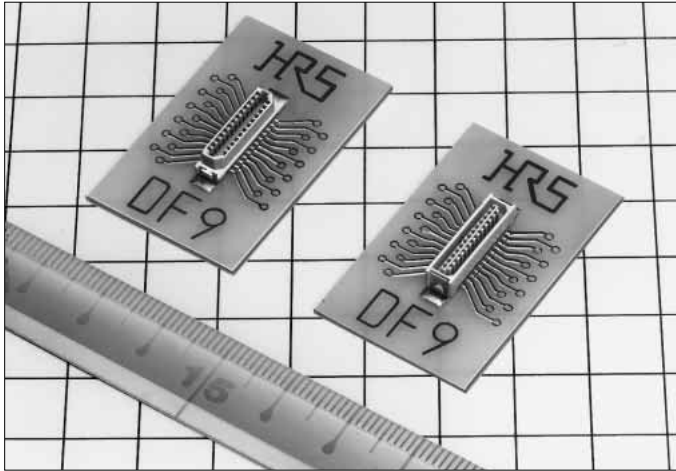


## 1mm Pitch SMT Board to Board Connector(Standard Interface Connector Compliant with VESA FPDI-1)

### DF9 Series



### ■Features

#### 1. Compliant with the VESA FPDI-1 Standard Interface Connector

The 31 and 41 contact connectors comply with the standard connector specification for the flat panel display interface, which U.S VESA. has selected as FPDI-1.

VESA: Video Electronics Standards Association

FPDI-1: Flat Panel Display Interface

#### 2. Perfect Mis-insertion Prevention

The mating area is designed in a trapezoidal structure, and perfectly prevents the mis-insertion despite the miniature size.

#### 3. Equipped with Easy Lock Mechanism

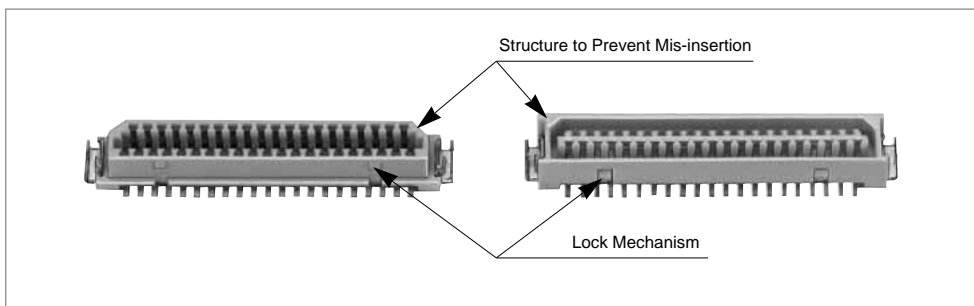
The easy lock mechanism assures the firm insertion and extraction properties as well as the insertion/extraction feeling touch.

#### 4. Smooth Insertion and Extraction Feeling

The contact is constructed without the material fragile surface in the contact portion, and provides a smooth insertion and use feeling.

#### 5. Setting Two Type Platings as Standard

Two type platings, tin plated and gold plated, are prepared, and either appropriate plating can be selected under cost and use conditions.



### ■Applications

LCD (Liquid Crystal Display), Mobile phone, Note PC

**DF9 Series 1mm Pitch SMT Board to Board Connector (Standard Interface Connector Compliant with VESA FFD1-1)**

**Product Specifications**

Rating	Current rating 0.5A	Operating Temperature Range -45 to +125°C (Note 1)	Storage Temperature Range -10 to +60°C (Note 2)
	Voltage rating 150V AC	Operating Humidity Range 40 to 80%	Storage Humidity Range 40 to 70%

Item	specification	Condition
1. Insulation Resistance	500M ohms min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown.	250V AC/1 minute
3. Contact Resistance	50m ohms max.	100mA
4. Vibration	No electrical discontinuity of 1μs or more	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 directions.
5. Humidity (Steady state)	Contact resistance: 50m ohms max. Insulation resistance: 500M ohms min.	96 hours at temperature of 40°C and humidity of 90% to 95%
6. Temperature Cycle	Contact resistance: 50m ohms max. Insulation resistance: 500M ohms min.	(-55°C: 30 minutes 5 to 35°C: 10 minutes 85°C: 30 minutes 5 to 35°C: 10 minutes) 5 cycles
7. Durability (Mating/un-mating)	Contact resistance: 50m ohms max:	Tin plating: 30 cycles      Gold plating: 100 cycles
8. Resistance to Soldering heat	No deformation of components affecting performance.	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.

