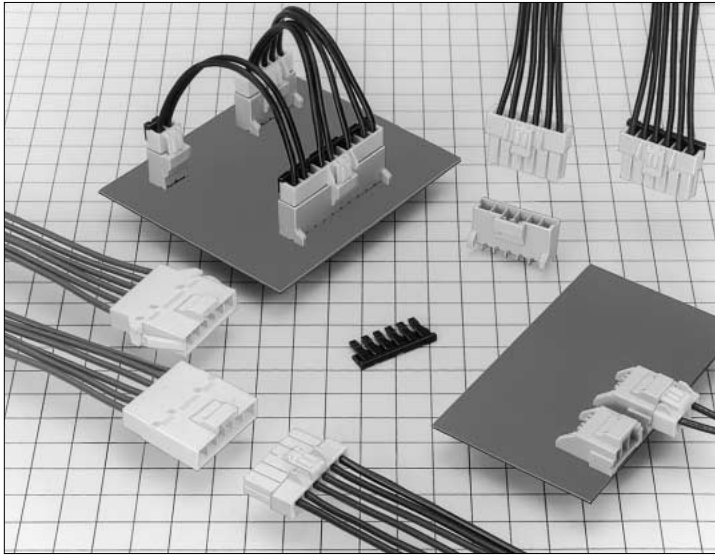


3.95mm Pitch Miniature Connector for Secondary Power Supply (Product Compliant to C-UL and TÜV)

DF7 Series



■ 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.

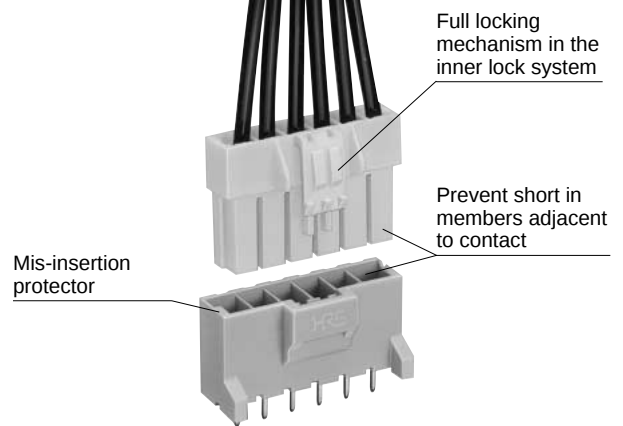
7. Reduction in Production Facility Cost

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

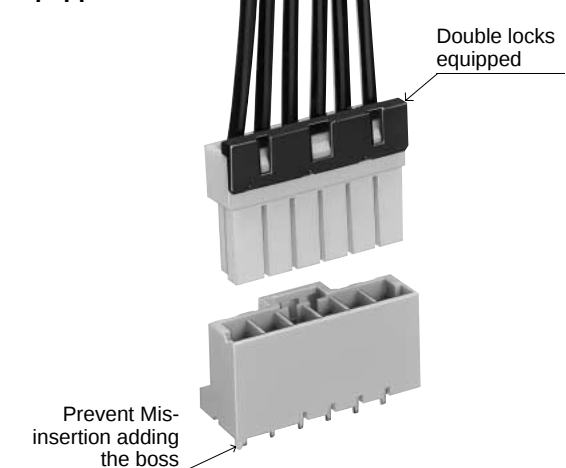
8. Prevent Short in Members Adjacent to Contact

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

Full lock function added



Double locks equipped



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	Current rating	Operating Temperature Range : -35 to +85°C (Note1) Operating Moisture Range : 40 to 80%	Storage Temperature Range : -10 to +60°C (Note2) Storage Humidity Range : 40 to 70% (Note2)
	AWG#22 : 4A 20 : 5A 18 : 7A 16 : 10A Voltage rating: 630V AC		

Product Compliant to C-UL, TÜV				
Rating	Current rating	AWG#22 : 4A AWG#20 : 5A AWG#18 : 7A AWG#16 : 10A		
	Voltage rating	C-UL	TÜV	
		600V AC	7.92mm pitch	3.96mm pitch
			600V AC	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	10m ohms max.	20mV max. , measured at 1mA
2. Insulation Resistance	1000M ohms min.	500V DC
3. Withstanding voltage	No flashover or insulation breakdown.	1500V AC/1 minute
4. Insertor/Extraction Force	0.3N min., 4.5N max.	Measured with 0.64±0.002mm steel pin
5. Operating Life	20m ohms max.	30 cycles
6. Vibration	No electrical discontinuity of 1μs or more	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 directions.
7. Shock	No electrical discontinuity of 1μs or more	Acceleration of 490 m/s ² , 11 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis
8. Humidity (Steady state)	20m ohms max.	96 hours at temperature of 40°C and humidity of 90% to 95%
9. Temperature Cycle	20m ohms max.	(-55°C: 30 minutes → 5 to 35°C: 5 minutes → 85°C: 30 minutes → 5 to 35°C: 5 minutes) 5 cycles
10. Resistance to Soldering heat	No deformation of components affecting performance.	Flow: 260°C for 10 seconds

Note 1: Includes temperature rise caused by 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.

