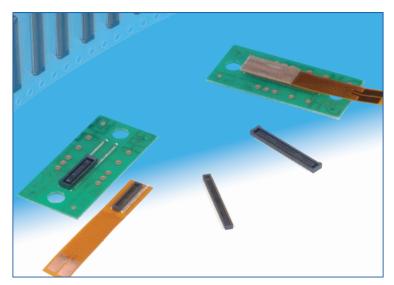
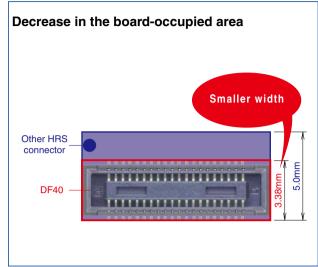
# 0.4 mm Contact Pitch Board-to-Board /Board-to-FPC Connectors

# **DF40** Series





## **Features**

# 1. Higher density of the board-mounted components

Extremely small board mounting pattern and low abovethe-board profile makes the connectors ideally suited for small device applications.

# 2. Stacking height variation: 1.5mm to 4.0mm

# 3. High contact reliability

Despite connectors small size and low profile the contacts provide strong contact forces and long contact wipe (0.45 mm), guaranteeing reliable electrical and mechanical performance.

# 4. Large self-alignment distance

The connectors will self-align within 0.33 mm.

## 5. Confirmation of the fully mated condition

Positive "click" sensation confirms correct insertion and connection of all contacts.

## 6. Built-in shock absorbing feature

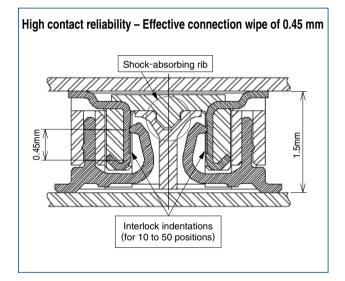
The protrusions and indents in the insulator bodies protect the connectors from failures when exposed to sudden impact.

## 7. Solder wicking prevention

Nickel-plated barriers provide protection against solder wicking into the contact areas.

## 8. Contact area protection

External walls protect the exposed contact areas from intrusion of flux or foreign particles.



# **Stacking Height variation**

Stac He	cking ight	1.5mm	2.0mm	2.5mm	3.0mm	3.5mm	4.0mm
	10	0					
	12			_			_
	20						
	24	0					
	30			$\triangle$		0	_
	34						
Pos.	40						$\triangle$
FUS.	44		$\triangle$		0		
	50					$\circ$	
	60					0	
	70						
	80						0
	90						
	100			_			

△: Reserved for product expansion

# **■**Product Specifications

Ratings	Current rating Voltage rating	0.3A 30V AC, DC	Operation temperature range Operation humidity range	-35°C to +85°C (Note 1) RH 20% to 80%	Storage temperature range Storage humidity range	-10°C to +60°C (Note 2) RH 40% to 70% (Note 2)
	voltage rating	001710, 20	operation namidity range	11112070100070	Otorago Harriarty Farigo	11114070 to 7070 (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	90 mΩ max.	1mA, 20mV AC, 1 kHz
4. Vibration	No electrical discontinuity of 1 $\mu$ s or more.	Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours, 3 axis
5. Humidity	Contact resistance: 90 m $\Omega$ max. IInsulation resistance: 25 M $\Omega$ min.	96 hours at +40±2°C and humidity of 90% to 95%.
6. Temperature cycle	Contact resistance: 90 m $\Omega$ max. Insulation resistance: 50 M $\Omega$ min.	Temperature: $-55 \rightarrow +5$ °C to $35$ °C $\rightarrow +85$ °C $\rightarrow +5$ °C to $+35$ °C Time: $30 \rightarrow 10 \rightarrow 30 \rightarrow 10$ (Minutes) 5 cycles
7. Durability (insertion/withdrawal)	Contact resistance: 90 mΩ max.	30 cycles
Resistance to soldering heat	No deformation of components affecting performance.	Reflow: At the recommended temperature profile 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.

