

2mm Pitch, Positive lock, Wire-to Board Connector (UL, C-UL Listed)

DF51K Series



■ Features

1. Positive lock provides clear tactile click and secures reliable connection

The locking mechanism delivers a clear tactile click, which prevents incomplete mating. (Fig.1)

2. Wide variation

Each of Straight / Right angle equipped with single row and dual row for flexible design. Gold and Tin plating options support various application needs.

3. Easy extraction workability

The width of the center lock lever is increased as the pin counts increase for easy extraction. Additionally, the center lock design does not need space to un-mate the connector, which provides high density mounting. (Fig.2)

4. Prevents incorrect mating

Visually and mechanically polarized features prevent reverse mating and incorrect mating between different number of positions. (Fig.3)

5. Suitable for potting

Capable of being potted up to 3mm. (Fig.3)

6. Use common crimping tools with DF11 Series

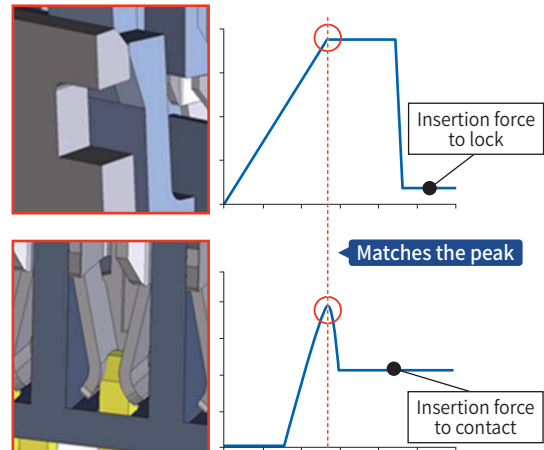
Wide applicable cable range : 22 to 30 AWG.
(However, the crimp contact of DF51K and DF11 are not compatible each other.)

7. UL, C-UL certified

■ Applications

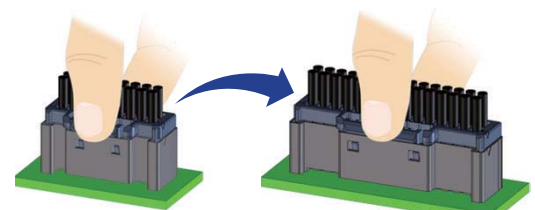
Office Equipment, Industrial Machinery,
Industrial robots, Amusement equipment,
Medical equipment.

◆ Secure mating with clear tactile click

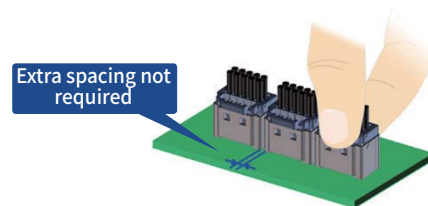


Matching peak insertion forces provides a clear click sound and tactile click

Fig.1



Center lock width gets wider as the pin count increases.



High workability and high density mounting due to center lock design

Fig.2

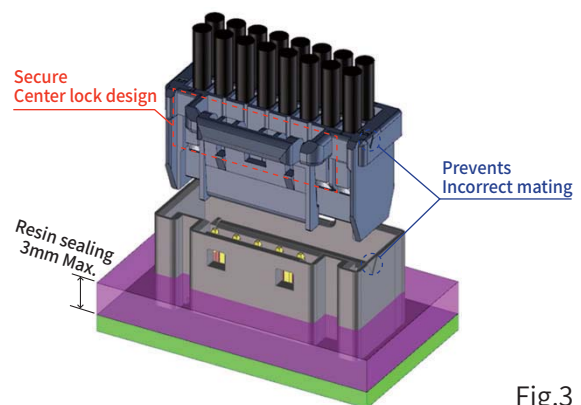


Fig.3

Product Specifications

Ratings	Current Rating	AWG#22~24	AWG#26	AWG#28	AWG#30	Operating temperature range	-55°C to 105°C (Note 2)
		2A	1.5A	1A	0.5A	Operating humidity range	20% to 80% (Note 3)
	Voltage Rating	AC/DC 250V				Storage temperature range	-10°C to 60°C (Note 4)
						Storage humidity range	40% to 70% (Note 4)