■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

●Connector

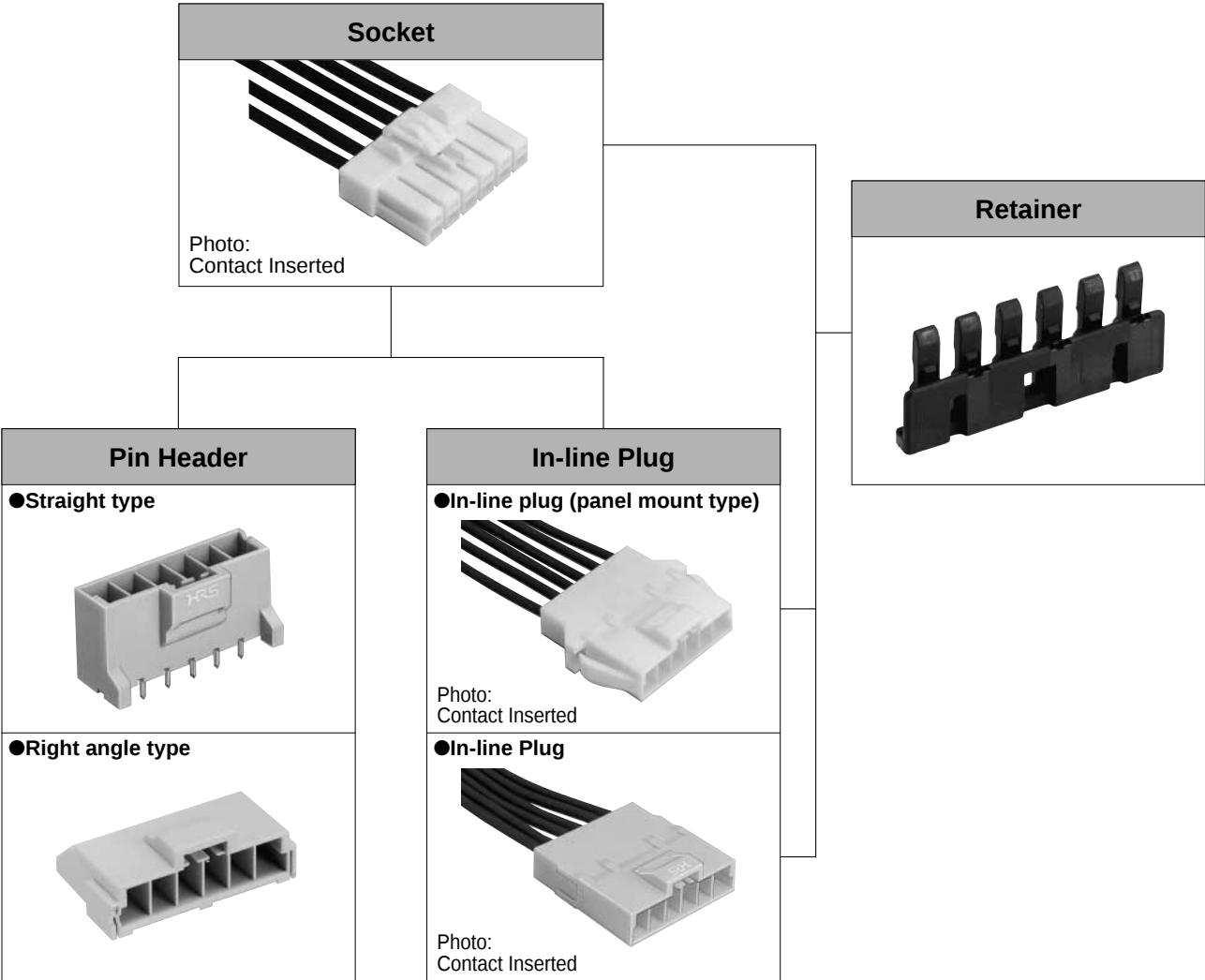
DF 7 - * S - 3.96 C
① ② ③ ④ ⑤ ⑥

●Crimping Contact

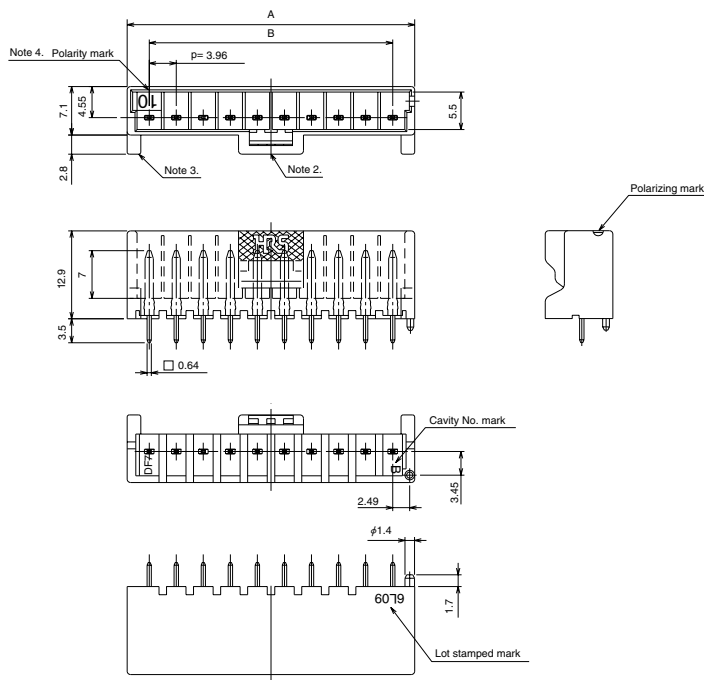
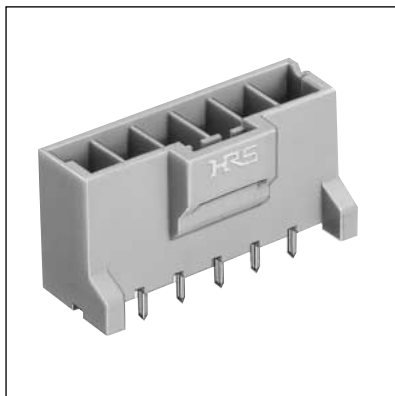
DF 7 - * * - SCF
① ② ⑦ ⑧