# ■Materials

Product	Part	Material	Finish	Remarks
Receptacles	Insulator	LCP	Color : Black	UL94V-0
Headers	Contacts	Phosphor bronze	Gold plated	

# **■**Ordering information

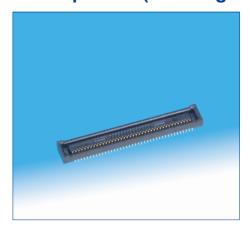
•Receptacle DF40 # (\*\*) - \* DS - 0.4 V (\*\*)

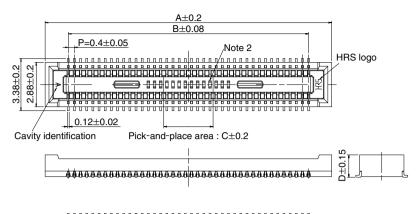
Series Name : DF40	3 Stacking	ı Height	<b>5</b> Connector Type
2 Configuration		Stacking Height	DS : Double-row receptacle
C: Without metal fittings	Blank	1.5mm	6 Contact Pitch : 0.4mm
HC: Without metal fittings	2.0	2.0mm	7 Terminal Type V: SMT vertical mount
J	2.5	2.5mm	
(Stacking height : 2.5mm to 4.0mm)	3.0	3.0mm	8 Packaging
	3.5	3.5mm	(51) : Embossed tape packaging
	4.0	4.0mm	
	4 Number	of Contacts	

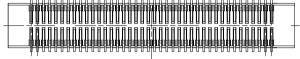
●Header	DF40	# -	*	DP	- 0.4	V	(**)
	0	2	3	4	<u> </u>	6	7

① Series Name : DF40	3 Number of Contacts 5 Contact Pitch : 0.4mm			
2 Configuration	4 Connector Type	6 Terminal Type V: SMT vertical mount		
C: Without metal fittings	DP : Double-row pin header	7 Packaging		
		(51) : Embossed tape packaging		

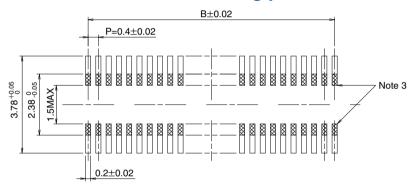
# ■Receptacles (Stacking Height: 1.5mm)

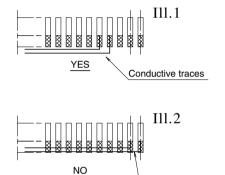






# ■Recommended PCB mounting pattern





Conductive traces

[Specification number]

(51): Embossed tape packaging (5,000 pieces per reel)

<ul><li>Stacking Height: 1.5m</li></ul>	m					Unit: mm
Part Number	CL No.	Number of contacts	Α	В	С	D
DF40C- 10DS-0.4V(51)	684-4036-2-51	10	4.6	1.6	1.0	1.45
DF40C- 12DS-0.4V(51)	Reserved for product expansion	12	5.0	2.0	1.0	1.45
DF40C- 20DS-0.4V(51)	684-4005-9-51	20	6.6	3.6	1.0	1.45
DF40C- 24DS-0.4V(51)	684-4006-1-51	24	7.4	4.4	1.2	1.45
DF40C- 30DS-0.4V(51)	684-4007-4-51	30	8.6	5.6	1.5	1.45
DF40C- 34DS-0.4V(51)	684-4023-0-51	34	9.4	6.4	2.3	1.45
DF40C- 40DS-0.4V(51)	684-4008-7-51	40	10.6	7.6	3.2	1.45
DF40C- 50DS-0.4V(51)	684-4009-0-51	50	12.6	9.6	3.2	1.45
DF40C- 60DS-0.4V(51)	684-4004-6-51	60	14.6	11.6	3.2	1.45
DF40C- 70DS-0.4V(51)	684-4016-5-51	70	16.6	13.6	3.2	1.45
DF40C- 80DS-0.4V(51)	684-4002-0-51	80	18.6	15.6	3.2	1.45
DF40C- 90DS-0.4V(51)	684-4124-8-51	90	20.6	17.6	3.2	1.45
DF40C-100DS-0.4V(51)	684-4033-4-51	100	22.6	19.6	3.2	1.45

Note 1: Order by number of reels.

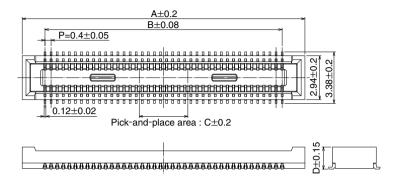
Note 2: Connectors with 60 or 100 contacts may have several recessed areas in this location. Pick-and-place operation will NOT be affected.

Refer to III.1 and III.2. for specific restrictions and exception to the above requirement.

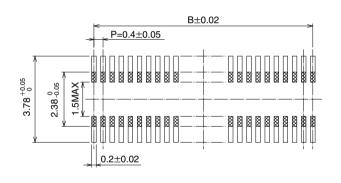
Note 4: This connector is NOT polarized.

