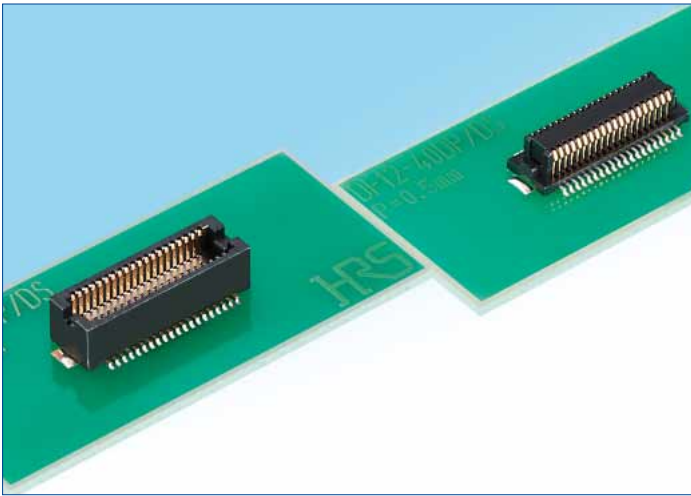


# 0.5mm Pitch SMT Board-to-Board Connector

## DF12N Series



### Correspond to automatic mounting

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

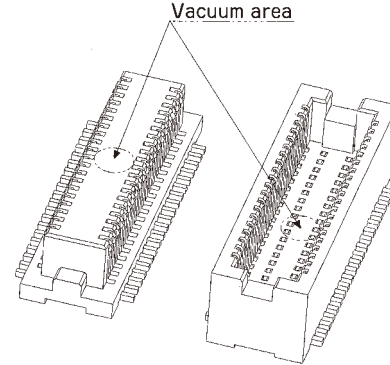
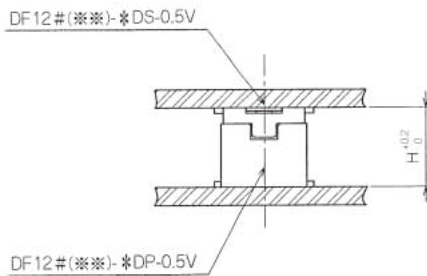


Fig.1

## 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

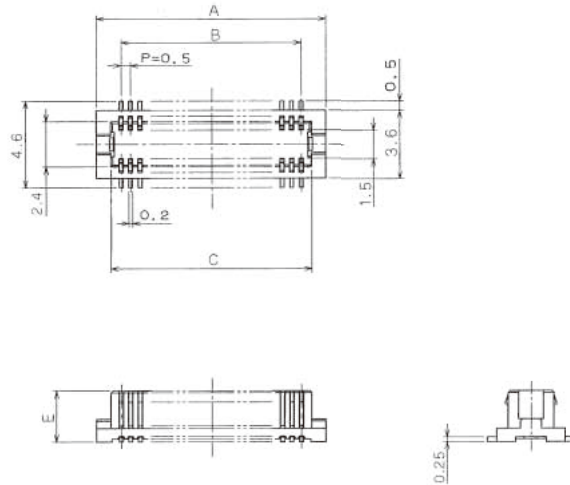
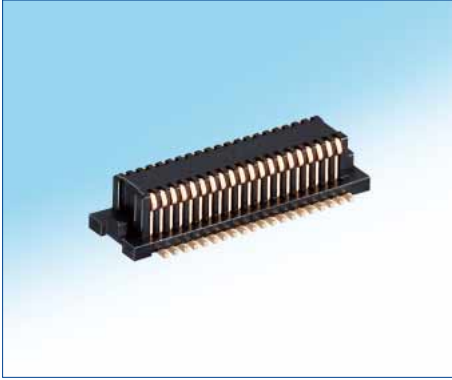
The connector has the vacuum pick-up area to enable automatic mounting with the embossed tape packaging. (Fig.1)