① Series Name	: DF	⑦ Applicable cable size	UL1007, UL1015
② Series No.	: 7, 7A	1618 : AWG#16 to 18	
③ Number of Contacts	: 2 to 10	2022 : AWG#20 to 22	
④ Connector Type	S : Socket P : Pin header EP : In-line plug RS/P : Retainer	⑧ packaging type	SCF : Female contact, reel SF : Female contact, bag PCF : Male contact, reel PC : Male contact, bag
⑤ Contact Pitch: 3.96mm (7.92mm)			
⑥ Contact type	C : Crimping socket DSA : Straight pin header DS : Right angle pin header None: Retainer		

■Application Pattern



■Straight Pin Header



Unit: mm

Part Number	CL No.	Number of Contacts	A	B
DF7- 2P-3.96DSA	680-0036-5	2	10.40	3.96
DF7- 3P-3.96DSA	680-0037-8	3	14.36	7.92
DF7- 4P-3.96DSA	680-0038-0	4	18.32	11.88
DF7- 5P-3.96DSA	680-0039-3	5	22.28	15.84
DF7- 6P-3.96DSA	680-0040-2	6	26.24	19.80
DF7- 7P-3.96DSA	680-0041-5	7	30.20	23.76
DF7- 8P-3.96DSA	680-0042-8	8	34.16	27.72
DF7- 9P-3.96DSA	680-0043-0	9	38.12	31.68
DF7-10P-3.96DSA	680-0044-3	10	42.08	35.64
DF7- 2P-7.92DSA	680-0108-4	2	14.36	7.92
DF7- 3P-7.92DSA	680-0109-7	3	22.28	15.84

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

If needed, order the product per bag.

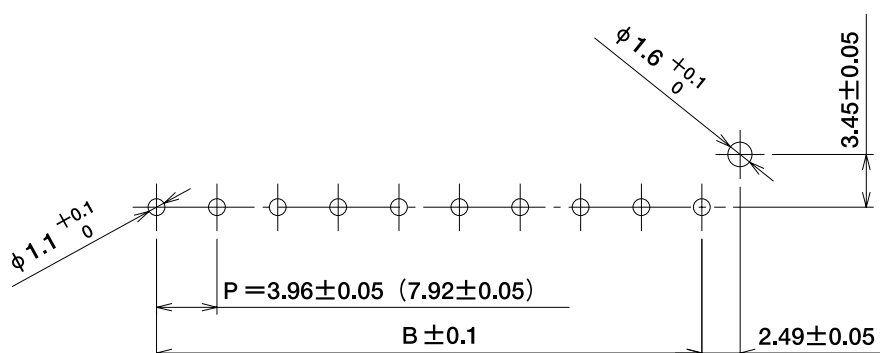
Note2: The odd number contact may partially differ in the locking form.

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

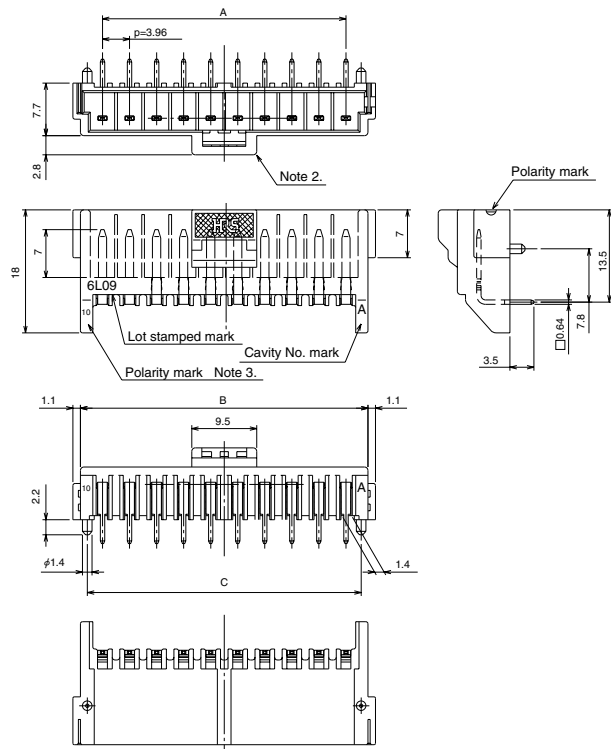
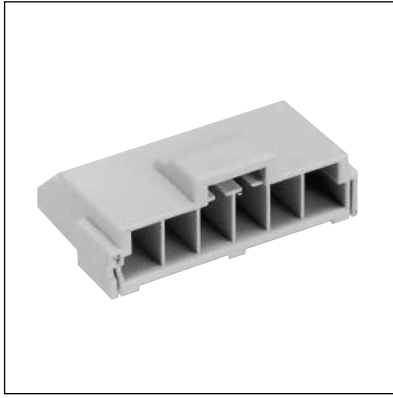
Note4: DF7-2P-7.92DS excludes pin No. 2 in DF7-3P-3.96DS, and the number of contacts indicates 2.