Ratings	Current Rating	22 AWG	24 to 28 AWG	30 AWG
		2A	1A	0.5A
	Voltage Rating	30V AC/DC		

UL/C-UL File No., and Recognition No.
L, C-UL : E132750

Items	Specifications	Conditions
1. Insulation Resistance	No less than 1,000MΩ	Measured at DC 500V
2. Withstanding Voltage	No flashover or breakdown	AC 650V is applied for 1 minute
3. Contact Resistance	No more than 30mΩ	Measured at 1mA and no higher than 20mV
4. Vibration Resistance	No electrical discontinuity of 1μs or greater	Frequency : 10 to 55Hz, half amplitude 0.75mm, 10 times in each of the 3 directions
5. Shock Resistance	No electrical discontinuity of 1μs or greater	Acceleration velocity : 490m/s ² for 11ms, half-sine wave in 3 directions, 3 times for each directions
6. Moisture-resistance	Contact resistance : no more than 30mΩ Insulation resistance : no less than 500MΩ	Temperature : 40±2°C, humidity : 90 to 95%, left as it is for 96 hours
7. Temperature cycles	Contact resistance : no more than 30mΩ Insulation resistance : no less than 1,000MΩ	-55°C: 30 minutes → 105 : 30 minutes 5 cycles
8. Durability	Contact resistance: no more than 30mΩ	Tin plated : 30 mating cycles, Gold plated : 50 mating cycles
9. Soldering heat resistance	The resin parts should withstand the temperature and resist melting.	Flow : 260°C for in immersion, 5 sec Hand soldering : temperature of soldering iron at 270°C for 3 seconds

Note 1 : Current rating of header is 2A

Note 2 : Includes temperature rise caused by current flow.

Note 3 : Use without condensation on parts.

Note 4 : The storage condition refers to long-term storage of the product on the shelf before assembly. Please use the operating temperature for temporary storage such as pre-assembly and during shipping.

Material / Finish

Product	Part	Material	Finish	UL Regulation
Header	Insulator	PBT (glass-reinforced)	Black	UL94V-0
	Contact	Brass	Tin plated or Gold plated	—
Crimp socket	Insulator	PBT (glass-reinforced)	Black	UL94V-0
Socket contact	Contact	Phosphor bronze	Tin plated or Gold 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.

● Connector

DF51K # - * P - 2 DSA

① ② ③ ④ ⑤ ⑥

● Crimp contact

DF51K - 2428 SCF A

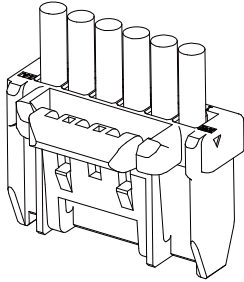
① ⑦ ⑧ ⑨

① Series Name : DF51K	⑥ Type of Housing DSA : Straight header DS : Right angle header C : Crimp socket
② Form Type Blank : Without guide-boss B : Guide-boss type	⑦ Applicable Conductor 22 : AWG#22 2428 : AWG#24~28 30 : AWG#30
③ Number of Contacts Single-row : 2 to 6 Double-row : 4 to 30	⑧ Packaging SC : Socket contacts · Pack SCF : Socket contacts · Reel
④ Connector type P : Single-row pin header S : Single-row crimp socket DP : Double-row pin header DS : Double-row crimp socket	⑨ Plating Specifications Blank : Tin plated A : Gold plated
⑤ Contact Pitch : 2mm	

■ Diagram of Connector Mating Combinations

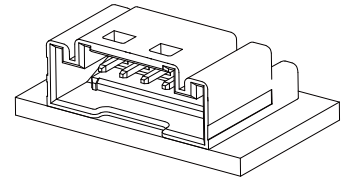
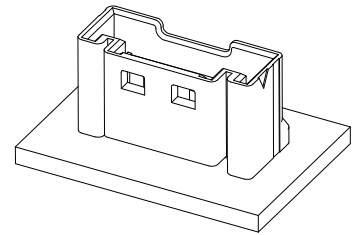
● Single-row

Crimp socket	Socket contact
DF51K-*S-2C	DF51K-22SC(F)(A)
	DF51K-2428SC(F)(A)
	DF51K-30SC(F)(A)