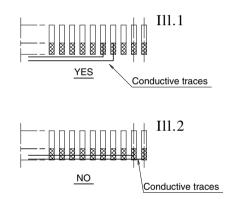
# ■ Receptacles (Stacking Height: 2.0mm)





# ■Recommended PCB mounting pattern





[Specification number] (51): Embossed tape packaging (4,000 pieces per reel)

15.6

3.2

1.95

# Stacking Height: 2.0mm

Unit: mm Part Number CL No. Number of contacts Α В С D DF40C(2.0)- 12DS-0.4V(51) 684-4148-6-51 2.0 1.0 5.0 1.95 12 DF40C(2.0)- 20DS-0.4V(51) 684-4040-0-51 20 6.6 1.0 3.6 1.95 DF40C(2.0)- 24DS-0.4V(51) 684-4021-2-51 24 7.4 4.4 1.2 1.95 DF40C(2.0)- 30DS-0.4V(51) 684-4058-5-51 1.5 30 8.6 5.6 1.95 684-4042-5-51 DF40C(2.0)- 40DS-0.4V(51) 3.2 40 10.6 7.6 1.95 DF40C(2.0)- 44DS-0.4V(51) Reserved for product expansion 44 11.4 8.4 3.2 1.95 DF40C(2.0)- 50DS-0.4V(51) 684-4091-0-51 50 12.6 3.2 9.6 1.95 DF40C(2.0)- 60DS-0.4V(51) 684-4034-7-51 60 14.6 11.6 3.2 1.95 DF40C(2.0)- 70DS-0.4V(51) 684-4147-3-51 70 16.6 13.6 3.2 1.95

18.6

DF40C(2.0)- 80DS-0.4V(51) Note 1: Order by number of reels.

Note 2: Connectors with 60 or 100 contacts may have several recessed areas in this location. Pick-and-place operation will NOT be affected.

80

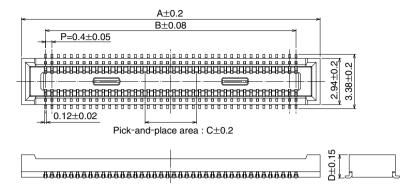
Refer to III.1 and III.2. for specific restrictions and exception to the above requirement.

684-4132-6-51

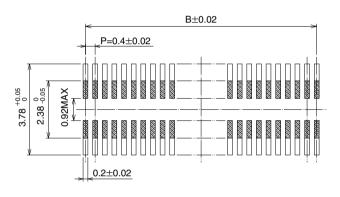
Note 4: This connector is NOT polarized.

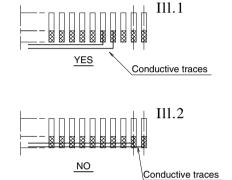
# ■Receptacles (Stacking Height : 2.5mm to 4.0mm)





# **■**Recommended PCB mounting pattern





[Specification number]

(51): Embossed tape packaging (3,000 pieces per reel)

## Stacking Height: 2.5mm

						Offic. Hilli
Part Number	CL No.	Number of contacts	Α	В	С	D
DF40HC(2.5)- 20DS-0.4V(51)	684-4126-3-51	20	6.6	3.6	1.0	2.4
DF40HC(2.5)- 30DS-0.4V(51)	Reserved for product expansion	30	8.6	5.6	1.5	2.4
DF40HC(2.5)- 40DS-0.4V(51)	684-4112-9-51	40	10.6	7.6	3.2	2.4
DF40HC(2.5)- 50DS-0.4V(51)	684-4101-2-51	50	12.6	9.6	3.2	2.4
DF40HC(2.5)- 60DS-0.4V(51)	684-4085-8-51	60	14.6	11.6	3.2	2.4

[Specification number]

(51): Embossed tape packaging (3,000 pieces per reel)

## Stacking Height : 3 0mm

Stacking Height: 3.0m	m					Unit: mm
Part Number	CL No.	Number of contacts	Α	В	С	D
DF40HC(3.0)- 30DS-0.4V(51)	684-4098-0-51	30	8.6	5.6	1.5	2.9
DF40HC(3.0)- 44DS-0.4V(51)	684-4076-7-51	44	11.4	8.4	3.2	2.9
DF40HC(3.0)- 50DS-0.4V(51)	684-4099-2-51	50	12.6	9.6	3.2	2.9
DF40HC(3.0)- 60DS-0.4V(51)	684-4100-0-51	60	14.6	11.6	3.2	2.9
DF40HC(3.0)- 70DS-0.4V(51)	684-4138-2-51	70	16.6	13.6	3.2	2.9
DF40HC(3.0)- 80DS-0.4V(51)	684-4180-9-51	80	18.6	15.6	3.2	2.9
DF40HC(3.0)- 90DS-0.4V(51)	684-4161-4-51	90	20.6	17.6	3.2	2.9
DF40HC(3.0)- 100DS-0.4V(51)	684-4151-0-51	100	22.6	19.6	3.2	2.9

Note 1: Order by number of reels.

Note 2: Connectors with 60 or 100 contacts may have several recessed areas in this location. Pick-and-place operation will NOT be affected.