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

◆PCB mounting pattern (Board thickness $t = 1.6 \pm 0.1$)



■Right Angle Pin Header



Unit: mm

Part Number	CL No.	Number of Contacts	A	B	C
DF7- 2P-3.96DS(24)	680-0081-0-24	2	3.96	10.40	8.40
DF7- 3P-3.96DS(24)	680-0082-2-24	3	7.92	14.36	12.36
DF7- 4P-3.96DS(24)	680-0083-5-24	4	11.88	18.32	16.32
DF7- 5P-3.96DS(24)	680-0084-8-24	5	15.84	22.28	20.28
DF7- 6P-3.96DS(24)	680-0085-0-24	6	19.80	26.24	24.24
DF7- 7P-3.96DS(24)	680-0086-3-24	7	23.76	30.20	28.20
DF7- 8P-3.96DS(24)	680-0087-6-24	8	27.72	34.16	32.16
DF7- 9P-3.96DS(24)	680-0088-9-24	9	31.68	38.12	36.12
DF7-10P-3.96DS(24)	680-0089-1-24	10	35.64	42.08	40.08
DF7- 2P-7.92DS(24)	680-0124-0-24	2	7.92	14.36	12.36
DF7- 3P-7.92DS(24)	680-0125-3-24	3	15.84	22.28	20.28

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

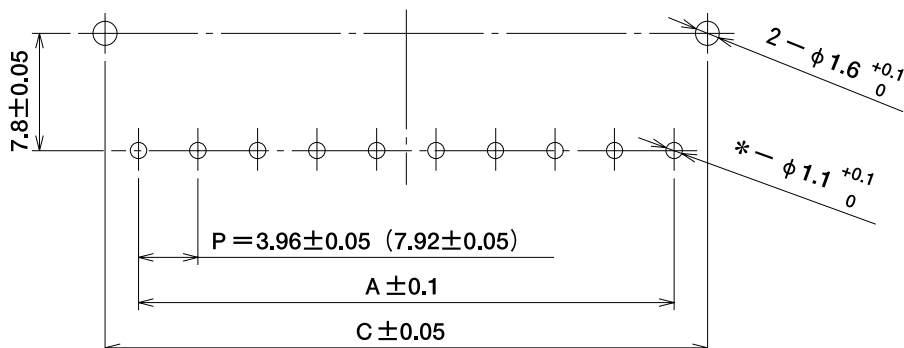
If needed, order the products per bag.

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

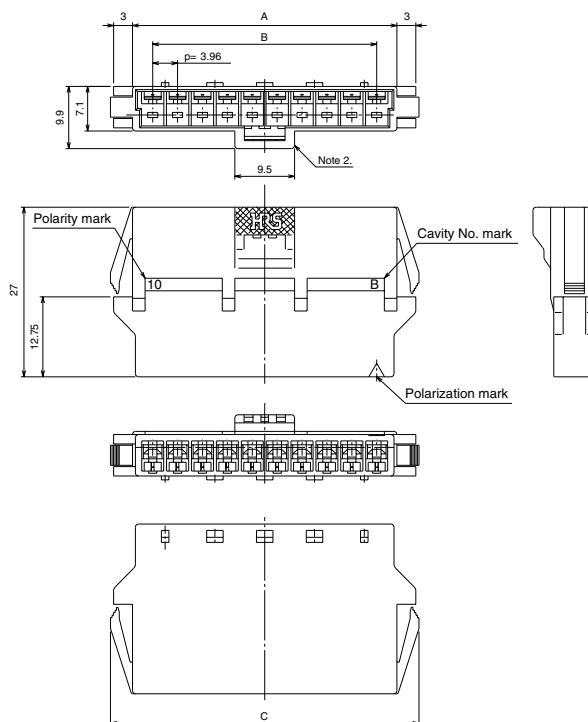
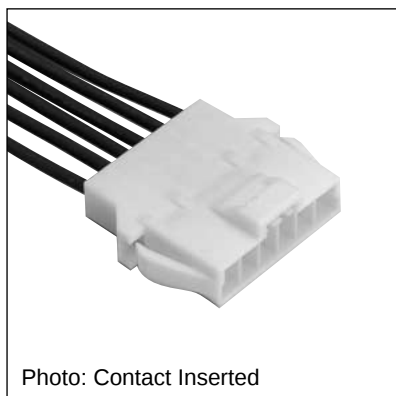
Note3: DF7-2P-7.92DS excludes pin No. 2 in DF7-3P-3.96DS, and the number of contacts indicates 2.

