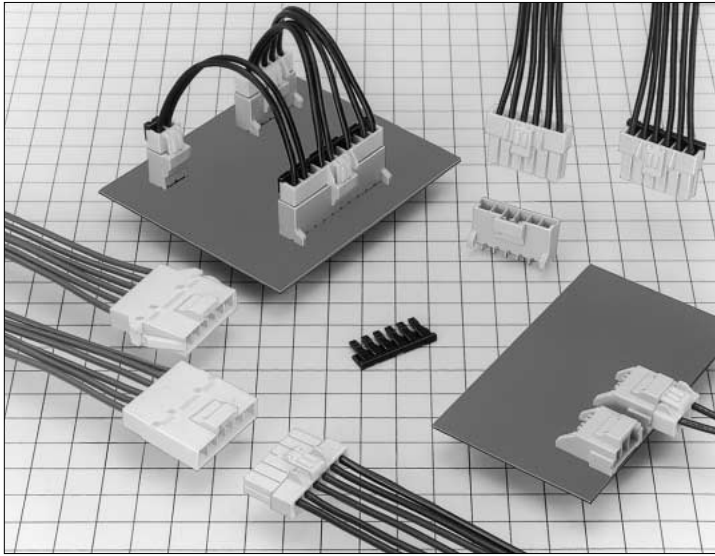


# 3.95mm Pitch Miniature Connector for Secondary Power Supply (Product Compliant to C-UL and TÜV)

## DF7 Series



### Full lock function added

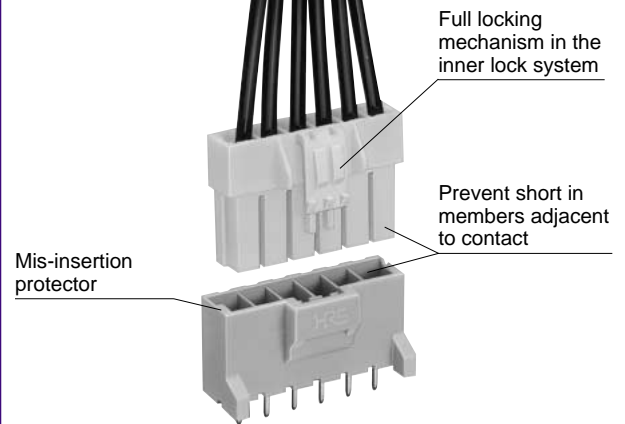


Photo ①

## ■ Features

### 1. Full Lock Function Added

This connector employs the full lock mechanism in the inner lock system.

Prevent displacement due to unexpected external shock.

### 2. Prevent Crimping Contact Fixation Force Up and Half-insertion

To use the method where stress is applied to the cable, or to increase crimping contact fixation force, or to prevent crimping contact half-insertion, the double locks can be equipped.

### 3. Prevent False-insertion

This connector is equipped with the mechanism to prevent reverse insertion for engagement between dissimilar contacts.

### 4. Means to Prevent Solder Crack

The pin header employs glass enforced resin, and takes measures to prevent solder cracks due to heat shrinkage.

### 5. Prevent Reverse Insertion in Printed Board

A guide post is added to the pin header, and prevents reverse insertion in the printed board.

### 6. Corresponding to Bonding (filled with resin)

This connector is capable of potting 6mm maximum, and mounting height is a 20mm (no retainer) in the low profile.

### 7. Reduction in Production Facility Cost

The female crimping contact and in-line male crimping contact allow harness with the same crimping tool.

### 8. Prevent Short in Members Adjacent to Contact

Each contact is independently enclosed in a box, in order to prevent short in members adjacent to the contact.

### Double locks equipped

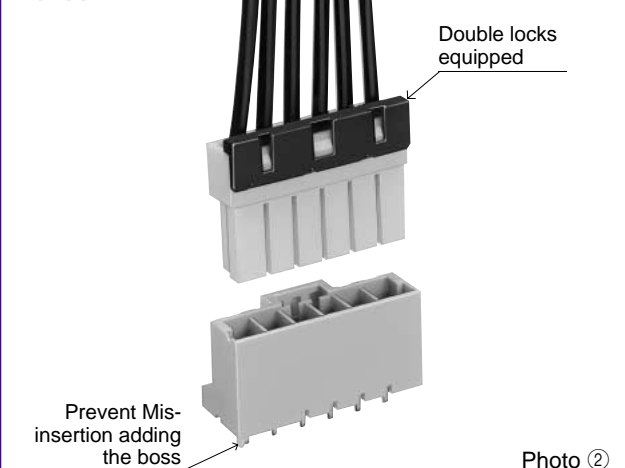


Photo ②

### 9. Product Compliant with C-UL and TÜV

(C-UL and TÜV file No. is listed on page 428.)

### 10. Correspond with 7.92mm Pitch Product

According to the pin specification for removal, 2 contact and 3 contact 7.92mm pitch products can be merchandised.

## ■ Applications

Business machines, industrial equipment, and consumer appliances etc.

