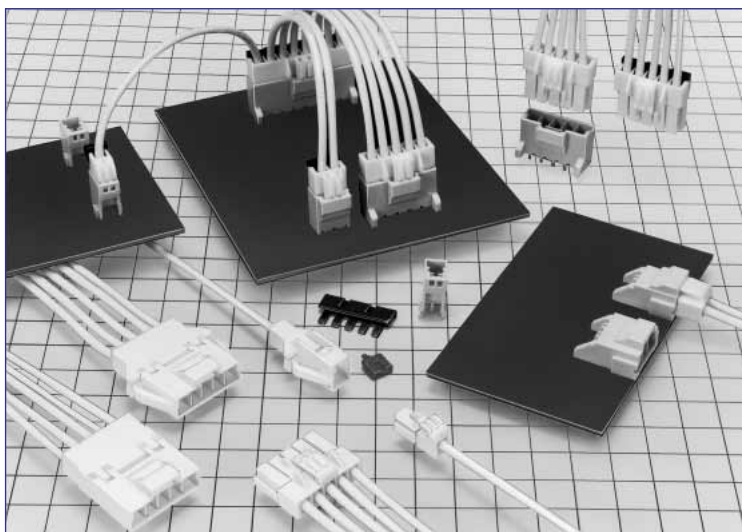
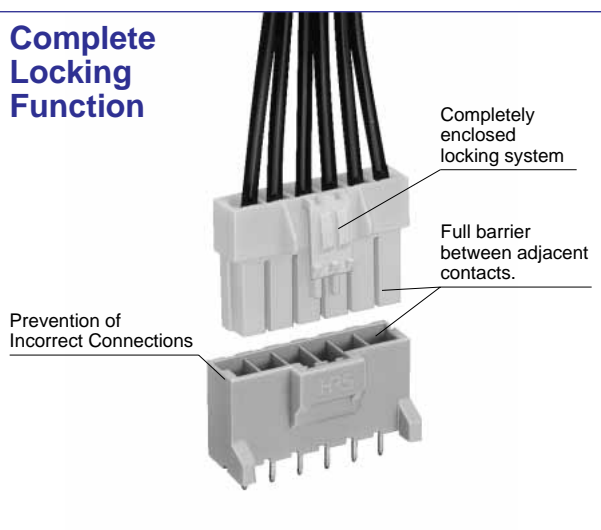


## 3.96 mm Pitch Miniature Connectors for Internal Power Supplies (UL,C-UL and TÜV Listed)

### DF7 Series



#### Complete Locking Function



#### Features

##### 1. Complete Locking Function

Reliable interior lock protects mated connectors from accidental disconnection.

##### 2. Increased Contact Retention of Crimped Contacts and Prevention of Incomplete Insertion

Separate contact retainer increases the contact retention, assures and visually confirms the complete contact insertion.

##### 3. Molded-in Contact Retention Tabs

Handling of terminated contacts during the assembly and termination is easier and avoids entangling of wires, since there are no protruding metal tabs.

##### 4. Incorrect Insertion Prevention

Connectors are polarized to assure correct mating with corresponding parts.

##### 5. Solder Crack Prevention

Glass reinforced resin is used in the pin header bodies to prevent solder cracks caused by the heat shrinkage.

##### 6. Prevention of Incorrect Board Placement

Built-in locating posts assure correct connector placement and orientation on the board.(2-12 pos.)

##### 7. Supports Sealing after Installation.

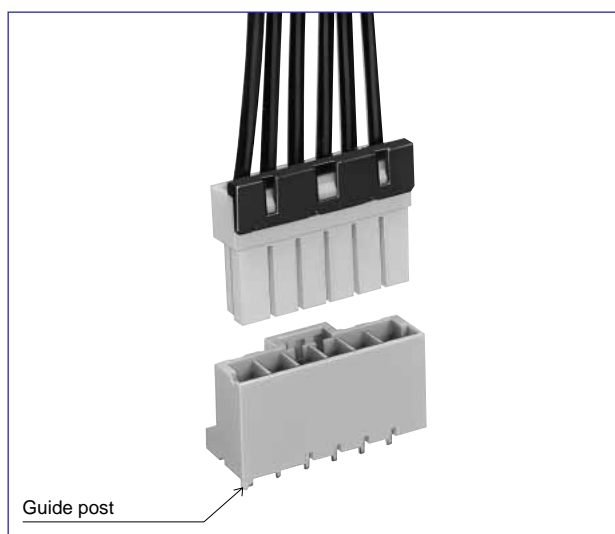
Sealing compound can be applied to the board installed connector for distance of 6 mm max. from the mounting surface (9 mm max. for single position).

##### 8. Cost Effective Tooling

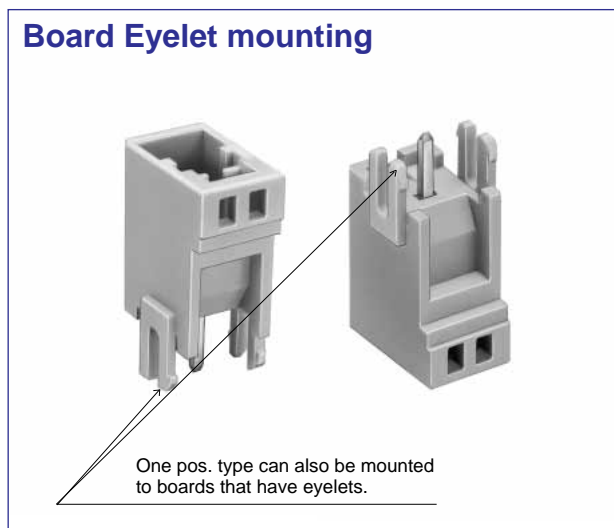
The same crimping tools are used to terminate socket and pin contacts.

##### 9. Prevention of Short Circuits between Adjacent Contacts

Each contact is completely surrounded by the insulator housing, electrically isolating it from adjacent contacts.



#### Board Eyelet mounting



Continued.

10. 10 A maximum Current

Connector can carry current of 10 A per contact with #16 AWG conductor. Refer to page 3 for current ratings for multi-position connectors using other conductor sizes.

11. Color Variations

1 pos. is available in a standard 3 colors: natural, blue, and red.


12. Supports Eyelets

1 pos. can be mounted to boards which have eyelets attached.

Applications

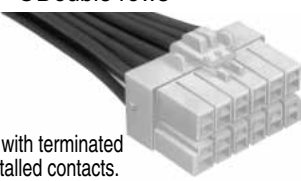
Office equipment, power supplies for industrial, medical and instrumentation applications, variety of consumer electronic and electrical applications.

●Single row



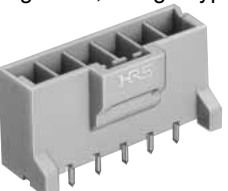
Shown with terminated and installed contacts. Refer to page 8 for details.

●Double rows



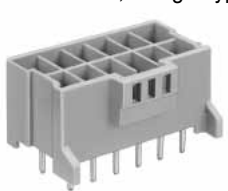
Shown with terminated and installed contacts. Refer to page 11 for details.

●Single row, straight type




Refer to page 4 for details.

●Double rows, straight type




Refer to page 10 for details.

●Single row, right angle type




Refer to page 5 for details.

●Double row, right angle type




Refer to page 10 for details.

●Panel lock type




Shown with terminated and installed contacts. Refer to page 6 for details.



Shown with terminated and installed contacts. Refer to page 7 for details.

Retainer  
(optional, order separately)



Refer to page 10 for details.