Note 3: No conductive traces through the areas indicated by Refer to III.1 and III.2. for specific restrictions and exception to the above requirement.

Note 4: This connector is NOT polarized.

[Specification number]

(51): Embossed tape packaging (2,000 pieces per reel)

# Stacking Height: 3.5mm

Unit: mm

Part Number	CL No.	Number of contacts	Α	В	С	D
DF40HC(3.5)- 30DS-0.4V(51)	684-4136-7-51	30	8.6	5.6	1.5	3.4
DF40HC(3.5)- 50DS-0.4V(51)	684-4109-4-51	50	12.6	9.6	3.2	3.4
DF40HC(3.5)- 60DS-0.4V(51)	684-4102-5-51	60	14.6	11.6	3.2	3.4
DF40HC(3.5)- 80DS-0.4V(51)	684-4162-7-51	80	18.6	15.6	3.2	3.4

[Specification number]

(51): Embossed tape packaging (2,000 pieces per reel)

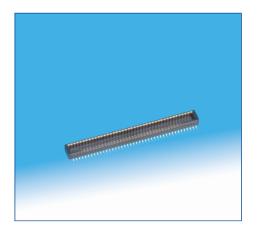
## Stacking Height: 4.0mm

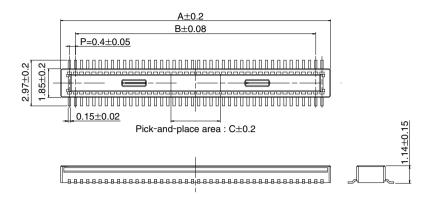
Unit: mm

Part Number	CL No.	Number of contacts	Α	В	С	D
DF40HC(4.0)- 40DS-0.4V(51)	Reserved for product expansion	40	10.6	7.6	3.2	3.9
DF40HC(4.0)- 50DS-0.4V(51)	684-4104-0-51	50	12.6	9.6	3.2	3.9
DF40HC(4.0)- 60DS-0.4V(51)	684-4133-9-51	60	14.6	11.6	3.2	3.9
DF40HC(4.0)- 80DS-0.4V(51)	684-4140-4-51	80	18.6	15.6	3.2	3.9
DF40HC(4.0)- 90DS-0.4V(51)	684-4165-5-51	90	20.6	17.6	3.2	3.9

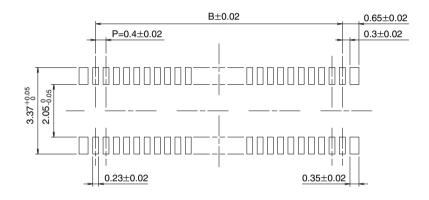
Note 4: This connector is NOT polarized.

# **■**Header





# **■**Recommended PCB mounting pattern



[Specification number]

(51): Embossed tape packaging (5,000 pieces per reel)

Unit: mm

					Unit: mm
Part Number	CL No.	Number of contacts	Α	В	С
DF40C- 10DP-0.4V(51)	684-4035-0-51	10	3.52	1.6	1.0
DF40C- 12DP-0.4V(51)	684-4149-9-51	12	3.92	2.0	1.0
DF40C- 20DP-0.4V(51)	684-4010-9-51	20	5.52	3.6	1.0
DF40C- 24DP-0.4V(51)	684-4011-1-51	24	6.32	4.4	1.2
DF40C- 30DP-0.4V(51)	684-4012-4-51	30	7.52	5.6	1.5
DF40C- 34DP-0.4V(51)	684-4024-3-51	34	8.32	6.4	2.3
DF40C- 40DP-0.4V(51)	684-4013-7-51	40	9.52	7.6	3.2
DF40C- 44DP-0.4V(51)	684-4077-0-51	44	10.32	8.4	3.2
DF40C- 50DP-0.4V(51)	684-4014-0-51	50	11.52	9.6	3.2
DF40C- 60DP-0.4V(51)	684-4003-3-51	60	13.52	11.6	3.2
DF40C- 70DP-0.4V(51)	684-4015-2-51	70	15.52	13.6	3.2
DF40C- 80DP-0.4V(51)	684-4001-8-51	80	17.52	15.6	3.2
DF40C- 90DP-0.4V(51)	684-4125-0-51	90	19.52	17.6	3.2
DF40C-100DP-0.4V(51)	684-4032-1-51	100	21.52	19.6	3.2

Note 1: Order by number of reels.

Note 2: 60 or 100 positions connectors will not have small interlock indentations in the contact areas.