## ■Product Specifications

Rating	Rated Current	Operating Temperature Range:-35~+85°C (Note1) Operating Moisture Range : 40~80%	Storage Temperature Range:-10~+60°C (Note2) Storage Humidity Range : 40~70% (Note2)
	AWG#22 : 4A 20 : 5A 18 : 7A 16 : 10A Rated Voltage:300V AC		

Product Compliant to C-UL, TÜV			
Rating	Rated Current	AWG#22 : 4A AWG#20 : 5A AWG#18 : 7A AWG#16 : 10A	
	Rated Voltage	C-UL	TÜV
600V AC		7.92mm pitch 600V AC	3.96mm pitch 300V AC

**■C-UL, TÜV File No.**  
 C-UL :E52653  
 TÜV :R9750437  
 (C-UL  
 Countries: U.S.A, Canada)

Item	Specification	Condition
1. Contact Resistance	10mΩ max.	20mV max. , measured at 1mA
2. Insulation Resistance	1000MΩ min.	Measured at 500V DC
3. Withstand voltage	Neither short nor breakdown	1500V AC applied for 1 minute
4. Insertor/Extraction Force	0.3N (30gt) min., 5N (450gt) max.	Measured with 0.64±0.002mm steel pin
5. Operating Life	20mΩ max.	30 cycles
6. Vibration	Electrical discontinuity, 1μS max.	10~55Hz and single amplitude 0.75mm in 3 directions for 2 hours
7. Shock	Electrical discontinuity, 1μS max.	Acceleration: 490m/s <sup>2</sup> , 11ms, half-sinewave in 3 directions, 3 times, respectively
8. Moisture Resistance	20mΩ max.	Exposed to temperature 40±2°C and humidity 90~95% for 96 hours
9. Temperature Cycle	20mΩ max.	(-55°C: 30 minutes → 5~35°C: 5 minutes→ 85°C: 30 minutes → 5~35°C: 5minutes) 5 cycles
10. Resistance to Soldering heat	Neither appearance is deformed nor contact is remarkably loosened.	Soldering temperature: 260°C Dipping time: 10 seconds

Note 1: Temperature rise is included when energized.

Note 2: This storage indicates a long-term storage state for the unused product before the board mounted.

The operating temperature and moisture ranges are applied to the non-energized state after the connector has been installed to the board.

Note 3: The above standards represent this series. Individual formal agreement should be based on the "Specification".

## ■Material

Product	Part	Material	Finish	Remarks
Socket	Insulator	Polyamide	white	UL94V-0
Header	Insulator	Polyamide	beige	UL94V-0
	Contact	Brass	plating	—
In-line Plug	Insulator	Polyamide	white	UL94V-0
Retainer	Insulator	Polyamide	Black	UL94V-0
Crimping Contact	Contact	Copper alloy	Tin plating	—

## Ordering Information

Please determine the specific product. If needed, please select and order the product from the product No. as listed on catalog pages B94~104.

### Connector

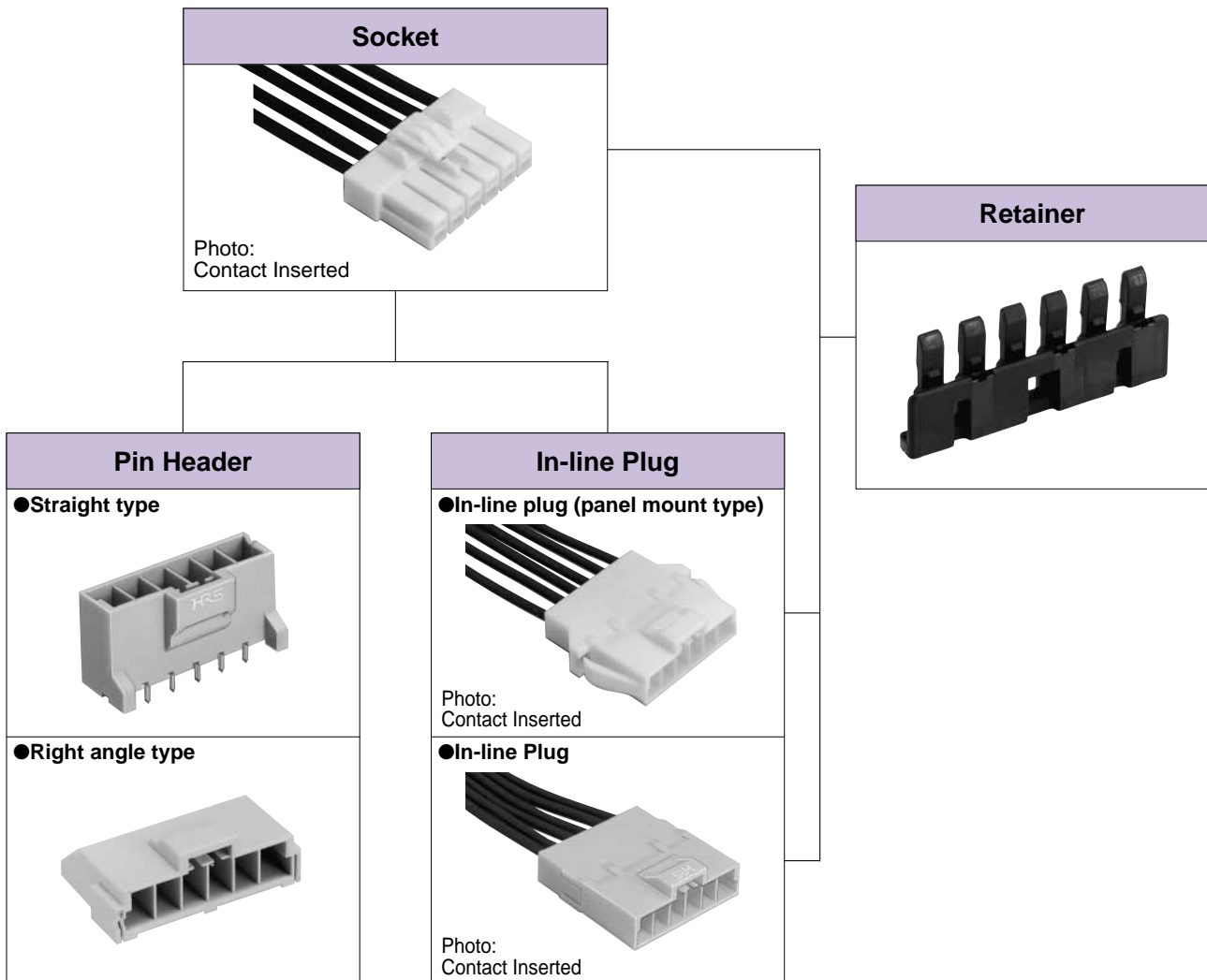
**DF** **7** - **\*** **S** - **3.96** **C**  
q w e r t y