Ordering information

●Socket, Header

DF7 - \* S - 3.96 C

1

2

3

4

5

●Contacts

DF7 - \*\* SCF

1

6

7

1	Series name: DF7, DF7A	6	Applicable Conductor
2	Number of contacts: 1 to 12		1618: AWG 16 to AWG 18
3	Connector type		2022: AWG 20 to AWG 22
	S: Socket		2426: AWG 24 to AWG 26
	DS: Double-row socket	7	Packaging
	P: Header		SCF: Socket contacts / Reel
	DP: Double-row Header		SC: Socket contacts / Bag
	EP: In-line plug		PCF: Plug contacts / Reel
	RS/P: Retainer		PC: Plug contacts / Bag
4	Contact pitch: 3.96mm(7.92 mm)		
5	Type of housing: header		
	C: Crimp housing		
	DSA: Straight header		
	DS: Right-angle header		
	Blank: Retainer		

B96 HRS

## ■Product Specifications

Ratings	Current rating	Row	No. of contacts	AWG16	AWG18	AWG20	AWG22		
		1	1~10	10A	7A	5A	4A	Operating temperature range	-35°C to 85°C (Note 1)
		2	4	10A	9A	7A	6A	Operating humidity range	20% to 80%
			6	9A	8A	6A	5A		
			8	9A	8A	6A	5A	Storage temperature range	-10°C to 60°C (Note 2)
			10	8A	7A	5A	4A	Storage humidity range	40% to 70% (Note 2)
			12	8A	7A	5A	4A		
	Voltage rating	Specification			AC 630V			UL/C-UL/TÜV	File No. and Recognition No
		UL/C-UL			AC 600V			UL	:E52653
		TÜV			AC 600V(7.92mm pitch)			C-UL	:E52653
					AC 300V (3.96mm pitch)			TÜV	:R9750437

Item	Specification	Condition
1. Contact resistance	Contact resistance (Initial value)	10 m ohms max. 20mV max., 1mA
2. Insulator resistance	1000 M ohms min.	500 V DC
3. Withstanding voltage	No flashover or Insulator breakdown	1500 V AC for 1 minute
4. Insertion-Extraction force (per contact)	0.3N min., 4.5N max.	Measured with a steel pin of 0.64 x 1.2 ± 0.002 mm
5. Durability (mating/unmating)	30 cycles	Contact resistance of 20 m ohms max.
6. Vibration	No momentary disconnections of 1 μs min.	Frequency 10 to 55 Hz, single amplitude of 0.75 mm, 3 axis, 2 hours
7. Shock	No electrical discontinuity of 1 μs. min.	Acceleration of 490 m/s <sup>2</sup> , 11 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis.
8. Humidity	Contact resistance 20 m ohms max.	Temperature 40°C ± 2°C, 90% to 95% RH, 96 hours
9. Temperature cycle	Contact resistance of 20 m ohms max.	(-55°C: 30 minutes → 5 to 35°C: 5 minutes → 85°C: 30 minutes → 5 to 35°C: 5 minutes) for 5 cycles
10. Resistance to soldering heat	No deformation of the insulator parts affecting performance	Flow solder temperature 250°C, 10 seconds Manual soldering: Soldering iron temperature 300°C, 3 seconds

Note 1: Includes temperature rise caused by the current flow.

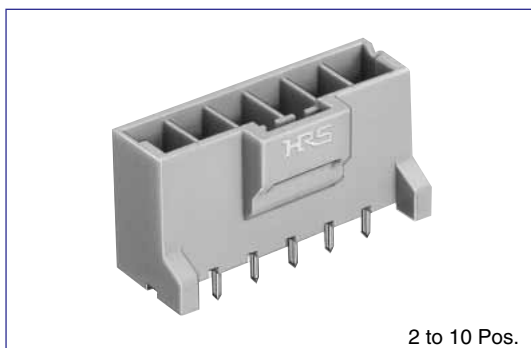
Note 2: The term “storage” refers to products stored for long period of time prior to mounting and use. Operating Temperature Range and Humidity range covers non- conducting condition of installed connectors in storage, shipment or during transportation.

## ■Materials

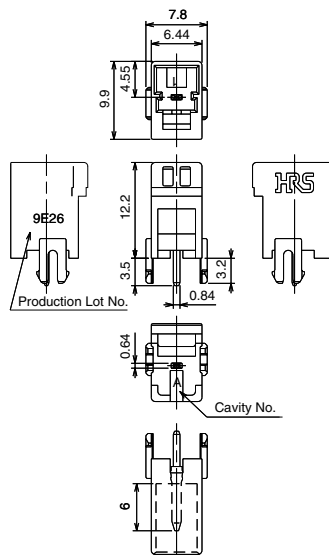
Product	Part	Material	Finish	Remarks
Sockets	Insulator	Polyamide	Color: White	UL94V-0
Headers	Insulator	Polyamide (Glass reinforced)	Color: Beige (Single row) Color: Grey (Double row)	UL94V-0
	Contact	High conductivity copper alloy	Tin plating (Note)	—
In-line plug	Insulator	Polyamide	Color: White	UL94V-0
Retainer	Insulator	Polyamide	Color: Black	UL94V-0
Crimp contacts	Contacts	High conductivity copper alloy	Tin plating (Note)	—

Note: Hirose Electric's plating incorporates anti-whisking compounds.

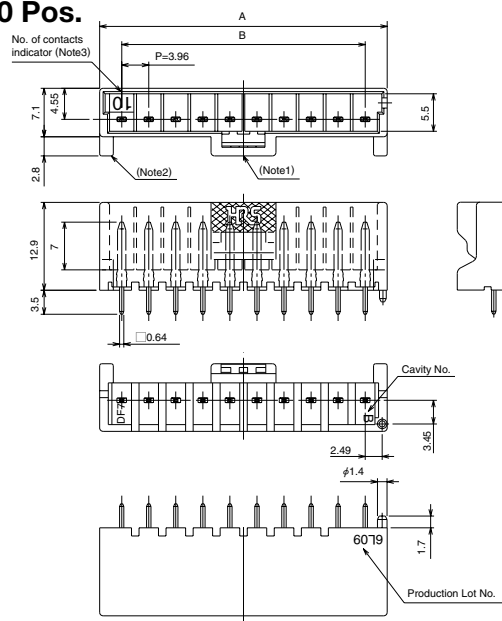
## ■ Straight header



1 Pos.

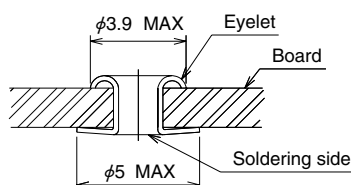


2 to 10 Pos.

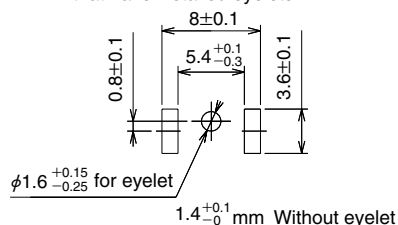


## ◆ PCB mounting pattern (Board thickness: $1.6 \pm 0.1$ )

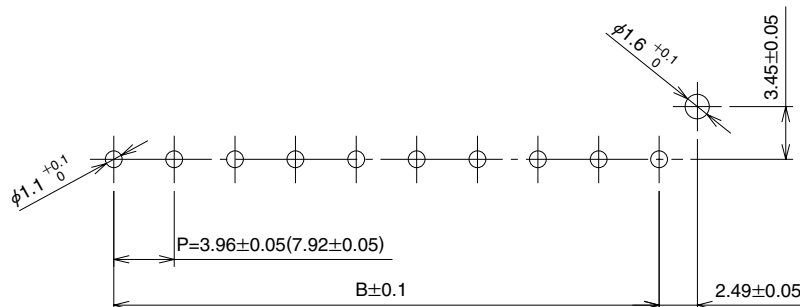
1 Pos.



