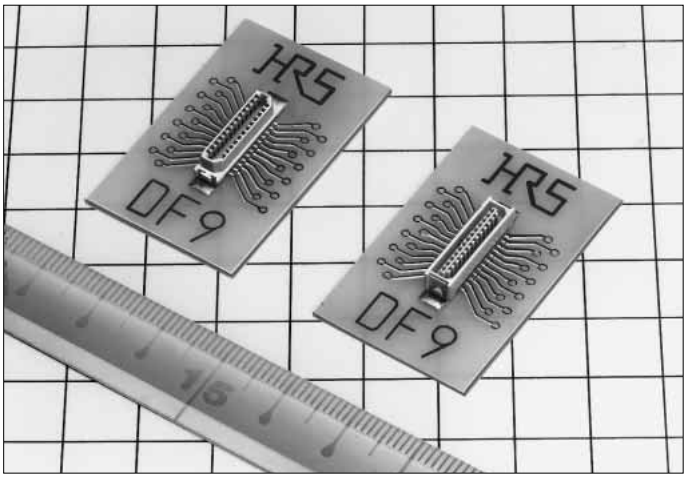
The product information in this catalog is for reference only. Please request the Engineering Drawing for the most current and accurate design information.
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1mm Pitch SMT Board to Board Connector(Standard Interface Connector Compliant with VESA FPDI-1)

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

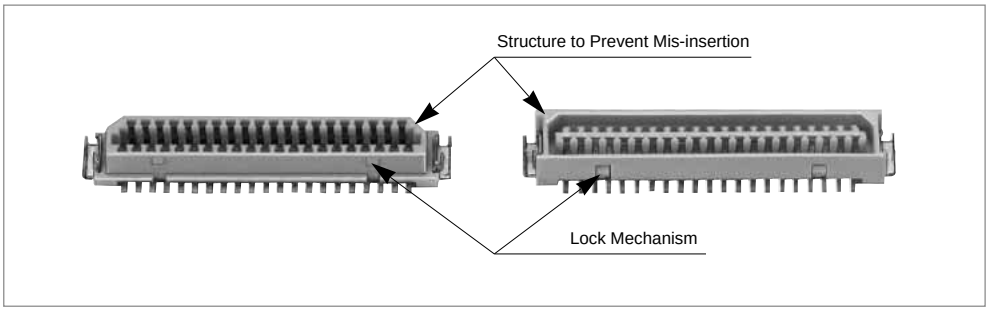
The easy lock mechanism assures the firm insertion and extraction properties as well as the insertion/extraction feeling touch.

4. Smooth Insertion and Extraction Feeling

The contact is constructed without the material fragible 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

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■Product Specifications

Rating	Current rating 0.5A Voltage rating150V AC	Operating Temperature Range -45 to +125℃ (Note 1) Operating Humidity Range 40 to 80%	Storage Temperature Range -10 to +60℃ (Note 2) 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℃ and humidity of 90% to 95%	
6. Temperature Cycle	Contact resistance: 50m ohms max. Insulation resistance: 500M ohms min.	(-55℃: 30 minutes 5 to 35℃: 10 minutes 85℃: 30 minutes 5 to 35℃: 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℃ 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 (＊＊)
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Series Name : DF9