### Crimping Contact

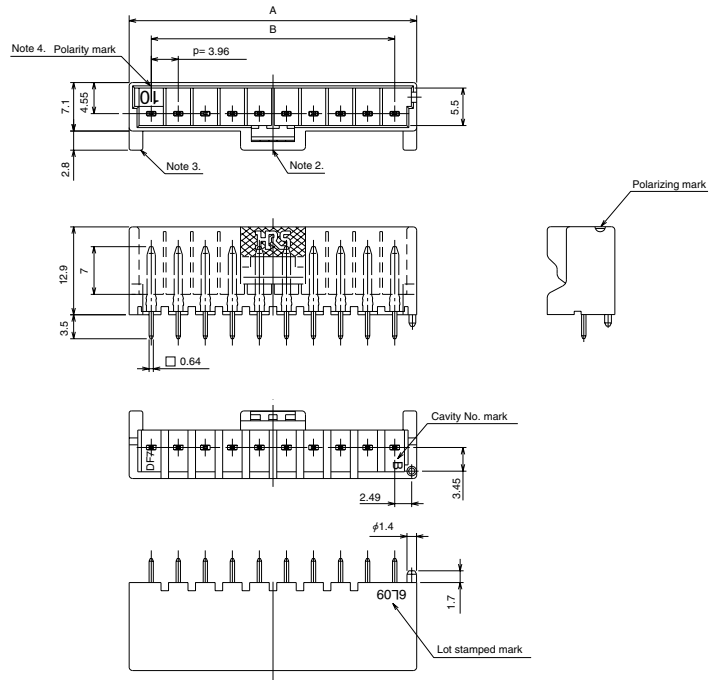
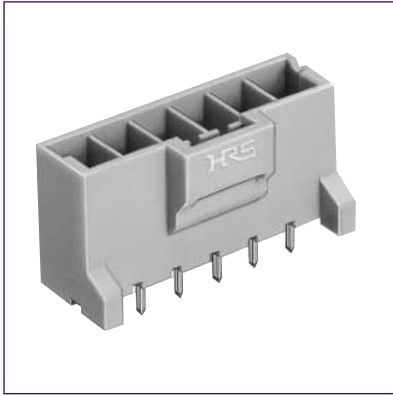
**DF** **7** - **\*** **\*** - **SCF**  
q w u i

<b>q</b> Series Name	: DF	<b>u</b> Applicable cable size	UL1007, UL1015
<b>w</b> Series No.	: 7, 7A	1618 : AWG#16~18	
<b>e</b> Number of Contacts	: 2~10	2022 : AWG#20~22	
<b>r</b> Connector Type	S : Socket P : Pin header EP : In-line plug RS/P : Retainer	<b>i</b> packaging type	SCF : Female contact, reel SF : Female contact, bag PCF : Male contact, reel PC : Male contact, bag
<b>t</b> Contact Pitch	: 3.96mm (7.92mm)		
<b>y</b> Contact type	C : Crimping socket DSA : Straight pin header DS : Right angle pin header None: Retainer		

## Application Pattern



## ■ Straight Pin Header



Unit: mm

Product No.	HRS No.	Number of Contacts	A	B
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

Note1: A packaging quantity is delivered by the bag unit (100 pcs.).

If needed, order the product per bag.

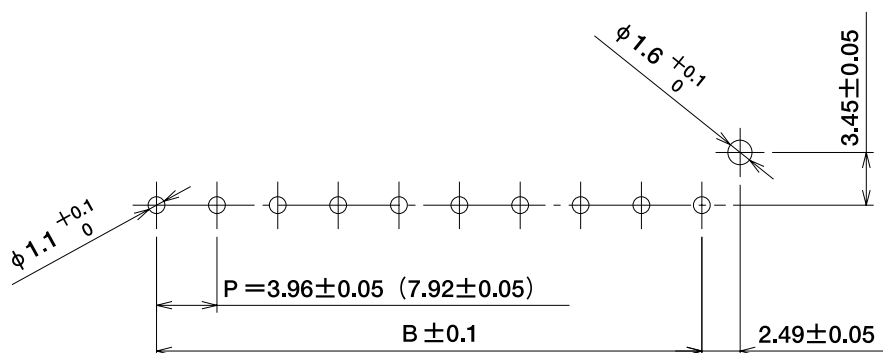
Note2: The odd number contact may partially differ in the locking form.

