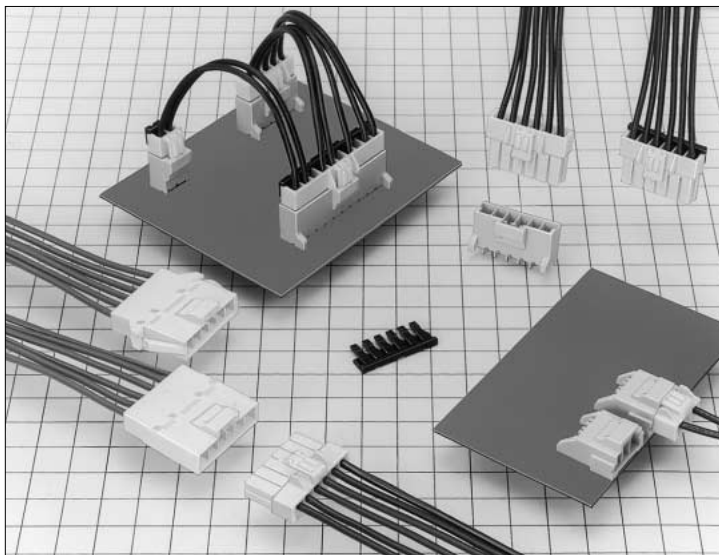


3.95mm Pitch Miniature Connector for Secondary Power Supply (Product Compliant to C-UL and TÜV)

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.

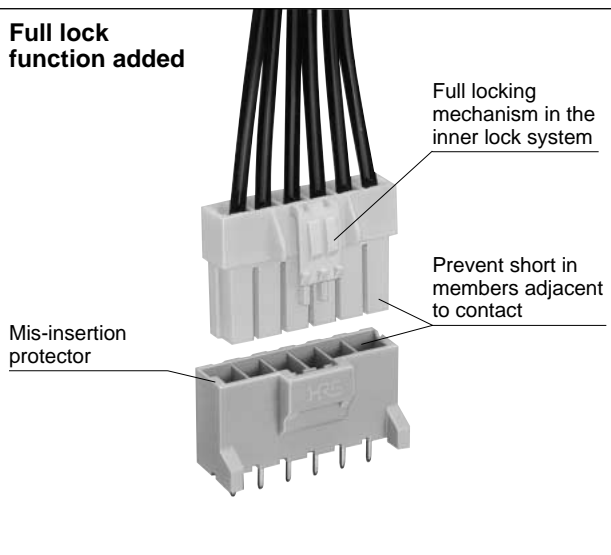
7. Reduction in Production Facility Cost

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

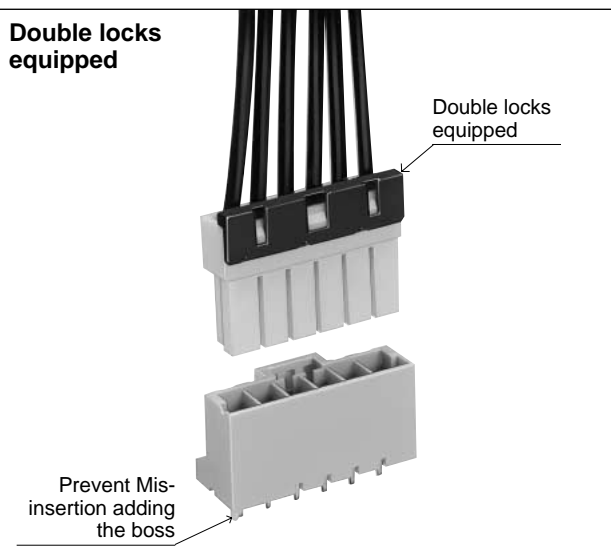
8. Prevent Short in Members Adjacent to Contact