❷ Type

	Fitting	Boss
Blank	○	○
A	×	○
B	○	×
C	×	×

❸ Number of Contacts
9 to 25,31,41,51

❹ Connector Type
S: Receptacle
P: Header

❺ Contact Pitch : 1mm

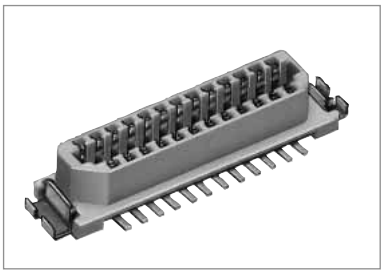
❻ Contact Type
V: Straight SMT

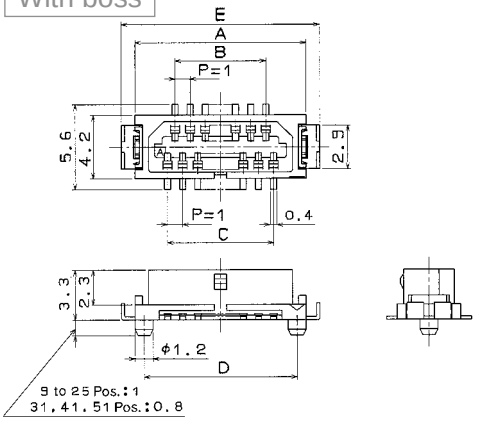
❼ Contact Surface Finish/Packaging Type
(22)(32): Tin plated, embossed tape packaging
(69): Gold plated, embossed tape packaging

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

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■Receptacle With metal fitting With boss





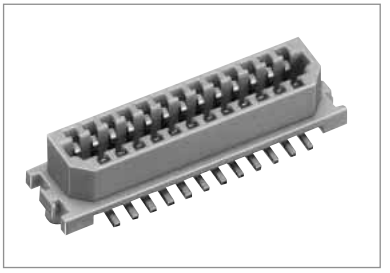
[Specific No.] − **, (**)
(32) : Tin plated, embossed tape packaging
(69) : Gold plated, embossed tape packaging

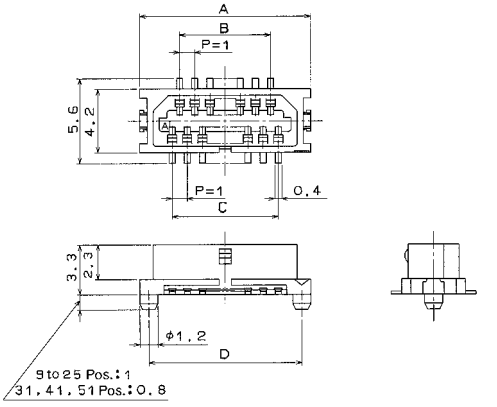
Unit: mm

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	○	○		
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	○	○	With metal	
DF9-17S-1V (**)	540-0058-0-**	17	12.3	7	8	11.1	14.1	○	○	fitting	
DF9-19S-1V (**)	540-0059-3-**	19	13.3	8	9	12.1	15.1	○	○	With boss	YES
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	○	○	With pick and	
DF9-25S-1V (**)	540-0062-8-**	25	16.3	11	12	15.1	18.1	○	○	place tape	
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





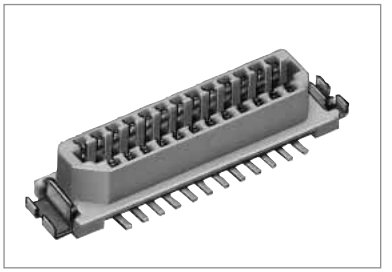
[Specific No.] − **, (**)
(22): Tin plated, tube packaging
(69): Gold plated, embossed tape packaging

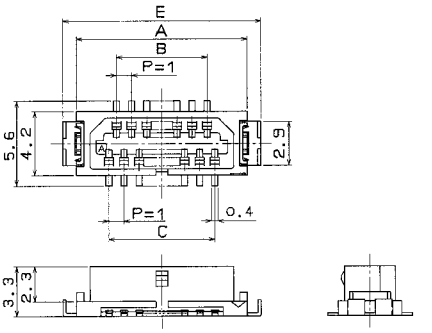
Unit: mm

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	−	○	−		
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	−	○	○	Without metal	
DF9A-17S-1V (**)	540-0008-2-**	17	12.3	7	8	11.1	−	○	−	fitting	
DF9A-19S-1V (**)	540-0009-5-**	19	13.3	8	9	12.1	−	○	−	With boss	YES
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	−	○	−	With pick and	
DF9A-25S-1V (**)	540-0012-0-**	25	16.3	11	12	15.1	−	○	○	place tape	
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.

