

DF12NB(3.0)-80DP-0.5V(51) HIROSE ELECTRIC

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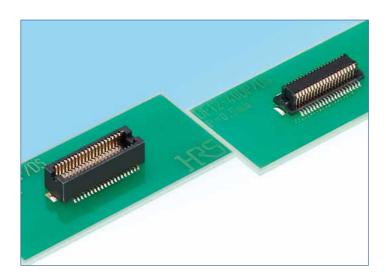
Company Address

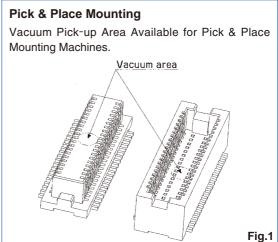
Arrow Electronics, Inc 9201 East Dry Creek Road Centennial, CO 80112

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0.5mm Pitch SMT Board-to-Board Connectors

DF12N Series

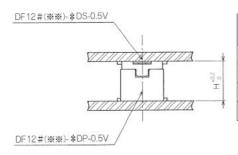




■Features

1. Wide Variety of Stacking Heights

Stacking heights of 3mm, 3.5mm 4mm and 5mm are provided in addition to the ultra-compact size of 0.5mm pitch.



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: The (**) after DF12# indicates the stacking height.

Note 2: The stacking height does not include the soldering paste thickness.

[Stacking Height Variations]

Stacking	Height	3.0mm	3.5mm	4.0mm	5.0mm
	10pos.	V			
	14pos.	V			
	20pos.	V	V	V	V
	30pos. 🗸	V	V	V	
No. of Dog	32pos.	V		V	
No. of Pos.	36pos.	V	V	V	V
	40pos.	V	V	V	V
	50pos.	V	V	V	V
	60pos.	V	V	V	V
	80pos.	V			

2. Pick & Place Mounting

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

3. Solder Tabs on the Soldering Portion

In consideration of mounting on FPC, solder tabs are provided on the product in order to prevent solder peeling.

4. 5Gbps Transmission Speed

■Product Specifications

Ratings	Rated Current	0.3A	Operating Temperature	-55 to +125°C (Note 1)	Storage Temperature Range	-10 to +60°C (Note 2)
nalliys	Rated Voltage	50V AC	Operating Humidity Range	40 to 80%	Storage Humidity Range	40 to 70% (Note 2)

Items	Specifications	Conditions				
1. Insulation Resistance	500M Ω min.	100V	DC			
2. Withstanding Voltage	No flashover or insulation breakdown.	150V AC per min.				
3. Contact Resistance	50m $Ω$ max.	20mV AC or less 1kHz, 1mA.				
4. Vibration	No electrical discontinuity of 1 μ s or more	Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours in each of the 3 direct				
5. Humidity (Steady State)	Contact resistance : $50m\Omega$ max. Insulation resistance : $500M\Omega$ min	96 hou	rs at temperature of 40±2°C and humidity of 90% to 95%			
6. Temperature Cycle	Contact resistance : $50m\Omega$ max. Insulation resistance : $500M\Omega$ min	(-65℃ : 3	0 minutes 5 to 35 $^\circ\!$			
7. Mating Durability	Contact resistance : $50m\Omega$ max.	50 cyc	cles			
O Desistance to Coldevine Heat	No defermention of common outs offertion newforms and	SMT	Reflow : At the recommended temperature profile			
Resistance to Soldering Heat	No deformation of components affecting performance.		Manual soldering : 350℃ for 3 seconds			

Note 1: Includes temperature rise due to current flow. (105°C in automotive vibration environment)

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 / Finish

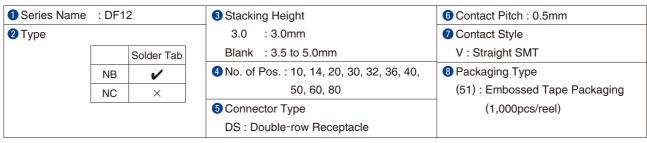
Product	Part	Part Material Finish		Remarks
	Insulator	Polyamide	Black	UL94V-0
Receptacle/Header	Contact	Contact Phosphor Copper		_
	Solder Tab	Brass	Tin Plated	_

■Product Number Structure

Refer to the chart below when determining the product specifications from the product number. Please select from the product numbers listed in this catalog when placing orders.