### 3. Metal Fitting Available

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



## Receptacle Without metal fitting



### Stacking Height : 3mm Product

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	E	Remarks	RoHS
DF12NC(3.0)-10DS-0.5V(51)	537-0191-0 51	10	4.6	2.0	3.1	2.2	Without metal fitting Without boss	YES
DF12NC(3.0)-14DS-0.5V(51)	537-0192-0 51	14	5.6	3.0	4.1			
DF12NC(3.0)-20DS-0.5V(51)	537-0193-0 51	20	7.1	4.5	5.6			
DF12NC(3.0)-30DS-0.5V(51)	537-0194-0 51	30	9.6	7.0	8.1			
DF12NC(3.0)-32DS-0.5V(51)	537-0195-0 51	32	10.1	7.5	8.6			
DF12NC(3.0)-36DS-0.5V(51)	537-0196-0 51	36	11.1	8.5	9.6			
DF12NC(3.0)-40DS-0.5V(51)	537-0197-0 51	40	12.1	9.5	10.6			
DF12NC(3.0)-50DS-0.5V(51)	537-0198-0 51	50	14.6	12.0	13.1			
DF12NC(3.0)-60DS-0.5V(51)	537-0199-0 51	60	17.1	14.5	15.6			
DF12NC(3.0)-80DS-0.5V(51)	537-0285-0 51	80	22.1	19.5	20.6			

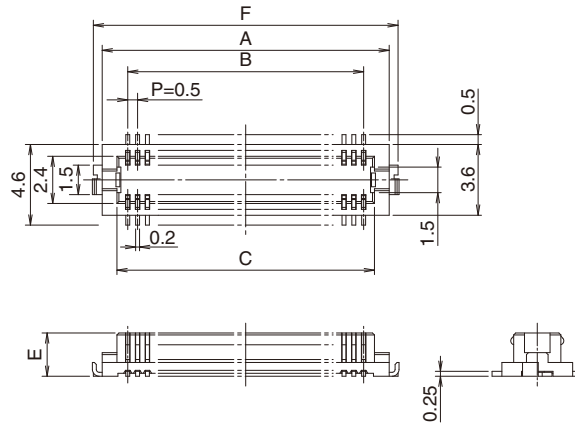
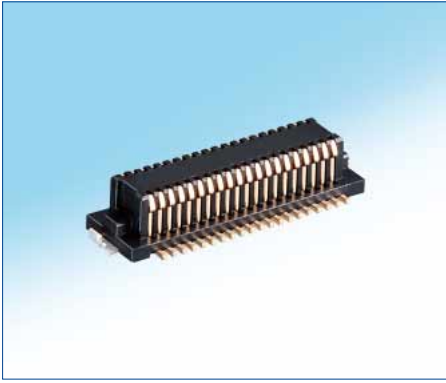
### Stacking Height : 3.5 to 5mm Product

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	E	Remarks	RoHS
DF12NC-20DS-0.5V(51)	537-0292-0 51	20	7.1	4.5	5.6	2.7	Without metal fitting	YES
DF12NC-30DS-0.5V(51)	537-0293-0 51	30	9.6	7.0	8.1			
DF12NC-32DS-0.5V(51)	537-0294-0 51	32	10.1	7.5	8.6			
DF12NC-36DS-0.5V(51)	537-0295-0 51	36	11.1	8.5	9.6			
DF12NC-40DS-0.5V(51)	537-0296-0 51	40	12.1	9.5	10.6			
DF12NC-50DS-0.5V(51)	537-0297-0 51	50	14.6	12.0	13.1			
DF12NC-60DS-0.5V(51)	537-0298-0 51	60	17.1	14.5	15.6			

