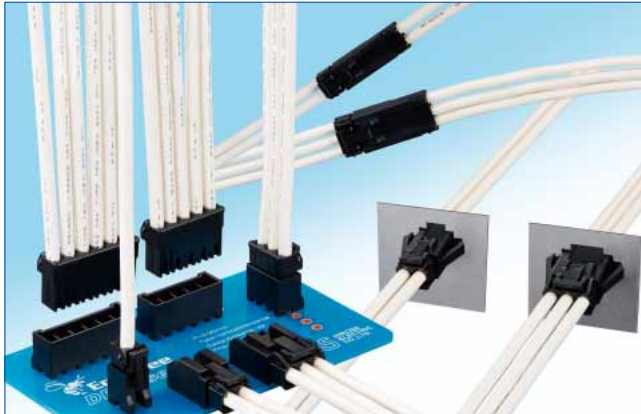


# 15A 3.96mm pitch Wire-to-Board Connectors for Internal Power Supply

## DF63 Series



### ■ Features

#### 1. Rated for up to 15A

DF63 has the capacity to handle a max of 15A when using 16 AWG wire.  
(Please refer to the chart for the rated current in other pin counts.)

#### 2. Secure mating and clear tactile click

The locking mechanism delivers a clear and tactile click, which prevents incomplete mating. (Fig.2)

#### 3. Prevents incomplete insertion of the crimp contact

A structure to prevent incomplete insertion of the crimp contacts is provided. (Fig.3)

#### 4. Prevents incorrect mating

A mechanism has been added to prevent reverse mating and incorrect mating between different number of positions. (Fig.4)

#### 5. Reverse mounting prevention to PCB

The pin header is equipped with a guide post to prevent reverse insertion on the PCB. (Fig.1)

#### 6. Molded lance design

The lance is actually part of the housing instead of being a part of the terminal. This prevents tangled wires during assembly.

#### 7. Short-circuit prevention

The wall structure between the contacts helps to isolate the contacts and prevents short circuits between contacts. (Fig.1)

#### 8. Suitable for potting

Capable of being potted, up to 5mm.

#### 9. Solder crack prevention

Glass-reinforced resin is used on the pin header to prevent solder cracks due to thermal contraction.

#### 10. Glow Wire compliance (Compliant with IEC 60695-2-11)

##### \* Keying options were provided to prevent incorrect connections.

Keying options prevent incorrect connections due to the use of multiple connectors on the same board. When using identical pin counts, two versions are available with different keying options. (Fig.4)

##### \* Supports 7.92mm pitch

Also supports 7.92mm pitch with 2 or 3 pos. without pins

Note 1 : \* means the product will be available upon request.  
Please contact Hirose representative.

(UL, C-UL, TÜV, Listed)

