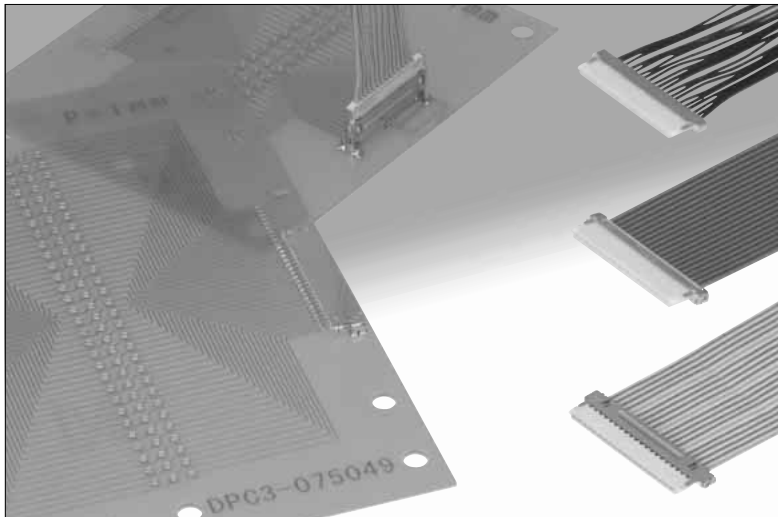


# 1mm Contact Pitch, Board-to-Cable, Board-to-FPC, Board-to-Micro-coaxial Cable Connectors

## DF19 Series



### Overview

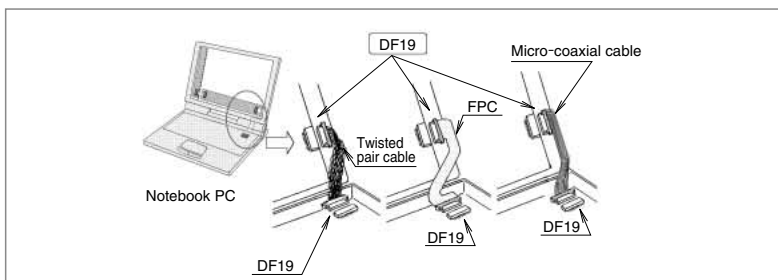
Industry and market accepted as “De facto” standard for LCD panel connections (panels under 12 inches). High-performance connectors for LVDS high-speed differential signals.

### Features

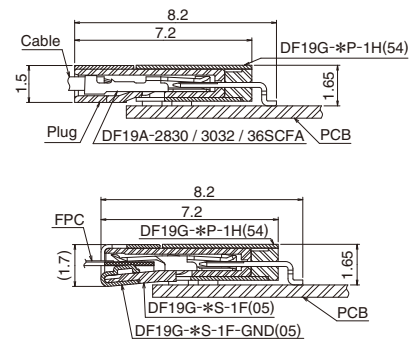
- Small configuration and board space**  
Thin design accepts discrete wire, thin micro-coaxial cable ( $\phi 1.5\text{mm}$ ,  $\phi 1.6\text{mm}$  max.) and FPC 1.7mm maximum thick.
- Common use of receptacle**  
The same receptacle will accept plugs terminated with discrete wire, FPC or micro-coaxial cable.
- Uniform external dimensions**  
The plug assembly external dimensions remain the same when is terminated with discrete wire, FPC or micro-coaxial cable.
- Variety of mounting styles**  
Device design engineers have a choice of mounting styles : top-board, offset, reverse mount offset and vertical.
- Ground connection**  
Metal grounding plates connect with the common ground line.
- Glow wire compliance (Compliant with IEC60695-2-11)**

### Applications

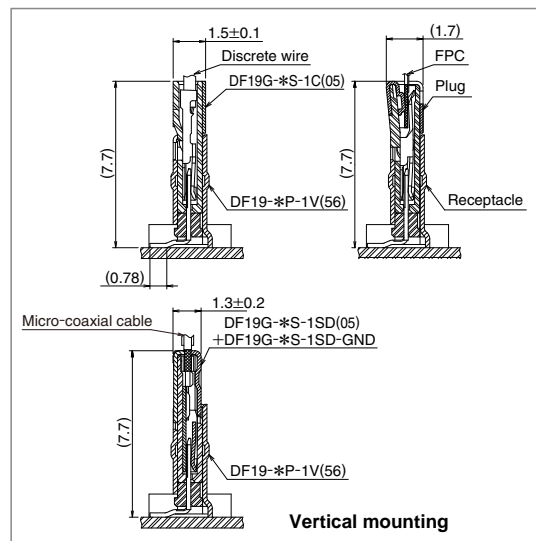
LCD connections in small consumer devices : digital cameras, notebook computers, PDA's. Any device requiring high-density interconnection for consistent high speed transmission data rates.