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

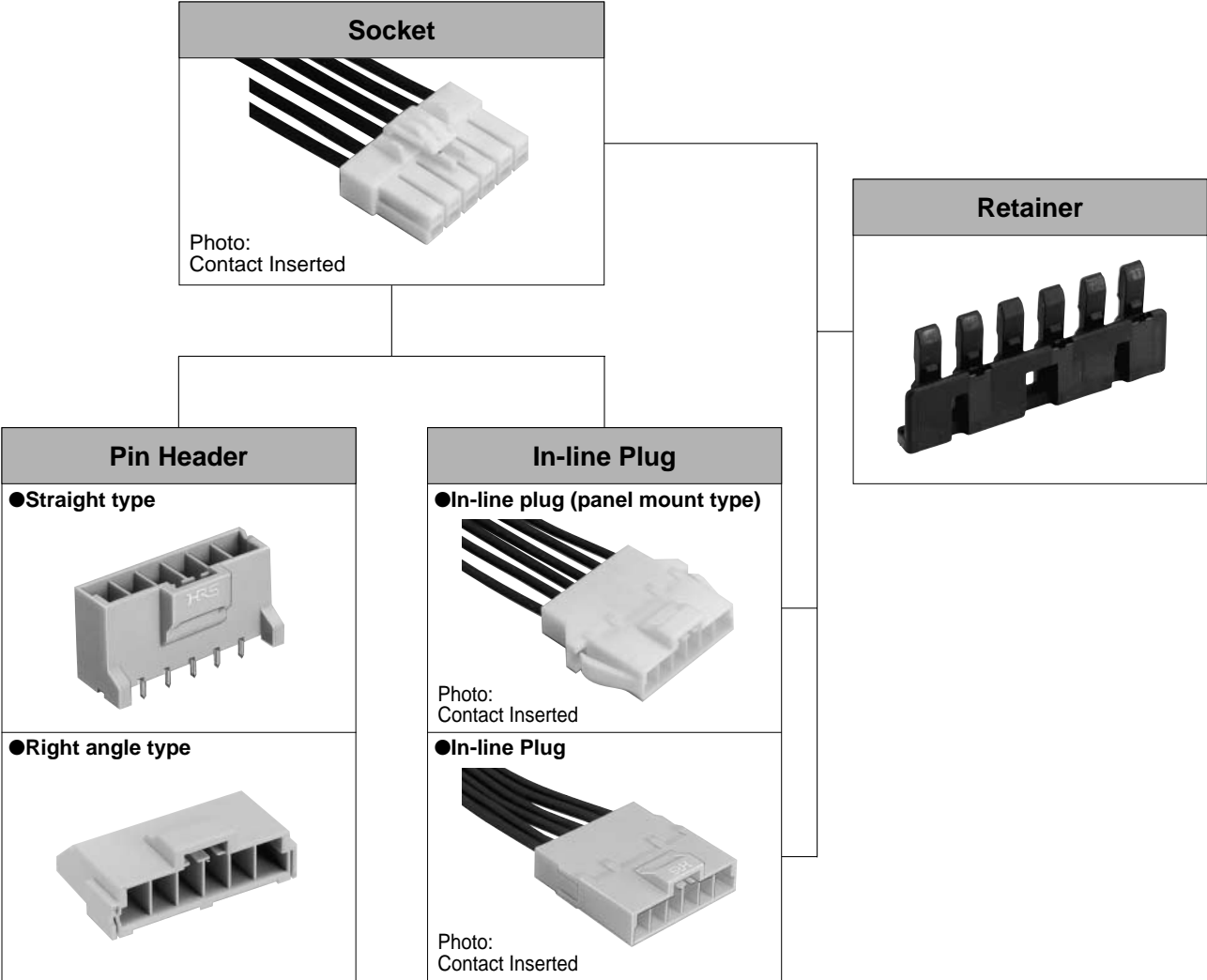
DF 7 - * S - 3.96 C
① ② ③ ④ ⑤ ⑥

●Crimping Contact

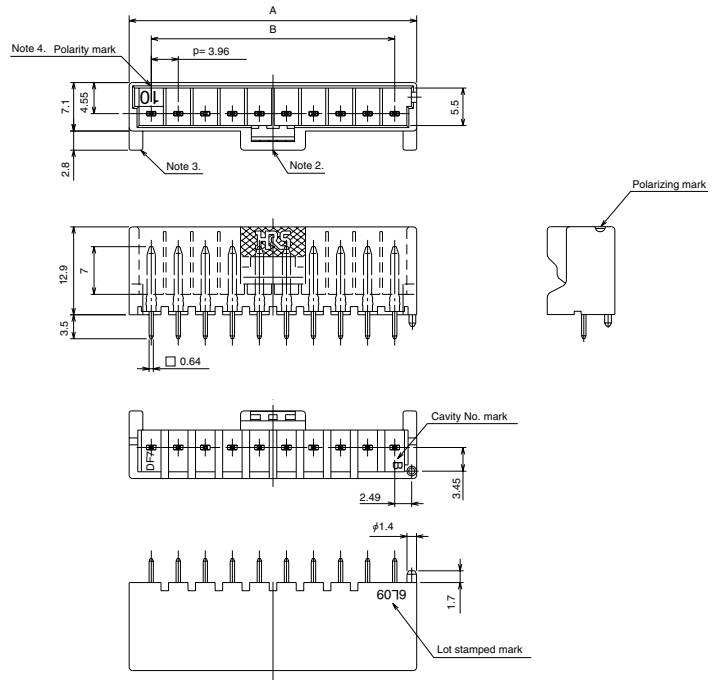
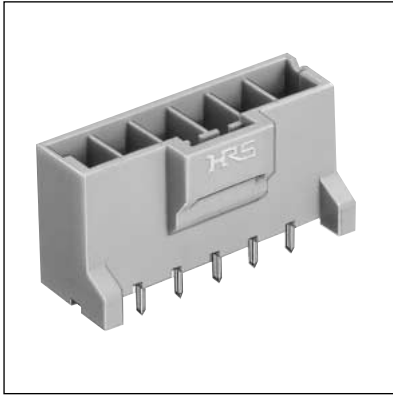
DF 7 - * * - SCF
① ② ⑦ ⑧

| | | | |
|----------------------------------|---|-------------------------|--|