Note 5: One pos. type can also be mounted to boards that have installed eyelets.



2 to 10 Pos.



Part Number	CL No.	Number of contacts	A	B
DF7- 1P-3.96DSA	CL680-0133-1	1	—	—
DF7- 2P-3.96DSA	CL680-0036-5	2	10.40	3.96
DF7- 3P-3.96DSA	CL680-0037-8	3	14.36	7.92
DF7- 4P-3.96DSA	CL680-0038-0	4	18.32	11.88
DF7- 5P-3.96DSA	CL680-0039-3	5	22.28	15.84
DF7- 6P-3.96DSA	CL680-0040-2	6	26.24	19.80
DF7- 7P-3.96DSA	CL680-0041-5	7	30.20	23.76
DF7- 8P-3.96DSA	CL680-0042-8	8	34.16	27.72
DF7- 9P-3.96DSA	CL680-0043-0	9	38.12	31.68
DF7-10P-3.96DSA	CL680-0044-3	10	42.08	35.64
DF7- 2P-7.92DSA	CL680-0108-4	2	14.36	7.92
DF7- 3P-7.92DSA	CL680-0109-7	3	22.28	15.84
DF7- 4P-7.92DSA	CL680-0110-6	4	30.20	23.76
DF7- 5P-7.92DSA	CL680-0111-9	5	38.12	31.68

Note 1) Bag packaging (100 pieces/bag). Order by number of bags.

Note 2) The 2 pos. type does not have walls on both sides.

Note 3) DF7-2P-7.92DSA plug has #2 contact positions of DF7-3P-3.96DSA without contacts inserted and the number of pos. indication is 2.

(Mating receptacle: DF7#-3S-3-96C)

DF7-3P-7.92DSA plug has #2 and #4 contact positions of DF7-5P-3.96DSA without contacts inserted and the number of pos. indication is 3.

(Mating receptacle: DF7#-5S-3-96C)

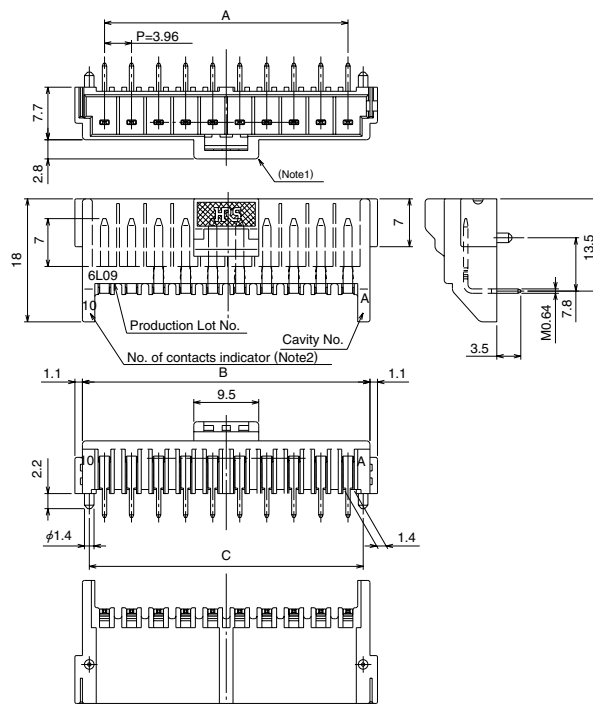
DF7-4P-7.92DSA plug has #2, #4 and #6 contact of DF7-7P-3.96DSA without contacts inserted and the number of pos. indication is 4.

(Mating receptacle: DF7#-7S-3-96C)

DF7-5P-7.92DSA plug has #2, #4, #6 and #8 contact positions of DF7-9P-3.96DSA without contacts inserted and the number of pos. indication is 5.

(Mating receptacle: DF7#-9S-3-96C)

## ■ Right angle header



Part Number	CL No.	Number of contacts	A	B	C	Quantity per tray
DF7- 2P-3.96DS(24)	CL680-0081-0-24	2	3.96	10.40	8.40	114
DF7- 3P-3.96DS(24)	CL680-0082-2-24	3	7.92	14.36	12.36	84
DF7- 4P-3.96DS(24)	CL680-0083-5-24	4	11.88	18.32	16.32	66
DF7- 5P-3.96DS(24)	CL680-0084-8-24	5	15.84	22.28	20.28	60
DF7- 6P-3.96DS(24)	CL680-0085-0-24	6	19.80	26.24	24.24	48
DF7- 7P-3.96DS(24)	CL680-0086-3-24	7	23.76	30.20	28.20	42
DF7- 8P-3.96DS(24)	CL680-0087-6-24	8	27.72	34.16	32.16	36
DF7- 9P-3.96DS(24)	CL680-0088-9-24	9	31.68	38.12	36.12	36
DF7-10P-3.96DS(24)	CL680-0089-1-24	10	35.64	42.08	40.08	30
DF7- 2P-7.92DS(24)	CL680-0124-0-24	2	7.92	14.36	12.36	84
DF7- 3P-7.92DS(24)	CL680-0125-3-24	3	15.84	22.28	20.28	60
DF7- 4P-7.92DS(24)	CL680-0126-6-24	4	23.76	30.20	28.20	42
DF7- 5P-7.92DS(24)	CL680-0127-9-24	5	31.68	38.12	36.12	36

Note 1) Tray packaging. Order by number of quantity in the tray.

Note 2) DF7-2P-7.92DS plug has #2 contact positions of DF7-3P-3.96DS without contacts inserted and the number of pos. indication is 2.

(Mating receptacle: DF7#-3S-3-96C)

DF7-3P-7.92DS plug has #2 and #4 contact positions of DF7-5P-3.96DS without contacts inserted and the number of pos. indication is 3.

(Mating receptacle: DF7#-5S-3-96C)

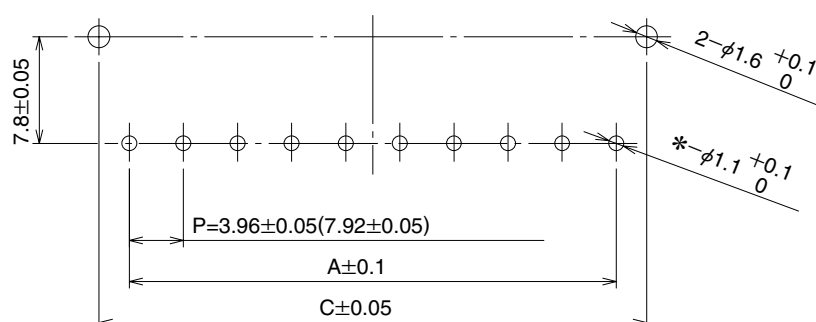
DF7-4P-7.92DS plug has #2, #4 and #6 contact of DF7-7P-3.96DS without contacts inserted and the number of pos. indication is 4.