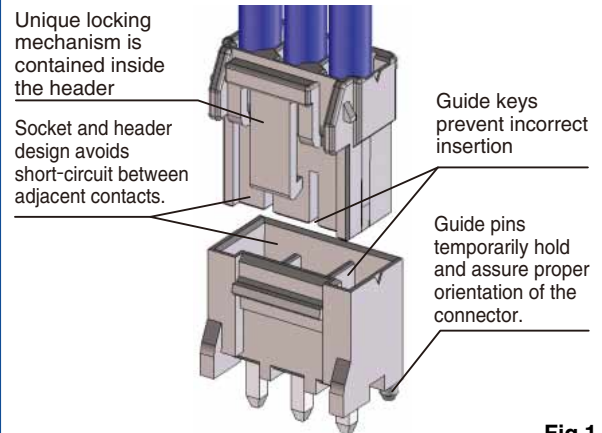


Fig.1

#### Lock structure

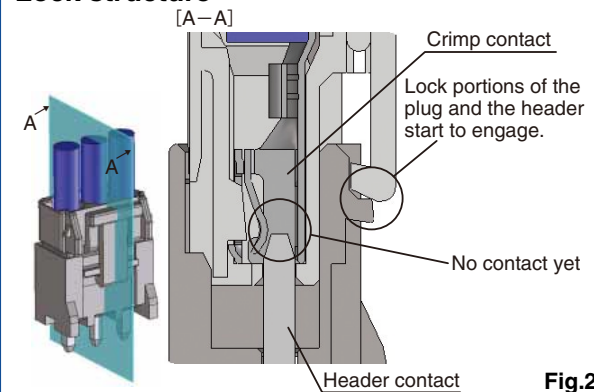


Fig.2

#### Prevention of insufficient insertion of the crimp contact

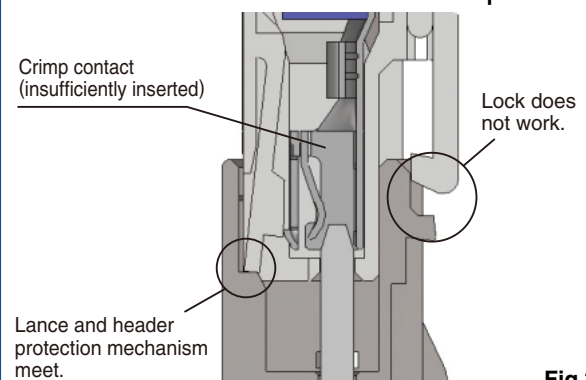


Fig.3

#### Keying options are available to prevent incorrect connections due to the use of multiple connectors on the same board.

■ Standard type (color : black)



■ R-type (color : white)



Fig.4

## ■Product Specifications

|         |                     |                     |            |        |        |        |                                                                                        |  |
|---------|---------------------|---------------------|------------|--------|--------|--------|----------------------------------------------------------------------------------------|--|
| Ratings | Current Rating      | No. of Contacts     | 16 AWG     | 18 AWG | 20 AWG | 22 AWG | Operating temperature range -55 to 105°C (Note 2)                                      |  |
|         |                     | 1                   | 15A        | 13A    | 11A    | 9A     | Operating humidity range 20 to 80% (Note 3)                                            |  |
|         |                     | 2                   | 14A        | 12A    | 10A    | 8A     | Storage temperature range -10 to 60°C (Note 4)                                         |  |
|         |                     | 3                   | 12A        | 10A    | 8A     | 7A     | Storage humidity range 40 to 70% (Note 4)                                              |  |
|         |                     | 4                   | 10A        | 8A     | 7A     | 6A     | UL/TÜV File No. and Recognition No.<br>UL : E52653<br>C-UL : E52653<br>TÜV : R50318850 |  |
|         |                     | 5                   | 10A        | 8A     | 7A     | 6A     |                                                                                        |  |
|         |                     | 6                   | 10A        | 8A     | 7A     | 6A     |                                                                                        |  |
|         |                     | 2<br>(7.92mm pitch) | 15A        | 13A    | 11A    | 9A     |                                                                                        |  |
|         | 3<br>(7.92mm pitch) | 12A                 | 11A        | 9A     | 8A     |        |                                                                                        |  |
|         | Voltage Rating      | Specification       | AC/DC 630V |        |        |        |                                                                                        |  |
| UL,C-UL |                     | AC/DC 600V          |            |        |        |        |                                                                                        |  |
| TÜV     |                     | AC/DC 300V          |            |        |        |        |                                                                                        |  |

| Item                      | Specifications                                                                         | Conditions                                                                                                       |
|---------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 1. Insulation Resistance  | No less than 1,000MΩ                                                                   | Measured at DC 500V                                                                                              |
| 2. Withstand Voltage      | No flashover or breakdown                                                              | AC 1,500V is applied for one minute.                                                                             |
| 3. Contact Resistance     | No more than 10mΩ                                                                      | Measured at 1mA and no higher than 20mV                                                                          |
| 4. Vibration Resistance   | No electrical discontinuity of 1μs or greater                                          | Frequency 10-55 Hz, half amplitude 0.75 mm, 10 times in each of the three directions                             |
| 5. Shock Resistance       | No electrical discontinuity of 1μs or greater                                          | Accelerated velocity : 490 m/s <sup>2</sup> for 11ms, half-sine wave in 3 directions, 3 times for each direction |
| 6. Moisture-resistance    | Contact resistance : no more than 20mΩ<br>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 20mΩ<br>Insulation resistance : no less than 1,000MΩ | -55°C : 30 minutes → 85°C : 30 minutes<br>5 cycles                                                               |
| 8. Durability             | Contact resistance : no more than 20mΩ                                                 | Tin plated : 30 mating cycles,<br>Gold plated : 50 mating cycles                                                 |
| 9. Solder heat resistance | The resin parts should withstand the temperature and resist melting.                   | Flow : 260°C, 10 sec<br>Hand soldering : temperature of soldering iron at 300°C for 3 seconds                    |

Note 1 : This is the maximum current rating while all pins are powered or used as all power lines.