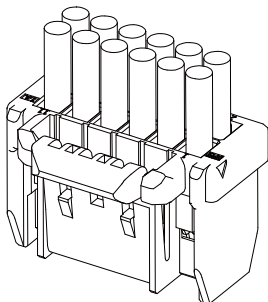
Straight header
DF51K(B)-*P-2DSA

Right angle header
DF51K(B)-*P-2DS



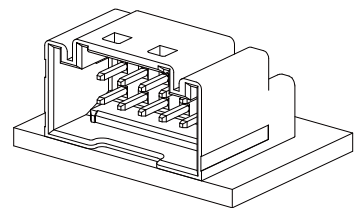
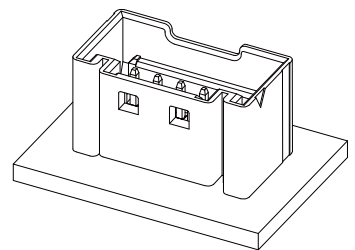
● Double-row

Crimp socket	Socket contact
DF51K-*DS-2C	DF51K-22SC(F)(A)
	DF51K-2428SC(F)(A)
	DF51K-30SC(F)(A)

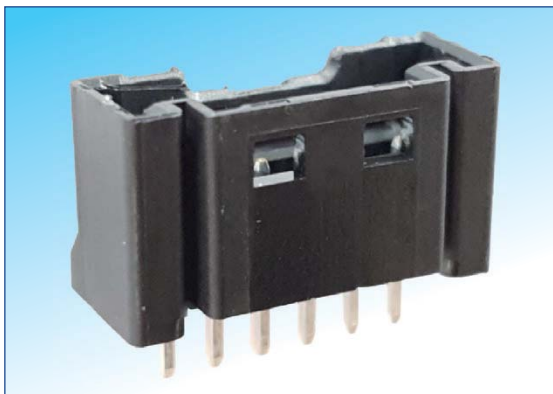


Straight header
DF51K(B)-*DP-2DSA

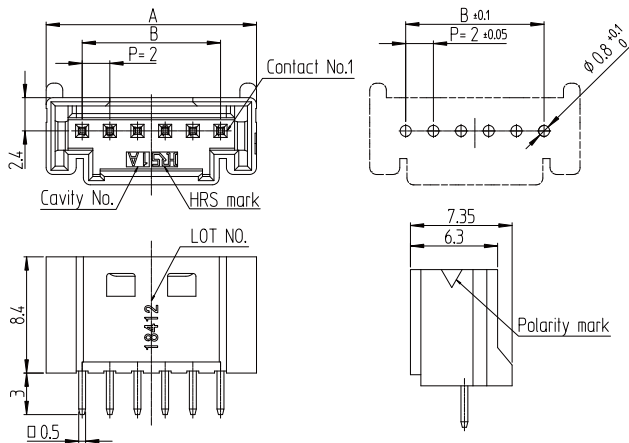
Right angle header
DF51K(B)-*P-2DS



Single-row Straight Header



Recommended PCB Layout (t=1.6mm)