■Receptacle With metal fitting Without boss





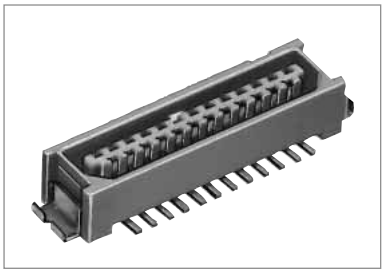
[Specific No.] − **, (**)
(32): Tin plated, tube packaging
(69): Gold plated, embossed tape packaging

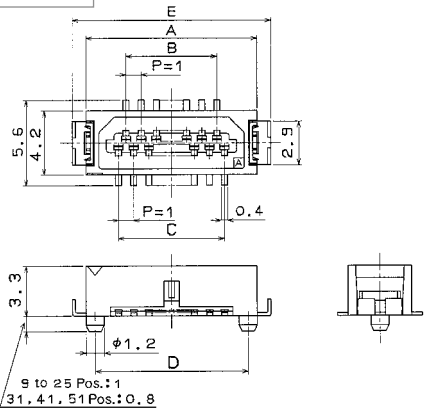
Unit: mm

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

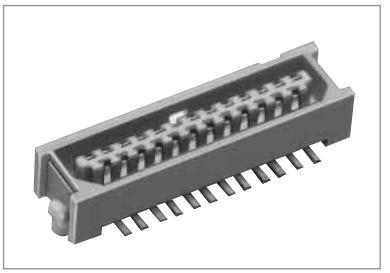
Unit: mm

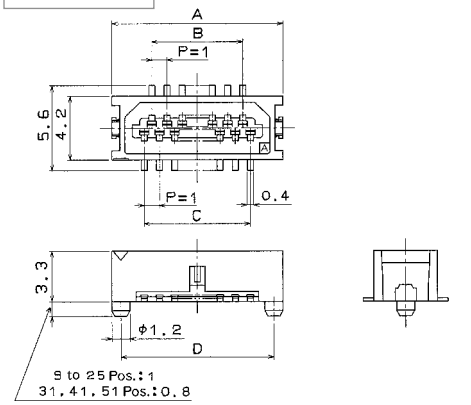
Part Number	CL No.	Number of Contacts	A	B	C	D	E	Spec. (32)	Spec. (69)	Remarks	RoHS
DF9- 9P-1V (**)	540-0066-9-**	9	8.3	3	4	7.1	10.1	○	○	With metal fitting With boss With pick and place tape	YES
DF9-11P-1V (**)	540-0067-1-**	11	9.3	4	5	8.1	11.1	○	○		
DF9-13P-1V (**)	540-0068-4-**	13	10.3	5	6	9.1	12.1	○	○		
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.

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■Header Without metal fitting With boss





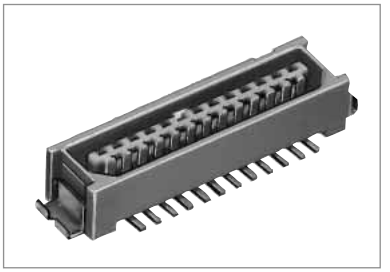
[Specific No.] – **, (**)
(22) : Tin plated, embossed tape packaging
(69) : Gold plated, embossed tape packaging

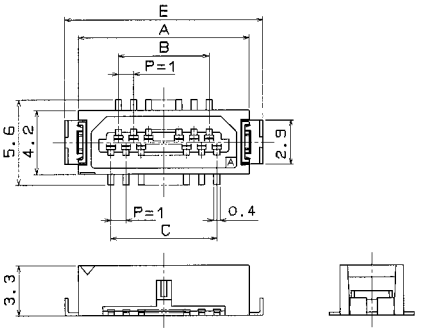
Unit: mm

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	–	○	–		
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	–	○	○	Without metal fitting	
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	–	○	–	With boss	
DF9A-21P-1V (**)	540-0022-3-**	21	14.3	9	10	13.1	–	○	○		YES
DF9A-23P-1V (**)	540-0023-6-**	23	15.3	10	11	14.1	–	–	–	With pick and	
DF9A-25P-1V (**)	540-0024-9-**	25	16.3	11	12	15.1	–	○	○	place tape	
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