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.

## ■Materials / Finish

| Component     | Part      | Material               | Finish                    | UL Specification |
|---------------|-----------|------------------------|---------------------------|------------------|
| Header        | Insulator | PBT (glass-reinforced) | Black or White            | UL94V-0          |
|               | Contact   | Brass                  | Tin plated or Gold plated | —                |
| Crimp socket  | Insulator | PBT (glass-reinforced) | Black or White            | UL94V-0          |
| In-line plug  |           |                        |                           |                  |
| Crimp contact | Contact   | Copper alloy           | Tin plated or Gold plated | —                |

## ■Product Number Structure

### ●Connector

**DF 63 # - \* P - 3.96 DSA**

① ② ③ ④ ⑤ ⑥ ⑦

### ●Crimp contact

**DF 63 - 1618 SCF**

⑧ ⑨

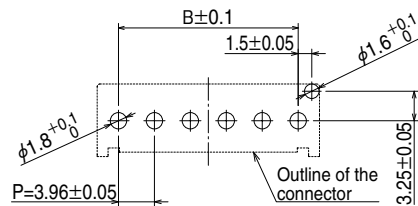
|                                                                                                                                                                                                                                         |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ① Series name : DF                                                                                                                                                                                                                      | ④ Number of Contacts : 1,2,3,4,5,6                                                                                                                                                                          | ⑧ Applicable Conductor<br>1618 : 16 to 18 AWG<br>2022 : 20 to 22 AWG                                                                                                                                                                                                                                                                                                            |
| ② Series No. : 63                                                                                                                                                                                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                 |
| ③ Form Type<br>Header<br>Blank : Black<br>A : Without guide post<br>R : Guide post-Guide Key Type, white<br>Sockets<br>Blank : Black<br>R : Guide Key Type, white<br>In-line Plugs<br>Blank : Panel Lock Type<br>A : Without Panel Lock | ⑤ Connector type<br>P : Header<br>S : Crimp socket<br>EP : In-line plug<br>⑥ Contact Pitch : 3.96mm<br>7.92mm<br>⑦ Type of housing<br>DSA : Straight header<br>DS : Right angle header<br>C : Crimp housing | ⑨ Packaging<br>SCF : Socket contacts-Reel-Tin plated<br>SCFA : Socket contacts-Reel-Gold plated<br>SC : Socket contacts-Pack-Tin plated<br>SCA : Socket contacts-Pack-Gold plated<br>PCF : In-line plug contacts-Reel-Tin plated<br>PCFA : In-line plug contacts-Reel-Gold plated<br>PC : In-line plug contacts-Pack-Tin plated<br>PCA : In-line plug contacts-Pack-Gold plated |

## ■Straight Header

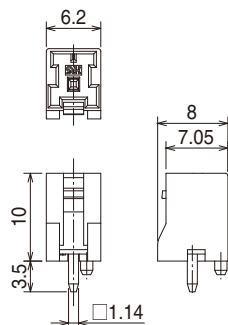


### ●Recommended PCB Layout (Board thickness : 1.6±0.1)

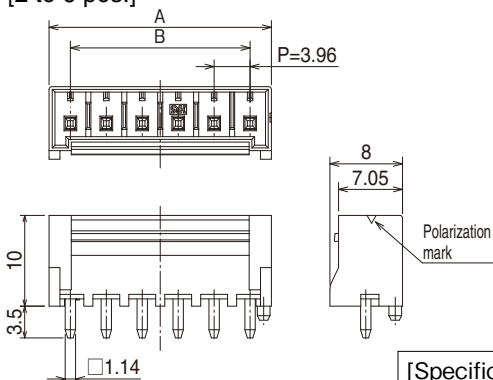
[1 to 6 pos.]



[1 pos.]



[2 to 6 pos.]