| 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.

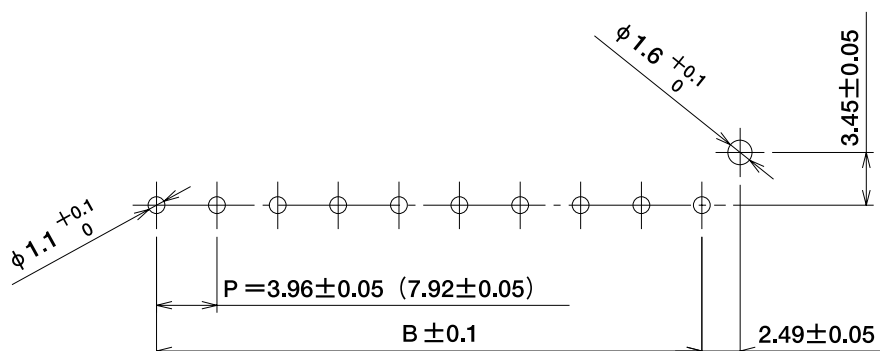
Note2: The odd number contact may partially differ in the locking form.

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

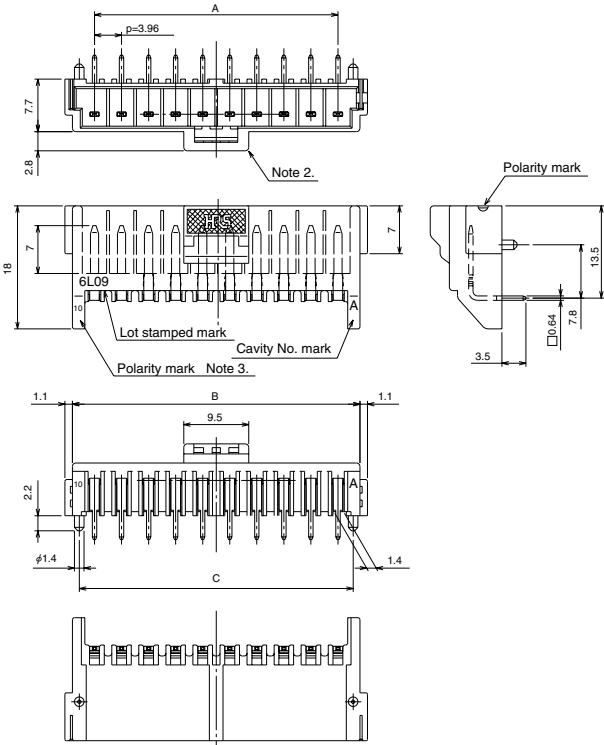
Note4: DF7-2P-7.92DS excludes pin No. 2 in DF7-3P-3.96DS, and the number of contacts indicates 2.