Note3: The 2-contact connector contains no wall on both sides.

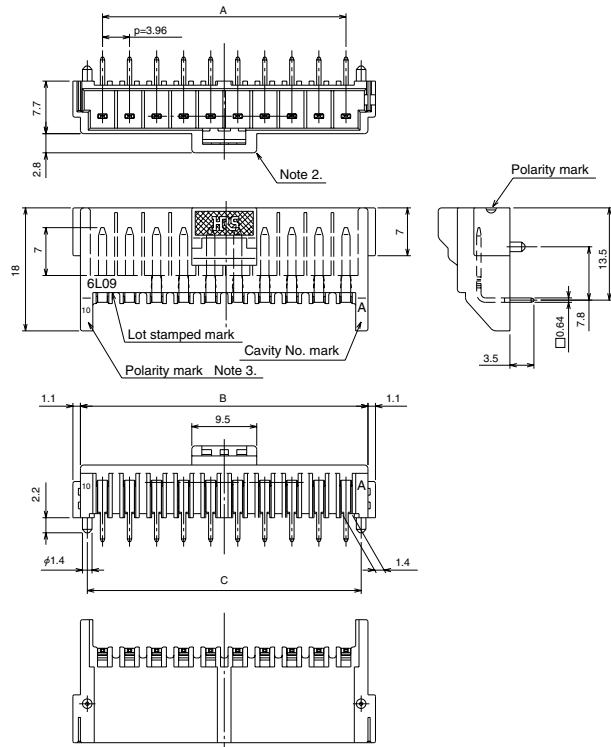
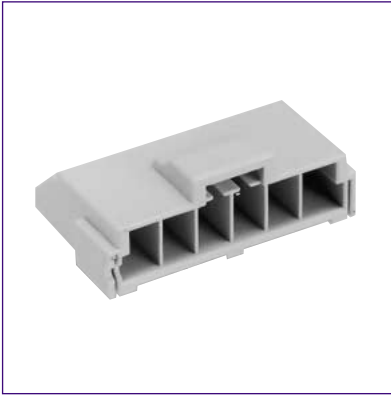
Note4: DF7-2P-7.92DS excludes pin No. 2 in DF7-3P-3.96DS, and the number of contacts indicates 2.

DF7-2P-7.92DS excludes No. 2 and No. 4 in DF7-3P-3.96DS, and the number of contacts indicates 3.

## ◆ PCB Footprints (Board thickness $t = 1.6 \pm 0.1$ )



## Right Angle Pin Header



Unit: mm

Product No.	HRS No.	Number of Contacts	A	B	C
DF7- 2P-3.96DS	CL680-0081-0	2	3.96	10.40	8.40
DF7- 3P-3.96DS	CL680-0082-2	3	7.92	14.36	12.36
DF7- 4P-3.96DS	CL680-0083-5	4	11.88	18.32	16.32
DF7- 5P-3.96DS	CL680-0084-8	5	15.84	22.28	20.28
DF7- 6P-3.96DS	CL680-0085-0	6	19.80	26.24	24.24
DF7- 7P-3.96DS	CL680-0086-3	7	23.76	30.20	28.20
DF7- 8P-3.96DS	CL680-0087-6	8	27.72	34.16	32.16
DF7- 9P-3.96DS	CL680-0088-9	9	31.68	38.12	36.12
DF7-10P-3.96DS	CL680-0089-1	10	35.64	42.08	40.08
DF7- 2P-7.92DS	CL680-0124-0	2	7.92	14.36	12.36
DF7- 3P-7.92DS	CL680-0125-3	3	15.84	22.28	20.28

Note1: A packaging quantity is delivered by the bag unit (100 pcs.).

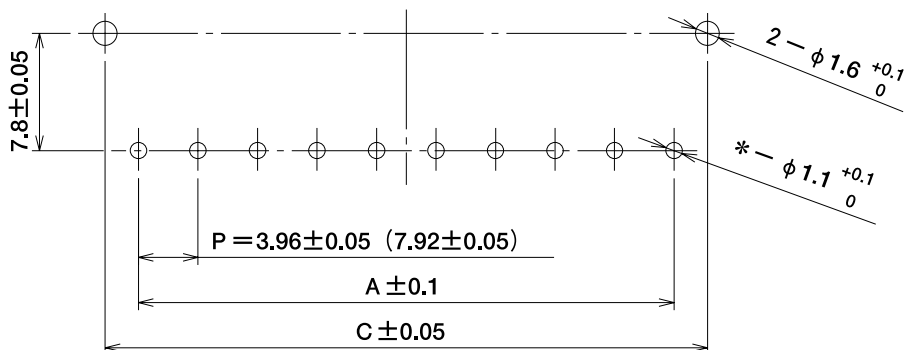
If needed, order the products per bag.

Note2: The 2 contact connector has no walls on both sides.