[Specification number]\*\*  
None : Tin plated  
(01) : Gold plated

Standard Type (Guide post : Left Side, Color : Black)

Unit : mm

| Part No.            | HRS No.       | No. of Contacts | A     | B     |
|---------------------|---------------|-----------------|-------|-------|
| DF63-1P-3.96DSA(**) | 680-0503-9 ** | 1               | 6.2   | -     |
| DF63-2P-3.96DSA(**) | 680-0504-1 ** | 2               | 8.66  | 3.96  |
| DF63-3P-3.96DSA(**) | 680-0501-3 ** | 3               | 12.62 | 7.92  |
| DF63-4P-3.96DSA(**) | 680-0505-4 ** | 4               | 16.58 | 11.88 |
| DF63-5P-3.96DSA(**) | 680-0506-7 ** | 5               | 20.54 | 15.84 |
| DF63-6P-3.96DSA(**) | 680-0507-0 ** | 6               | 24.50 | 19.80 |

R Type (Guide post : Right Side, Guide key, Color : White)

| Part No.             | HRS No.        | No. of Contacts | A     | B     |
|----------------------|----------------|-----------------|-------|-------|
| DF63R-1P-3.96DSA(**) | 680-0517-3 **  | 1               | 6.2   | -     |
| DF63R-2P-3.96DSA(**) | 680-0518-6 **  | 2               | 8.66  | 3.96  |
| DF63R-3P-3.96DSA(**) | 680-0515-8 **  | 3               | 12.62 | 7.92  |
| DF63R-4P-3.96DSA(**) | 680-0519-9 **  | 4               | 16.58 | 11.88 |
| DF63R-5P-3.96DSA(**) | 680-0520-8 **  | 5               | 20.54 | 15.84 |
| DF63R-6P-3.96DSA(**) | Under planning | 6               | 24.50 | 19.80 |

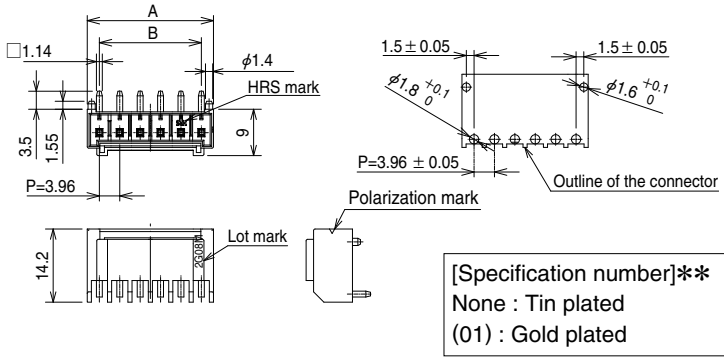
7.92mm pitch

| Part No.             | HRS No.       | No. of Contacts | A     | B     |
|----------------------|---------------|-----------------|-------|-------|
| DF63-2P-7.92DSA(**)  | 680-0513-2 ** | 2               | 12.62 | 7.92  |
| DF63R-2P-7.92DSA(**) | 680-0550-0 ** |                 |       |       |
| DF63-3P-7.92DSA(**)  | 680-0537-0 ** | 3               | 20.54 | 15.84 |
| DF63R-3P-7.92DSA(**) | 680-0562-0 ** |                 |       |       |

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

Note 2 : Please contact Hirose representative if you have request for (01) specification.

## ■Right Angle Header



Standard Type (Color : Black)

Unit : mm

| Part No.           | HRS No.       | No. of Contacts | A     | B     |
|--------------------|---------------|-----------------|-------|-------|
| DF63-1P-3.96DS(**) | 680-0544-0 ** | 1               | 6.2   | -     |
| DF63-2P-3.96DS(**) | 680-0528-0 ** | 2               | 8.66  | 3.96  |
| DF63-3P-3.96DS(**) | 680-0527-7 ** | 3               | 12.62 | 7.92  |
| DF63-4P-3.96DS(**) | 680-0545-0 ** | 4               | 16.58 | 11.88 |
| DF63-5P-3.96DS(**) | 680-0546-0 ** | 5               | 20.54 | 15.84 |
| DF63-6P-3.96DS(**) | 680-0547-0 ** | 6               | 24.50 | 19.80 |