**Material**

Product	Part	Material	Finish	Remarks
Receptacle/Header	Insulator	Polyamide	Beige	UL94V-0
	Contact	Phosphor copper	Tin plated or gold plated	————
	Metal fitting	Brass	Tin plating	————

Note: The gold plated product contact area is plated with gold, and lead plated with tin.

**Ordering Information**

● Receptacle/Header

**DF9 # - \* S - 1 V (\*\*)**

①      ②      ③      ④      ⑤      ⑥      ⑦

① Series Name : DF9	<table border="1"> <thead> <tr> <th></th> <th>Fitting</th> <th>Boss</th> </tr> </thead> <tbody> <tr> <td>Blank</td> <td>○</td> <td>○</td> </tr> <tr> <td>A</td> <td>×</td> <td>○</td> </tr> <tr> <td>B</td> <td>○</td> <td>×</td> </tr> <tr> <td>C</td> <td>×</td> <td>×</td> </tr> </tbody> </table>		Fitting	Boss	Blank	○	○	A	×	○	B	○	×	C	×	×	④ Connector Type S: Receptacle P: Header
		Fitting	Boss														
Blank		○	○														
A		×	○														
B	○	×															
C	×	×															
② Type	⑤ Contact Pitch : 1mm																
③ Number of Contacts 9 to 25,31,41,51	⑥ Contact Type V: Straight SMT																
	⑦ Contact Surface Finish/Packaging Type (22)(32): Tin plated, embossed tape packaging (69): Gold plated, embossed tape packaging																

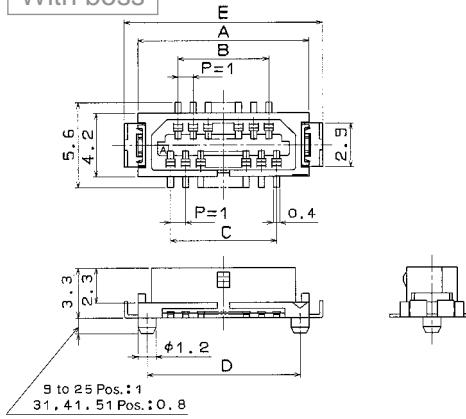
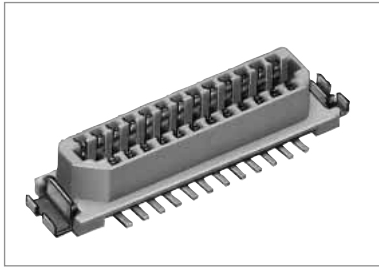
\*Refer to page A141 for the bottom entry type (DF9L).

DF9 Series 9mm Pitch SMT Board to Board Connector (Standard Interface Connector Compliant with VESA FPD-1)

■Receptacle

With metal fitting

With boss



[Specific No.] - \*\*, (\*\*)  
 (32) : Tin plated, embossed tape packaging  
 (69) : Gold plated, embossed tape packaging

Unit: mm

Part Number	CL No.	Number of Contacts	A	B	C	D	E	Spec. (32)	Spec. (69)	Remarks	RoHS
DF9- 9S-1V (**)	540-0054-0-**	9	8.3	3	4	7.1	10.1	○	○	With metal fitting With boss With pick and place tape	YES
DF9-11S-1V (**)	540-0055-2-**	11	9.3	4	5	8.1	11.1	○	○		
DF9-13S-1V (**)	540-0056-5-**	13	10.3	5	6	9.1	12.1	○	○		
DF9-15S-1V (**)	540-0057-8-**	15	11.3	6	7	10.1	13.1	○	○		
DF9-17S-1V (**)	540-0058-0-**	17	12.3	7	8	11.1	14.1	○	○		
DF9-19S-1V (**)	540-0059-3-**	19	13.3	8	9	12.1	15.1	○	○		
DF9-21S-1V (**)	540-0060-2-**	21	14.3	9	10	13.1	16.1	○	○		
DF9-23S-1V (**)	540-0061-5-**	23	15.3	10	11	14.1	17.1	○	○		
DF9-25S-1V (**)	540-0062-8-**	25	16.3	11	12	15.1	18.1	○	○		
DF9-31S-1V (**)	540-0063-0-**	31	19.3	14	15	18.1	21.1	○	○		
DF9-41S-1V (**)	540-0213-1-**	41	24.3	19	20	23.1	26.1	○	○		
DF9-51S-1V (**)	540-0064-3-**	51	29.3	24	25	28.1	31.1	—	○		