(Mating receptacle: DF7#-7S-3-96C)

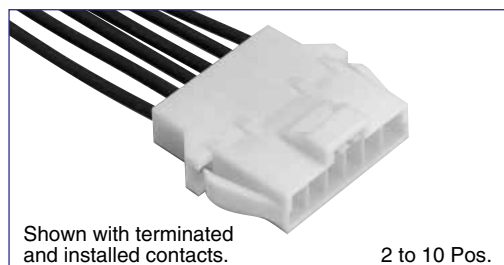
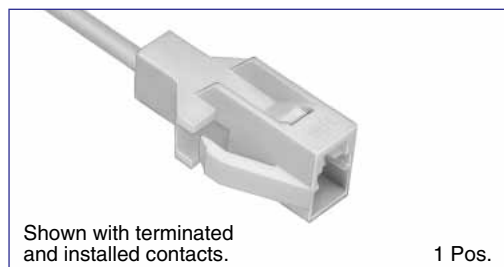
DF7-5P-7.92DS plug has #2, #4, #6 and #8 contact positions of DF7-9P-3.96DS without contacts inserted and the number of pos. indication is 5.

(Mating receptacle: DF7#-9S-3-96C)

## ◆ PCB mounting pattern (Board thickness: $1.6 \pm 0.1$ )



## ■ In-line plug (Panel lock type)

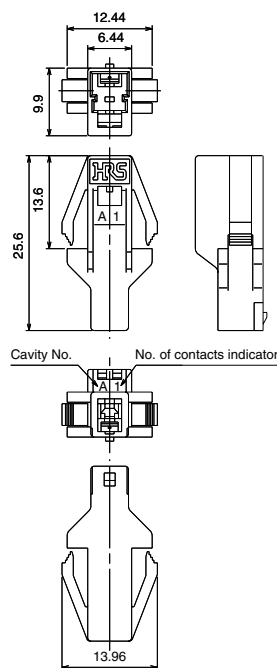


Part Number	CL No.	Number of contacts	A	B	C
DF7- 1EP-3.96C	CL680-0134-4	1	6.44	—	13.96
DF7- 2EP-3.96C	CL680-0018-3	2	10.40	3.96	17.40
DF7- 3EP-3.96C	CL680-0019-6	3	14.36	7.92	21.36
DF7- 4EP-3.96C	CL680-0020-5	4	18.32	11.88	25.32
DF7- 5EP-3.96C	CL680-0021-8	5	22.28	15.84	29.28
DF7- 6EP-3.96C	CL680-0022-0	6	26.24	19.80	33.24
DF7- 7EP-3.96C	CL680-0023-3	7	30.20	23.76	37.20
DF7- 8EP-3.96C	CL680-0024-6	8	34.16	27.72	41.16
DF7- 9EP-3.96C	CL680-0025-9	9	38.12	31.68	45.12
DF7-10EP-3.96C	CL680-0026-1	10	42.08	35.64	49.08

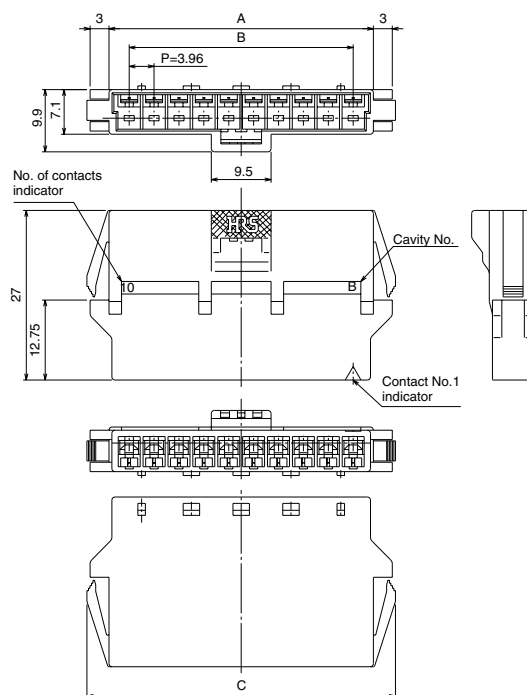
Note1: Bag packaging (100 pieces/bag). Order by number of bags.

Note2: Refer to page 10 for retainer.

1 Pos.

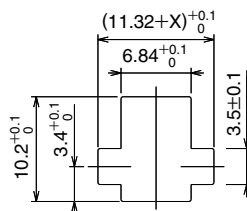


2 to 10 Pos.



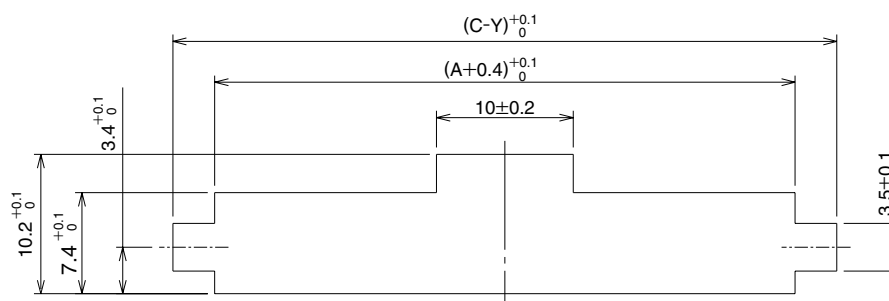
## ◆ Panel Cutout

1 Pos.



	X	Y
2.0	1.44	0.88
1.6	0.96	0.96
1.2	0.48	1.44
0.8	0	1.92

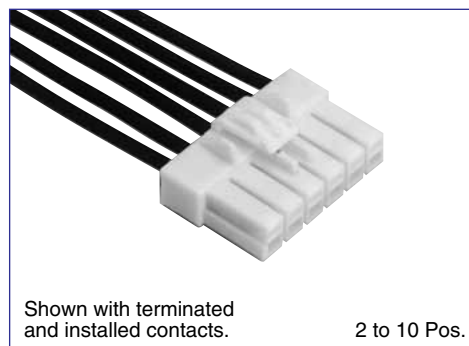
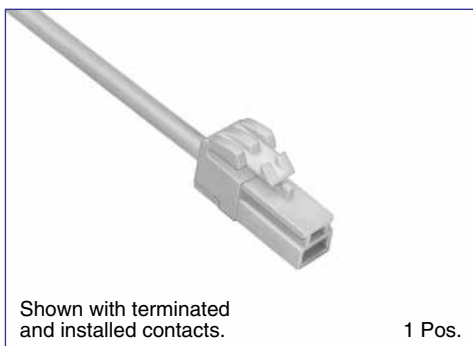
2 to 10 Pos.