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

◆PCB mounting pattern (Board Thickness $t = 1.6 \pm 0.1$)



■In-line Plug (Panel Mount Type)



Unit: mm

Part Number	CL No.	Number of Contacts	A	B	C
DF7- 2EP-3.96C	680-0018-3	2	10.40	3.96	17.40
DF7- 3EP-3.96C	680-0019-6	3	14.36	7.92	21.36
DF7- 4EP-3.96C	680-0020-5	4	18.32	11.88	25.32
DF7- 5EP-3.96C	680-0021-8	5	22.28	15.84	29.28
DF7- 6EP-3.96C	680-0022-0	6	26.24	19.80	33.24
DF7- 7EP-3.96C	680-0023-3	7	30.20	23.76	37.20
DF7- 8EP-3.96C	680-0024-6	8	34.16	27.72	41.16
DF7- 9EP-3.96C	680-0025-9	9	38.12	31.68	45.12
DF7-10EP-3.96C	680-0026-1	10	42.08	35.64	49.08

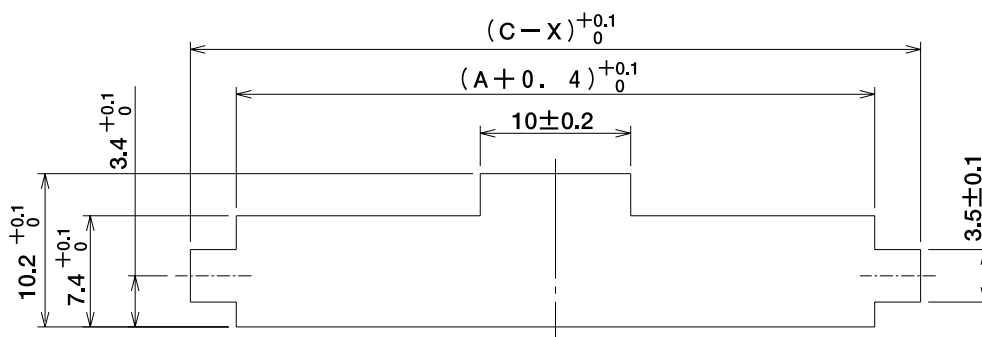
Note1: A packaging quantity is delivered by the bag unit (100 pcs.).

If needed, order the products per bag.

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

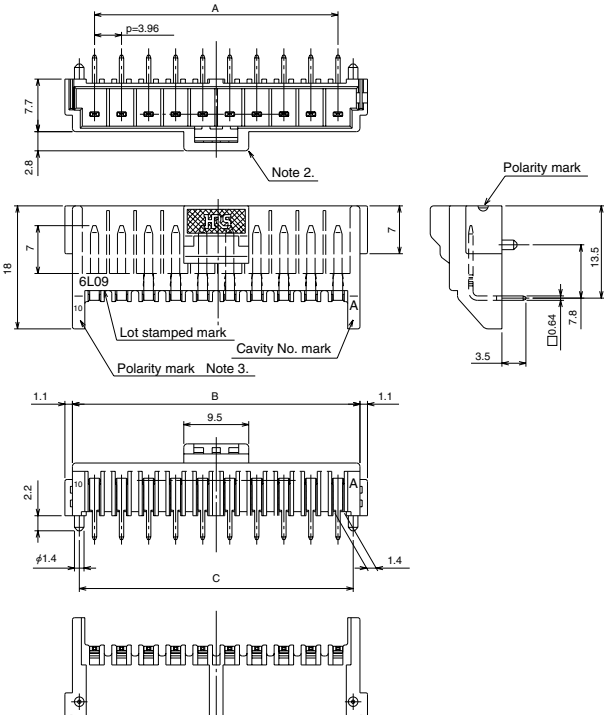
*Refer to page B103 for the retainer.

◆Panel Cutouts



Panel Thickness	X
2.0	0.48
1.6	0.96
1.2	1.44
0.8	1.92

■In-line Plug

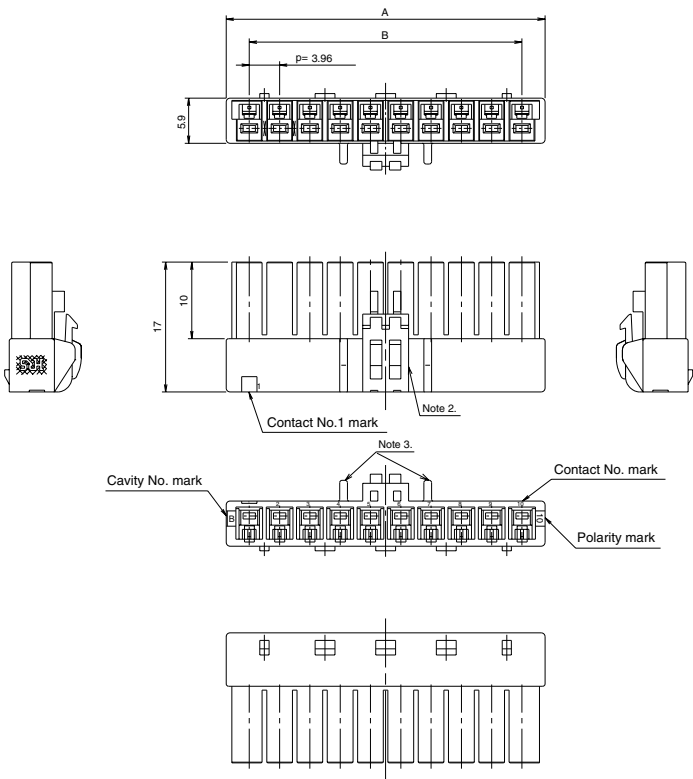
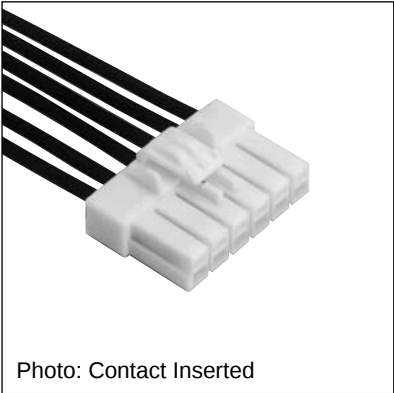