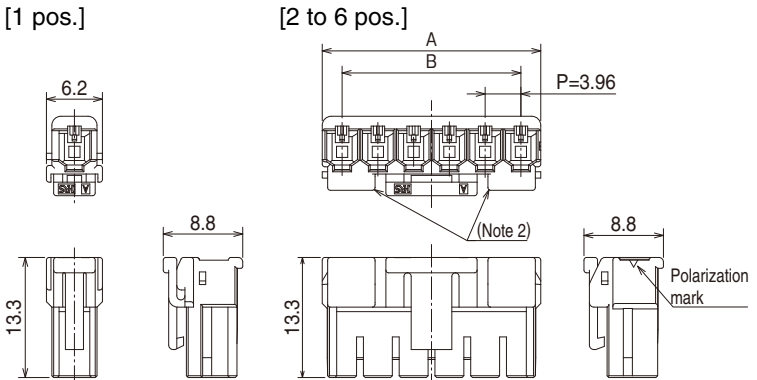
7.92mm pitch

| Part No.            | HRS No.        | No. of Contacts | A     | B     |
|---------------------|----------------|-----------------|-------|-------|
| DF63-2P-7.92DS(**)  | 680-0543-0 **  | 2               | 12.62 | 7.92  |
| DF63R-2P-7.92DS(**) | Under planning |                 |       |       |
| DF63-3P-7.92DS(**)  | 680-0559-0 **  | 3               | 20.54 | 15.84 |
| DF63R-3P-7.92DS(**) | Under planning |                 |       |       |

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

Note 2 : Please contact Hirose representative if you have request for (01) specification.

## ■Crimp Socket



Standard Type

| Part No.          | HRS No.       | No. of Contacts | A     | B     |
|-------------------|---------------|-----------------|-------|-------|
| DF63-1S-3.96C(**) | 680-0508-2 ** | 1               | 6.2   | —     |
| DF63-2S-3.96C(**) | 680-0509-5 ** | 2               | 8.36  | 3.96  |
| DF63-3S-3.96C(**) | 680-0502-6 ** | 3               | 12.32 | 7.92  |
| DF63-4S-3.96C(**) | 680-0510-4 ** | 4               | 16.28 | 11.88 |
| DF63-5S-3.96C(**) | 680-0511-7 ** | 5               | 20.24 | 15.84 |
| DF63-6S-3.96C(**) | 680-0512-0 ** | 6               | 24.20 | 19.80 |

[Specification number]\*\*  
None : Black

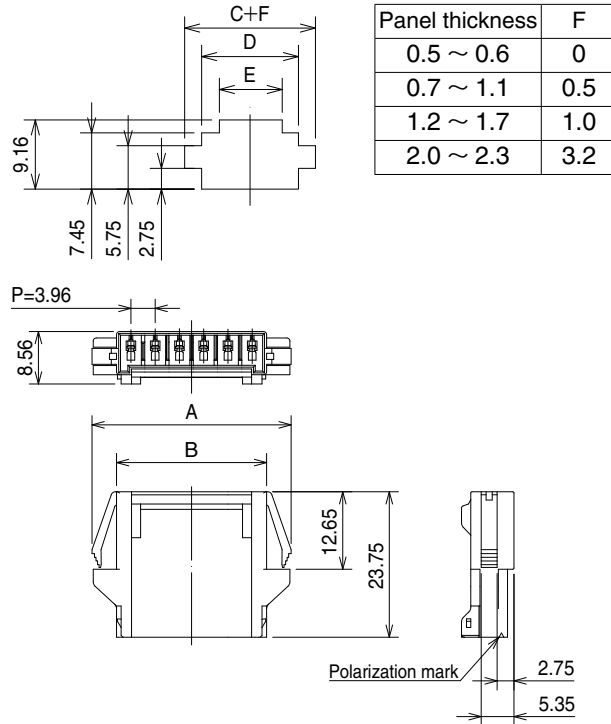
R Type (Guide key)

| Part No.           | HRS No.        | No. of Contacts | A     | B     |
|--------------------|----------------|-----------------|-------|-------|
| DF63R-1S-3.96C(**) | 680-0522-3 **  | 1               | 6.2   | —     |
| DF63R-2S-3.96C(**) | 680-0523-6 **  | 2               | 8.36  | 3.96  |
| DF63R-3S-3.96C(**) | 680-0516-0 **  | 3               | 12.32 | 7.92  |
| DF63R-4S-3.96C(**) | 680-0524-9 **  | 4               | 16.28 | 11.88 |
| DF63R-5S-3.96C(**) | 680-0525-1 **  | 5               | 20.24 | 15.84 |
| DF63R-6S-3.96C(**) | Under planning | 6               | 24.20 | 19.80 |