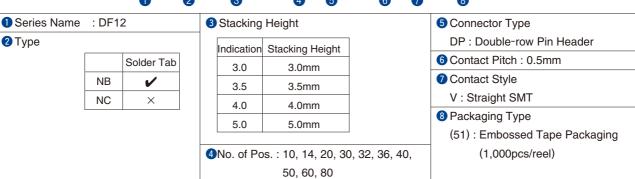
•Receptacle

$$\frac{\mathsf{DF12}}{\bullet} \ \frac{\#}{2} \ \frac{(\% \ \%)}{\bullet} - \frac{*}{4} \ \frac{\mathsf{DS}}{\bullet} - \frac{0.5}{\bullet} \ \frac{\mathsf{V}}{\bullet} \ \frac{(**)}{\bullet}$$



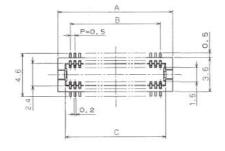
•Header

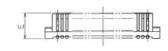




■Receptacle Without Solder Tab









Stacking Height: 3mm Product

Unit: mm

Part No.	HRS No.	No. of Pos.	Α	В	С	Е	Remarks	RoHS
DF12NC(3.0)-10DS-0.5V(51)	537-0191-0 51	10	4.6	2.0	3.1			
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	2.2	Without Solder Tab	YES
DF12NC(3.0)-36DS-0.5V(51)	537-0196-0 51	36	11.1	8.5	9.6	2.2		150
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			

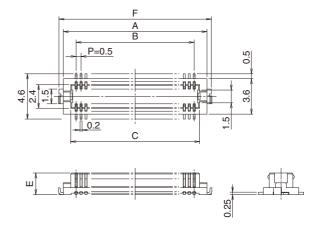
●Stacking Height: 3.5 to 5mm Product

Unit: mm

Part No.	HRS No.	No. of Pos.	Α	В	С	Е	Remarks	RoHS
DF12NC-20DS-0.5V(51)	537-0292-0 51	20	7.1	4.5	5.6		7 Without Solder Tab	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	2.7		
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			

■ Receptacle With Solder Tab





Stacking Height: 3mm Product

Unit: mm

Part No.	HRS No.	No. of Pos.	Α	В	С	Е	F	Remarks	RoHS
DF12NB(3.0)-10DS-0.5V(51)	537-0097-0 51	10	4.6	2.0	3.1		5.6		
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	With Solder	
DF12NB(3.0)-32DS-0.5V(51)	537-0186-0 51	32	10.1	7.5	8.6	2.0	11.1		YES
DF12NB(3.0)-36DS-0.5V(51)	537-0187-0 51	36	11.1	8.5	9.6	2.2	12.1	Tab	150
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		

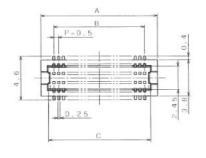
●Stacking Height: 3.5 to 5mm Product

Unit: mm

Part No.	HRS No.	No. of Pos.	Α	В	С	Е	F	Remarks	RoHS
DF12NB-20DS-0.5V(51)	537-0286-0 51	20	7.1	4.5	5.6		8.1		
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	2.7	12.1	With Solder Tab	YES
DF12NB-40DS-0.5V(51)	537-0290-0 51	40	12.1	9.5	10.6		13.1	Tab	
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		

■**Header** Without Solder Tab









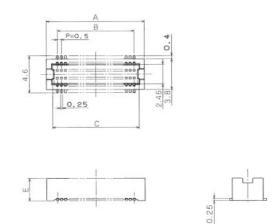
Stacking Height: 3mm Product

Unit: mm

Part No.	HRS No.	No. of Pos.	Α	В	С	Е	Remarks	RoHS
DF12NC(3.0)-10DP-0.5V(51)	537-0396-0 51	10	4.7	2.0	3.2			
DF12NC(3.0)-14DP-0.5V(51)	537-0397-0 51	14	5.7	3.0	4.2		Without Solder Tab	
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	0.0		VEC
DF12NC(3.0)-36DP-0.5V(51)	537-0488-0 51	36	11.2	8.5	9.7	2.3		YES
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			