Unit: mm

Part Number	CL No.	Number of Contacts	A	B
DF7A- 2EP-3.96C	680-0072-9	2	10.40	3.96
DF7A- 3EP-3.96C	680-0073-1	3	14.36	7.92
DF7A- 4EP-3.96C	680-0074-4	4	18.32	11.88
DF7A- 5EP-3.96C	680-0075-7	5	22.28	15.84
DF7A- 6EP-3.96C	680-0076-0	6	26.24	19.80
DF7A- 7EP-3.96C	680-0077-2	7	30.20	23.76
DF7A- 8EP-3.96C	680-0078-5	8	34.16	27.72
DF7A- 9EP-3.96C	680-0079-8	9	38.12	31.68
DF7A-10EP-3.96C	680-0080-7	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

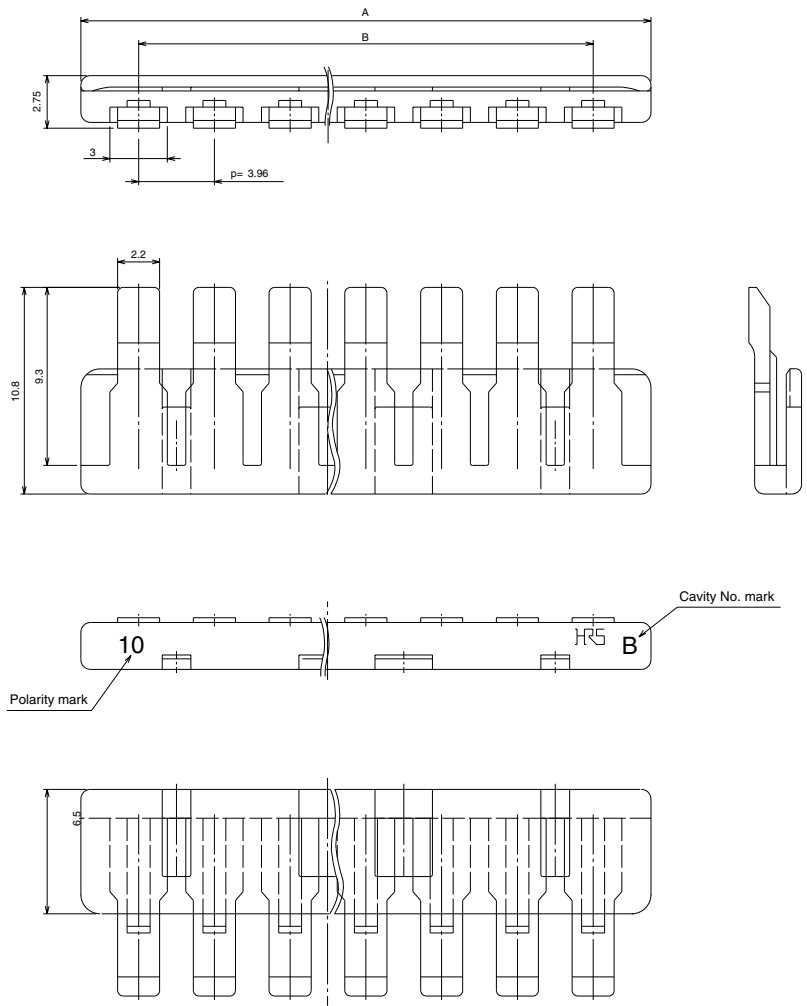


Unit: mm

Part Number	CL No.	Number of Contacts	A	B
DF7- 2S-3.96C	680-0009-2	2	10.00	3.96
DF7- 3S-3.96C	680-0010-1	3	13.96	7.92
DF7- 4S-3.96C	680-0011-4	4	17.92	11.88
DF7- 5S-3.96C	680-0012-7	5	21.88	15.84
DF7- 6S-3.96C	680-0013-0	6	25.84	19.80
DF7- 7S-3.96C	680-0014-2	7	29.80	23.76
DF7- 8S-3.96C	680-0015-5	8	33.76	27.72
DF7- 9S-3.96C	680-0016-8	9	37.72	31.68
DF7-10S-3.96C	680-0017-0	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

Part Number	CL No.	Number of Contacts	A	B
DF7- 2RS/P-3.96	680-0027-4	2	10.00	3.96
DF7- 3RS/P-3.96	680-0028-7	3	13.96	7.92
DF7- 4RS/P-3.96	680-0029-0	4	17.92	11.88
DF7- 5RS/P-3.96	680-0030-9	5	21.88	15.84
DF7- 6RS/P-3.96	680-0031-1	6	25.84	19.80
DF7- 7RS/P-3.96	680-0032-4	7	29.80	23.76
DF7- 8RS/P-3.96	680-0033-7	8	33.76	27.72
DF7- 9RS/P-3.96	680-0034-0	9	37.72	31.68
DF7-10RS/P-3.96	680-0035-2	10	41.68	35.64