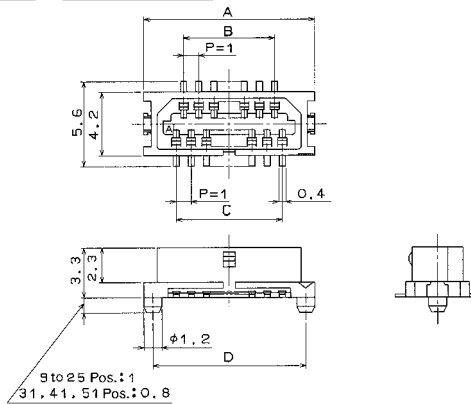
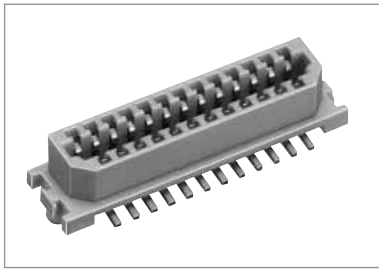
Note 1 : Please order the embossed tape packaging product per reel. (1000 pcs. per reel)

Note 2 : — are not available. Regarding blank, please contact Hirose sales representative.

■Receptacle

Without metal fitting

With boss



[Specific No.] - \*\*, (\*\*)  
 (22): Tin plated, tube packaging  
 (69): Gold plated, embossed tape packaging

Unit: mm

Part Number	CL No.	Number of Contacts	A	B	C	D	E	Spec. (22)	Spec. (69)	Remarks	RoHS
DF9A- 9S-1V (**)	540-0004-1-**	9	8.3	3	4	7.1	—	○	—	Without metal fitting With boss With pick and place tape	YES
DF9A-11S-1V (**)	540-0005-4-**	11	9.3	4	5	8.1	—	○	—		
DF9A-13S-1V (**)	540-0006-7-**	13	10.3	5	6	9.1	—	○	○		
DF9A-15S-1V (**)	540-0007-0-**	15	11.3	6	7	10.1	—	○	○		
DF9A-17S-1V (**)	540-0008-2-**	17	12.3	7	8	11.1	—	○	—		
DF9A-19S-1V (**)	540-0009-5-**	19	13.3	8	9	12.1	—	○	—		
DF9A-21S-1V (**)	540-0010-4-**	21	14.3	9	10	13.1	—	○	○		
DF9A-23S-1V (**)	540-0011-7-**	23	15.3	10	11	14.1	—	○	—		
DF9A-25S-1V (**)	540-0012-0-**	25	16.3	11	12	15.1	—	○	○		
DF9A-31S-1V (**)	540-0013-2-**	31	19.3	14	15	18.1	—	○	○		
DF9A-41S-1V (**)	540-0222-2-**	41	24.3	19	20	23.1	—	○	○		
DF9A-51S-1V (**)	540-0014-5-**	51	29.3	24	25	28.1	—	—	○		

Note 1 : Please order the emboss packaging product per reel. (1000 pcs. per reel)

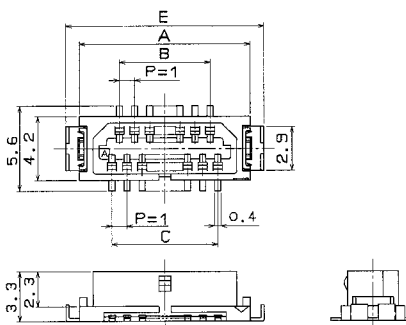
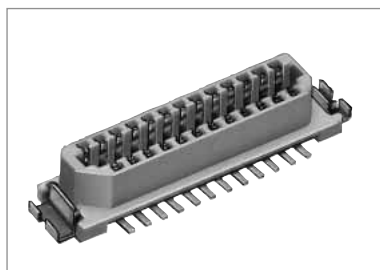
Note 2 : — are not available. Regarding blank, please contact Hirose sales representative.