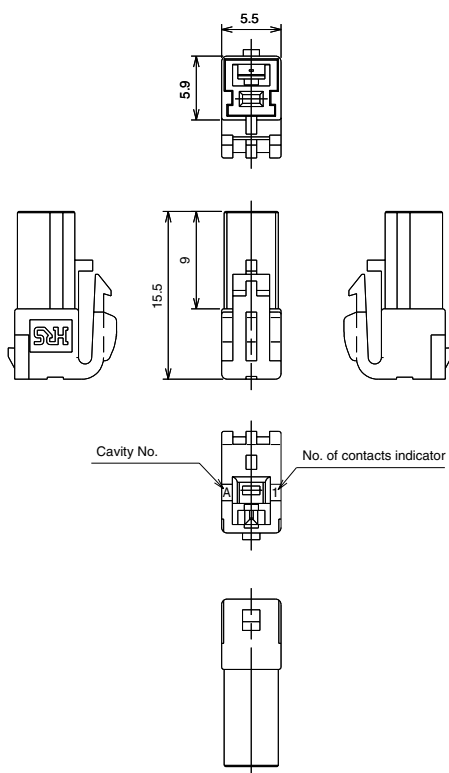




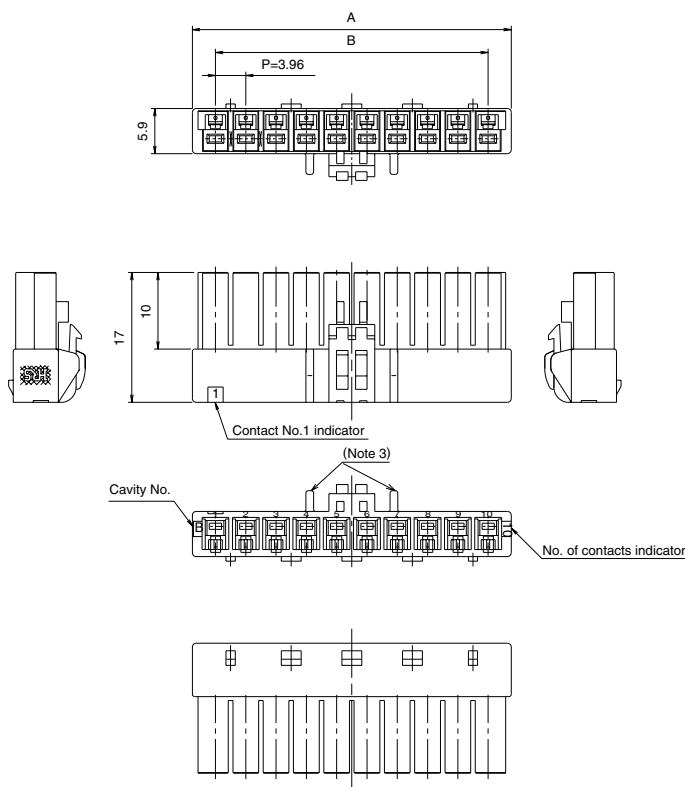
## ■ Crimp Sockets



### 1 Pos.



### 2 to 10 Pos.



Part Number	CL No.	Number of contacts	A	B
DF7- 1S-3.96C	CL680-0132-9	1	5.50	—
DF7- 2S-3.96C	CL680-0009-2	2	10.00	3.96
DF7- 3S-3.96C	CL680-0010-1	3	13.96	7.92
DF7- 4S-3.96C	CL680-0011-4	4	17.92	11.88
DF7- 5S-3.96C	CL680-0012-7	5	21.88	15.84
DF7- 6S-3.96C	CL680-0013-0	6	25.84	19.80
DF7- 7S-3.96C	CL680-0014-2	7	29.80	23.76
DF7- 8S-3.96C	CL680-0015-5	8	33.76	27.72
DF7- 9S-3.96C	CL680-0016-8	9	37.72	31.68
DF7-10S-3.96C	CL680-0017-0	10	41.68	35.64

Note1: Bag packaging (100 pieces/bag). Order by number of bags.

Note2: Refer to page 10 for retainer.



## ■ Retainer

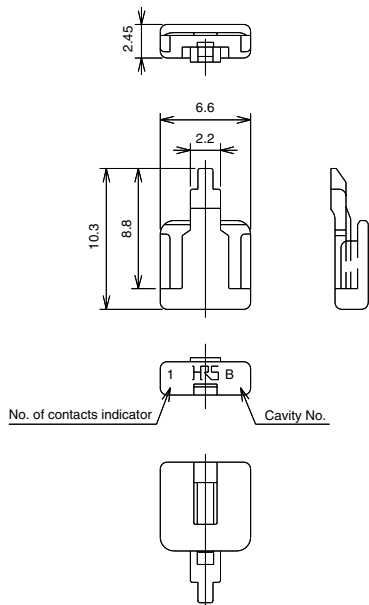


1 Pos.

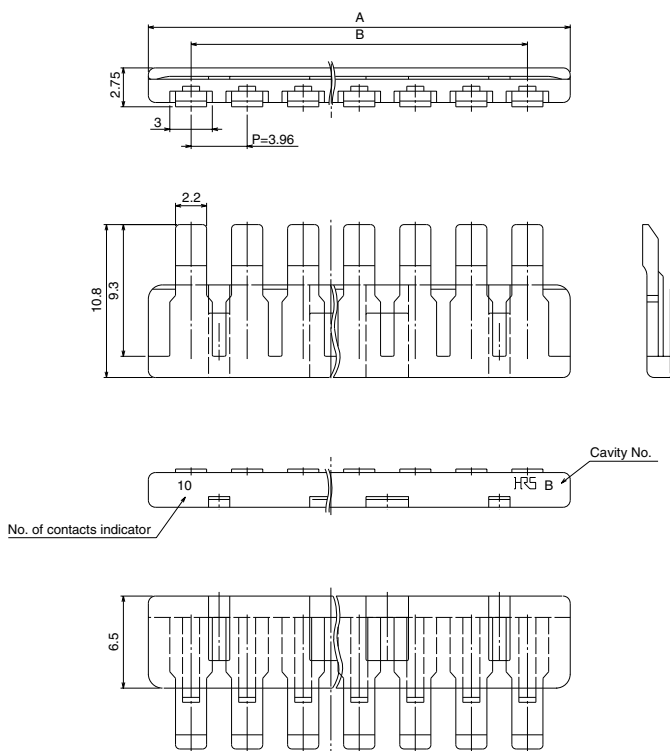


2 to 10 Pos.

### 1 Pos.



### 2 to 10 Pos.

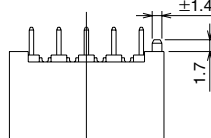
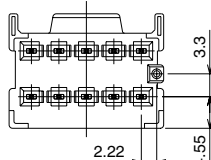
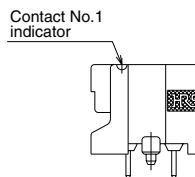
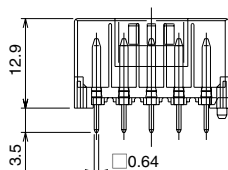
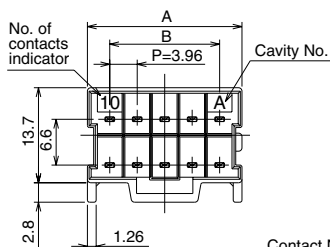
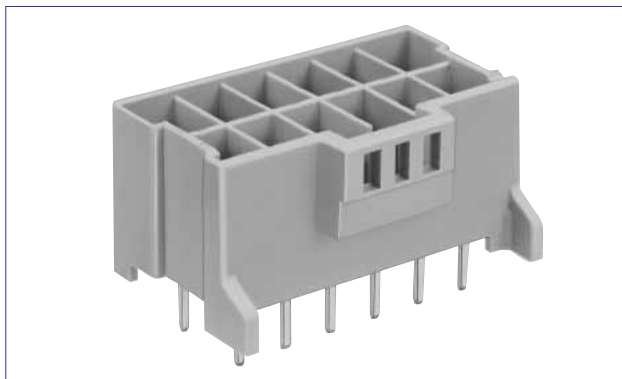


Part Number	CL No.	Number of contacts	A	B
DF7- 1RS/P-3.96	CL680-0136-0	1	—	—
DF7- 2RS/P-3.96	CL680-0027-4	2	10.00	3.96
DF7- 3RS/P-3.96	CL680-0028-7	3	13.96	7.92
DF7- 4RS/P-3.96	CL680-0029-0	4	17.92	11.88
DF7- 5RS/P-3.96	CL680-0030-9	5	21.88	15.84
DF7- 6RS/P-3.96	CL680-0031-1	6	25.84	19.80
DF7- 7RS/P-3.96	CL680-0032-4	7	29.80	23.76
DF7- 8RS/P-3.96	CL680-0033-7	8	33.76	27.72
DF7- 9RS/P-3.96	CL680-0034-0	9	37.72	31.68
DF7-10RS/P-3.96	CL680-0035-2	10	41.68	35.64

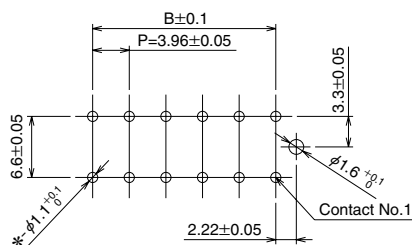
Note1: Bag packaging (100 pieces/bag). Order by number of bags.