[Specification number]\*\*  
None : White

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

## In-line Plug (Panel Lock Type)



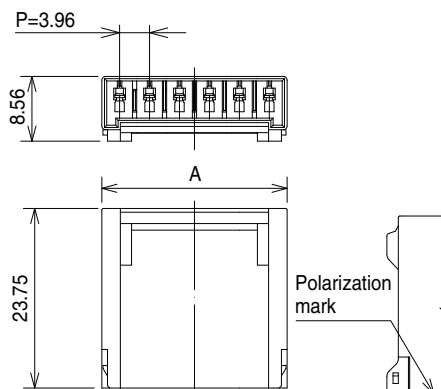
[Specification number]\*\*  
None : Black

Unit : mm

| Part No.           | HRS No.        | No. of Contacts | A     | B     | C     | D     | E     |
|--------------------|----------------|-----------------|-------|-------|-------|-------|-------|
| DF63-1EP-3.96C(**) | Under planning | 1               | 12.7  | 6.2   | 8.8   | 5.0   | —     |
| DF63-2EP-3.96C(**) | 680-0533-0 **  | 2               | 16.66 | 8.66  | 12.76 | 8.86  | 4.36  |
| DF63-3EP-3.96C(**) | 680-0532-7 **  | 3               | 20.62 | 12.62 | 16.72 | 12.82 | 8.32  |
| DF63-4EP-3.96C(**) | Under planning | 4               | 24.58 | 16.58 | 20.68 | 16.78 | 12.28 |
| DF63-5EP-3.96C(**) |                | 5               | 28.54 | 20.54 | 24.64 | 20.74 | 16.24 |
| DF63-6EP-3.96C(**) |                | 6               | 32.5  | 24.5  | 28.6  | 24.70 | 20.2  |

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

## In-line Plug



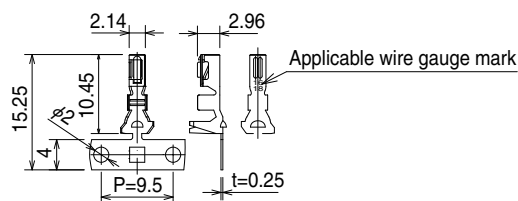
Unit : mm

| Part No.            | HRS No.        | No. of Contacts | A     |
|---------------------|----------------|-----------------|-------|
| DF63A-1EP-3.96C(**) | Under planning | 1               | 6.2   |
| DF63A-2EP-3.96C(**) | 680-0535-5 **  | 2               | 8.66  |
| DF63A-3EP-3.96C(**) | 680-0534-2 **  | 3               | 12.62 |
| DF63A-4EP-3.96C(**) | Under planning | 4               | 16.58 |
| DF63A-5EP-3.96C(**) |                | 5               | 20.54 |
| DF63A-6EP-3.96C(**) |                | 6               | 24.5  |

[Specification number]\*\*  
None : Black

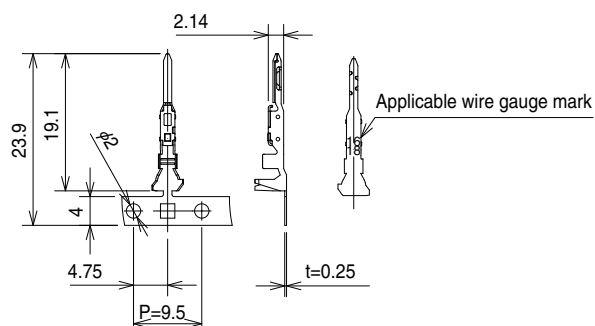
Note 1 : Bag packaging (100 pcs/pack). Order by number of packs.