DF9 Series 1mm Pitch SMT Board to Board Connector (Standard Interface Connector Compliant with VESA FFD-1)

■ Receptacle

With metal fitting

Without boss



[Specific No.] - \*\*, (\*\*)  
 (32): Tin plated, tube packaging  
 (69): Gold plated, embossed tape packaging

Unit: mm

Part Number	CL No.	Number of Contacts	A	B	C	D	E	Spec. (32)	Spec. (69)	Remarks	RoHS
DF9B- 9S-1V (**)	540-0125-6-**	9	8.3	3	4	-	10.1	○	○	With metal fitting Without boss With pick and place tape	YES
DF9B-11S-1V (**)	540-0126-9-**	11	9.3	4	5	-	11.1	○	-		
DF9B-13S-1V (**)	540-0127-1-**	13	10.3	5	6	-	12.1	○	○		
DF9B-15S-1V (**)	540-0128-4-**	15	11.3	6	7	-	13.1	○	○		
DF9B-17S-1V (**)	540-0129-7-**	17	12.3	7	8	-	14.1	-	○		
DF9B-19S-1V (**)	540-0247-3-**	19	13.3	8	9	-	15.1	-	○		
DF9B-21S-1V (**)	540-0131-9-**	21	14.3	9	10	-	16.1	○	○		
DF9B-23S-1V (**)	540-0132-1-**	23	15.3	10	11	-	17.1	○	-		
DF9B-25S-1V (**)	540-0133-4-**	25	16.3	11	12	-	18.1	○	-		
DF9B-31S-1V (**)	540-0143-8-**	31	19.3	14	15	-	21.1	○	○		
DF9B-41S-1V (**)	540-0216-0-**	41	24.3	19	20	-	26.1	○	○		
DF9B-51S-1V (**)	540-0145-3-**	51	29.3	24	25	-	31.1	-	○		

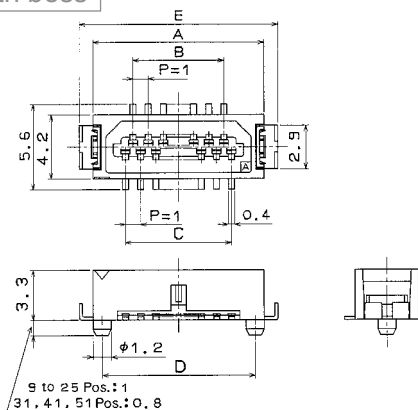
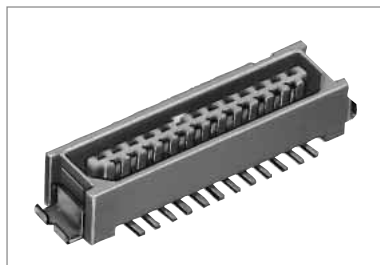
Note 1 : Please order the embossed tape packaging product per reel. (1000 pcs. per reel)

Note 2 : - are not available. Regarding blank, please contact Hirose sales representative.

■ Header

With metal fitting

With boss



[Specific No.] - \*\*, (\*\*)  
 (32): Tin plated, tube packaging  
 (69): Gold plated, embossed tape packaging

Unit: mm

Part Number	CL No.	Number of Contacts	A	B	C	D	E	Spec. (32)	Spec. (69)	Remarks	RoHS
DF9- 9P-1V (**)	540-0066-9-**	9	8.3	3	4	7.1	10.1	○	○	With metal fitting With boss With pick and place tape	YES
DF9-11P-1V (**)	540-0067-1-**	11	9.3	4	5	8.1	11.1	○	○		
DF9-13P-1V (**)	540-0068-4-**	13	10.3	5	6	9.1	12.1	○	○		
DF9-15P-1V (**)	540-0069-7-**	15	11.3	6	7	10.1	13.1	○	○		
DF9-17P-1V (**)	540-0070-6-**	17	12.3	7	8	11.1	14.1	○	○		
DF9-19P-1V (**)	540-0071-9-**	19	13.3	8	9	12.1	15.1	○	○		
DF9-21P-1V (**)	540-0072-1-**	21	14.3	9	10	13.1	16.1	○	○		
DF9-23P-1V (**)	540-0073-4-**	23	15.3	10	11	14.1	17.1	○	○		
DF9-25P-1V (**)	540-0074-7-**	25	16.3	11	12	15.1	18.1	○	○		
DF9-31P-1V (**)	540-0075-0-**	31	19.3	14	15	18.1	21.1	○	○		
DF9-41P-1V (**)	540-0214-4-**	41	24.3	19	20	23.1	26.1	○	○		
DF9-51P-1V (**)	540-0088-1-**	51	29.3	24	25	28.1	31.1	-	○		

Note 1 : Please order the emboss packaging product per reel. (1000 pcs. per reel)