Note2: Retainer is common to sockets, in-line plug.

## Double-row Straight Header



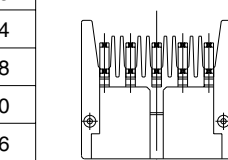
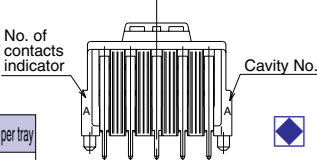
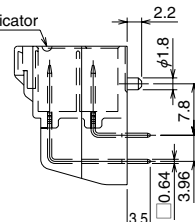
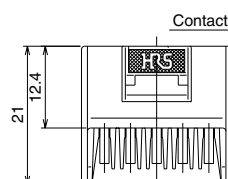
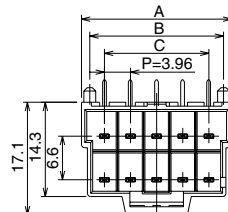
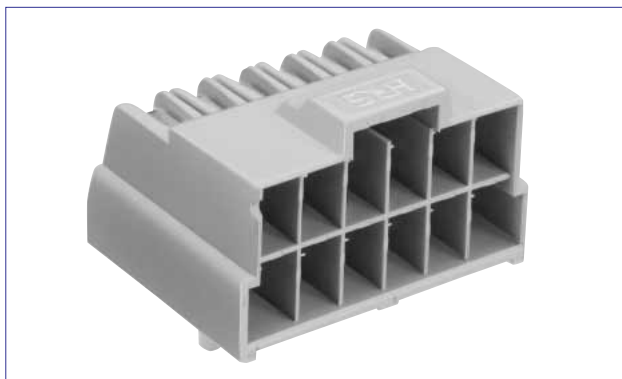
### PCB mounting pattern (Board thickness: 1.6±0.1)



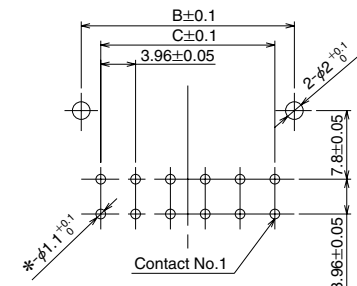
Part Number	CL No.	Number of contacts	A	B	Quantity per tray
DF7- 4DP-3.96DSA(24)	CL680-0145-0-24	4	10.40	3.96	132
DF7- 6DP-3.96DSA(24)	CL680-0146-3-24	6	14.36	7.92	96
DF7- 8DP-3.96DSA(24)	CL680-0147-6-24	8	18.32	11.88	72
DF7-10DP-3.96DSA(24)	CL680-0148-9-24	10	22.28	15.84	60
DF7-12DP-3.96DSA(24)	CL680-0149-1-24	12	26.24	19.80	54

Note: Tray packaging. Order by number of trays quantity.

## Double-row Right angle Header



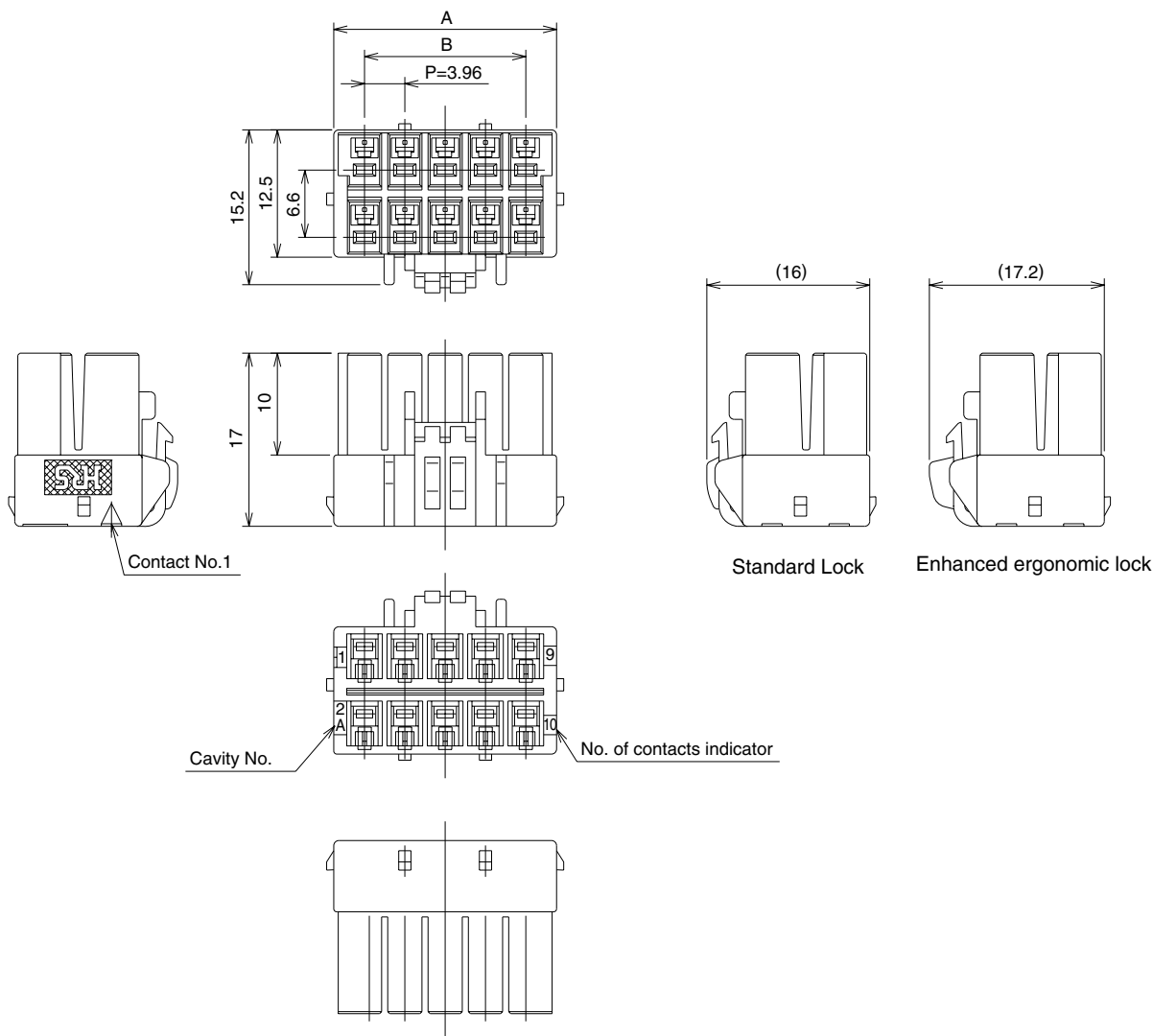
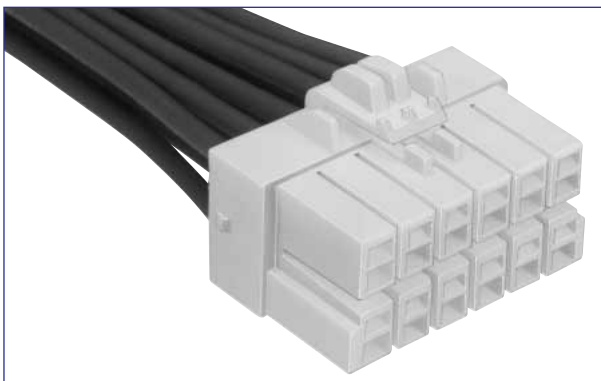
### PCB mounting pattern (Board thickness: 1.6±0.1)



Part Number	CL No.	Number of contacts	A	B	C	Quantity per tray
DF7- 4DP-3.96DS(24)	CL680-0150-0-24	4	10.40	8.40	3.96	88
DF7- 6DP-3.96DS(24)	CL680-0151-3-24	6	14.36	12.36	7.92	64
DF7- 8DP-3.96DS(24)	CL680-0152-6-24	8	18.32	16.32	11.88	48
DF7-10DP-3.96DS(24)	CL680-0153-9-24	10	22.28	20.28	15.84	40
DF7-12DP-3.96DS(24)	CL680-0154-1-24	12	26.24	24.24	19.80	36

Note: Tray packaging. Order by number of trays quantity.

