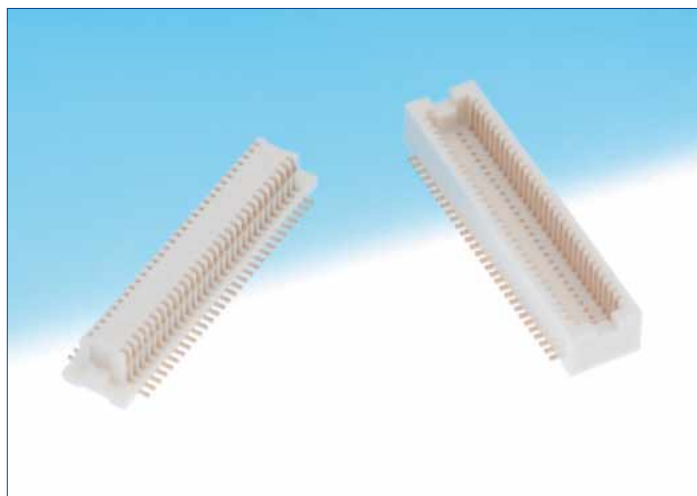


# 0.5mm Pitch SMT Board-to-Board Connector

## DF12 Series



### Correspond to automatic mounting

The vacuum pick-up area secures the automatic mounting machine for pick and place.

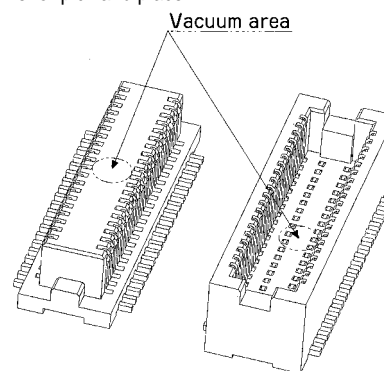
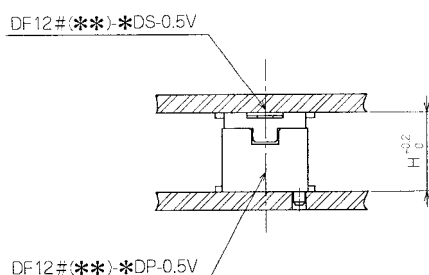


Fig.1

## ■ Features

### 1. Broad Variations of Stacking Height

In addition to 0.5mm pitch ultra-miniature size connector, the stacking height of 3mm, 3.5mm, 4mm, and 5mm are provided.



Header/Receptacle	DF12#(3.0)-*DS-0.5V Combination stacking height	DF12#-*DS-0.5V Combination stacking height
DF12#(3.0)-*DP-0.5V	3.0	—
DF12#(3.5)-*DP-0.5V	—	3.5
DF12#(4.0)-*DP-0.5V	—	4.0
DF12#(5.0)-*DP-0.5V	—	5.0

Note 1 : (\*\*) of the product name DF12# (\*\*) indicates the stacking height.

Note 2 : The stacking height doesn't include the soldering paste thickness.

### [Stacking Height Variation]

Stacking Height		3.0mm	3.5mm	4.0mm	5.0mm
Number of Contacts	10 contacts	○	—	—	—
	14 contacts	○	—	—	—
	20 contacts	○	○	○	○
	30 contacts	○	○	○	○
	32 contacts	○	—	○	—
	36 contacts	○	○	○	○
	40 contacts	○	○	○	○
	50 contacts	○	○	○	○
	60 contacts	○	○	○	○
	80 contacts	○	—	—	—

### 2. Corresponding to Automatic Mounting

The connector has the vacuum pick-up area to enable automatic mounting with the embossed tape packaging.(Fig.1)

### 3. Metal Fitting Available

The product including the metal fitting to prevent solder peeling is provided, considering the mounting on FPC.