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

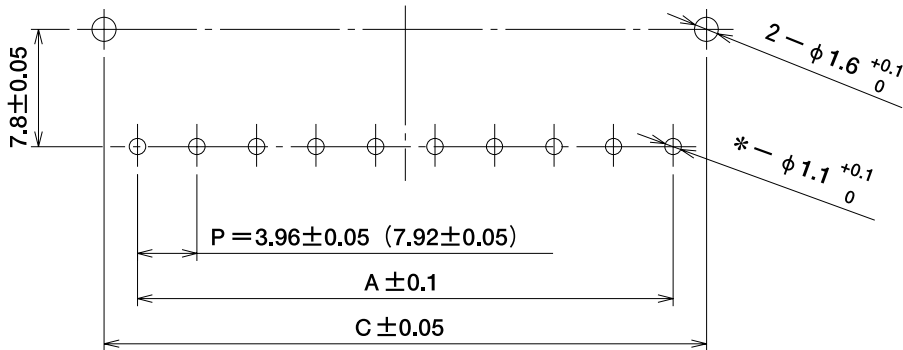


Unit: mm

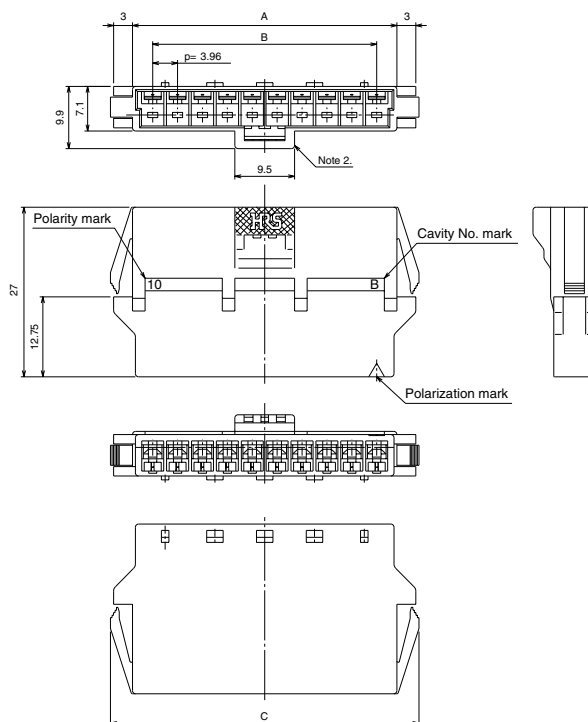
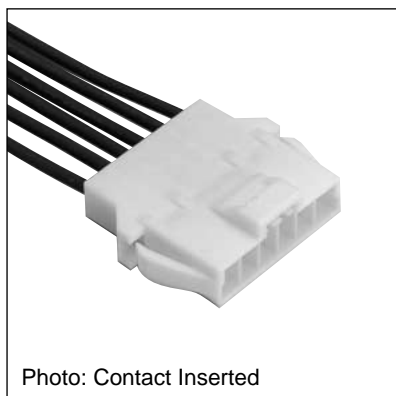
| Part Number | CL No. | Number of Contacts | A | B | C |
|--------------------|---------------|--------------------|-------|-------|-------|
| DF7- 2P-3.96DS(24) | 680-0081-0-24 | 2 | 3.96 | 10.40 | 8.40 |
| DF7- 3P-3.96DS(24) | 680-0082-2-24 | 3 | 7.92 | 14.36 | 12.36 |
| DF7- 4P-3.96DS(24) | 680-0083-5-24 | 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±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 |

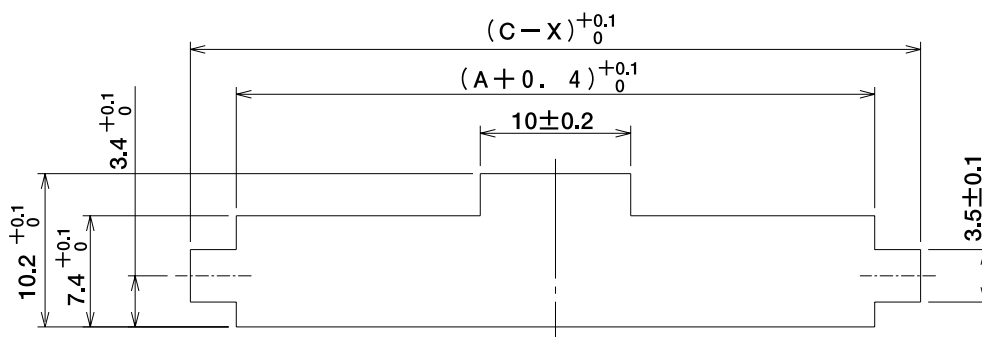
Note1: A packaging quantity is delivered by the bag unit (100 pcs.).