## ■Crimp Contact for Socket



| Part No.      | HRS No.        | Packaging | Finish      |
|---------------|----------------|-----------|-------------|
| DF63-1618SCF  | 680-0500-0     | 4000/reel | Tin plated  |
| DF63-1618SC   | 680-0514-5     | 100/pack  |             |
| DF63-1618SCFA | 680-0540-0     | 4000/reel | Gold plated |
| DF63-1618SCA  | 680-0542-0     | 100/pack  |             |
| DF63-2022SCF  | 680-0541-0     | 4000/reel | Tin plated  |
| DF63-2022SC   | Under planning | 100/pack  |             |
| DF63-2022SCFA |                | 4000/reel | Gold plated |
| DF63-2022SCA  |                | 100/pack  |             |
| DF63-2428SCF  |                | 4000/reel | Tin plated  |
| DF63-2428SC   |                | 100/pack  |             |
| DF63-2428SCFA |                | 4000/reel | Gold plated |
| DF63-2428SCA  |                | 100/pack  |             |

## ■Crimp Contact for In-line Plug



| Part No.      | HRS No.        | Packaging | Finish      |
|---------------|----------------|-----------|-------------|
| DF63-1618PCF  | 680-0529-2     | 4000/reel | Tin plated  |
| DF63-1618PC   | 680-0536-8     | 100/pack  |             |
| DF63-1618PCFA | Under planning | 4000/reel | Gold plated |
| DF63-1618PCA  |                | 100/pack  |             |
| DF63-2022PCF  | 680-0538-3     | 4000/reel | Tin plated  |
| DF63-2022PC   | Under planning | 100/pack  |             |
| DF63-2022PCFA |                | 4000/reel | Gold plated |
| DF63-2022PCA  |                | 100/pack  |             |
| DF63-2428PCF  |                | 4000/reel | Tin plated  |
| DF63-2428PC   |                | 100/pack  |             |
| DF63-2428PCFA |                | 4000/reel | Gold plated |
| DF63-2428PCA  |                | 100/pack  |             |

### ●Recommended wire

UL1007, 1015

### ●Applicable wire (Tinned, Annealed Copper Wire)

| Wire size (Stranded wire conductor) | Jacket diameter                |
|-------------------------------------|--------------------------------|
| 16 AWG(26/0.254)                    | UL1007(2.5mm)<br>UL1015(3.2mm) |
| 18 AWG(34/0.18)                     | UL1007(2.1mm)<br>UL1015(2.9mm) |
| 20 AWG(21/0.18)                     | UL1007(1.7mm)                  |
| 22 AWG(17/0.16)                     | UL1007(1.5mm)                  |

## ◆Applicable Crimping Tool

| Type       | Part No.              | HRS No.       | Wire type         | Applicable Contacts                                            |
|------------|-----------------------|---------------|-------------------|----------------------------------------------------------------|
| Applicator | AP105-DF63-1618S-1    | 901-4634-1 00 | UL1007 (Note3)    | DF63-1618SCF<br>DF63-1618SCFA                                  |
|            | AP105-DF63-1618S-2    | 901-4635-4 00 | UL1015 (Note3)    |                                                                |
|            | CHS893400H-UP (Note8) | —             | UL1015            |                                                                |
|            | AP105-DF63-1618-3     | 901-4642-0 00 | UL1007 (Note3)    | DF63-1618PCF<br>DF63-1618PCFA                                  |
|            | AP105-DF63-1618-4     | 901-4643-2 00 | UL1015 (Note3)    |                                                                |
|            | CHS893500H-UP (Note8) | —             | UL1015            |                                                                |
|            | AP105-DF63-2022-1     | 901-4617-0 00 | UL1007 (Note3)    | DF63-2022SCF<br>DF63-2022SCFA<br>DF63-2022PCF<br>DF63-2022PCFA |
| Hand tool  | HT802/DF63-1618S-1    | 550-0411-2 00 | UL1007 (Note4, 5) | DF63-1618SC                                                    |
|            | HT802/DF63-1618S-2    | 550-0413-8 00 | UL1015 (Note4, 6) | DF63-1618SCA                                                   |
|            | HT802/DF63-1618P-1    | 550-0423-1 00 | UL1007 (Note4, 5) | DF63-1618PC                                                    |
|            | HT802/DF63-1618P-2    | 550-0424-4 00 | UL1015 (Note4, 6) | DF63-1618PCA                                                   |
|            | HT802/DF63-2022S-1    | 550-0432-0 00 | UL1007 (Note4, 7) | DF63-2022SC<br>DF63-2022SCA                                    |
|            | HT802/DF63-2022P-1    | 550-0433-0 00 |                   | DF63-2022PC<br>DF63-2022PCA                                    |

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 : Hand tool dies cannot be switched.