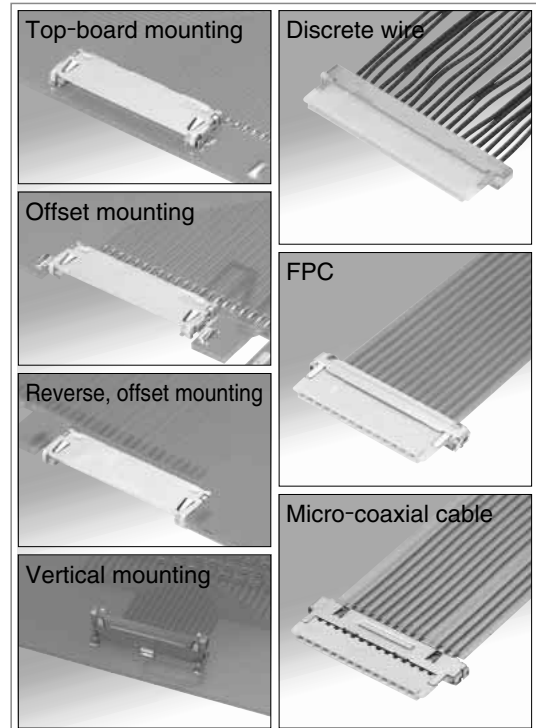
### Small configuration and board space



### Horizontal mounting



### Vertical mounting



## Product Specifications

|        |                |   |                             |                                |                           |                      |
|--------|----------------|---|-----------------------------|--------------------------------|---------------------------|----------------------|
| Rating | Current rating | 28 AWG : 1A<br>30 AWG : 0.9A<br>32 AWG : 0.8A<br>36 AWG : 0.5A<br>FPC : 0.5A<br>Micro-coaxial cable 40 AWG : 0.3A | Operating temperature range | -35°C to 85°C Note 1<br>Note 2 | Storage temperature range | -10°C to 60°C Note 2 |
|        | Voltage rating | 100V AC   | Operating humidity range    | 20% to 80%                     | Storage humidity range    | 40% to 70%           |

| Item  | Specification  | Conditions   |
|---|--|--|
| 1. Insulation resistance                    | 500MΩ min.   | 100 V DC   |
| 2. Withstanding voltage                     | No flashover or insulation breakdown.  | 300 V AC / one minute  |
| 3. Contact resistance                       | 30mΩ max. (50mΩ max. for FPC)  | 100 mA   |
| 4. Insertion-Extraction force (per contact) | Min. 0.2N, Max. 3N   | Measured with a steel pin $\phi 0.2 \pm 0.005$   |
| 5. Vibration                                | No electrical discontinuity of 1μs or more.  | Frequency : 10 to 55 Hz, single amplitude of 0.75mm, 2 hours in each of the 3 directions.                                    |
| 6. Humidity (Steady state)                  | Contact resistance : 30mΩ max. (50mΩ max. for FPC)<br>Insulation resistance : 500MΩ min. | 96 hours at temperature of 40±2°C and humidity of 90% to 95%   |
| 7. Temperature cycle                        | Contact resistance : 30mΩ max. (50mΩ max. for FPC)<br>Insulation resistance : 500MΩ min. | Temperature : -55°C → +5°C to +35°C → +85°C → +5°C to +35°C<br>Time (Minutes) : 30 → 10 → 30 → 10 5 cycles                   |
| 8. Durability (insertion/ withdrawal)       | Contact resistance : 30mΩ max. (50mΩ max. for FPC)                                       | 30 cycles  |
| 9. Resistance to soldering heat             | No deformation of the insulator parts affecting performance.                             | Re-flow soldering : At the recommended temperature profile<br>Manual soldering : Soldering iron temperature 300°C, 3 seconds |

Note1 : Includes temperature rise caused by current flow.

Note2 : The term "storage" refers to connectors 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 / Finish

| Product                                 | Component       | Material        | Finish/Color                    | Remarks |
|---|-----------------|-----------------|---------------------------------|---------|
| Receptacle                              | Insulator       | Polyamide       | Black or Beige                  | UL94V-0 |
|   | Contacts        | Phosphor bronze | Gold plated                     | ——      |
|   | Grounding plate | Phosphor bronze | Tin plated or Tin-copper plated | ——      |
| Plug                                    | Insulator       | Polyamide       | Beige                           | ——      |
|   | Tin-lead plated | Stainless steel | Tin-copper plated               | ——      |
| Crimp contact                           | Contact         | Phosphor bronze | Gold Plated                     | ——      |
| Plug for PPC                            | Insulator       | Polyamide       | Beige                           | UL94V-0 |
|   | Contact         | Phosphor bronze | Gold plated                     | ——      |
| Grounding plate for PPC                 | Grounding plate | Stainless steel | Tin-copper plated               | ——      |
| Plug for micro-coaxial cable            | Insulator       | LCP             | Beige                           | UL94V-0 |
|   | Contact         | Phosphor bronze | Gold plated                     | ——      |
|   | Grounding plate | Phosphor bronze | Tin plated                      | ——      |
| Grounding plate for micro-coaxial cable | Grounding plate | Phosphor bronze | Tin plated                      | ——      |