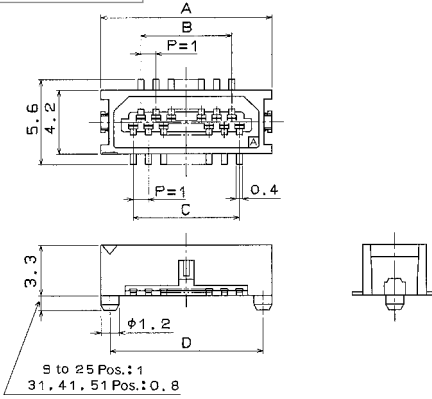
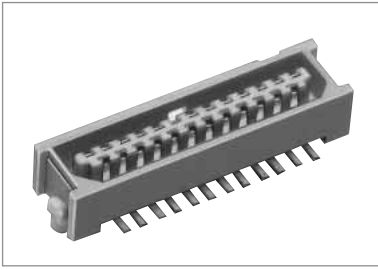
Note 2 : - are not available. Regarding blank, please contact Hirose sales representative.

DF9 Series 1mm Pitch SMT Board to Board Connector (Standard Interface Connector Compliant with VESA FPD-1)

Header

Without metal fitting

With boss



[Specific No.] - \*\*, (\*\*)  
 (22) : Tin plated, embossed tape packaging  
 (69) : Gold plated, embossed tape packaging

Unit: mm

Part Number	CL No.	Number of Contacts	A	B	C	D	E	Spec. (22)	Spec. (69)	Remarks	RoHS
DF9A- 9P-1V (**)	540-0016-0-**-	9	8.3	3	4	7.1	-	○	-	Without metal fitting With boss With pick and place tape	YES
DF9A-11P-1V (**)	540-0017-3-**-	11	9.3	4	5	8.1	-	○	-		
DF9A-13P-1V (**)	540-0018-6-**-	13	10.3	5	6	9.1	-	○	○		
DF9A-15P-1V (**)	540-0019-9-**-	15	11.3	6	7	10.1	-	○	○		
DF9A-17P-1V (**)	540-0020-8-**-	17	12.3	7	8	11.1	-	○	○		
DF9A-19P-1V (**)	540-0021-0-**-	19	13.3	8	9	12.1	-	○	-		
DF9A-21P-1V (**)	540-0022-3-**-	21	14.3	9	10	13.1	-	○	○		
DF9A-23P-1V (**)	540-0023-6-**-	23	15.3	10	11	14.1	-	-	-		
DF9A-25P-1V (**)	540-0024-9-**-	25	16.3	11	12	15.1	-	○	○		
DF9A-31P-1V (**)	540-0025-1-**-	31	19.3	14	15	18.1	-	○	○		
DF9A-41P-1V (**)	540-0223-5-**-	41	24.3	19	20	23.1	-	○	-		
DF9A-51P-1V (**)	540-0026-4-**-	51	29.3	24	25	28.1	-	-	○		

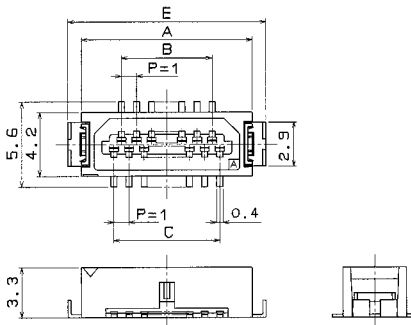
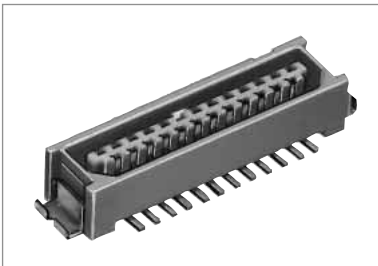
Note 1 : Please order the emboss packaging product per reel. (1000 pcs. per reel)

Note 2 : - are not available. Regarding blank, please contact Hirose sales representative.

Header

With metal fitting

Without boss



[Specific No.] - \*\*, (\*\*)  
 (32) : Tin plated, embossed tape packaging  
 (69) : Gold plated, embossed tape packaging