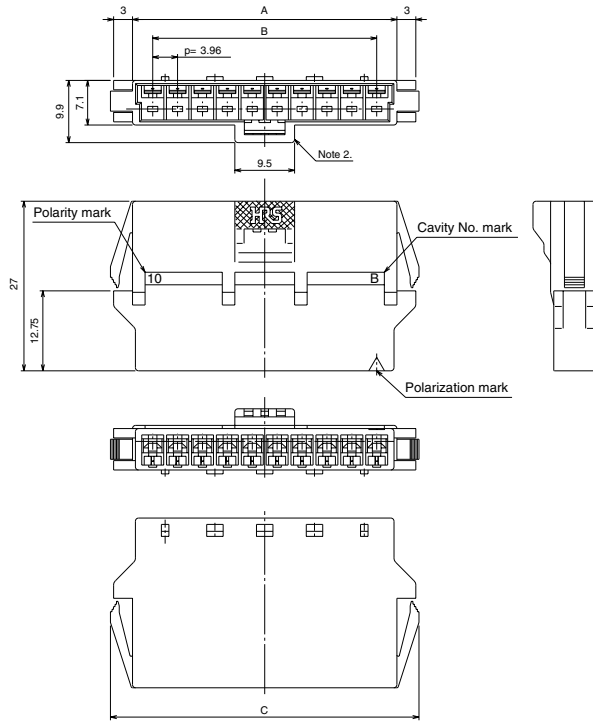
Note3: DF7-2P-7.92DS excludes pin No. 2 in DF7-3P-3.96DS, and the number of contacts indicates 2.

DF7-2P-7.92DS excludes No. 2 and No. 4 in DF7-3P-3.96DS, and the number of contacts indicates 3.

## PCB Footprints (Board Thickness $t = 1.6 \pm 0.1$ )



## ■ In-line Plug (Panel Mount Type)



Unit: mm

Product No.	HRS No.	Number of Contacts	A	B	C
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

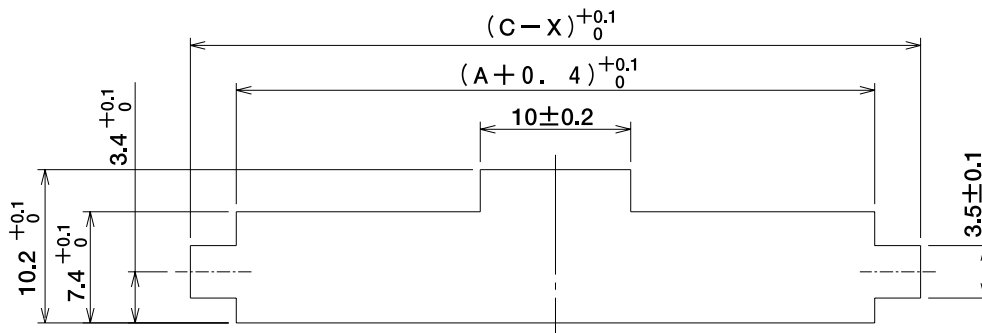
Note1: A packaging quantity is delivered by the bag unit (100 pcs.).

If needed, order the products per bag.

Note2: The odd number contact partially differs in the locking form.

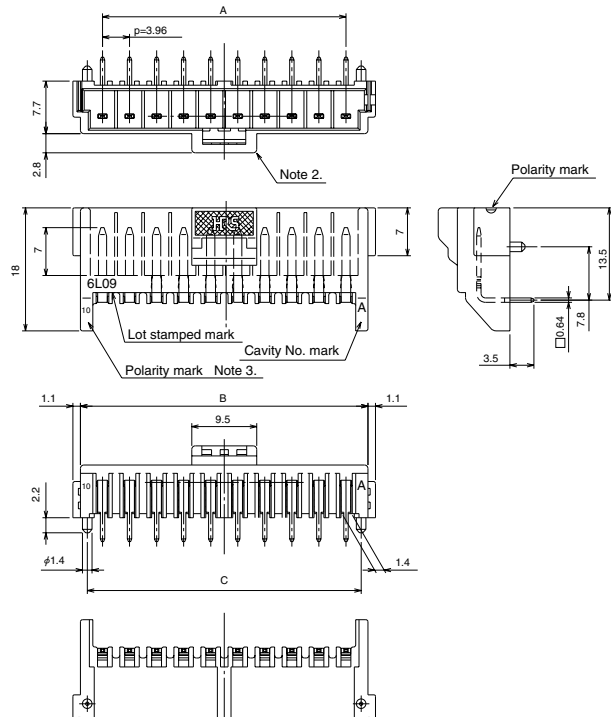
※Refer to page B103 for the retainer.

## ◆ Panel Cutouts



Panel Thickness	X
2.0	0.48
1.6	0.96
1.2	1.44
0.8	1.92

## ■ In-line Plug



Unit: mm

Product No.	HRS No.	Number of Contacts	A	B
DF7A- 2EP-3.96C	CL680-0072-9	2	10.40	3.96
DF7A- 3EP-3.96C	CL680-0073-1	3	14.36	7.92
DF7A- 4EP-3.96C	CL680-0074-4	4	18.32	11.88
DF7A- 5EP-3.96C	CL680-0075-7	5	22.28	15.84
DF7A- 6EP-3.96C	CL680-0076-0	6	26.24	19.80
DF7A- 7EP-3.96C	CL680-0077-2	7	30.20	23.76
DF7A- 8EP-3.96C	CL680-0078-5	8	34.16	27.72
DF7A- 9EP-3.96C	CL680-0079-8	9	38.12	31.68
DF7A-10EP-3.96C	CL680-0080-7	10	42.08	35.64