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

■ Receptacle With metal fitting



● Stacking Height : 3mm Product

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	E	F	Remarks	RoHS
DF12NB(3.0)-10DS-0.5V(51)	537-0097-0 51	10	4.6	2.0	3.1	2.2	5.6	With metal fitting Without boss	YES
DF12NB(3.0)-14DS-0.5V(51)	537-0098-0 51	14	5.6	3.0	4.1		6.6		
DF12NB(3.0)-20DS-0.5V(51)	537-0099-0 51	20	7.1	4.5	5.6		8.1		
DF12NB(3.0)-30DS-0.5V(51)	537-0185-0 51	30	9.6	7.0	8.1		10.6		
DF12NB(3.0)-32DS-0.5V(51)	537-0186-0 51	32	10.1	7.5	8.6		11.1		
DF12NB(3.0)-36DS-0.5V(51)	537-0187-0 51	36	11.1	8.5	9.6		12.1		
DF12NB(3.0)-40DS-0.5V(51)	537-0188-0 51	40	12.1	9.5	10.6		13.1		
DF12NB(3.0)-50DS-0.5V(51)	537-0189-0 51	50	14.6	12.0	13.1		15.6		
DF12NB(3.0)-60DS-0.5V(51)	537-0190-0 51	60	17.1	14.5	15.6		18.1		
DF12NB(3.0)-80DS-0.5V(51)	537-0095-0 51	80	22.1	19.5	20.6		23.1		

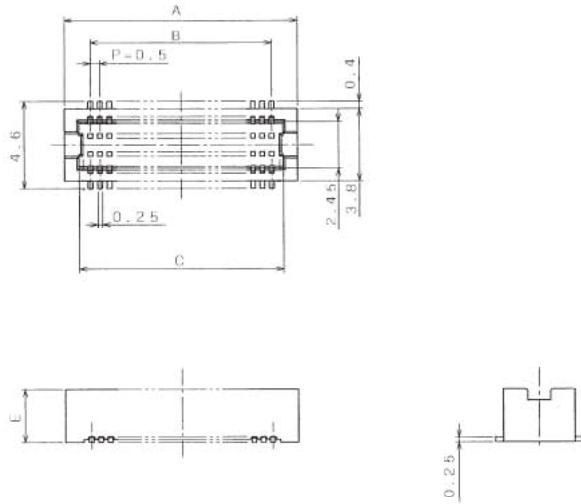
● Stacking Height : 3.5 to 5mm Product

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	E	F	Remarks	RoHS
DF12NB-20DS-0.5V(51)	537-0286-0 51	20	7.1	4.5	5.6	2.7	8.1	With metal fitting	YES
DF12NB-30DS-0.5V(51)	537-0287-0 51	30	9.6	7.0	8.1		10.6		
DF12NB-32DS-0.5V(51)	537-0288-0 51	32	10.1	7.5	8.6		11.1		
DF12NB-36DS-0.5V(51)	537-0289-0 51	36	11.1	8.5	9.6		12.1		
DF12NB-40DS-0.5V(51)	537-0290-0 51	40	12.1	9.5	10.6		13.1		
DF12NB-50DS-0.5V(51)	537-0291-0 51	50	14.6	12.0	13.1		15.6		
DF12NB-60DS-0.5V(51)	537-0096-0 51	60	17.1	14.5	15.6		18.1		