## ■ Double-row Socket



### ■ Standard lock

Part Number	CL No.	Number of contacts	A	B
DF7-4DS-3.96C	Reserved For product expansion	4	10.00	3.96
DF7-6DS-3.96C		6	13.96	7.92
DF7-8DS-3.96C		8	17.92	11.88
DF7-10DS-3.96C		10	21.88	15.84
DF7-12DS-3.96C		12	25.84	19.80

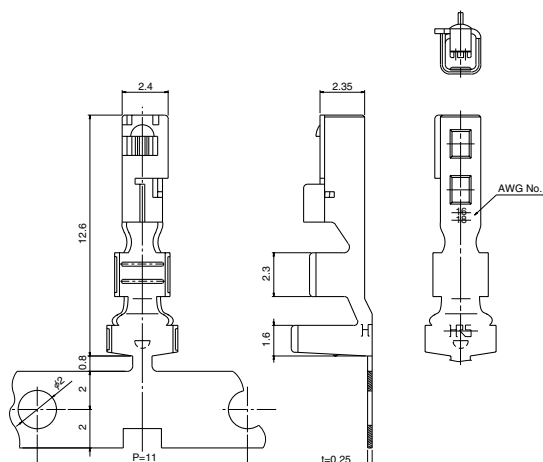
### ■ Enhanced ergonomic lock

Part Number	CL No.	Number of contacts	A	B
DF7A-4DS-3.96C	CL680-0160-4	4	10.00	3.96
DF7A-6DS-3.96C	CL680-0161-7	6	13.96	7.92
DF7A-8DS-3.96C	CL680-0162-0	8	17.92	11.88
DF7A-10DS-3.96C	CL680-0163-2	10	21.88	15.84
DF7A-12DS-3.96C	CL680-0164-5	12	25.84	19.80

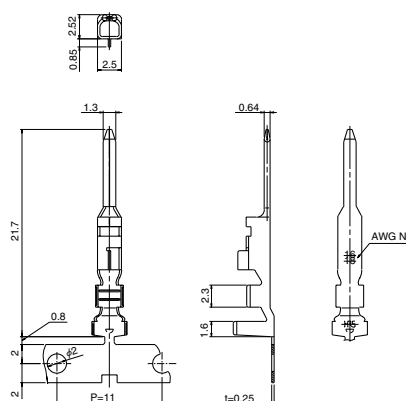
Note: Bag packaging (100 pieces/bag). Order by number of bags.

## ■ Crimp Contact

### ● Female Contact



### ● Male Contact



Part Number	CL No.	Packaging	Quantity	Finish
DF7-1618SCF	CL680-0001-0	Reel	3,000	Tin plating
DF7-1618SC	CL680-0002-3	Bag	100	
DF7-2022SCF	CL680-0003-6	Reel	3,000	
DF7-2022SC	CL680-0004-9	Bag	100	
DF7-1618PCF	CL680-0005-1	Reel	3,000	
DF7-1618PC	CL680-0006-4	Bag	100	
DF7-2022PCF	CL680-0007-7	Reel	3,000	
DF7-2022PC	CL680-0008-0	Bag	100	

## ● Applicable cable (Tin plated annealed copper wire)

Wire size(Stranded wire conductor)	UL style	Jacket diameter
AWG#16(26/0.254mm)	UL1007	2.1 to 2.5mm
AWG#18(34/0.18mm)		
AWG#20(21/0.18mm)		1.6 to 1.9mm
AWG#22(17/0.16mm)		
AWG#16(26/0.254mm)	UL1015	2.9 to 3.2mm
AWG#18(34/0.18mm)		
AWG#20(21/0.18mm)		2.4 to 2.7mm
AWG#22(17/0.16mm)		

Note 1: Applicable wire with tin plated solid soft conductor.

Note 2: When using other than the recommended wire, contact your nearest Hirose representative.

Note 3: Strip length: 3.0 to 3.8mm.

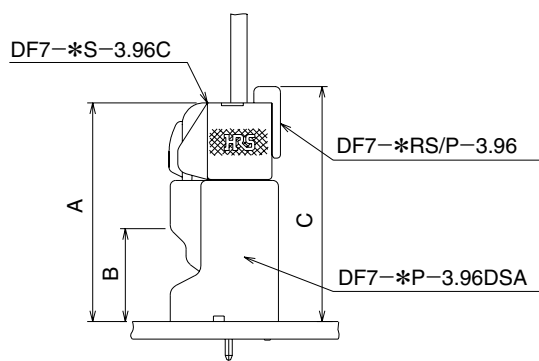
## ■ Tools

Type	Part Number	CL No.	Applicable Contacts
Automatic	Press unit	CM-105	CL901-0005-4
	Applicator	AP105-DF7-1618	CL901-4554-4
		AP105-DF7-2022	CL901-4553-1
Manual	Crimp tools	HT104/DF7-1618	CL550-0268-0
		HT104/DF7-2022	CL550-0269-3

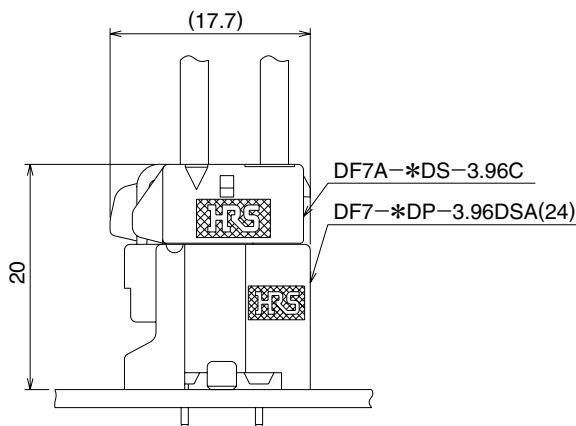
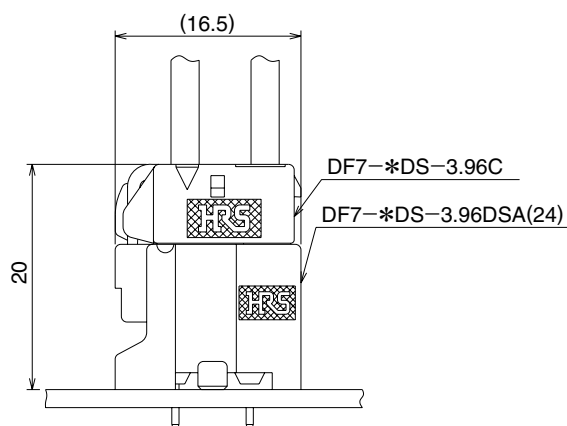
## ◆ Mating Dimensions