Unit: mm

Part Number	CL No.	Number of Contacts	A	B	C	D	E	Spec. (32)	Spec. (69)	Remarks	RoHS
DF9B- 9P-1V (**)	540-0134-7-**-	9	8.3	3	4	-	10.1	○	○	With metal fitting Without boss With pick and place tape	YES
DF9B-11P-1V (**)	540-0135-0-**-	11	9.3	4	5	-	11.1	○	○		
DF9B-13P-1V (**)	540-0136-2-**-	13	10.3	5	6	-	12.1	○	-		
DF9B-15P-1V (**)	540-0137-5-**-	15	11.3	6	7	-	13.1	○	○		
DF9B-17P-1V (**)	540-0138-8-**-	17	12.3	7	8	-	14.1	○	○		
DF9B-19P-1V (**)	540-0248-6-**-	19	13.3	8	9	-	15.1	○	○		
DF9B-21P-1V (**)	540-0140-0-**-	21	14.3	9	10	-	16.1	○	○		
DF9B-23P-1V (**)	540-0141-2-**-	23	15.3	10	11	-	17.1	○	-		
DF9B-25P-1V (**)	540-0142-5-**-	25	16.3	11	12	-	18.1	○	-		
DF9B-31P-1V (**)	540-0144-0-**-	31	19.3	14	15	-	21.1	○	○		
DF9B-41P-1V (**)	540-0221-0-**-	41	24.3	19	20	-	26.1	○	○		
DF9B-51P-1V (**)	540-0146-6-**-	51	29.3	24	25	-	31.1	-	○		

Note 1 : Please order the emboss packaging product per reel. (1000 pcs./reel)

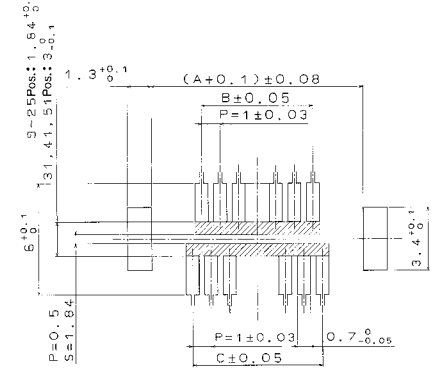
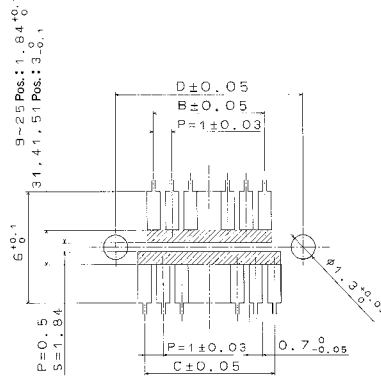
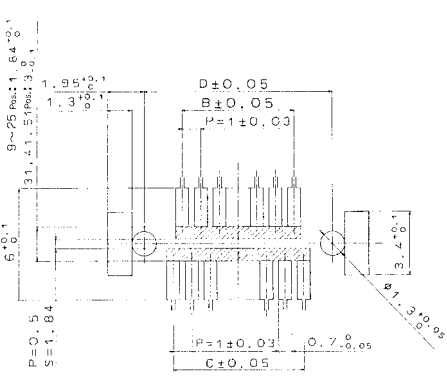
Note 2 : - are not available. Regarding blank, please contact Hirose sales representative.

## ◆ Recommended PCB mounting pattern

● With metal fitting, with boss

● Without metal fitting, with boss

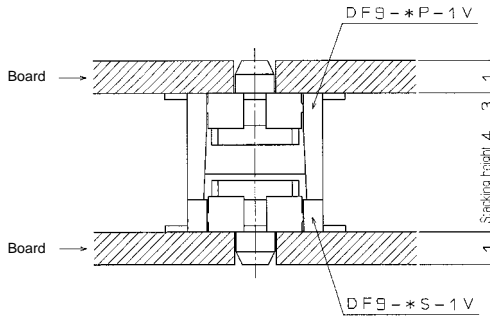
● Metal fitting, without boss



Note 1 : If the pattern is included in the shaded area and not treated with resist, it could touch the connector contact .

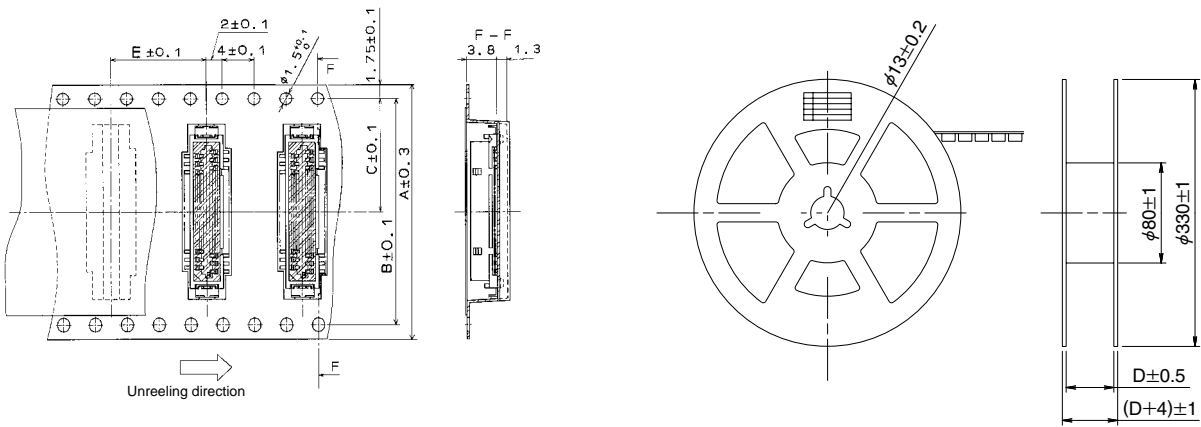
Note 2 : Please refer to each product size pattern for the universal size on the above patterns (A, B, C, D...).