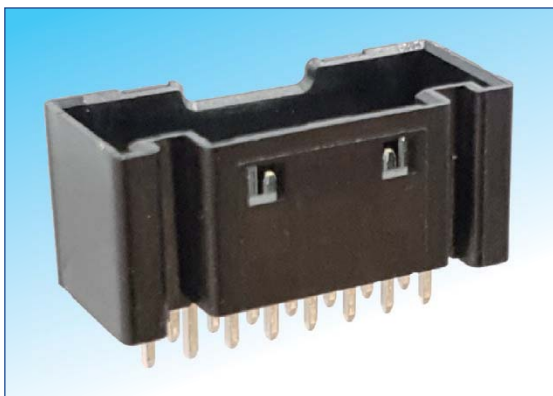


[Specification number] - **, (8**)
 00 : Tin plated
 05 : Gold plated

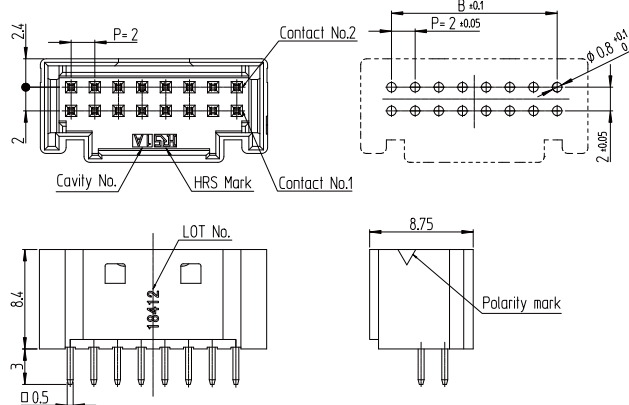
Part No.	HRS No.	No. of contacts	A	B
DF51K-2P-2DSA(8**)	480-0542-0 **	2	7.2	2
DF51K-3P-2DSA(8**)	480-0543-0 **	3	9.2	4
DF51K-4P-2DSA(8**)	480-0544-0 **	4	11.2	6
DF51K-5P-2DSA(8**)	480-0545-0 **	5	13.2	8
DF51K-6P-2DSA(8**)	480-0546-0 **	6	15.2	10

Note 1 : Bag packaging(100pcs/pack). Order by number of packs.

Double-row Straight Header



Recommended PCB Layout (t=1.6mm)



[Specification number] - **, (8**)
 00 : Tin plated
 05 : Gold plated

Part No.	HRS No.	No. of contacts	A	B
DF51K-4DP-2DSA(8**)	480-0547-0 **	4	7.2	2
DF51K-6DP-2DSA(8**)	480-0548-0 **	6	9.2	4
DF51K-8DP-2DSA(8**)	480-0549-0 **	8	11.2	6
DF51K-10DP-2DSA(8**)	480-0550-0 **	10	13.2	8
DF51K-12DP-2DSA(8**)	480-0551-0 **	12	15.2	10
DF51K-14DP-2DSA(8**)	480-0552-0 **	14	17.2	12
DF51K-16DP-2DSA(8**)	480-0553-0 **	16	19.2	14

Part No.	HRS No.	No. of contacts	A	B
DF51K-18DP-2DSA(8**)	480-0554-0 **	18	21.2	16
DF51K-20DP-2DSA(8**)	480-0555-0 **	20	23.2	18
DF51K-22DP-2DSA(8**)	480-0556-0 **	22	25.2	20
DF51K-24DP-2DSA(8**)	480-0557-0 **	24	27.2	22
DF51K-26DP-2DSA(8**)	480-0558-0 **	26	29.2	24
DF51K-28DP-2DSA(8**)	480-0559-0 **	28	31.2	26
DF51K-30DP-2DSA(8**)	480-0560-0 **	30	33.2	28

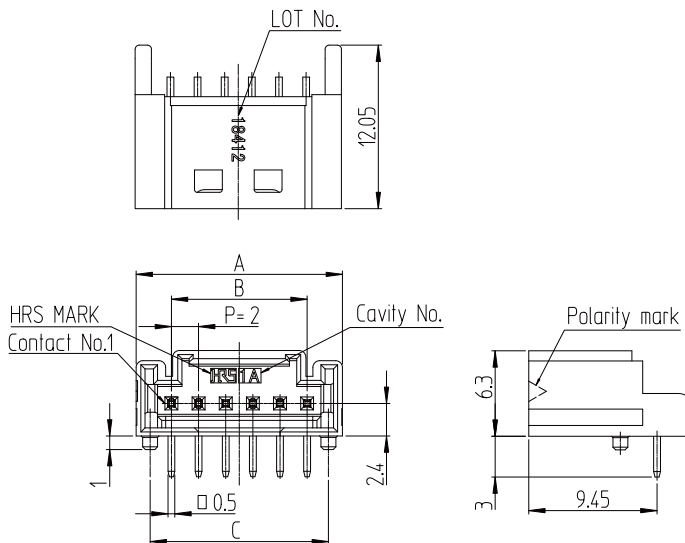
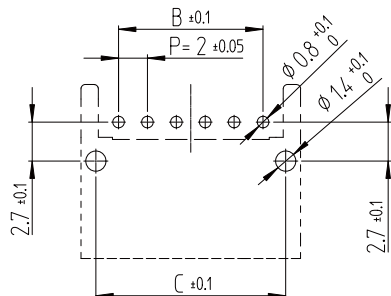
Note 1 : Bag packaging(100pcs/pack). Order by number of packs.