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

## Header Without metal fitting



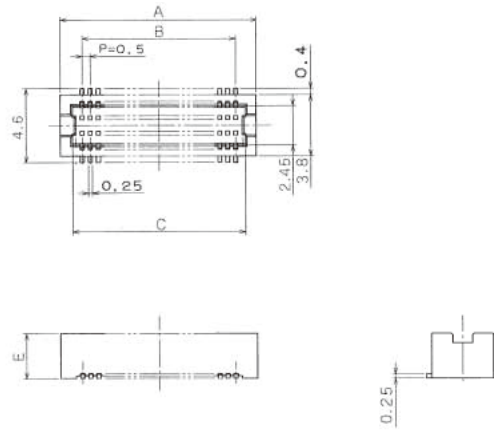
### ● Stacking Height : 3mm Product

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	E	Remarks	RoHS
DF12NC(3.0)-10DP-0.5V(51)	537-0396-0 51	10	4.7	2.0	3.2	2.3	Without metal fitting	YES
DF12NC(3.0)-14DP-0.5V(51)	537-0397-0 51	14	5.7	3.0	4.2			
DF12NC(3.0)-20DP-0.5V(51)	537-0398-0 51	20	7.2	4.5	5.7			
DF12NC(3.0)-30DP-0.5V(51)	537-0399-0 51	30	9.7	7.0	8.2			
DF12NC(3.0)-32DP-0.5V(51)	537-0487-0 51	32	10.2	7.5	8.7			
DF12NC(3.0)-36DP-0.5V(51)	537-0488-0 51	36	11.2	8.5	9.7			
DF12NC(3.0)-40DP-0.5V(51)	537-0489-0 51	40	12.2	9.5	10.7			
DF12NC(3.0)-50DP-0.5V(51)	537-0490-0 51	50	14.7	12.0	13.2			
DF12NC(3.0)-60DP-0.5V(51)	537-0491-0 51	60	17.2	14.5	15.7			
DF12NC(3.0)-80DP-0.5V(51)	537-0492-0 51	80	22.2	19.5	20.7			

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

**Header** Without metal fitting



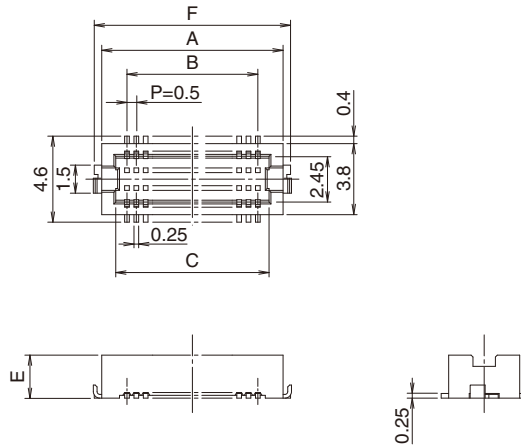
● Stacking Height : 3.5 to 5mm Product

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	E	Remarks	RoHS				
DF12NC(3.5)-20DP-0.5V(51)	537-0499-0 51	20	7.2	4.5	5.7	2.8	Without metal fitting	YES				
DF12NC(3.5)-30DP-0.5V(51)	537-0587-0 51	30	9.7	7.0	8.2							
DF12NC(3.5)-36DP-0.5V(51)	537-0588-0 51	36	11.2	8.5	9.7							
DF12NC(3.5)-40DP-0.5V(51)	537-0589-0 51	40	12.2	9.5	10.7							
DF12NC(3.5)-50DP-0.5V(51)	537-0590-0 51	50	14.7	12.0	13.2							
DF12NC(3.5)-60DP-0.5V(51)	537-0591-0 51	60	17.2	14.5	15.7							
DF12NC(4.0)-20DP-0.5V(51)	537-0599-0 51	20	7.2	4.5	5.7	3.3			Without metal fitting	YES		
DF12NC(4.0)-30DP-0.5V(51)	537-0699-0 51	30	9.7	7.0	8.2							
DF12NC(4.0)-32DP-0.5V(51)	537-0872-0 51	32	10.2	7.5	8.7							
DF12NC(4.0)-36DP-0.5V(51)	537-0873-0 51	36	11.2	8.5	9.7							
DF12NC(4.0)-40DP-0.5V(51)	537-0874-0 51	40	12.2	9.5	10.7							
DF12NC(4.0)-50DP-0.5V(51)	537-0875-0 51	50	14.7	12.0	13.2							
DF12NC(4.0)-60DP-0.5V(51)	537-0876-0 51	60	17.2	14.5	15.7	4.3					Without metal fitting	YES
DF12NC(5.0)-20DP-0.5V(51)	537-0883-0 51	20	7.2	4.5	5.7							
DF12NC(5.0)-30DP-0.5V(51)	537-0884-0 51	30	9.7	7.0	8.2							
DF12NC(5.0)-36DP-0.5V(51)	537-0885-0 51	36	11.2	8.5	9.7							
DF12NC(5.0)-40DP-0.5V(51)	537-0886-0 51	40	12.2	9.5	10.7							
DF12NC(5.0)-50DP-0.5V(51)	537-0887-0 51	50	14.7	12.0	13.2							
DF12NC(5.0)-60DP-0.5V(51)	537-0888-0 51	60	17.2	14.5	15.7							

