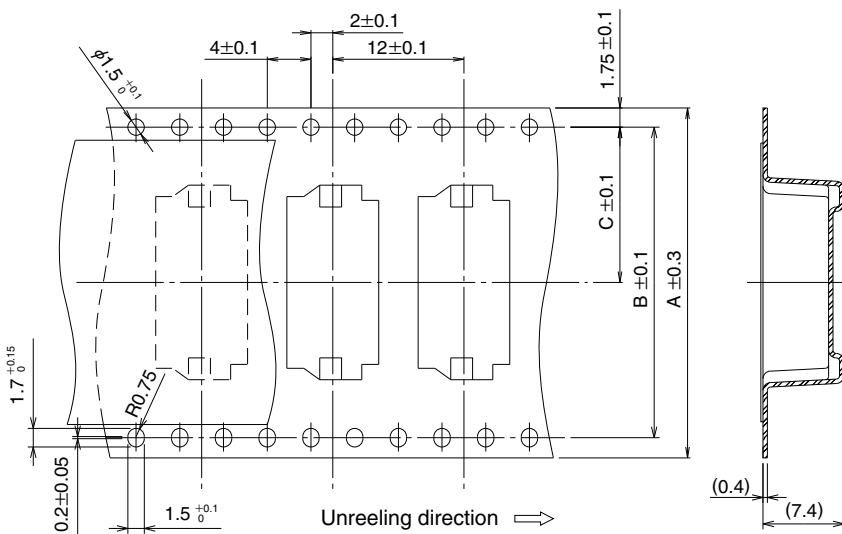
Note : Order embossed tape packaging items by the reel. (1 reel contains 1,000 pieces)

### ◆ Embossed Carrier Tape Dimensions

#### ● Straight pin header

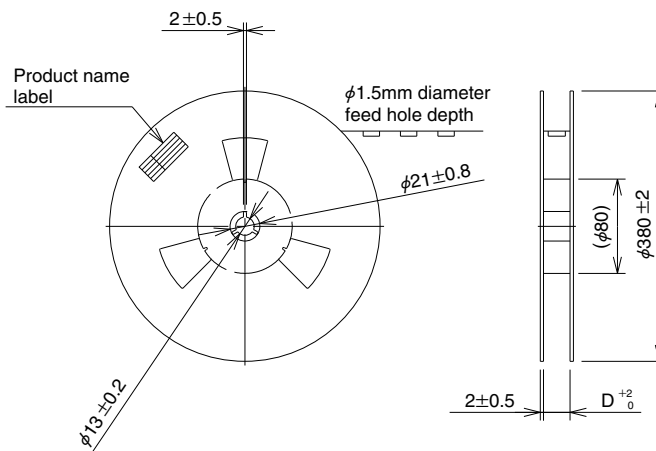


#### ● Right angle pin header

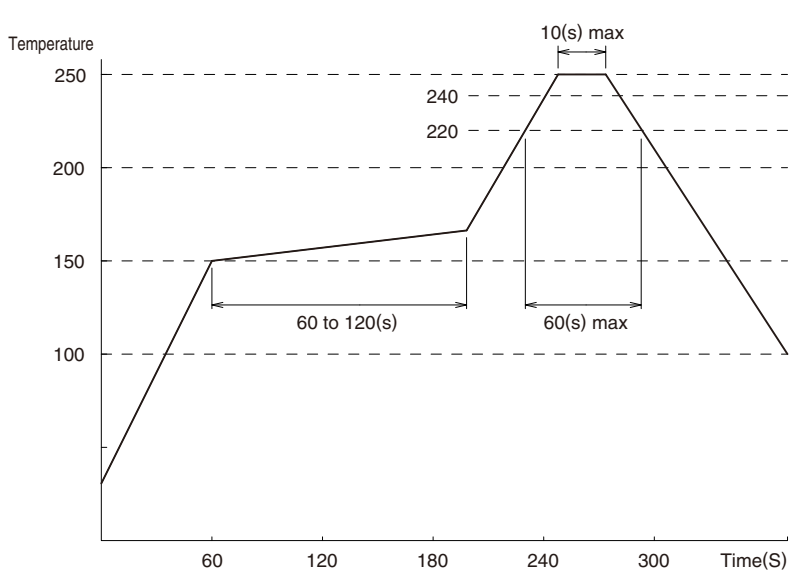


#### ● Reel dimensions

Part No.	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



◆ Usage recommendation

<p>1. Recommended Soldering Temperature Profile for IR Reflow.</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 0.03mm at the connector center section, with both ends of the connector as reference points.</p>
<p>5. Cleaning Conditions</p>	<p>Refer to "Wire-to-Board Connector Use Handbook"</p>
<p>6. Wiring Termination Conditions</p>	<p>Refer to "Wire-to-Board 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>
<p>8. Precautions</p>	<p>Refer to "Wire-to-Board Connector Use Handbook"</p>

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