■ Header Without Solder Tab





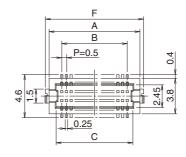
● Stacking Height: 3.5 to 5mm Product

 $\mathsf{Unit}:\mathsf{mm}$

Part No.	HRS No.	No. of Pos.	Α	В	С	Е	Remarks	RoHS
DF12NC(3.5)-20DP-0.5V(51)	537-0499-0 51	20	7.2	4.5	5.7			
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	0.0		
DF12NC(3.5)-40DP-0.5V(51)	537-0589-0 51	40	12.2	9.5	10.7	2.8		
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			
DF12NC(4.0)-30DP-0.5V(51)	537-0699-0 51	30	9.7	7.0	8.2	3.3	Without Solder Tab	YES
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			
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	4.3		
DF12NC(5.0)-40DP-0.5V(51)	537-0886-0 51	40	12.2	9.5	10.7	4.3		
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	 		

■Header With Solder Tab









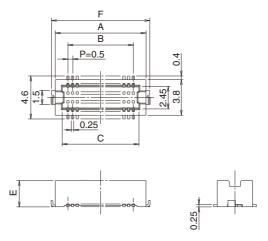
●Stacking Height : 3mm Product

Unit: mm

Part No.	HRS No.	No. of Pos.	Α	В	С	Е	F	Remarks	RoHS
DF12NB(3.0)-10DP-0.5V(51)	537-0299-0 51	10	4.7	2.0	3.2		5.6	5.6 6.6	
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	With Solder Tab	
DF12NB(3.0)-32DP-0.5V(51)	537-0390-0 51	32	10.2	7.5	8.7	2.3	11.1		YES
DF12NB(3.0)-36DP-0.5V(51)	537-0391-0 51	36	11.2	8.5	9.7	2.3	12.1		TES
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	1	
DF12NB(3.0)-80DP-0.5V(51)	537-0395-0 51	80	22.2	19.5	20.7		23.1		

■Header With Solder Tab





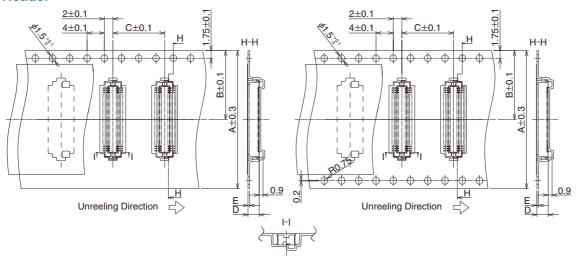
● Stacking Height: 3.5 to 5mm Product

Unit: mm

Part No.	HRS No.	No. of Pos.	Α	В	C	Е	F	Remarks	RoHS
DF12NB(3.5)-20DP-0.5V(51)	537-0493-0 51	20	7.2	4.5	5.7		8.1		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	2.8	12.1	With Solder Tab	
DF12NB(3.5)-40DP-0.5V(51)	537-0496-0 51	40	12.2	9.5	10.7	2.0	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		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	3.3	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		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	4.3	12.1		
DF12NB(5.0)-40DP-0.5V(51)	537-0880-0 51	40	12.2	9.5	10.7	4.3	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		

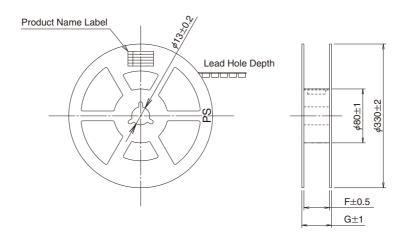
● Embossed Carrier Tape Dimensions

•Receptacle <u>2±0.1</u> 규 1.75±0.1 2±0.1 Н-Н Н-Н 0.9 0.9 Unreeling Direction Header 2±0.1 4±0.1