If needed, order the products per bag.

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

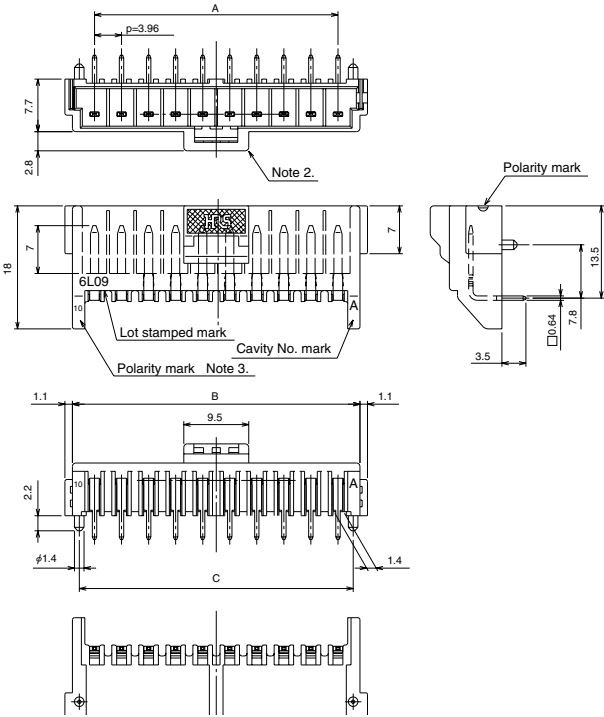
*Refer to page B103 for the retainer.

◆Panel Cutouts



| Panel Thickness | X |
|-----------------|------|
| 2.0 | 0.48 |
| 1.6 | 0.96 |
| 1.2 | 1.44 |
| 0.8 | 1.92 |

In-line Plug

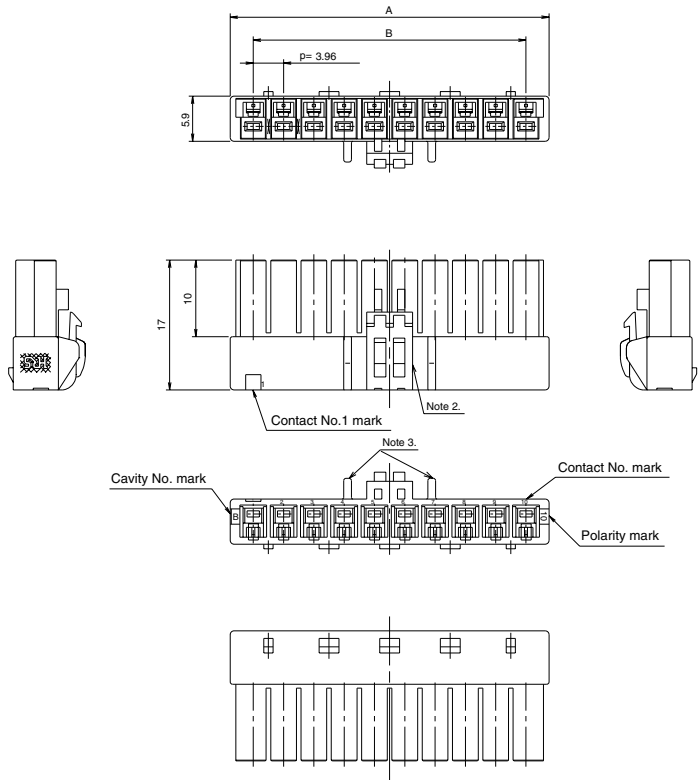
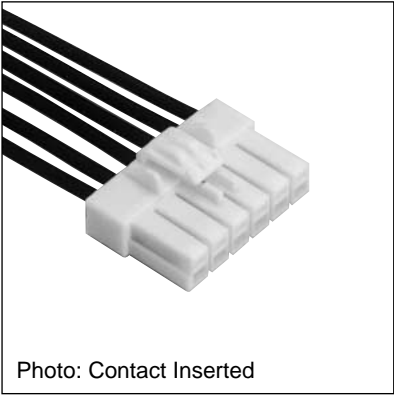