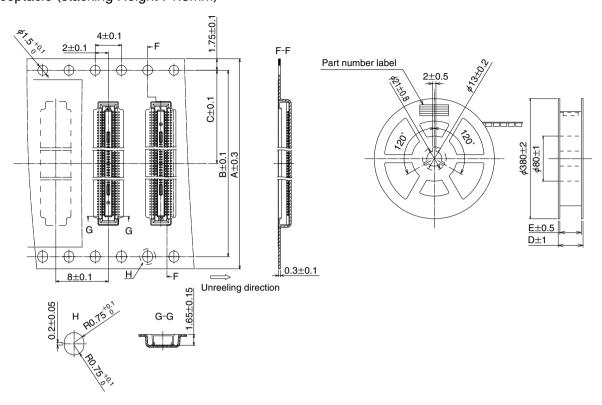
Note 3: The contacts in each of the 4 corners serve as metal solder brackets only and should NOT be used for current carrying.

Note 4: Location of the HRS logo and cavity identification mark may differ from what is shown.

Note 5: This connector is not polarized.

# **■**Packaging Specification

- Embossed Carrier Tape Dimensions
   Receptacle (stacking Height: 1.5mm)
- Reel Dimensions



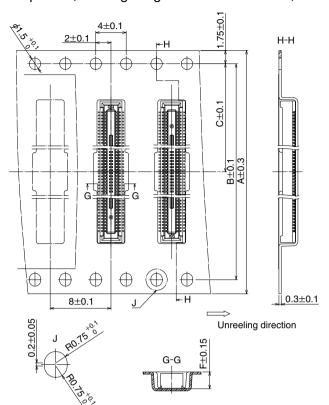
# Stacking Height: 1.5mm

Unit: mm

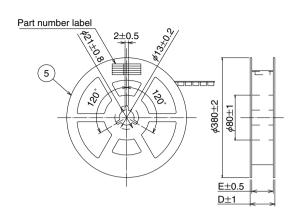
Part Number	Α	В	С	D	Е
DF40C- 10DS-0.4V(51)	16.0	_	7.5	21.5	17.5
DF40C- 12DS-0.4V(51)	16.0	_	7.5	21.5	17.5
DF40C- 20DS-0.4V(51)	16.0	_	7.5	21.5	17.5
DF40C- 24DS-0.4V(51)	16.0	_	7.5	21.5	17.5
DF40C- 30DS-0.4V(51)	24.0	_	11.5	29.5	25.5
DF40C- 34DS-0.4V(51)	24.0	_	11.5	29.5	25.5
DF40C- 40DS-0.4V(51)	24.0	_	11.5	29.5	25.5
DF40C- 50DS-0.4V(51)	24.0	_	11.5	29.5	25.5
DF40C- 60DS-0.4V(51)	24.0	_	11.5	29.5	25.5
DF40C- 70DS-0.4V(51)	32.0	28.4	14.2	37.5	33.5
DF40C- 80DS-0.4V(51)	32.0	28.4	14.2	37.5	33.5
DF40C- 90DS-0.4V(51)	44.0	40.4	20.2	49.5	45.5
DF40C-100DS-0.4V(51)	44.0	40.4	20.2	49.5	45.5

# Embossed Carrier Tape Dimensions

- Receptacle (stacking Height : 2.0mm to 3.0mm)



## Reel Dimensions



# Stacking Height: 2.0mm

Unit: mm

						Offic. Hilli
Part Number	A	В	С	D	Е	F
DF40C(2.0)-12DS-0.4V(51)	16.0		7.5	21.5	17.5	2.2
DF40C(2.0)-20DS-0.4V(51)	16.0		7.5	21.5	17.5	2.2
DF40C(2.0)-24DS-0.4V(51)	16.0	_	7.5	21.5	17.5	2.2
DF40C(2.0)-30DS-0.4V(51)	24.0	_	11.5	29.5	25.5	2.2
DF40C(2.0)-40DS-0.4V(51)	24.0		11.5	29.5	25.5	2.2
DF40C(2.0)-44DS-0.4V(51)	24.0		11.5	29.5	25.5	2.2
DF40C(2.0)-50DS-0.4V(51)	24.0		11.5	29.5	25.5	2.2
DF40C(2.0)-60DS-0.4V(51)	24.0	_	11.5	29.5	25.5	2.2
DF40C(2.0)-70DS-0.4V(51)	32.0	28.4	14.2	37.5	33.5	2.2
DF40C(2.0)-80DS-0.4V(51)	32.0	28.4	14.2	37.5	33.5	2.2