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

## Header With metal fitting



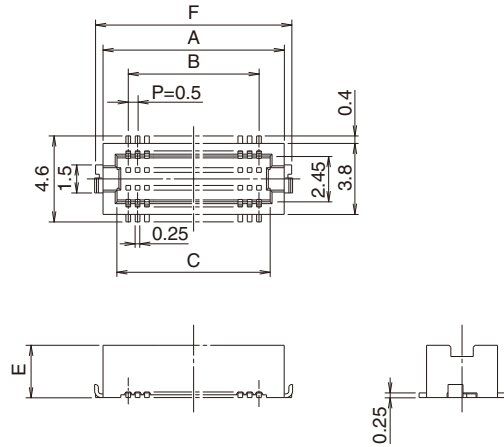
### ● Stacking Height : 3mm Product

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	E	F	Remarks	RoHS
DF12NB(3.0)-10DP-0.5V(51)	537-0299-0 51	10	4.7	2.0	3.2	2.3	5.6	With metal fitting	YES
DF12NB(3.0)-14DP-0.5V(51)	537-0387-0 51	14	5.7	3.0	4.2		6.6		
DF12NB(3.0)-20DP-0.5V(51)	537-0388-0 51	20	7.2	4.5	5.7		8.1		
DF12NB(3.0)-30DP-0.5V(51)	537-0389-0 51	30	9.7	7.0	8.2		10.6		
DF12NB(3.0)-32DP-0.5V(51)	537-0390-0 51	32	10.2	7.5	8.7		11.1		
DF12NB(3.0)-36DP-0.5V(51)	537-0391-0 51	36	11.2	8.5	9.7		12.1		
DF12NB(3.0)-40DP-0.5V(51)	537-0392-0 51	40	12.2	9.5	10.7		13.1		
DF12NB(3.0)-50DP-0.5V(51)	537-0393-0 51	50	14.7	12.0	13.2		15.6		
DF12NB(3.0)-60DP-0.5V(51)	537-0394-0 51	60	17.2	14.5	15.7		18.1		
DF12NB(3.0)-80DP-0.5V(51)	537-0395-0 51	80	22.2	19.5	20.7		23.1		