## ◆ Application Pattern



Note 1 : The board to board size 4.3mm in the pattern does not include the soldering paste thickness.

## ◆ Embossed Carrier Tape Dimensions

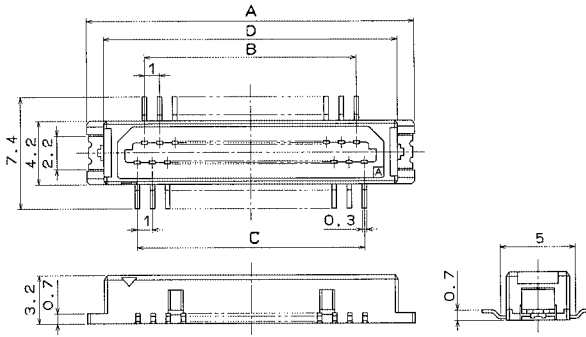
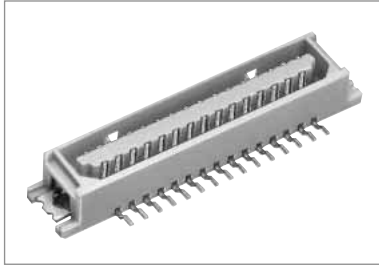


Unit:mm

Product Type	Size	Number of Contacts	A	B	C	D	E
DF9-*S/P-1V	9 to 25	24	—	11.5	25.5	12	
	31	32	28.4	14.2	33.5	12	
	41, 51	44	40.4	20.2	45.5	12	
DF9A-*S/P-1V	9 to 13	16	—	7.5	17.5	8	
	15 to 25	24	—	11.5	22.5	12	
	31	32	28.4	14.2	33.5	12	
DF9B-*S/P-1V	41, 51	44	40.4	20.2	45.5	12	
	9 to 25	24	—	11.5	25.5	12	
	31	32	28.4	14.2	33.5	12	
		41, 51	44	40.4	20.2	45.5	12

DF9 Series 1mm Pitch SMT Board to Board Connector (Standard Interface Connector Compliant with VESA FDI-1)

## Bottom Entry Header



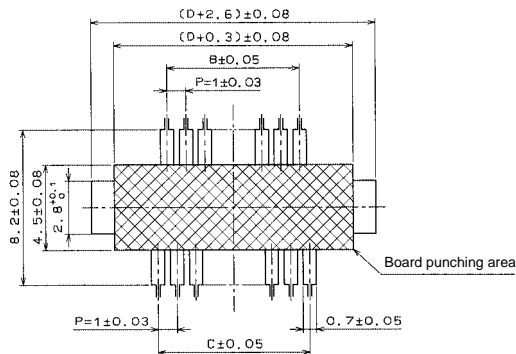
[Specific No.] - \*\*, (\*\*)  
 (31): Gold plated embossed tape packaging

Part Number	CL No.	Number of Contacts	A	B	C	D	Spec. (31)	Remarks	RoHS
DF9L-31P-1V (**)	540-0215-7-**	31	21.64	14	15	19.4	○	With metal fitting	YES

Note 1 : Please order the embossed tape packaging product per reel. (1000 pcs. per reel)

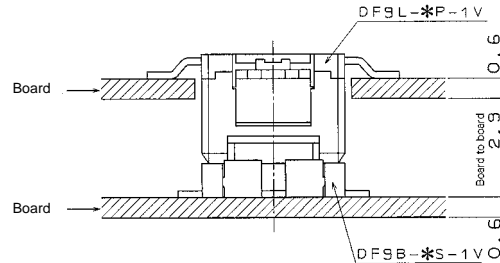
Note 2 : The vacuum area on the embossed tape product utilizes the connector case surface. However, it is necessary to check the previous vacuum, because the surface isn't always plain.