Unit: mm

| 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

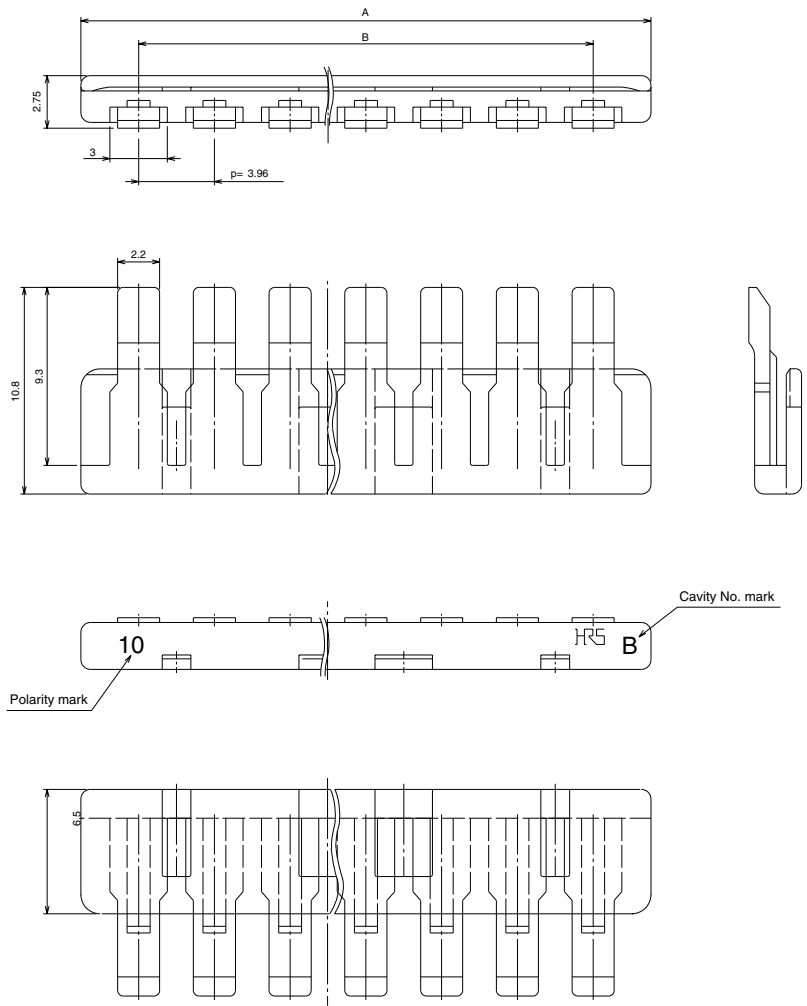


Unit: mm

| 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 |

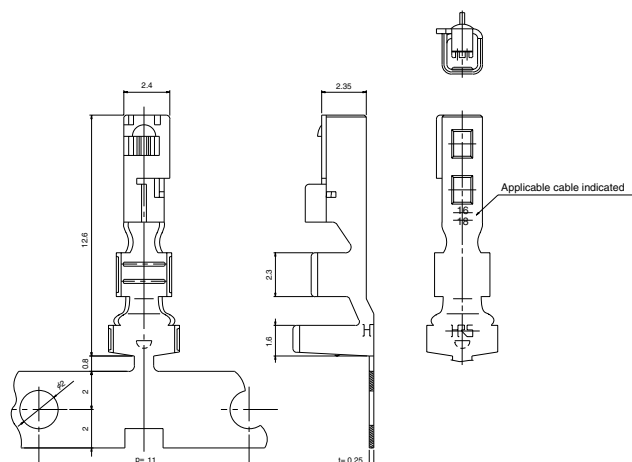
Note1: A packaging quantity is delivered by the bag unit (100 pcs.).

If needed, order the products per bag.