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Single-row Right Angle Header



Recommended PCB Layout (t=1.6mm)



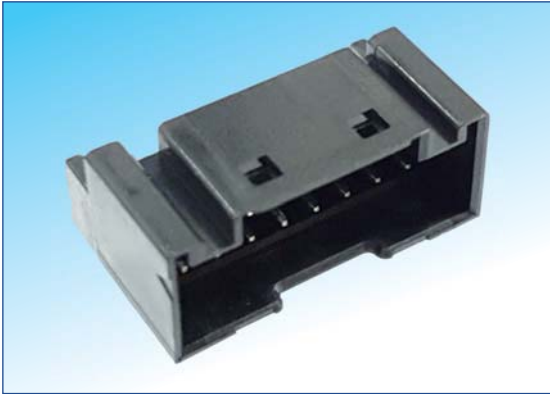
※ Above drawing is guide-boss type.

[Specification number] - **, (8**)
 00 : Tin plated
 05 : Gold plated

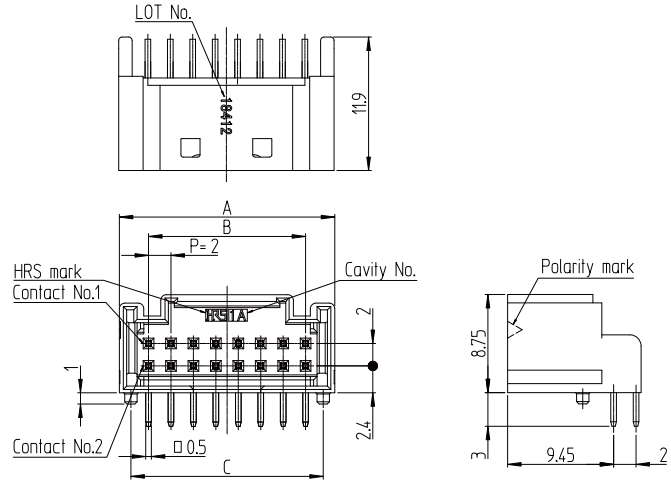
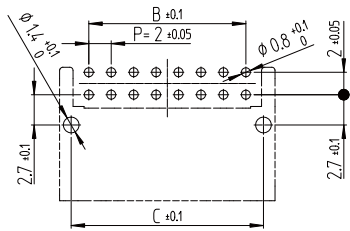
Part No.	HRS No.	Guide-boss	No. of contacts	A	B	C	Quantity per package
DF51KB-2P-2DS(8**)	480-0587-0 **	With boss	2	7.2	2	5.14	420
DF51KB-3P-2DS(8**)	480-0588-0 **	With boss	3	9.2	4	7.14	330
DF51K-4P-2DS(8**)	480-0589-0 **	Without boss	4	11.2	6	—	270
DF51K-5P-2DS(8**)	480-0590-0 **	Without boss	5	13.2	8	—	230
DF51K-6P-2DS(8**)	480-0591-0 **	Without boss	6	15.2	10	—	200

Note 1 : Please place orders in full lot quantities.

Double-row Right Angle Header



Recommended PCB Layout (t=1.6mm)



※ Above drawing is guide-boss type.

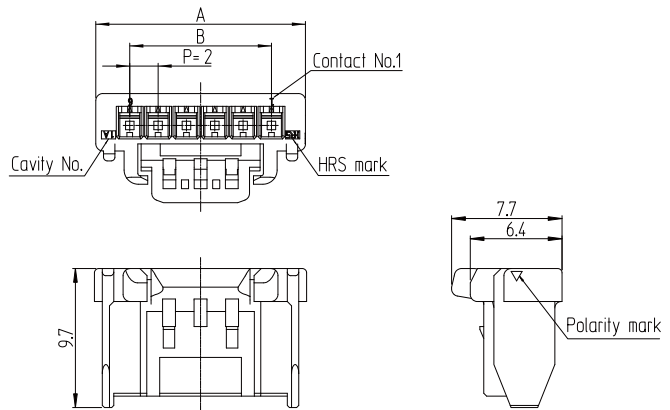
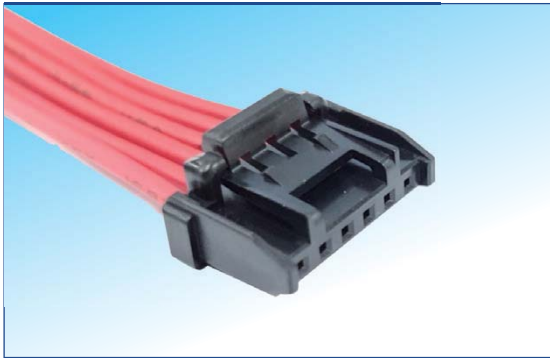
[Specification number] - **, (8**)
 00 : Tin plated
 05 : Gold plated