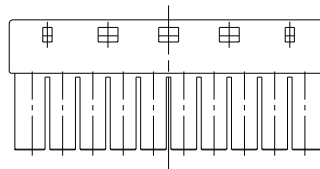
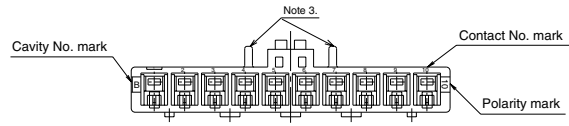
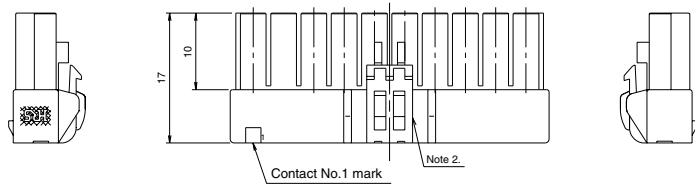
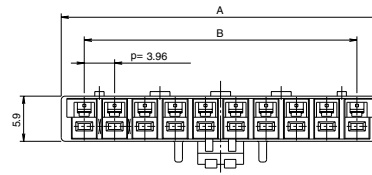
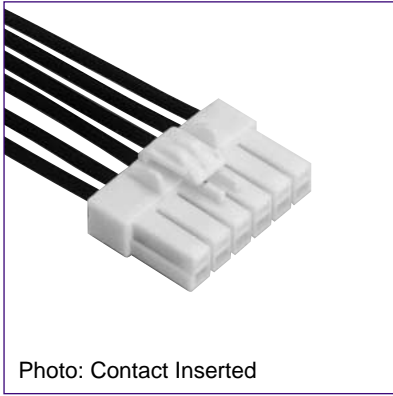
Note1: A packaging quantity is delivered by the bag unit (100 pcs.).

If needed, order the products per bag.

Note2: The odd number contact partially differs in the locking form.

※Refer to page B103 for the retainer.

## Socket



Unit: mm

Product No.	HRS No.	Number of Contacts	A	B
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: A packaging quantity is delivered by the bag unit (100 pcs.).  
If needed, order the products per bag.

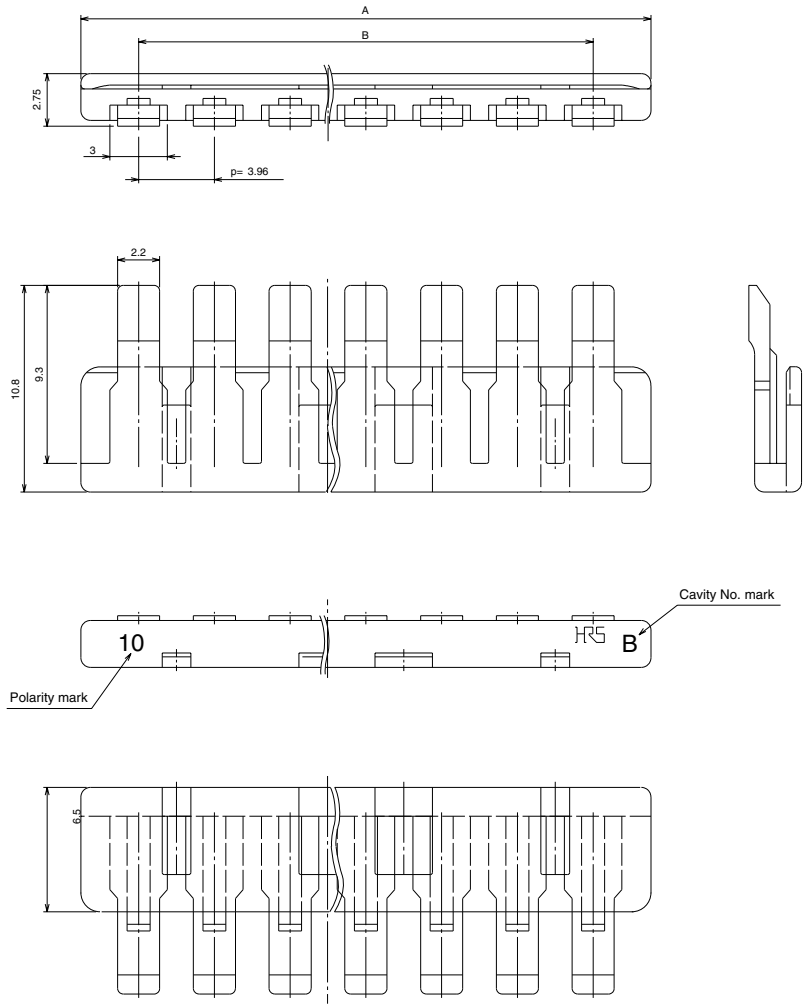
Note2: The odd number contact partially differs in the locking form.

Note3: The 2 contact connector contains no wall on both sides.

※Refer to page B103 for the retainer.



## Retainer



Unit: mm

Product No.	HRS No.	Number of Contacts	A	B
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

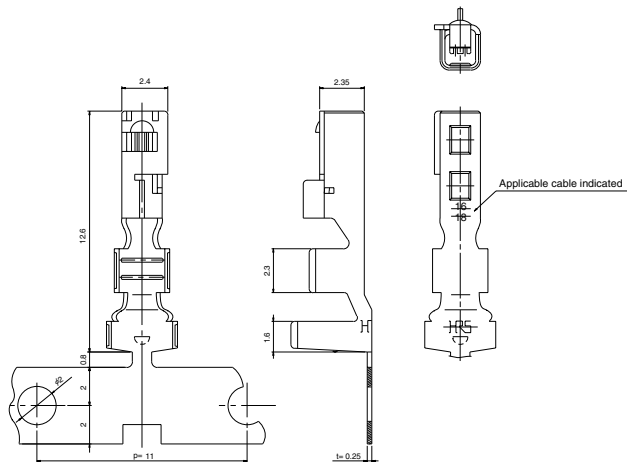
Note1: A packaging quantity is delivered by the bag unit (100 pcs.).