## Product Number Structure

Refer to the chart below when determining the product specifications from the product number.  
Please select from the product numbers listed in this catalog when placing orders.

### ● Connector

|             |          |          |          |          |          |          |          |
|-------------|----------|----------|----------|----------|----------|----------|----------|
| <b>DF19</b> | <b>#</b> | <b>-</b> | <b>*</b> | <b>P</b> | <b>-</b> | <b>1</b> | <b>H</b> |
| ①           | ②        |          | ③        | ④        |          | ⑤        | ⑥        |

|             |          |          |          |          |          |          |          |          |            |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|------------|
| <b>DF19</b> | <b>#</b> | <b>-</b> | <b>*</b> | <b>S</b> | <b>-</b> | <b>1</b> | <b>F</b> | <b>-</b> | <b>GND</b> |
| ①           | ②        |          | ③        | ④        |          | ⑤        | ⑥        |          | ⑦          |

|   |  |
|---|--|
| <b>① Series Name</b> : DF19   | <b>③ Number of contacts</b> : 8,14,20,30 (Note 1)  |
| <b>② Configuration</b><br>■ Receptacle<br>G : Top-board mounting (1.65mm high)<br>K : Offset mounting (1.0mm high)<br>L : Offset mounting (1.1mm high)<br>KR: Reverse offset mounting version of DF19K (1.0mm high)<br><br>■ Plug for discrete wire<br>Blank : No grounding plate<br>G : With grounding plate<br><br>■ Plug for FPC<br>G : With grounding plate<br><br>■ Grounding plate for FPC<br>G : With grounding plate<br><br>■ Plug for micro-coaxial cable<br>G : With grounding plate<br><br>■ Grounding plate for micro-coaxial cable<br>G : With grounding plate | <b>④ Connector type</b><br>S : Plug<br>P : Receptacle<br><br><b>⑤ Contact pitch</b> : 1mm<br><br><b>⑥ Mounting type/Termination type</b><br>H : Horizontal SMT<br>V : Vertical SMT<br>C : Plug – discrete wire (crimp contact)<br>F : Plug – FPC<br>SD : Plug – micro-coaxial cable<br><br><b>⑦ Additional separate component</b><br>GND : Ground plate (Note 2) |

Note 1 : Number of contacts will differ depending on the connector style.

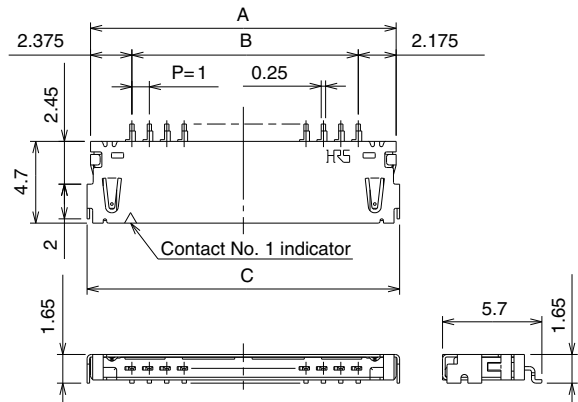
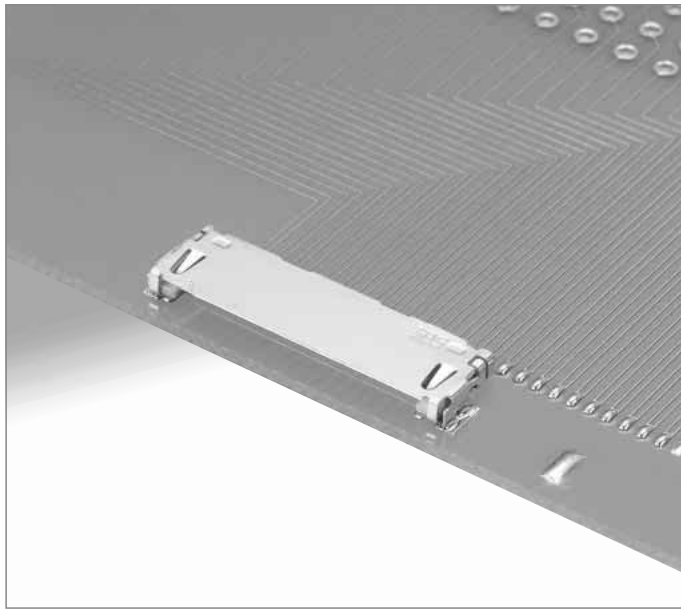
Note 2 : Grounding plates are required when terminating with the FPC and micro-coaxial cable.