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

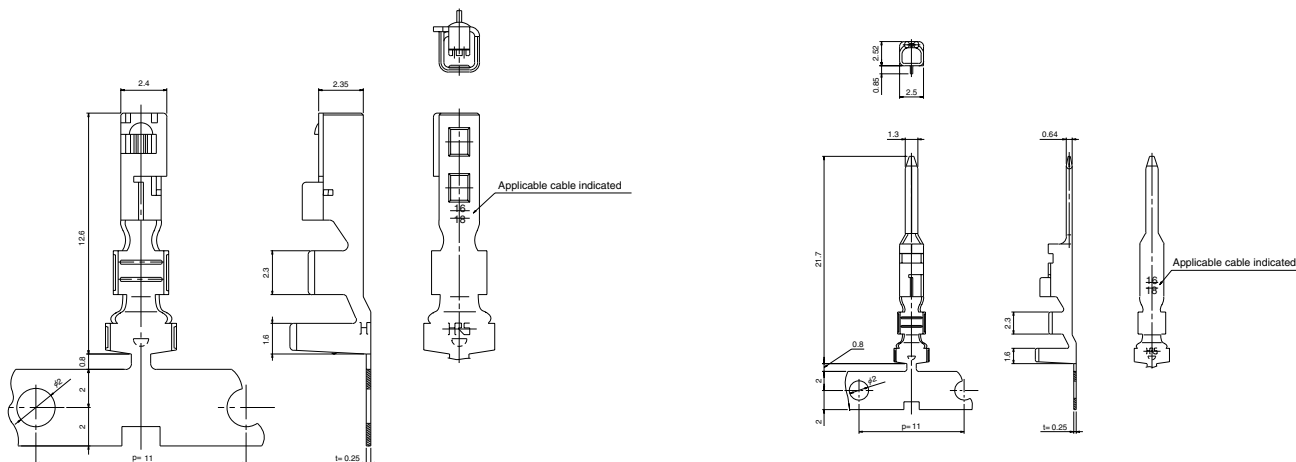
If needed, order the products per bag.

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

■Crimping Contact

●Female Contact

●Male Contact



Part Number	CL No.	Packaging	Quantity	Finish
DF7-1618SCF	680-0001-0	Reel	3000	Tin plating
DF7-1618SC	680-0002-3	Bag	100	
DF7-2022SCF	680-0003-6	Reel	3000	
DF7-2022SC	680-0004-9	Bag	100	
DF7-1618PCF	680-0005-1	Reel	3000	
DF7-1618PC	680-0006-4	Bag	100	
DF7-2022PCF	680-0007-7	Reel	3000	
DF7-2022PC	680-0008-0	Bag	100	

●Applicable Cable (Tin plating annealed conductor)

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

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

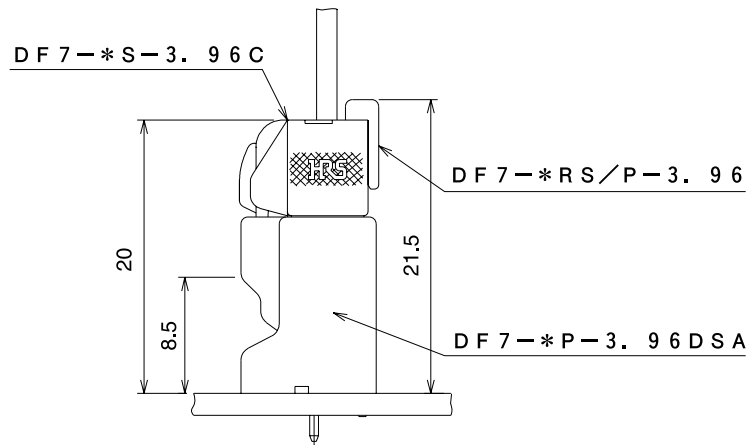
●Strip Length: 3.0 to 3.8mm

■Applicable Tool

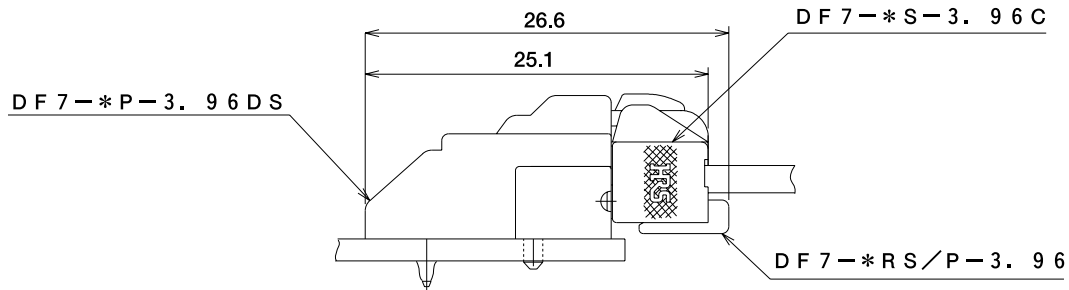
Type		Part Number	CL No.	Applicable contact
Automatic	Main press unit	CM-105	901-0005-4	————
	Applicator	AP105-DF7-1618	901-4554-4	DF7-1618SCF/PCF
		AP105-DF7-2022	901-4553-1	DF7-2022SCF/PCF
Manual	Manual crimping tool	HT104/DF7-1618	550-0268-0	DF7-1618SC/PC
		HT104/DF7-2022	550-0269-3	DF7-2022SC/PC