If needed, order the products per bag.

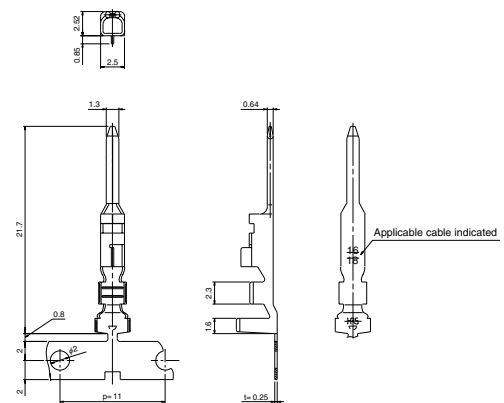
※This retainer is commonly used for socket and in-line plug.

# ■Crimping Contact

## ●Female Contact



## ●Male Contact



Product No.	HRS No.	Packaging	Quantity	Finish
DF7-1618SCF	CL680-0001-0	Reel	3000	Tin plating
DF7-1618SC	CL680-0002-3	Bag	100	
DF7-2022SCF	CL680-0003-6	Reel	3000	
DF7-2022SC	CL680-0004-9	Bag	100	
DF7-1618PCF	CL680-0005-1	Reel	3000	
DF7-1618PC	CL680-0006-4	Bag	100	
DF7-2022PCF	CL680-0007-7	Reel	3000	
DF7-2022PC	CL680-0008-0	Bag	100	

## ●Applicable Cable (Tin plating annealed conductor)

Conductor Size (Wire Construction)	Recommended Cable	Jacket Diameter
AWG16 (26 cores/0.254mm)	UL1007	φ2.1~2.5mm
AWG18 (34 cores/0.18mm)		
AWG20 (21 cores/0.18mm)		φ1.6~1.9mm
AWG22 (17 cores/0.16mm)		
AWG16 (26 cores/0.254mm)	UL1015	φ2.9~3.2mm
AWG18 (34 cores/0.18mm)		
AWG20 (21 cores/0.18mm)		φ2.4~2.7mm
AWG22 (17 cores/0.16mm)		

Note: If other cables are used instead of the applicable cable, contact Hirose sales department.

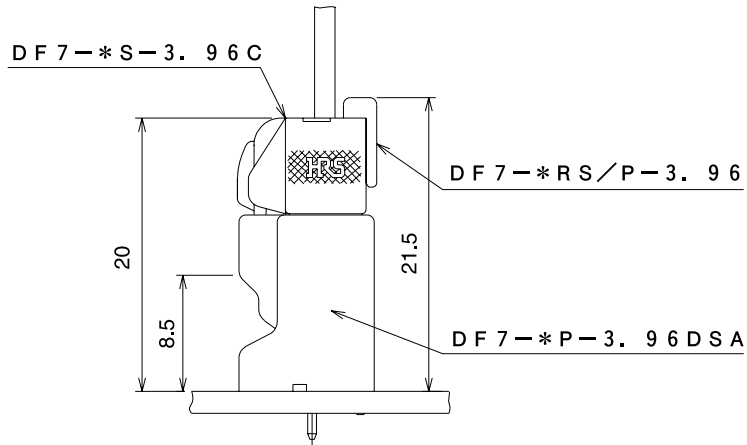
●Strip Length: 3.0~3.8mm

## ■Applicable Tool

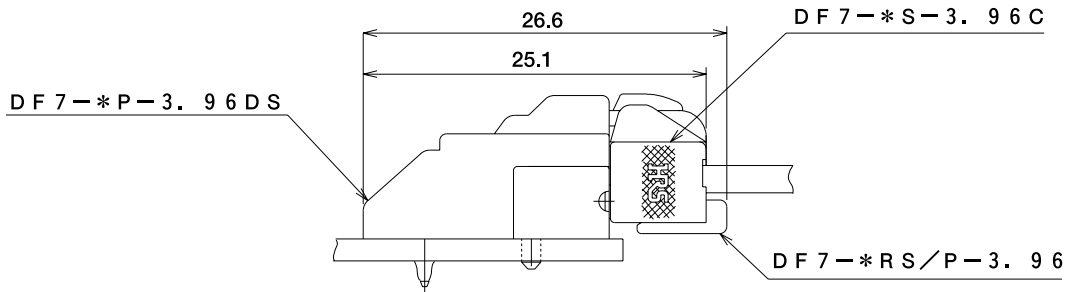
Type	Product No.	HRS. No.	Applicable contact
Automatic	Main press unit CM-105	CL901-0005-4	—
	Applicator AP105-DF7-1618	CL901-4554-4	DF7-1618SCF/PCF
Manual	Manual crimping tool HT104/DF7-2022	CL901-4553-1	DF7-2022SCF/PCF
	HT104/DF7-1618	CL550-0268-0	DF7-1618SC/PC
	HT104/DF7-2022	CL550-0269-3	DF7-2022SC/PC