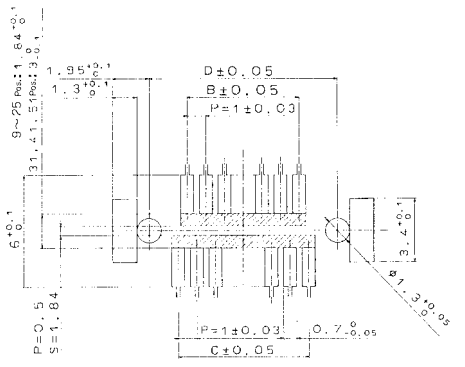
Part Number	CL No.	Number of Contacts	A	B	C	D	E	Spec. (32)	Spec. (69)	Remarks	RoHS
DF9B- 9P-1V (**)	540-0134-7-**	9	8.3	3	4	–	10.1	○	○		
DF9B-11P-1V (**)	540-0135-0-**	11	9.3	4	5	–	11.1	○	○		
DF9B-13P-1V (**)	540-0136-2-**	13	10.3	5	6	–	12.1	○	–		
DF9B-15P-1V (**)	540-0137-5-**	15	11.3	6	7	–	13.1	○	○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

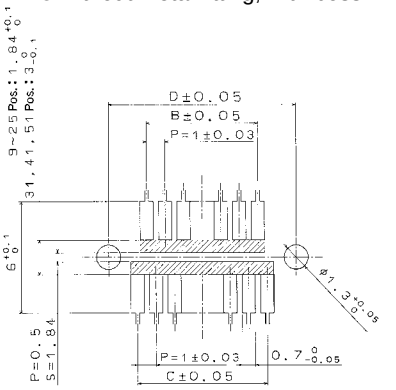
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◆Recommended PCB mounting pattern

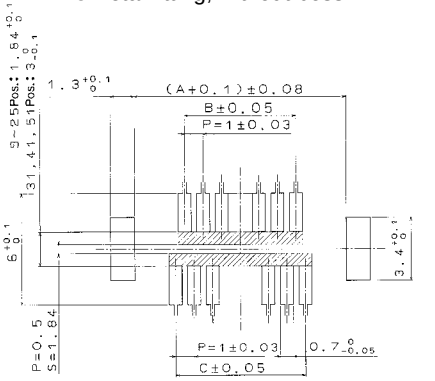
●With metal fitting, with boss



●Without metal fitting, with boss



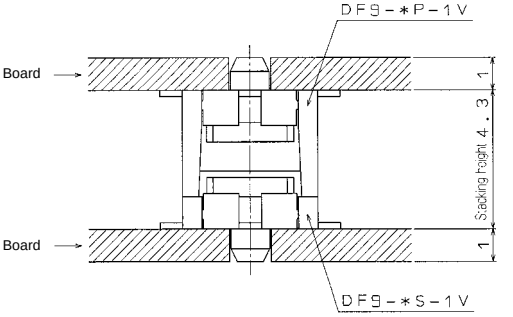
●Metal fitting, without boss



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

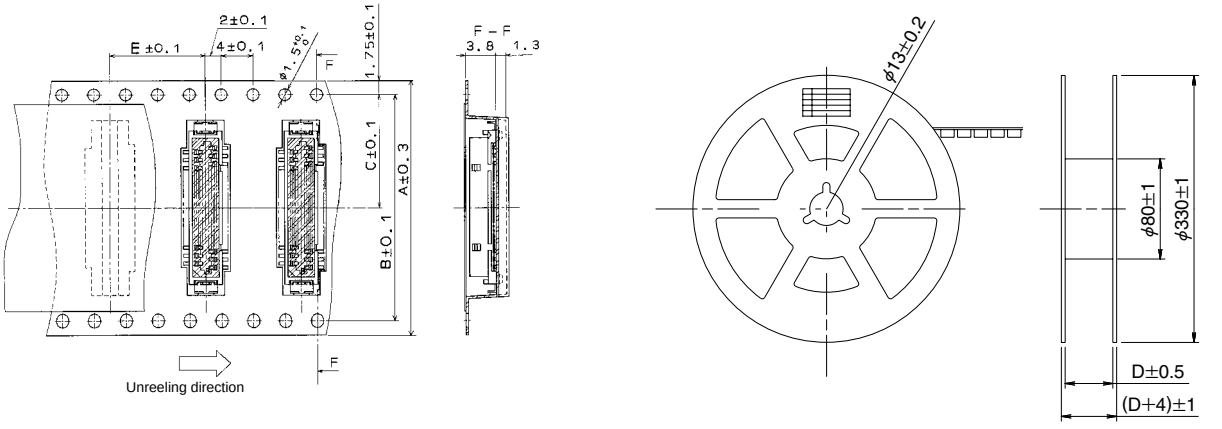
Note 2 : Please refer to each product size pattern for the universal size on the above patterns (A, B, C, D...).