◆ Mating Dimensions

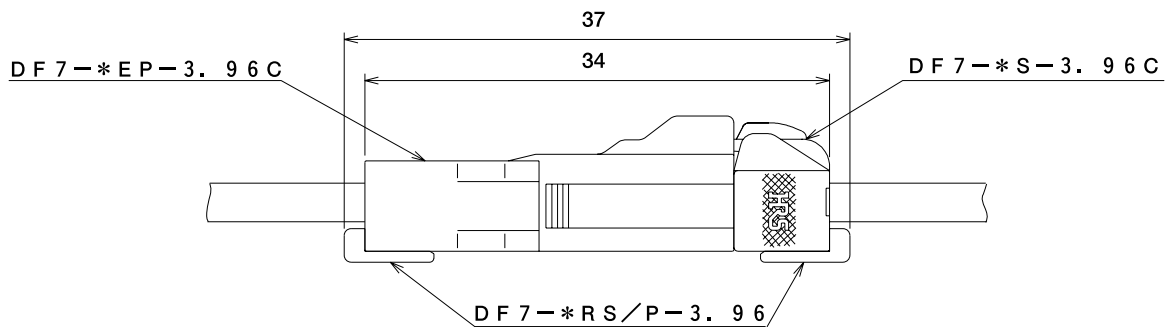
● Cable to Board (Straight Pin Header) Connection



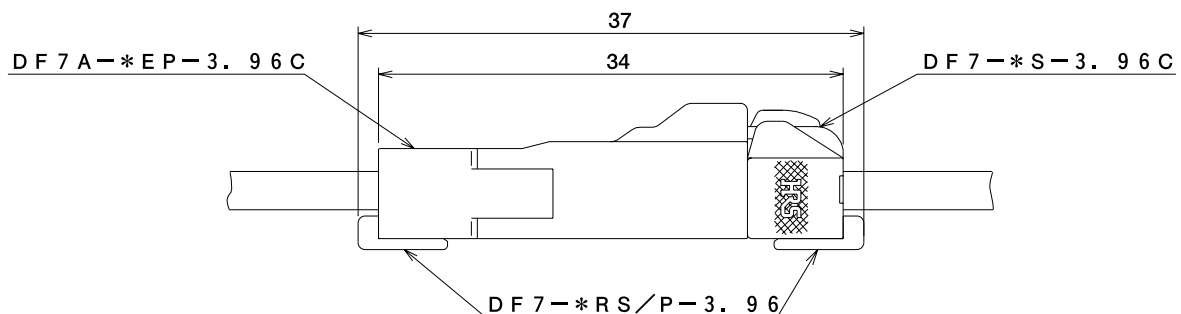
● Cable to Board (Right Angle Pin Header) Connection



● Cable to Cable Connection (Panel Lock Type)



● Cable to Cable Connection



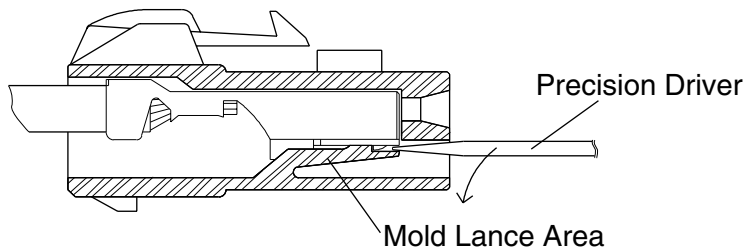
◆How to Remove Contacts

■ Tool Name for Contact Removal: Precision Driver (Minus driver, blade width: 1.4mm)

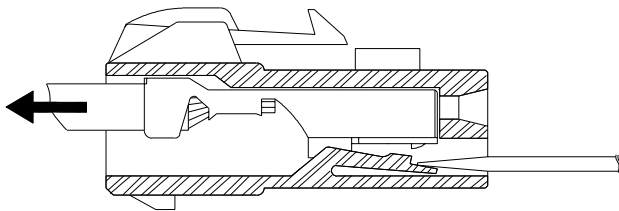
■ Objective Crimping Contact: DF7-1618SC(F), DF7-2022SC(F)
DF7-1618PC(F), DF7-2022PC(F)

■ 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.

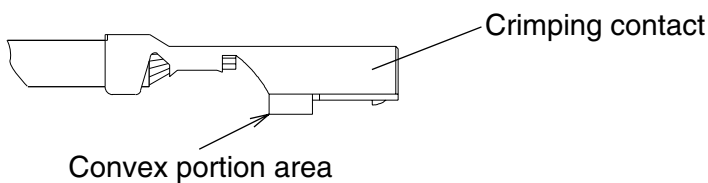


2. Check that the lance unit has removed in place, draw out the cable, and remove the crimping contact.



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.