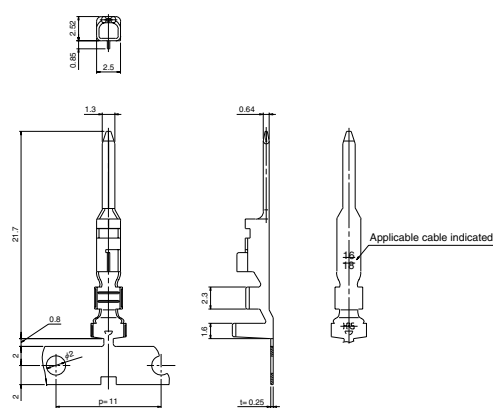
*This retainer is commonly used for socket and in-line plug.

■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 | ϕ 2.1 to 2.5mm |
| AWG18 (34 cores/0.18mm) | | |
| AWG20 (21 cores/0.18mm) | | ϕ 1.6 to 1.9mm |
| AWG22 (17 cores/0.16mm) | | |
| AWG16 (26 cores/0.254mm) | UL1015 | ϕ 2.9 to 3.2mm |
| AWG18 (34 cores/0.18mm) | | |
| AWG20 (21 cores/0.18mm) | | ϕ 2.4 to 2.7mm |
| AWG22 (17 cores/0.16mm) | | |

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

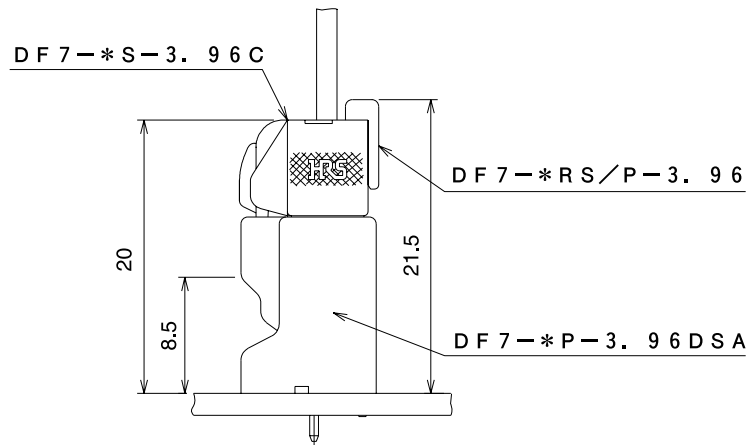
●Strip Length: 3.0 to 3.8mm

■Applicable Tool

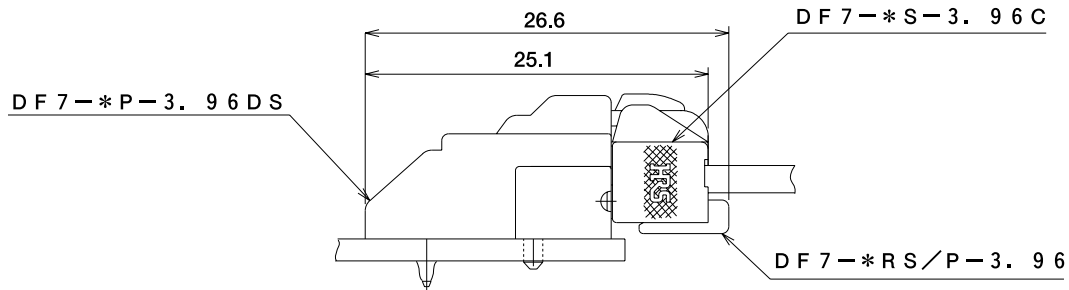
| Type | Part Number | CL No. | Applicable contact |
|-----------|----------------|------------|--------------------|
| Automatic | CM-105 | 901-0005-4 | — |
| | AP105-DF7-1618 | 901-4554-4 | DF7-1618SCF/PCF |
| | AP105-DF7-2022 | 901-4553-1 | DF7-2022SCF/PCF |
| Manual | HT104/DF7-1618 | 550-0268-0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