◆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

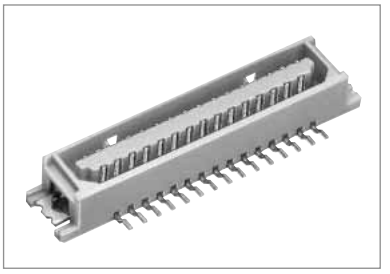


Unit:mm

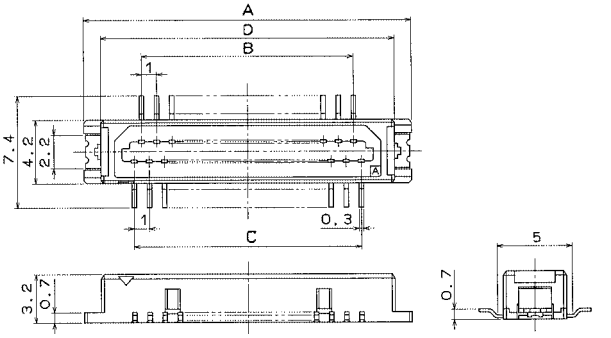
Product Type / Size	Number of Contacts	A	B	C	D	E
DF9-*S/P-1V	9 to 25	24	———	11.5	25.5	12
	31	32	28.4	14.2	33.5	12
	41, 51	44	40.4	20.2	45.5	12
DF9A-*S/P-1V	9 to 13	16	———	7.5	17.5	8
	15 to 25	24	———	11.5	22.5	12
	31	32	28.4	14.2	33.5	12
	41, 51	44	40.4	20.2	45.5	12
DF9B-*S/P-1V	9 to 25	24	———	11.5	25.5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

The product information in this catalog is for reference only. Please request the Engineering Drawing for the most current and accurate design information.
All non-RoHS products have been discontinued, or will be discontinued soon. Please check the products status on the Hirose website RoHS search at www.hirose-connectors.com, or contact your Hirose sales representative.

■Bottom Entry Header



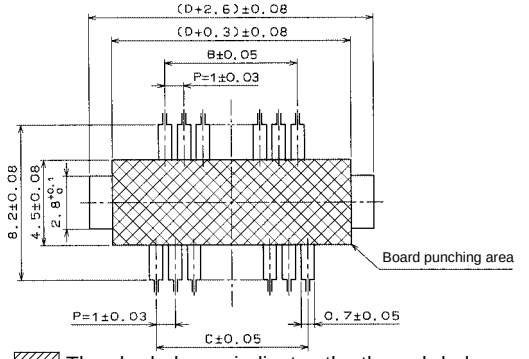
[Specific No.] − **, (**)
(31): Gold plated embossed tape packaging



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

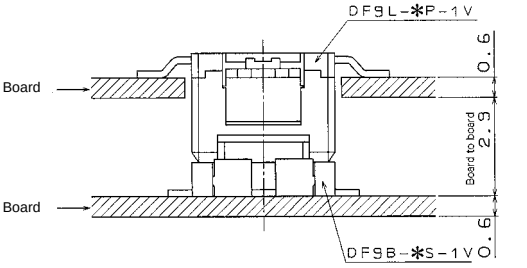
Note 1 : Please order the embossed tape packaging product per reel. (1000 pcs. per reel)
Note 2 : The vacuum area on the embossed tape product utilizes the connector case surface. However, it is necessary to check the previous vacuum, because the surface isn't always plain.