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

**Header** With metal fitting



● Stacking Height : 3.5 to 5mm Product

Unit : mm

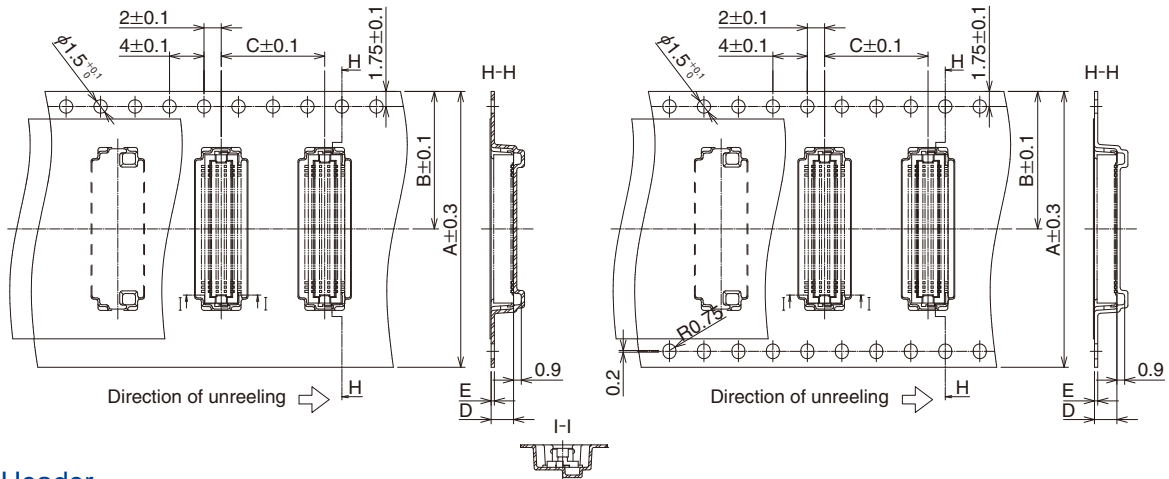
Part No.	HRS No.	No. of Contacts	A	B	C	E	F	Remarks	RoHS
DF12NB(3.5)-20DP-0.5V(51)	537-0493-0 51	20	7.2	4.5	5.7	2.8	8.1	With metal fitting	YES
DF12NB(3.5)-30DP-0.5V(51)	537-0494-0 51	30	9.7	7.0	8.2		10.6		
DF12NB(3.5)-36DP-0.5V(51)	537-0495-0 51	36	11.2	8.5	9.7		12.1		
DF12NB(3.5)-40DP-0.5V(51)	537-0496-0 51	40	12.2	9.5	10.7		13.1		
DF12NB(3.5)-50DP-0.5V(51)	537-0497-0 51	50	14.7	12.0	13.2		15.6		
DF12NB(3.5)-60DP-0.5V(51)	537-0498-0 51	60	17.2	14.5	15.7		18.1		
DF12NB(4.0)-20DP-0.5V(51)	537-0592-0 51	20	7.2	4.5	5.7	3.3	8.1		
DF12NB(4.0)-30DP-0.5V(51)	537-0593-0 51	30	9.7	7.0	8.2		10.6		
DF12NB(4.0)-32DP-0.5V(51)	537-0594-0 51	32	10.2	7.5	8.7		11.1		
DF12NB(4.0)-36DP-0.5V(51)	537-0595-0 51	36	11.2	8.5	9.7		12.1		
DF12NB(4.0)-40DP-0.5V(51)	537-0596-0 51	40	12.2	9.5	10.7		13.1		
DF12NB(4.0)-50DP-0.5V(51)	537-0597-0 51	50	14.7	12.0	13.2		15.6		
DF12NB(4.0)-60DP-0.5V(51)	537-0598-0 51	60	17.2	14.5	15.7	18.1			
DF12NB(5.0)-20DP-0.5V(51)	537-0877-0 51	20	7.2	4.5	5.7	4.3	8.1		
DF12NB(5.0)-30DP-0.5V(51)	537-0878-0 51	30	9.7	7.0	8.2		10.6		
DF12NB(5.0)-36DP-0.5V(51)	537-0879-0 51	36	11.2	8.5	9.7		12.1		
DF12NB(5.0)-40DP-0.5V(51)	537-0880-0 51	40	12.2	9.5	10.7		13.1		
DF12NB(5.0)-50DP-0.5V(51)	537-0881-0 51	50	14.7	12.0	13.2		15.6		
DF12NB(5.0)-60DP-0.5V(51)	537-0882-0 51	60	17.2	14.5	15.7		18.1		