Part No.	HRS No.	Guide-boss	No. of contacts	A	B	C	Quantity per package
DF51KB-4DP-2DS(8**)	480-0592-0 **	With boss	4	7.2	2	5.14	420
DF51KB-6DP-2DS(8**)	480-0593-0 **	With boss	6	9.2	4	7.14	330
DF51K-8DP-2DS(8**)	480-0594-0 **	Without boss	8	11.2	6	—	270
DF51K-10DP-2DS(8**)	480-0595-0 **	Without boss	10	13.2	8	—	230
DF51K-12DP-2DS(8**)	480-0596-0 **	Without boss	12	15.2	10	—	200
DF51K-14DP-2DS(8**)	480-0597-0 **	Without boss	14	17.2	12	—	170
DF51K-16DP-2DS(8**)	480-0598-0 **	Without boss	16	19.2	14	—	150
DF51K-18DP-2DS(8**)	480-0599-0 **	Without boss	18	21.2	16	—	140
DF51K-20DP-2DS(8**)	480-0600-0 **	Without boss	20	23.2	18	—	130
DF51K-22DP-2DS(8**)	480-0601-0 **	Without boss	22	25.2	20	—	120
DF51K-24DP-2DS(8**)	480-0602-0 **	Without boss	24	27.2	22	—	110
DF51K-26DP-2DS(8**)	480-0603-0 **	Without boss	26	29.2	24	—	100
DF51K-28DP-2DS(8**)	480-0604-0 **	Without boss	28	31.2	26	—	90
DF51K-30DP-2DS(8**)	480-0605-0 **	Without boss	30	33.2	28	—	90

Note 1 : Please place orders in full lot quantities.

■ Crimp Socket

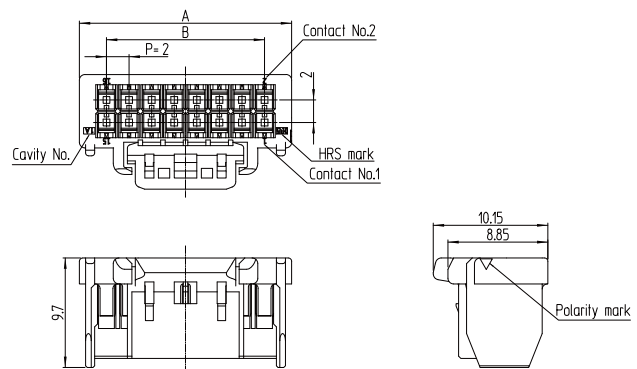
● Single-row



Part No.	HRS No.	No. of contacts	A	B
DF51K-2S-2C	480-0561-0 00	2	6.8	2
DF51K-3S-2C	480-0562-0 00	3	8.8	4
DF51K-4S-2C	480-0563-0 00	4	10.8	6
DF51K-5S-2C	480-0564-0 00	5	12.8	8
DF51K-6S-2C	480-0565-0 00	6	14.8	10

Note 1 : Bag packaging(100pcs/pack). Order by number of packs.