Connector	Α	В	С	D	Е	F	G	Connector	Α	В	С	D	Е	F	G		
DF12#(3.0)-10DS-0.5V	71				0.30		<u> </u>	DF12#(3.5)-20DP-0.5V	16	7.5					21.5		
DF12#(3.0)-14DS-0.5V	16	7.5					21.5				12		0.38				
DF12#(3.0)-20DS-0.5V								DF12#(3.5)-36DP-0.5V		<u>_</u>	8		0.30				
DF12#(3.0)-30DS-0.5V								DF12#(3.5)-40DP-0.5V	24	11.5	12	3.1	0.38	25.5	29.5		
DF12#(3.0)-32DS-0.5V								DF12#(3.5)-50DP-0.5V			8	1	0.30				
DF12#(3.0)-36DS-0.5V	24	11.5	11.5			0.38	25.5	29.5	DF12#(3.5)-60DP-0.5V	32	14.2				33.5	37.5	
DF12#(3.0)-40DS-0.5V								DF12#(4.0)-20DP-0.5V	16	7.5	40		0.38	17.5	21.5		
DF12#(3.0)-50DS-0.5V								DF12#(4.0)-30DP-0.5V					12				
DF12#(3.0)-60DS-0.5V	32	14.2				33.5	37.5	DF12#(4.0)-32DP-0.5V			ļ	3.6	0.00				
DF12#(3.0)-80DS-0.5V	44	20.2		2.6		45.5	49.5	DF12#(4.0)-36DP-0.5V	24	11.5	8		0.30	25.5	29.5		
DF12#(3.0)-10DP-0.5V				12	0.30			DF12#(4.0)-40DP-0.5V		, [12		0.38				
DF12#(3.0)-14DP-0.5V	16	7.5	12			17.5	21.5	DF12#(4.0)-50DP-0.5V			8		0.30				
DF12#(3.0)-20DP-0.5V								DF12#(4.0)-60DP-0.5V	32	14.2				33.5	37.5		
DF12#(3.0)-30DP-0.5V			1		0.38		29.5	DF12#(5.0)-20DP-0.5V	16	7.5		2 4.6	0.38	17.5	21.5		
DF12#(3.0)-32DP-0.5V								DF12#(5.0)-30DP-0.5V	24 11	11.5	12						
DF12#(3.0)-36DP-0.5V	24	11.5						DF12#(5.0)-36DP-0.5V						25.5	29.5		
DF12#(3.0)-40DP-0.5V								DF12#(5.0)-40DP-0.5V		11.5		4.0					
DF12#(3.0)-50DP-0.5V								DF12#(5.0)-50DP-0.5V			8		0.30				
DF12#(3.0)-60DP-0.5V	32	14.2				33.5	37.5	DF12#(5.0)-60DP-0.5V	32	14.2	12		0.38	33.5	37.5		
DF12#(3.0)-80DP-0.5V	44	20.2				45.5	49.5										
DF12#-20DS-0.5V	16	7.5				17.5	21.5										
DF12#-30DS-0.5V																	
DF12#-32DS-0.5V					0.30												
DF12#-36DS-0.5V	24	11.5	8	3.1	0.30	25.5	29.5										
DF12#-40DS-0.5V			12		0.38												
DF12#-50DS-0.5V			8		0.30												
DF12#-60DS-0.5V	32	14.2	12		0.38	33.5	37.5										

Reel Dimensions

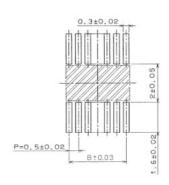


●Recommended PCB mounting pattern

■DF12N with Solder Tab

0.8±0.02 1,8±0,02 1,6±0,02 P=0,5±0,02

■DF12N without Solder Tab



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

Note 2: If there is a pattern on the shaded area and no resist is applied, it may come into contact with the connector contact.

● Precautions for Use

1.Recommended Temperature Profile (SMT)	Temperature (℃)							
	250 €							
	000%							
	220°C							
	200 60sec Max. Soldering							
	180°C - Soldering							
	150 - 150°C 7							
	90 to 120sec							
	100 Preheating							
	50 -							
	Room							
	Temperature							
	0 50 100 150 200 250 300							
	Time (sec)							
	Note 1 : 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.							
	Note 2 : The temperature profile indicates the temperature of the							
	surface of the connector lead.							
2.Recommended Manual Soldering Condition (SMT)	Soldering iron temperature : 350°C, Soldering time : Within 3 seconds							
3.Recommended Screen Thickness and	0.12mm							
Open Area Ratio(Pattern Area Ratio)	Open area ratio : 70%							
4.Board Warp(SMT)	Maxmum 0.02mm in the connector center area, based on both connector edges							
5.Cleaning Condition	Refer to "Nylon Connector Use Handbook".							
6.Cautions								
o.oddions	■ The receptacle is designed with the contacts exposed. Touching the contacts with bare hands may cause contact failure or damage to the device due to static							
	electricity.							
	■ Insertion/extraction when not mounted to the board may result in damage or							
	contact deformation.							
	Avoid securing the board only with the connector. Please use other methods to secure the board.							
	■ Excessive prying during insertion and extraction may result in damage.							
	■ Do not apply flux that will result in flux rise during manual soldering.							
	■ The color of the mold may differ slightly depending on the production lot however							
	this does not affect the performance.							

HIROSE ELECTRIC CO.,LTD.

2-6-3, Nakagawa Chuoh, Tsuzuki-Ku, Yokohama-Shi 224-8540, JAPAN https://www.hirose.com/