## Product Specifications

Rating	Current rating 0.3A	Operating Temperature Range -45 to +125°C (Note 1)	Storage Temperature Range -10 to +60°C (Note 2)
	Voltage rating 50V AC	Operating Humidity Range 40 to 80%	Storage Humidity Range 40 to 70% (Note 2)

Item	Specification	Condition
1. Insulation Resistance	500MΩ min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown.	150V AC/1 minute
3. Contact Resistance	50mΩ max.	100mA
4. Vibration	No electrical discontinuity of 1μs or more	Frequency : 10 to 55 Hz, single amplitude of 0.75mm, 2 hours in each of the 3 directions.
5. Humidity (Steady state)	Contact resistance : 50mΩ max. Insulation resistance:500MΩ min	96 hours at temperature of 40±2°C and humidity of 90% to 95%
6. Temperature Cycle	Contact resistance : 50mΩ max. Insulation resistance:500MΩ min	(-65°C : 30 minutes 5 to 35°C : 10 minutes 125°C : 30 minutes 5 to 35°C : 10 minutes) 5 cycles
7. Durability (Mating/un-mating)	Contact resistance : 50mΩ max.	50 cycles
8. Resistance to Soldering heat	No deformation of components affecting performance.	Reflow : At the recommended temperature profile
		Manual soldering : 350°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 / Finish

Product	Part	Material	Finish	Remarks
Receptacle/Header	Insulator	Polyamide	Beige	UL94-V0
	Contact	Phosphor copper	Gold plated	———
	Fitting	Brass	Tin plated	———

## Product Number Structure

### ●Receptacle

**DF12** **#** **(\*\*)** - **\*** **DS** - **0.5** **V** **(\*\*)**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Series Name : DF12			③ Stacking height 3.0 : 3.0mm Blank : 3.5 to 5.0mm		⑥ Contact Pitch : 0.5mm	
② Type					⑦ Contact Style V : Straight SMT	
	Fitting	Boss	④ Number of Contacts : 10, 14, 20, 30, 32, 36, 40, 50, 60, 80		⑧ Packaging Type (81) : Embossed tape packaging (1,000pcs/reel) (A, C type) (86) : Embossed tape packaging (1,000pcs/reel) (Blank, B type)	
Blank	○	○				
A	×	○				
B	○	×				
C	×	×	⑤ Connector Type DS : Double-row receptacle			

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

### ●Header

**DF12** **#** **(\*\*)** - **\*** **DP** - **0.5** **V** **(\*\*)**

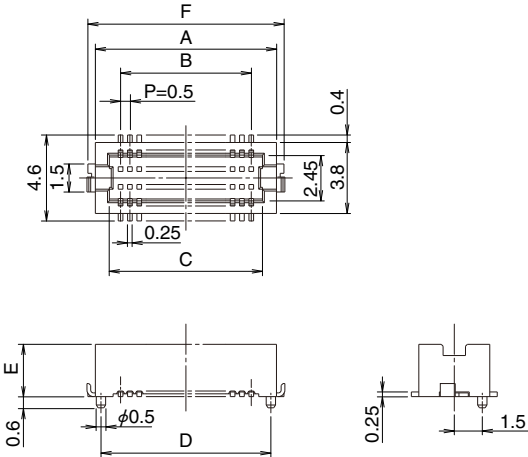
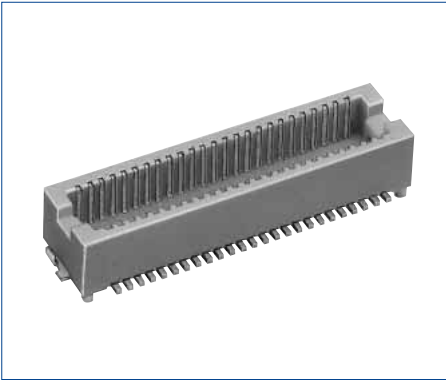
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

<div>① Series Name : DF12</div> <div>② Type</div>			<div>③ Stacking height</div> <table><tr><th>Indication</th><th>Stacking Height</th></tr><tr><td>3.0</td><td>3.0mm</td></tr><tr><td>3.5</td><td>3.5mm</td></tr><tr><td>4.0</td><td>4.0mm</td></tr><tr><td>5.0</td><td>5.0mm</td></tr></table>	Indication	Stacking Height	3.0	3.0mm	3.5	3.5mm	4.0	4.0mm	5.0	5.0mm	<div>⑤ Connector Type</div> <div>DP : Double-row pin header</div>				
	Indication	Stacking Height																
	3.0	3.0mm																
	3.5	3.5mm																
	4.0	4.0mm																
	5.0	5.0mm																
<table><tr><th></th><th>Fitting</th><th>Boss</th></tr><tr><td>Blank</td><td>○</td><td>○</td></tr><tr><td>B</td><td>○</td><td>×</td></tr><tr><td>D</td><td>×</td><td>○</td></tr><tr><td>E</td><td>×</td><td>×</td></tr></table>			Fitting	Boss	Blank	○	○	B	○	×	D	×	○	E	×	×	<div>④ Number of Contacts : 10, 14, 20, 30, 32, 36, 40, 50, 60, 80</div>	<div>⑥ Contact Pitch : 0.5mm</div>
	Fitting	Boss																
Blank	○	○																
B	○	×																
D	×	○																
E	×	×																
		<div>⑦ Contact Style</div> <div>V : Straight SMT</div>																
		<div>⑧ Packaging Type</div> <div>(81) : Embossed tape packaging (1,000pcs/reel) (D, E type)</div> <div>(86) : Embossed tape packaging (1,000pcs/reel) (Blank, B type)</div>																