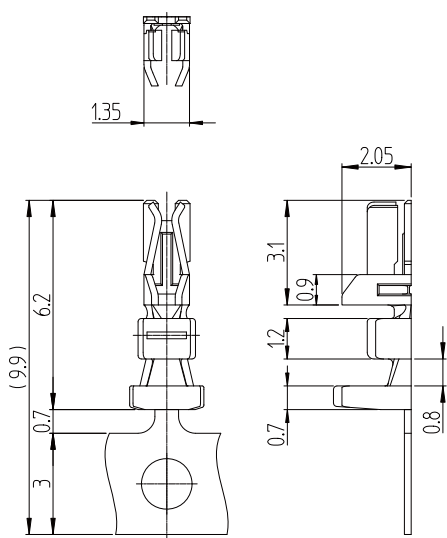
● Double-row



Part No.	HRS No.	No. of contacts	A	B
DF51K-4DS-2C	480-0567-0 00	4	6.8	2
DF51K-6DS-2C	480-0568-0 00	6	8.8	4
DF51K-8DS-2C	480-0569-0 00	8	10.8	6
DF51K-10DS-2C	480-0570-0 00	10	12.8	8
DF51K-12DS-2C	480-0571-0 00	12	14.8	10
DF51K-14DS-2C	480-0572-0 00	14	16.8	12
DF51K-16DS-2C	480-0573-0 00	16	18.8	14
DF51K-18DS-2C	480-0574-0 00	18	20.8	16
DF51K-20DS-2C	480-0575-0 00	20	22.8	18
DF51K-22DS-2C	480-0576-0 00	22	24.8	20
DF51K-24DS-2C	480-0577-0 00	24	26.8	22
DF51K-26DS-2C	480-0578-0 00	26	28.8	24
DF51K-28DS-2C	480-0579-0 00	28	30.8	26
DF51K-30DS-2C	480-0580-0 00	30	32.8	28

Note 1 : Bag packaging(100pcs/pack). Order by number of packs.

Socket Contact



Part No.	HRS No.	Packaging	Finish
DF51K-22SCF	480-0581-0 00	10,000/reel	Tin plated
DF51K-22SC	480-0582-0 00	100/pack	
DF51K-2428SCF	480-0583-0 00	10,000/reel	
DF51K-2428SC	480-0584-0 00	100/pack	
DF51K-30SCF	480-0585-0 00	10,000/reel	
DF51K-30SC	480-0586-0 00	100/pack	
DF51K-22SCFA	480-0612-0 00	10,000/reel	Gold plated
DF51K-22SCA	480-0613-0 00	100/pack	
DF51K-2428SCFA	480-0614-0 00	10,000/reel	
DF51K-2428SCA	480-0615-0 00	100/pack	
DF51K-30SCFA	480-0616-0 00	10,000/reel	
DF51K-30SCA	480-0617-0 00	100/pack	

● **Applicable wire (Tinned, Annealed copper wire)**

Conductor size (Core structure)	Jacket Diameter
22 AWG (17 pieces / Ø 0.16mm)	Ø1.2 ~ Ø1.45mm
24 AWG (11 pieces / Ø 0.16mm)	Ø0.9 ~ Ø1.45mm
26 AWG (7 pieces / Ø 0.16mm)	
28 AWG (7 pieces / Ø 0.127mm)	
30 AWG (7 pieces / Ø 0.1mm)	Ø0.75 ~ Ø1.2mm

● **Recommended wire**

UL1061, UL1007 (Note 2)

● **Strip length**

1.7 to 2.3mm

Note 1 : When using other than the applicable wire, contact your nearest Hirose representative.

Note 2 : DF51K-22SCF/SC/SCFA/SCA is for UL1061

Applicable Crimping Tool

Type	Part No.	HRS NO.	Wire Type	Applicable Contacts
Applicator	AP105-DF11-22S	901-4529-7	UL1061 (Note 3, 4)	DF51K-22SCF/SCFA
	AP105-DF11-2428S	901-4511-1	UL1007 (Note 3) UL1061 (Note 3)	DF51K-2428SCF/SCFA
	AP10-DF11-30S	901-4532-1	UL1007 (Note 3) UL1061 (Note 3)	DF51K-30SCF/SCFA
Press Unit	CM-105C	901-0001-0		
Hand Tool	HT801/DF11-22S(A)	Under developing	UL1061 (Note 4, 5)	DF51K-22SC/SCA
	HT801/DF11-2428S(A)	Under developing	UL1007 (Note 4) UL1061 (Note 4)	DF51K-2428SC/SCA
	HT801/DF11-30S(A)	Under developing	UL1007 (Note 4) UL1061 (Note 4)	DF51K-30SC/SCA
Contact Extraction Tool	DF-C-PO(B)	550-0179-2		DF51K-****SCF/SCFA

Note 1 : Please conduct crimping work according to the "Crimping work standards" and "Crimping condition table".