# ● Stacking Height: 2.5mm

Unit: mm

Part Number	Α	В	С	D	Е	F
DF40HC(2.5)-20DS-0.4V(51)	16.0		7.5	21.5	17.5	2.72
DF40HC(2.5)-30DS-0.4V(51)	24.0		11.5	29.5	25.5	2.72
DF40HC(2.5)-40DS-0.4V(51)	24.0		11.5	29.5	25.5	2.72
DF40HC(2.5)-50DS-0.4V(51)	24.0	_	11.5	29.5	25.5	2.72
DF40HC(2.5)-60DS-0.4V(51)	24.0		11.5	29.5	25.5	2.72

# Stacking Height: 3.0mm

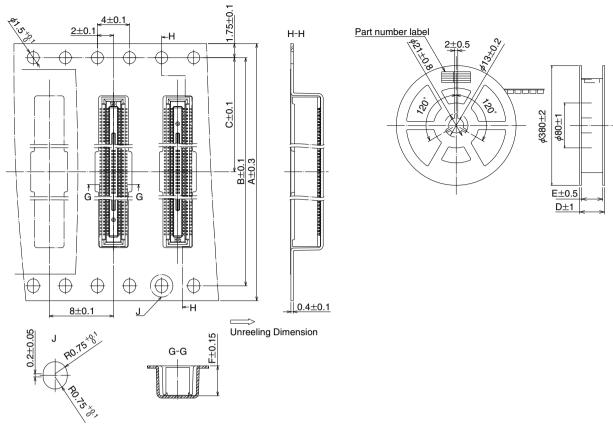
Unit: mm

Part Number	Α	В	С	D	E	F
DF40HC(3.0)-30DS-0.4V(51)	24.0		11.5	29.5	25.5	3.15
DF40HC(3.0)-44DS-0.4V(51)	24.0		11.5	29.5	25.5	3.15
DF40HC(3.0)-50DS-0.4V(51)	24.0	_	11.5	29.5	25.5	3.15
DF40HC(3.0)-60DS-0.4V(51)	24.0	_	11.5	29.5	25.5	3.15
DF40HC(3.0)-70DS-0.4V(51)	32.0	28.4	14.2	37.5	33.5	3.15
DF40HC(3.0)-80DS-0.4V(51)	32.0	28.4	14.2	37.5	33.5	3.15
DF40HC(3.0)-90DS-0.4V(51)	44.0	40.4	20.2	49.5	45.5	3.15
DF40HC(3.0)-100DS-0.4V(51)	44.0	40.4	20.2	49.5	45.5	3.15

# Embossed Carrier Tape Dimensions

- Receptacle (stacking Height : 3.5mm to 4.0mm)

## Reel Dimensions



● Stacking Height: 3.5mm

Unit: mm

Part Number	А	В	С	D	Е	F
DF40HC(3.5)-30DS-0.4V(51)	24.0		11.5	29.5	25.5	3.72
DF40HC(3.5)-50DS-0.4V(51)	24.0		11.5	29.5	25.5	3.72
DF40HC(3.5)-60DS-0.4V(51)	24.0		11.5	29.5	25.5	3.72
DF40HC(3.5)-80DS-0.4V(51)	32.0	28.4	14.2	37.5	33.5	3.72

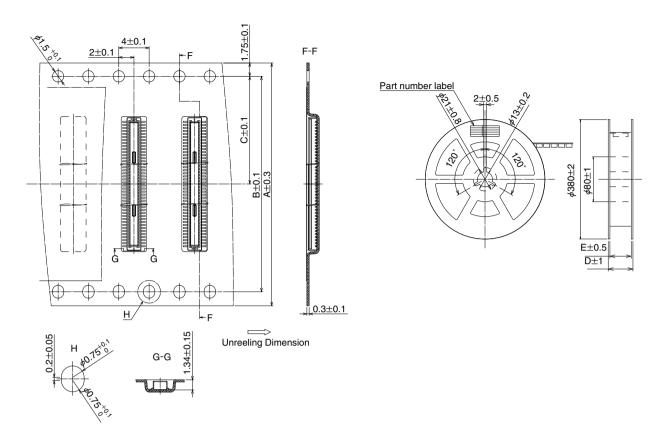
● Stacking Height: 4.0mm

Unit: mm

Part Number	А	В	С	D	Е	F
DF40HC(4.0)-40DS-0.4V(51)	24.0		11.5	29.5	25.5	4.22
DF40HC(4.0)-50DS-0.4V(51)	24.0		11.5	29.5	25.5	4.22
DF40HC(4.0)-60DS-0.4V(51)	24.0		11.5	29.5	25.5	4.22
DF40HC(4.0)-80DS-0.4V(51)	32.0	28.4	14.2	37.5	33.5	4.22
DF40HC(4.0)-90DS-0.4V(51)	44.0	40.4	20.2	49.5	45.5	4.22