	Fitting	Boss
Blank	○	○
B	○	×
D	×	○
E	×	×

Indication	Stacking Height
3.0	3.0mm
3.5	3.5mm
4.0	4.0mm
5.0	5.0mm

Header With metal fitting



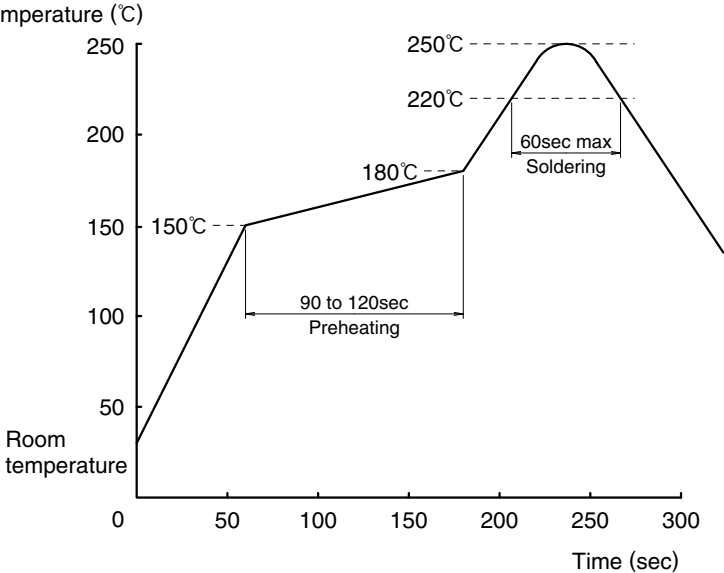
●Stacking Height : 3.5 to 5mm Product

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	D	E	F	Remarks	RoHS							
DF12 (3.5)-20DP-0.5V (86)	537-0028-7 86	20	7.2	4.5	5.7	6.6	2.8	8.1	With metal fitting With boss	YES							
DF12 (3.5)-30DP-0.5V (86)	537-0030-9 86	30	9.7	7.0	8.2	9.1		10.6									
DF12 (3.5)-36DP-0.5V (86)	537-0031-1 86	36	11.2	8.5	9.7	10.6		12.1									
DF12 (3.5)-40DP-0.5V (86)	537-0032-4 86	40	12.2	9.5	10.7	11.6		13.1									
DF12 (3.5)-50DP-0.5V (86)	537-0034-0 86	50	14.7	12.0	13.2	14.1		15.6									
DF12 (3.5)-60DP-0.5V (86)	537-0036-5 86	60	17.2	14.5	15.7	16.6		18.1									
DF12 (4.0)-20DP-0.5V (86)	537-0053-4 86	20	7.2	4.5	5.7	6.6	3.3	8.1			With metal fitting With boss	YES					
DF12 (4.0)-30DP-0.5V (86)	537-0055-0 86	30	9.7	7.0	8.2	9.1		10.6									
DF12 (4.0)-32DP-0.5V (86)	537-0926-2 86	32	10.2	7.5	8.7	9.6		11.1									
DF12 (4.0)-36DP-0.5V (86)	537-0056-2 86	36	11.2	8.5	9.7	10.6		12.1									
DF12 (4.0)-40DP-0.5V (86)	537-0057-5 86	40	12.2	9.5	10.7	11.6		13.1									
DF12 (4.0)-50DP-0.5V (86)	537-0059-0 86	50	14.7	12.0	13.2	14.1		15.6									
DF12 (4.0)-60DP-0.5V (86)	537-0061-2 86	60	17.2	14.5	15.7	16.6	18.1	With metal fitting With boss					YES				
DF12 (5.0)-20DP-0.5V (86)	537-0153-9 86	20	7.2	4.5	5.7	6.6	4.3							8.1			
DF12 (5.0)-30DP-0.5V (86)	537-0155-4 86	30	9.7	7.0	8.2	9.1								10.6			
DF12 (5.0)-36DP-0.5V (86)	537-0156-7 86	36	11.2	8.5	9.7	10.6								12.1			
DF12 (5.0)-40DP-0.5V (86)	537-0157-0 86	40	12.2	9.5	10.7	11.6								13.1			
DF12 (5.0)-50DP-0.5V (86)	537-0159-5 86	50	14.7	12.0	13.2	14.1								15.6			
DF12 (5.0)-60DP-0.5V (86)	537-0161-7 86	60	17.2	14.5	15.7	16.6								18.1			
DF12B (3.5)-20DP-0.5V (86)	537-0328-0 86	20	7.2	4.5	5.7	——	2.8		8.1					With metal fitting Without boss	YES		
DF12B (3.5)-30DP-0.5V (86)	537-0330-2 86	30	9.7	7.0	8.2				10.6								
DF12B (3.5)-36DP-0.5V (86)	537-0331-5 86	36	11.2	8.5	9.7				12.1								
DF12B (3.5)-40DP-0.5V (86)	537-0332-8 86	40	12.2	9.5	10.7				13.1								
DF12B (3.5)-50DP-0.5V (86)	537-0334-3 86	50	14.7	12.0	13.2				15.6								
DF12B (3.5)-60DP-0.5V (86)	537-0336-9 86	60	17.2	14.5	15.7				18.1								