Note 2 : Any problems that occur from using tools other than those specified by Hirose, are not covered by warranty.

Note 3 : Applicator dies can be switched to crimp the other wire size and type. The additional dies are sold separately.

Note 4 : The compatible wire is limited to UL1061, 22 AWG

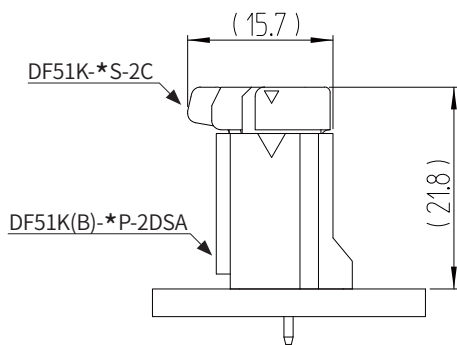
Note 5 : The compatibility with DF11 is limited to the crimping tool. The crimp contact of DF51K and DF11 are not compatible each other.

Note 6 : Please contact Hirose for information about Hand tooling.

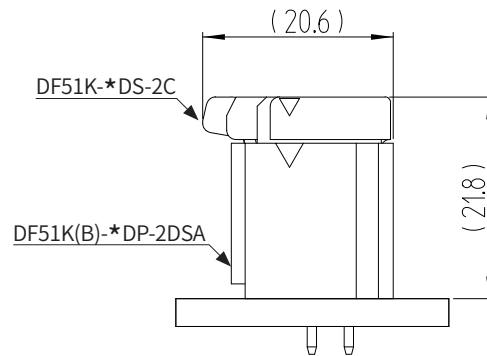
■ Mated Dimensions

● Board-to-Wire connection using the straight header

[Single-row]

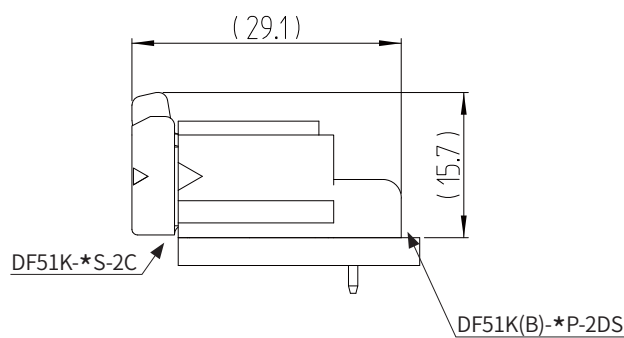


[Single-row]

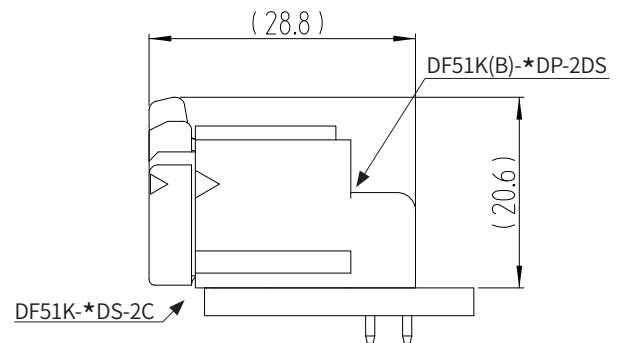


● Board-to-Wire connection using the right angle header

[Single-row]



[Single-row]



■ Precautions for use

1. The connector could be damaged if it is pulled out forcibly. When it is hard to pull out, push it in slightly first and then depress the lock and un-mate.
Please refer to "DF51K mating and unmating Procedure Document (DOC180208-010)" for points in handling regarding mating operations.
2. When fitting a crimped contact into a socket, please refrain from oblique insertion for keeping performance reliability.
Please refer to "Harness procedure manual (DOC180330-002)" for points in harness operations.

■ Operating Environment

Please contact us if you are designing this connector into environmental conditions where high and low temperatures are repeated.

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