Note 5 : The compatible wire is limited to UL1007, 16 to 18 AWG

Note 6 : The compatible wire is limited to UL1015, 16 to 18 AWG

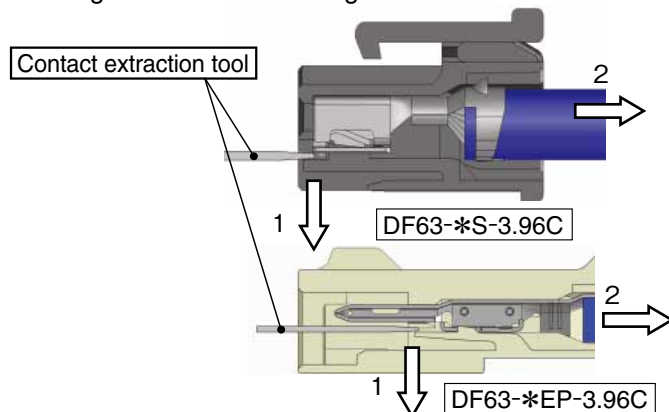
Note 7 : The compatible wire is limited to UL1007, 20 to 22 AWG

Note 8 : Applicator manufactured by JAPAN AUTOMATIC MACHINE (J.A.M.). Please access to HP of J.A.M., if you make inquiries about the applicator or crimp defect. (URL : <http://www.jam-net.co.jp>)

## ◆Contact Extraction

- Contact extraction tool : Flat-bladed screwdriver. 1.2mm blade width or DF-C-PO(B)
- Intended crimp Contacts : DF63-1618SC(F), DF63-2022SC(F), DF63-1618PC(F), DF63-2022PC(F)
- Work Method

Housing Cross Sectional Diagram



- 1.Refer to the drawing No.1. Insert correct size contact extraction tool 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.

\*Using crimping socket after repair could induce decrease of lance strength, use new socket to avoid such failures.

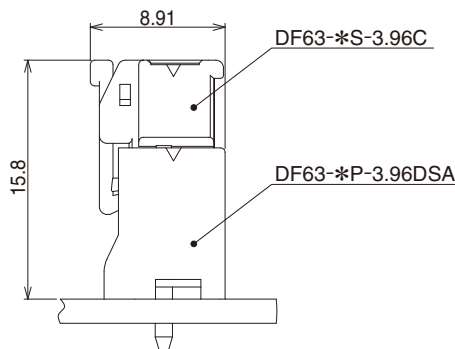


## Caution

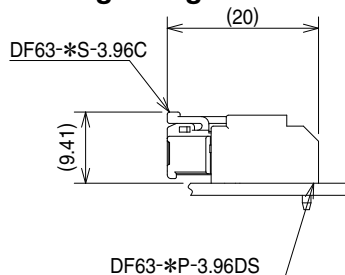
There are parts on the crimp contact that can cause injuries, please use caution when unmating the contacts.

## ◆Mated dimensions

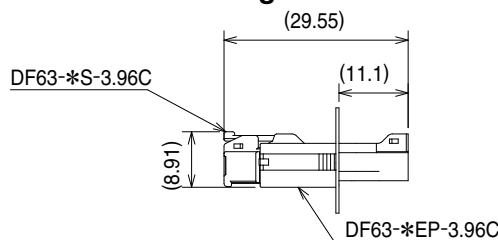
### ●Board-to-Wire Connection using the straight pin header



### ●Socket to Right Angle Header Connection



### ●Socket to In-line Plug Connection



## ◆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.
2. When thick, short sections of wire are used, the connector could be deformed due to the force of the wires' position. Route cables in such a way that they do twist when being installed.
3. Make sure to turn off the power when mating or un-mating the connector.
4. Please do not touch any area around the contact part with your hand when the power is on; it could be very dangerous.
5. Please contact Hirose representative about the assembly procedure and the instruction manual.

## ◆Rated values

Please avoid using the connectors above the ratings. Also, do not insert or pull out energized or "live" wires.

## ◆Operating environment

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



## HIROSE ELECTRIC CO.,LTD.

2-6-3,Nakagawa Chuoh,Tsuzuki-Ku,Yokohama-Shi 224-8540,JAPAN

TEL: +81-45-620-3526 Fax: +81-45-591-3726

<http://www.hirose.com>

<http://www.hirose-connectors.com>