# • Embossed Carrier Tape Dimensions - Header

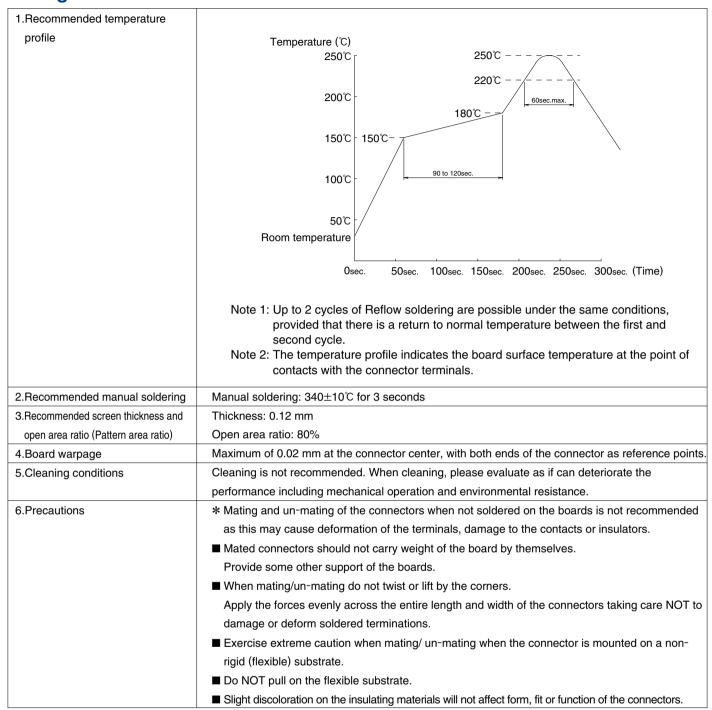
## Reel Dimensions



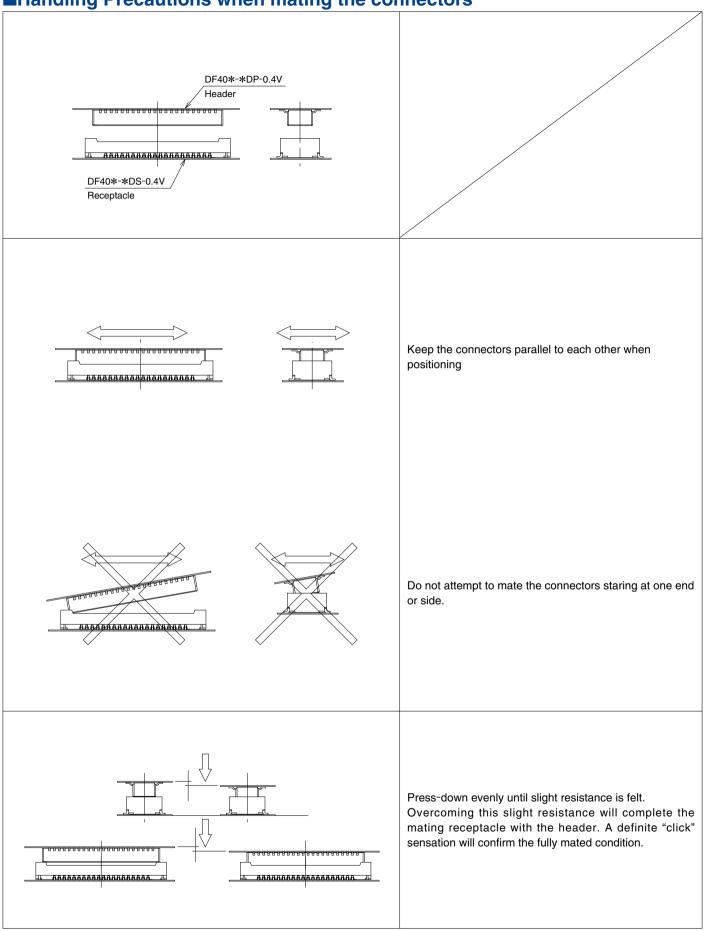
Unit: mm

					OTHE. 111111
Part Number	A	В	С	D	E
DF40C- 10DP-0.4V(51)	12.0	_	5.5	17.5	13.5
DF40C- 12DP-0.4V(51)	12.0	_	5.5	17.5	13.5
DF40C- 20DP-0.4V(51)	16.0		7.5	21.5	17.5
DF40C- 24DP-0.4V(51)	16.0	_	7.5	21.5	17.5
DF40C- 30DP-0.4V(51)	16.0	_	7.5	21.5	17.5
DF40C- 34DP-0.4V(51)	24.0		11.5	29.5	25.5
DF40C- 40DP-0.4V(51)	24.0		11.5	29.5	25.5
DF40C- 44DP-0.4V(51)	24.0		11.5	29.5	25.5
DF40C- 50DP-0.4V(51)	24.0		11.5	29.5	25.5
DF40C- 60DP-0.4V(51)	24.0	_	11.5	29.5	25.5
DF40C- 70DP-0.4V(51)	32.0	28.4	14.2	37.5	33.5
DF40C- 80DP-0.4V(51)	32.0	28.4	14.2	37.5	33.5
DF40C- 90DP-0.4V(51)	44.0	40.4	20.2	49.5	45.5
DF40C-100DP-0.4V(51)	44.0	40.4	20.2	49.5	45.5