## ◆ Mating Dimensions

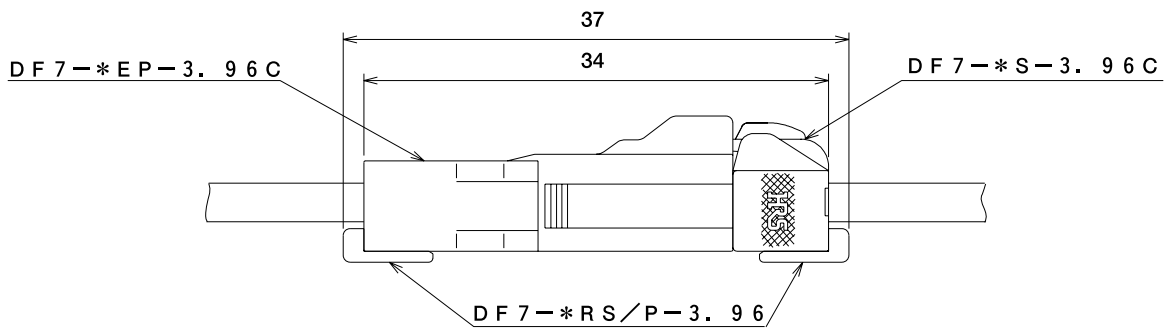
### ● Cable to Board (Straight Pin Header) Connection



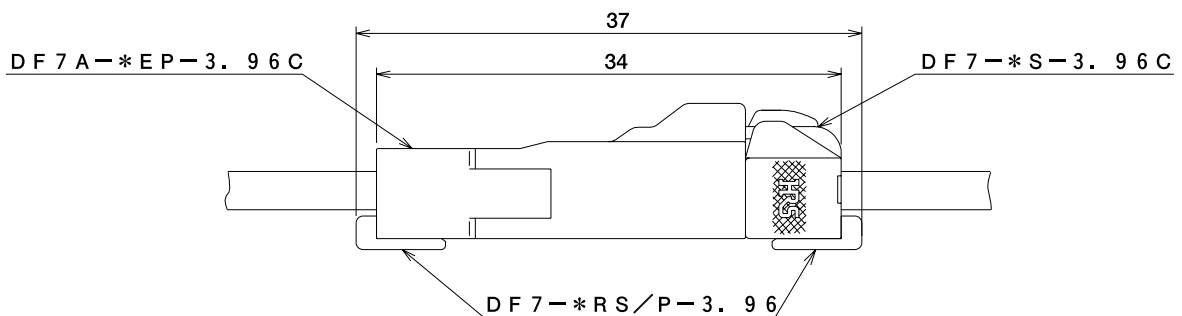
### ● Cable to Board (Right Angle Pin Header) Connection



### ● Cable to Cable Connection (Panel Lock Type)



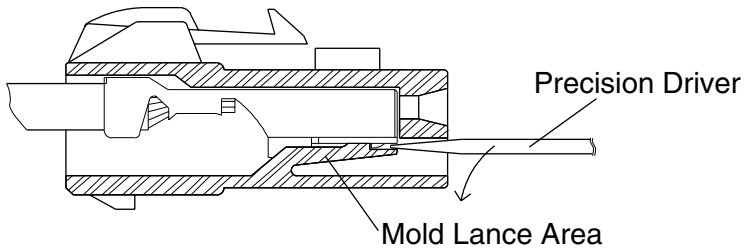
### ● Cable to Cable Connection



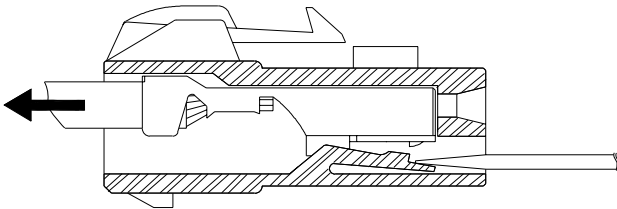
## ◆How to Remove Contacts

- Tool Name for Contact Removal: Precision Driver (Minus driver, blade width: 1.4mm)
- Objective Crimping Contact: DF7-1618SC(F), DF7-2022SC(F)  
DF7-1618PC(F), DF7-2022PC(F)
- Removal Method(Example) DF7-※S-3.96C, DF7-1618SCF

### Housing Cross-sectional View



1. As shown in the illustration, press the mold lance unit with a driver etc., not including the mating area, and press the lance down.

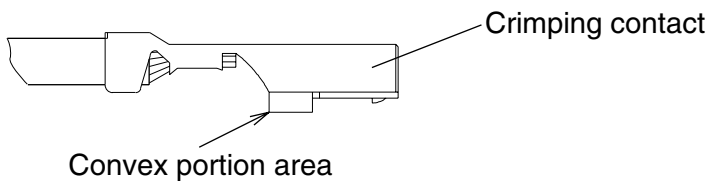


2. Check that the lance unit has removed in place, draw out the cable, and remove the crimping contact.



### Cautions

Take particular care in removing the contact, thus not being subject to injury at convex portion edge of the crimping contact.



## ◆Precautions for Use

- When the connector is removed, the forced removal could result in connector breakage. If the connector is hardly removed, slightly push it once and remove the connector, thus activating the lock.
- If cables are laid within equipment in wrong condition, tension will applied to the cables, so that the contact could be removed. In such a case, it is recommended to use the retainer.
- If the potting process is implemented, it is desired to fill the connector with resin, considering the resin surface tensile force.