DF12B (4.0)-20DP-0.5V (86)	537-0353-8 86	20	7.2	4.5	5.7	——	3.3		8.1		With metal fitting Without boss					YES	
DF12B (4.0)-30DP-0.5V (86)	537-0355-3 86	30	9.7	7.0	8.2				10.6								
DF12B (4.0)-32DP-0.5V (86)	537-0927-5 86	32	10.2	7.5	8.7				11.1								
DF12B (4.0)-36DP-0.5V (86)	537-0356-6 86	36	11.2	8.5	9.7				12.1								
DF12B (4.0)-40DP-0.5V (86)	537-0357-9 86	40	12.2	9.5	10.7				13.1								
DF12B (4.0)-50DP-0.5V (86)	537-0359-4 86	50	14.7	12.0	13.2				15.6								
DF12B (4.0)-60DP-0.5V (86)	537-0361-6 86	60	17.2	14.5	15.7	18.1	——	4.3	With metal fitting Without boss								YES
DF12B (5.0)-20DP-0.5V (86)	537-0378-9 86	20	7.2	4.5	5.7	8.1											
DF12B (5.0)-30DP-0.5V (86)	537-0380-0 86	30	9.7	7.0	8.2	10.6											
DF12B (5.0)-36DP-0.5V (86)	537-0381-3 86	36	11.2	8.5	9.7	12.1											
DF12B (5.0)-40DP-0.5V (86)	537-0382-6 86	40	12.2	9.5	10.7	13.1											
DF12B (5.0)-50DP-0.5V (86)	537-0384-1 86	50	14.7	12.0	13.2	15.6											
DF12B (5.0)-60DP-0.5V (86)	537-0386-7 86	60	17.2	14.5	15.7	18.1	With metal fitting Without boss	YES									

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

## ◆Precautions for Use

1.Recommended Temperature Profile (SMT)	 <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>
2.Recommended Manual Soldering Condition (SMT)	Soldering iron temperature : 350°C, Soldering time : Within 3 seconds
3.Recommended Screen Thickness and open area ratio(Pattern area ratio)	0.12mm Open area ratio : 70%
4.Board Warp(SMT)	Maximum 0.02mm in the connector center area, based on both connector edges
5.Cleaning Condition	Refer to "Nylon Connector Use Hand book".
6.Cautions	<ul style="list-style-type: none"> <li>■ The receptacle is designed in a structure where contacts are exposed. Touching it with bare hands would cause contact failure or electrostatic element damage.</li> <li>■ Where no board is mounted, the insertion or extraction will cause damage or contact deformation.</li> <li>■ Avoid retaining the board with the connector only, and fix the board by any other means than the connector.</li> <li>■ Excessive scoop insertion or extraction may result in damage.</li> <li>■ In the manual soldering process, don't carry out the 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 formed product according to the manufacturing lot. However, the difference doesn't affect the performance.</li> </ul>