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

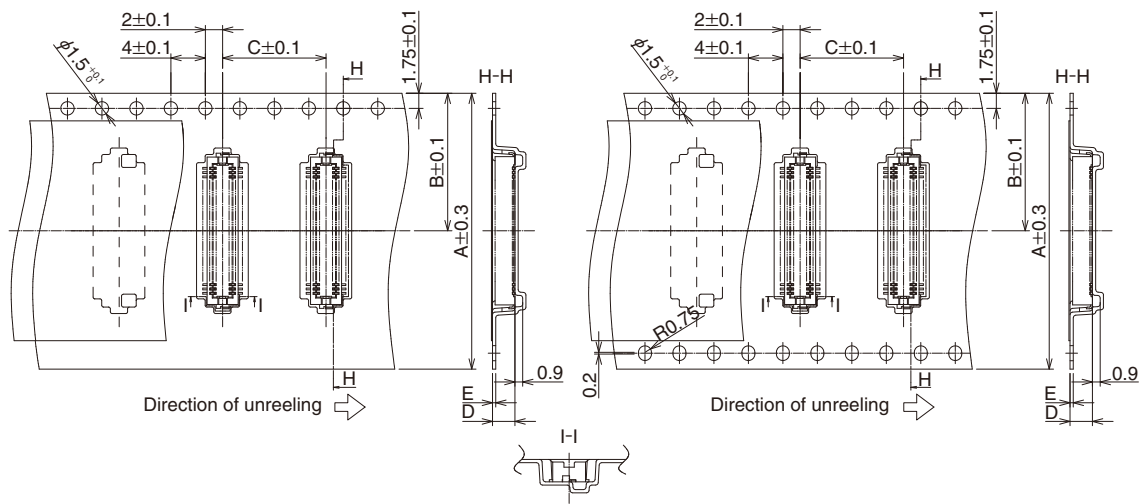


## ◆ Embossed Carrier Tape Dimensions

### ● Receptacle

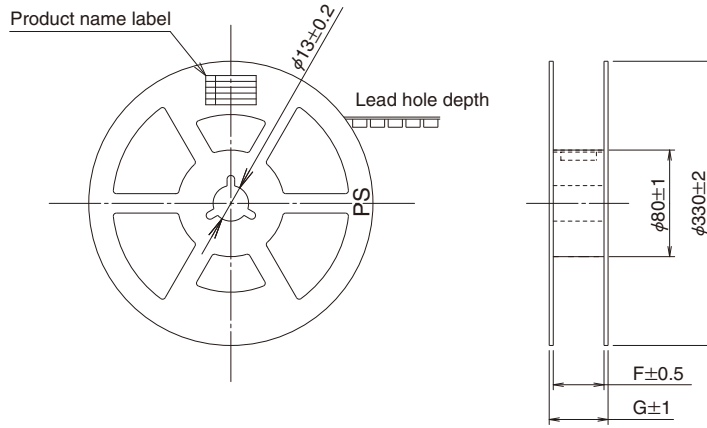


### ● Header



Connector	A	B	C	D	E	F	G	Connector	A	B	C	D	E	F	G
DF12#(3.0)-10DS-0.5V	16	7.5			0.30	17.5	21.5	DF12#(3.5)-20DP-0.5V	16	7.5	12		0.38	17.5	21.5
DF12#(3.0)-14DS-0.5V								DF12#(3.5)-30DP-0.5V							
DF12#(3.0)-20DS-0.5V	24	11.5			0.38	25.5	29.5	DF12#(3.5)-36DP-0.5V	24	11.5	8	3.1	0.30	25.5	29.5
DF12#(3.0)-30DS-0.5V								DF12#(3.5)-40DP-0.5V							
DF12#(3.0)-32DS-0.5V	32	14.2			0.38	33.5	37.5	DF12#(3.5)-50DP-0.5V	32	14.2	8		0.30	33.5	37.5
DF12#(3.0)-36DS-0.5V								DF12#(3.5)-60DP-0.5V							
DF12#(3.0)-40DS-0.5V	44	20.2			0.38	45.5	49.5	DF12#(3.5)-20DP-0.5V	16	7.5	12		0.38	17.5	21.5
DF12#(3.0)-50DS-0.5V								DF12#(4.0)-30DP-0.5V							
DF12#(3.0)-60DS-0.5V	32	14.2			0.30	17.5	21.5	DF12#(4.0)-32DP-0.5V	24	11.5	8	3.6	0.30	25.5	29.5
DF12#(3.0)-80DS-0.5V								DF12#(4.0)-36DP-0.5V							
DF12#(3.0)-10DP-0.5V	16	7.5	12		0.38	25.5	29.5	DF12#(4.0)-40DP-0.5V	32	14.2	8		0.38	33.5	37.5
DF12#(3.0)-14DP-0.5V								DF12#(4.0)-50DP-0.5V							
DF12#(3.0)-20DP-0.5V	24	11.5			0.38	33.5	37.5	DF12#(4.0)-60DP-0.5V	16	7.5	12		0.38	17.5	21.5
DF12#(3.0)-30DP-0.5V								DF12#(5.0)-20DP-0.5V							
DF12#(3.0)-32DP-0.5V	24	11.5			0.38	45.5	49.5	DF12#(5.0)-30DP-0.5V	24	11.5	8	4.6	0.30	25.5	29.5
DF12#(3.0)-36DP-0.5V								DF12#(5.0)-36DP-0.5V							
DF12#(3.0)-40DP-0.5V	32	14.2			0.38	17.5	21.5	DF12#(5.0)-40DP-0.5V	32	14.2	12		0.38	33.5	37.5
DF12#(3.0)-50DP-0.5V								DF12#(5.0)-50DP-0.5V							
DF12#(3.0)-60DP-0.5V	44	20.2			0.30	45.5	49.5	DF12#(5.0)-60DP-0.5V	44	20.2	8		0.30	33.5	37.5
DF12#(3.0)-80DP-0.5V								DF12#-20DS-0.5V							
DF12#-20DS-0.5V	16	7.5			0.30	25.5	29.5	DF12#-30DS-0.5V	24	11.5	8	3.1	0.38	25.5	29.5
DF12#-30DS-0.5V								DF12#-32DS-0.5V							
DF12#-32DS-0.5V	24	11.5	8		0.38	33.5	37.5	DF12#-36DS-0.5V	32	14.2	12		0.30	33.5	37.5
DF12#-40DS-0.5V								DF12#-40DS-0.5V							
DF12#-50DS-0.5V	32	14.2	12		0.38	45.5	49.5	DF12#-50DS-0.5V	44	20.2	8		0.30	33.5	37.5
DF12#-60DS-0.5V								DF12#-60DS-0.5V							