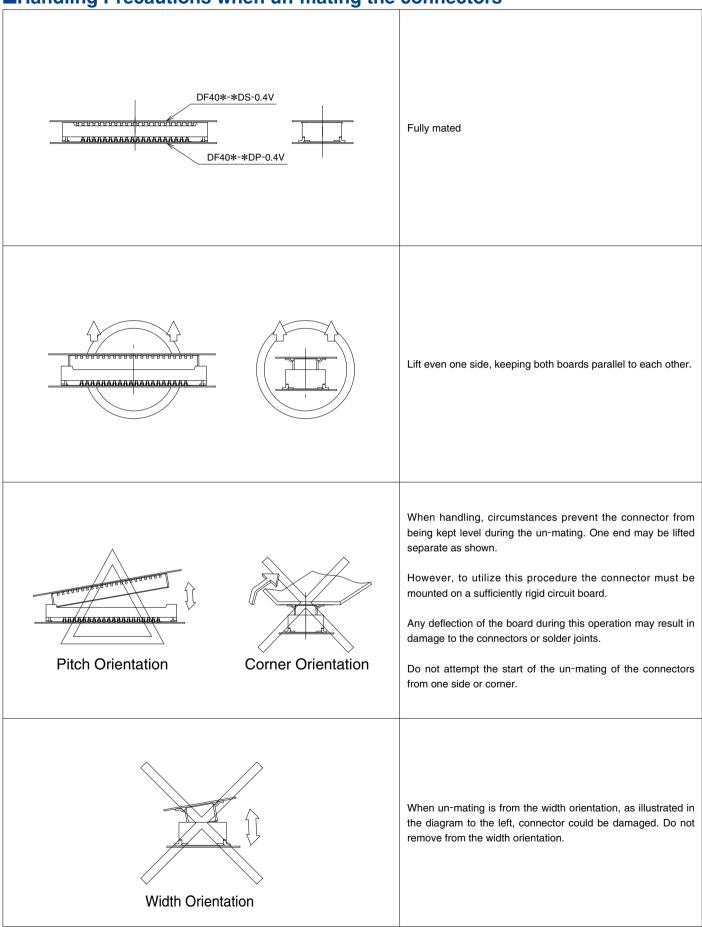
# ■Usage Recommendations



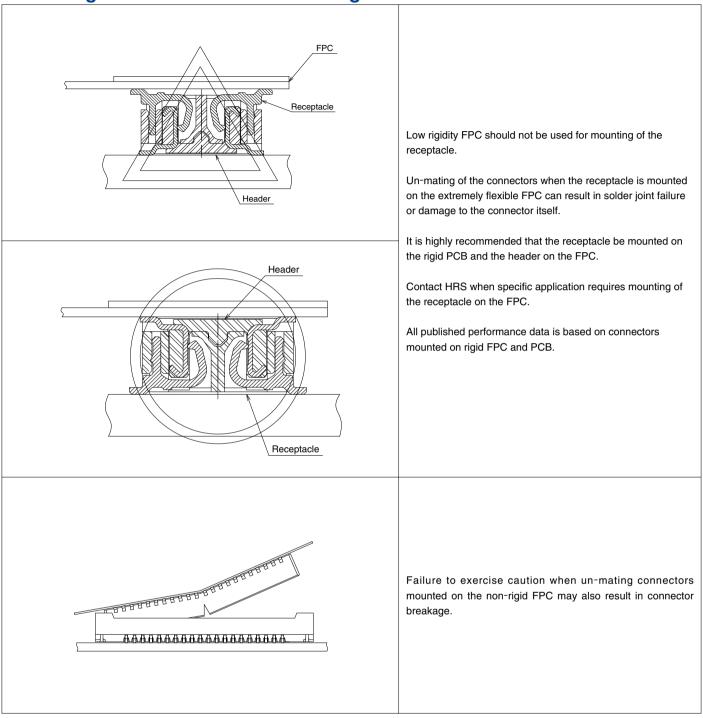
# **■**Handling Precautions when mating the connectors



# **■**Handling Precautions when un-mating the connectors



# **■**Handling Precautions when un-mating the connectors



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