◆ Mating Dimensions

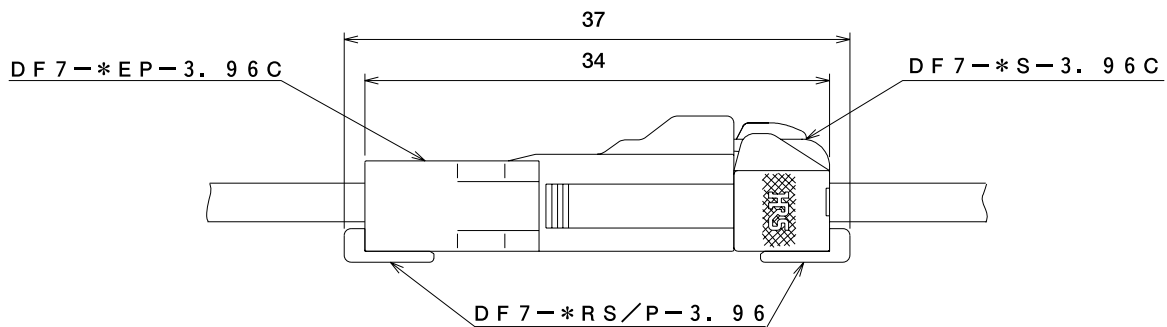
● Cable to Board (Straight Pin Header) Connection



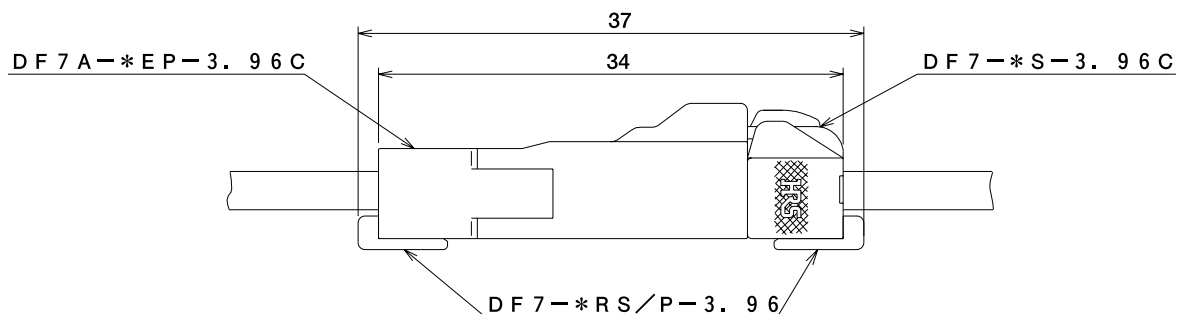
● Cable to Board (Right Angle Pin Header) Connection



● Cable to Cable Connection (Panel Lock Type)



● Cable to Cable Connection



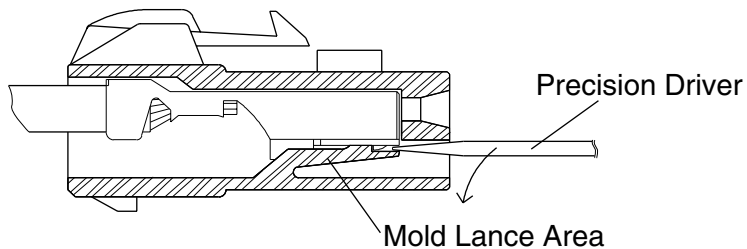
◆How to Remove Contacts

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

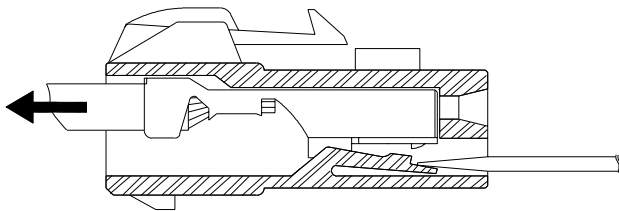
■ Objective Crimping Contact: DF7-1618SC(F), DF7-2022SC(F)
DF7-1618PC(F), DF7-2022PC(F)

■ 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.

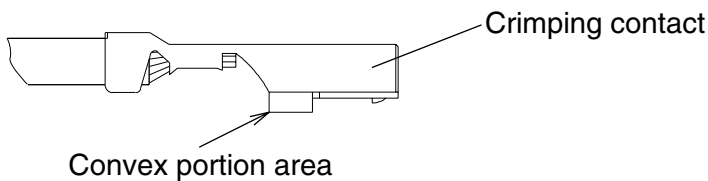


2. Check that the lance unit has removed in place, draw out the cable, and remove the crimping contact.



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.