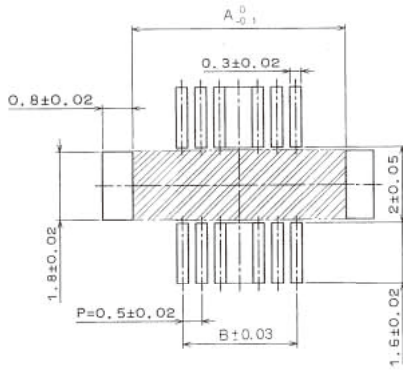
● Reel Dimensions



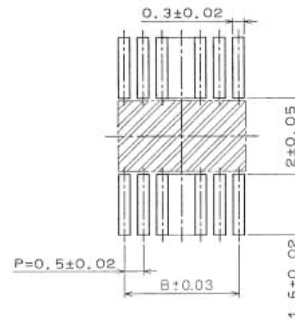
Refer to former page for F, G dimensions.

◆ Recommended PCB mounting pattern


■ DF12N with metal fitting



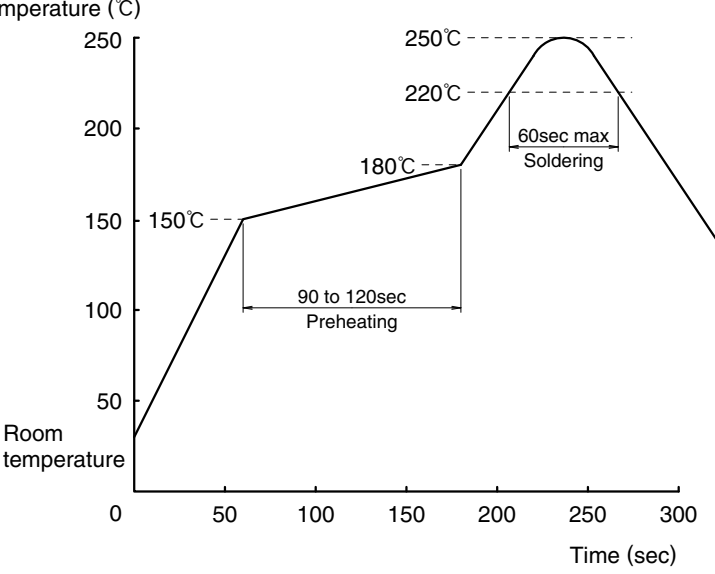
■ DF12N without metal fitting



Note 1 : Refer to 3 to 8 for sides A and B.

Note 2 :  If the pattern is included in the shaded area, and not treated with resist, it could touch the connector contact.

## ◆ 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>



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