### ● Socket to Straight Header Connection

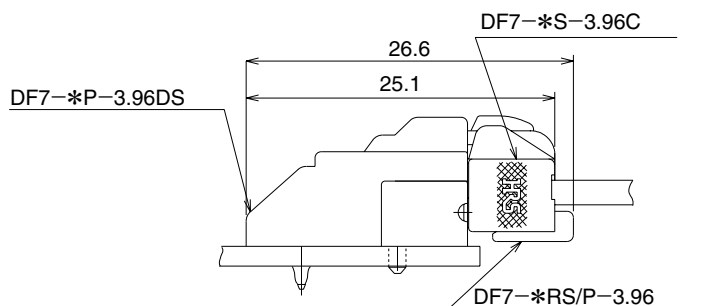
DF7-*S-3.96C		
	1 pos.	2 to 12 pos.
A	18.5	20.0
B	9.0	8.5
C	20.3	21.5



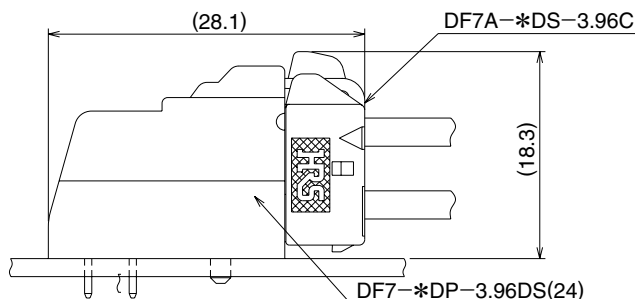
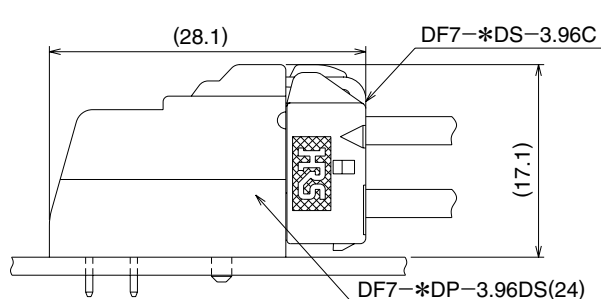
### ● Socket to Straight Header Connection (Double-row)



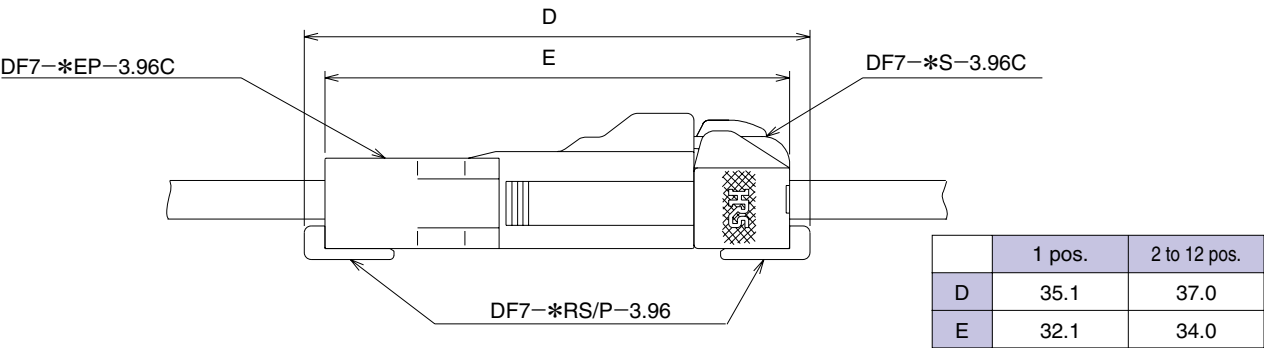
### ● Socket to Right angle Header Connection



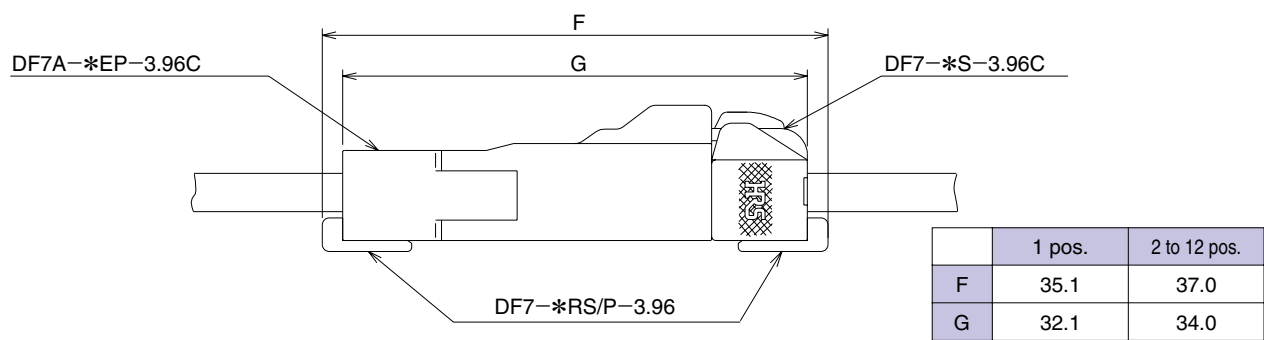
### ● Socket to Right angle Header Connection (Double-row)



● Socket to In-line Plug (Panel mount type) Connection



● Socket to In-line Plug Connection



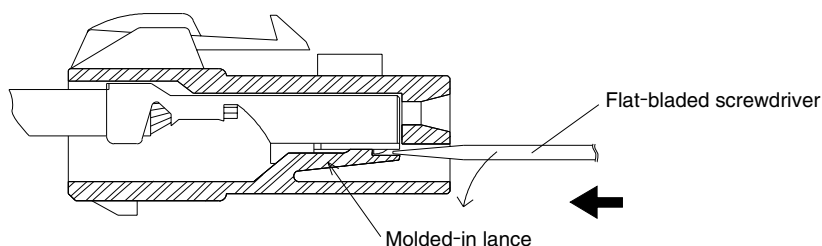
## ◆ Contact Extraction Procedure

■ Contact extraction tool: Flat-bladed screwdriver, 1.4 mm blade width

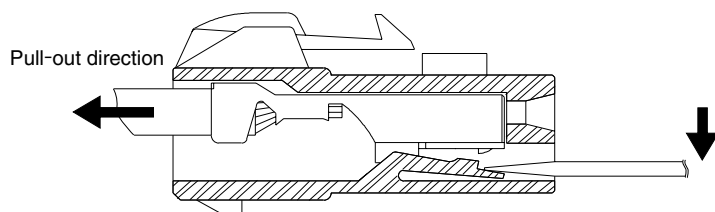
■ Use with crimp Contacts: DF7-1618SC(F), DF7-2022SC(F),  
DF7-1618PC(F), DF7-2022PC(F)

### ■ Work Method

#### Housing Cross-Section



1. Refer to the drawing No. 1. Insert correct size screwdriver in the insulator against the molded-in lance. Deflect the lance as shown.



2. Assure that the lance is deflected to release the contact and pull-out wire with the terminated contact.

## ◆ General Use Precautions

- Make sure that the lock is fully depressed before un-mating the connectors.
- Use correct size of the wires. Do NOT forcefully twist or deform wires, as this may affect the crimped contact connection.
- When the potting process is to be performed, please take into consideration the surface tension of the resin when filling.



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