### Recommended PCB mounting pattern



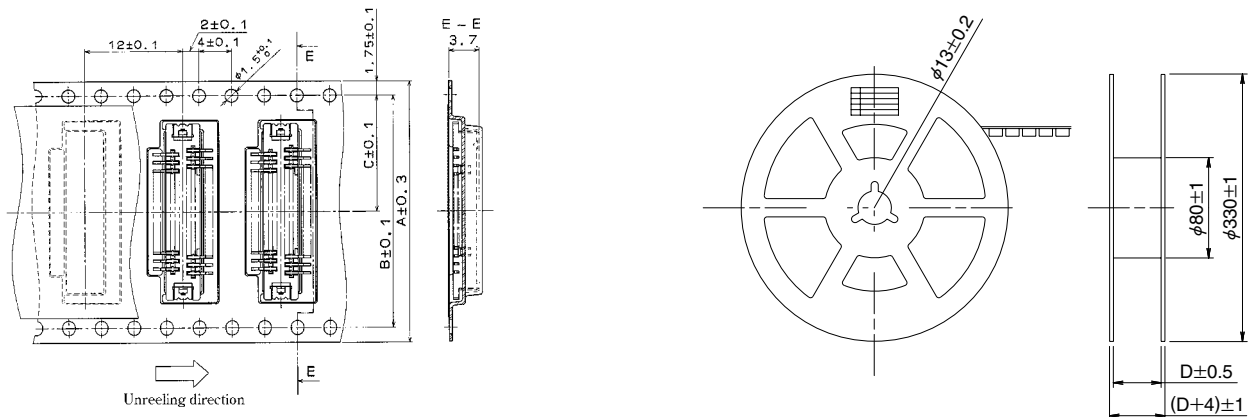
Note : The shaded area indicates the through-hole area.

### Application Pattern



Note : The 2.9mm board to board size does not include the soldering paste thickness.

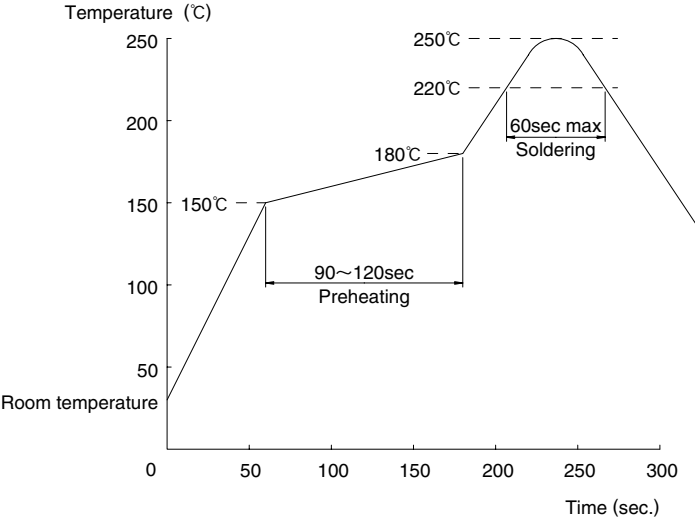
### Embossed Carrier Tape Dimensions



Unit: mm

Product Type	Size	Number of Contacts	A	B	C	D
DF9L-31P-1V		31	32	28.4	14.2	33.5

## ◆ Precautions for Use

<p>1. Recommended Temperature Profile (SMT)</p>	 <p>Note1: 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>Note2: The temperature profile indicates the board surface temperature at the point of contacts with the connector terminals.</p>
<p>2. Recommended Manual Soldering Condition (SMT)</p>	<p>Soldering iron temperature: <math>370 \pm 10^\circ\text{C}</math>, Soldering time: Within 3 seconds</p>
<p>3. Recommended Screen Thickness (SMT)</p>	<p>0.15mm</p>
<p>4. Board Warp(SMT)</p>	<p>Maximum 0.03mm in the connector center area, based on both connector edges.</p>
<p>5. Cleaning Condition</p>	<p>Refer to the "Nylon Connector Use Hand book".</p>
<p>6. Cautions</p>	<ul style="list-style-type: none"> <li>■ Avoid retaining the board with the connector only, and fix the board by any other means than the connector.</li> <li>■ Where the board is not mounted, the insertion or extraction will cause damage or deformation in contacts.</li> <li>■ Excessive scoop insertion or extraction may result in damage.</li> <li>■ In the manual soldering process, don't carry out 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 forming product according to the manufacturing lot. However, the difference doesn't affect the performance.</li> </ul>