◆Recommended PCB mounting pattern



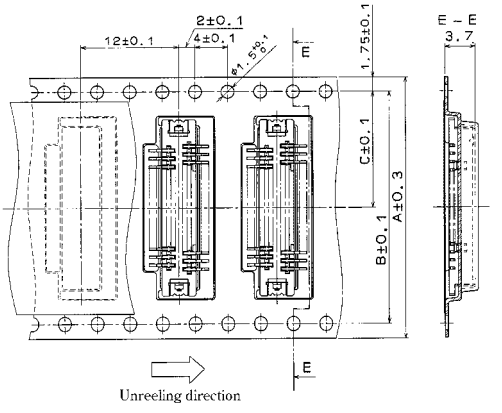
Note : ▨ The shaded area indicates the through-hole area.

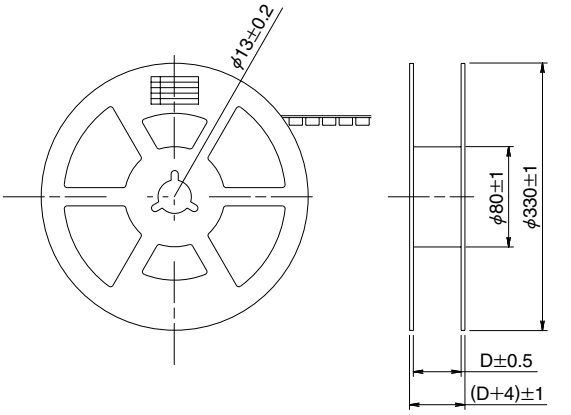
◆Application Pattern



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

◆Embossed Carrier Tape Dimensions



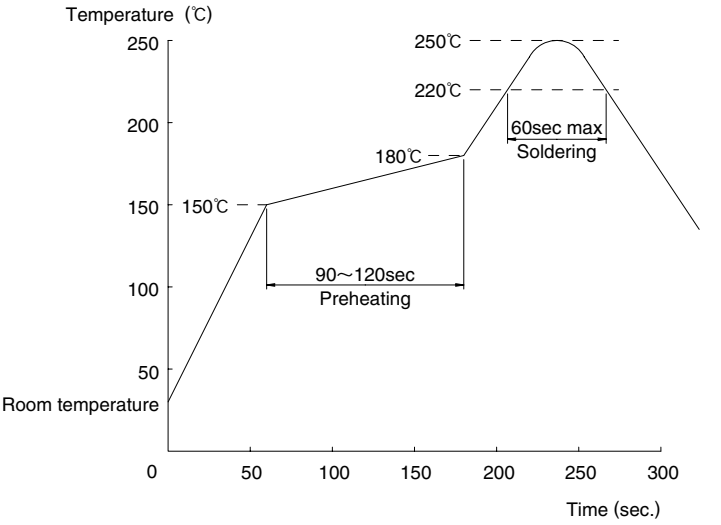


Unit: mm

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

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Precautions for Use

1. Recommended Temperature Profile (SMT)	 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. Note2: The temperature profile indicates the board surface temperature at the point of contacts with the connector terminals.
2. Recommended Manual Soldering Condition (SMT)	Soldering iron temperature: 370±10℃, Soldering time: Within 3 seconds
3. Recommended Screen Thickness (SMT)	0.15mm
4. Board Warp(SMT)	Maximum 0.03mm in the connector center area, based on both connector edges.
5. Cleaning Condition	Refer to the "Nylon Connector Use Hand book".
6. Cautions	■ Avoid retaining the board with the connector only, and fix the board by any other means than the connector. ■ Where the board is not mounted, the insertion or extraction will cause damage or deformation in contacts. ■ Excessive scoop insertion or extraction may result in damage. ■ In the manual soldering process, don't carry out flux coating which will cause a flux blister on the connector. ■ 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.