### ● Contact

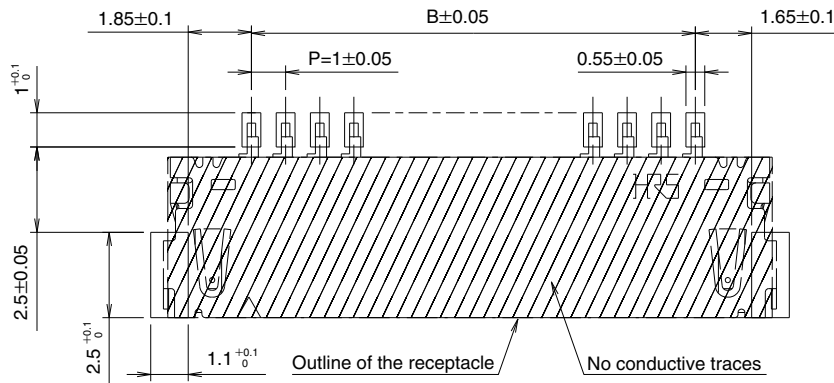
|              |          |             |            |          |             |
|--------------|----------|-------------|------------|----------|-------------|
| <b>DF19A</b> | <b>-</b> | <b>2830</b> | <b>SCF</b> | <b>A</b> | <b>(**)</b> |
| ①            |          | ②           | ③          | ④        |             |

|  |   |
|--|---|
| <b>① Conductor size</b><br>2830 : 28 to 30 AWG<br>3032 : 30 to 32 AWG<br>36 : 36 AWG | <b>③ Plating</b><br>A : Gold  |
| <b>② Contact type</b><br>SCF : Plug contact, tape and reel packaging                 | <b>④ Packaging</b><br>Blank : 10,000 pcs/reel<br>(41) : 20,000 pcs/reel |

## ■ Right angle receptacle, top-board mounting



## ◆ PCB mounting pattern



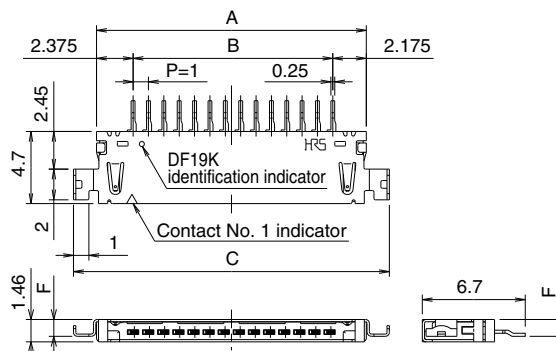
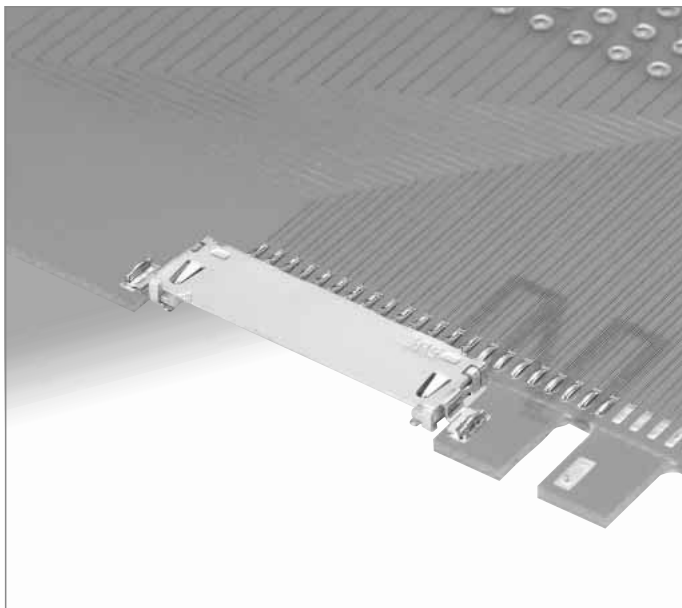
Specification  
 (54) : Tape & reel packaging  
 (1,000 pcs/reel)

Unit : mm

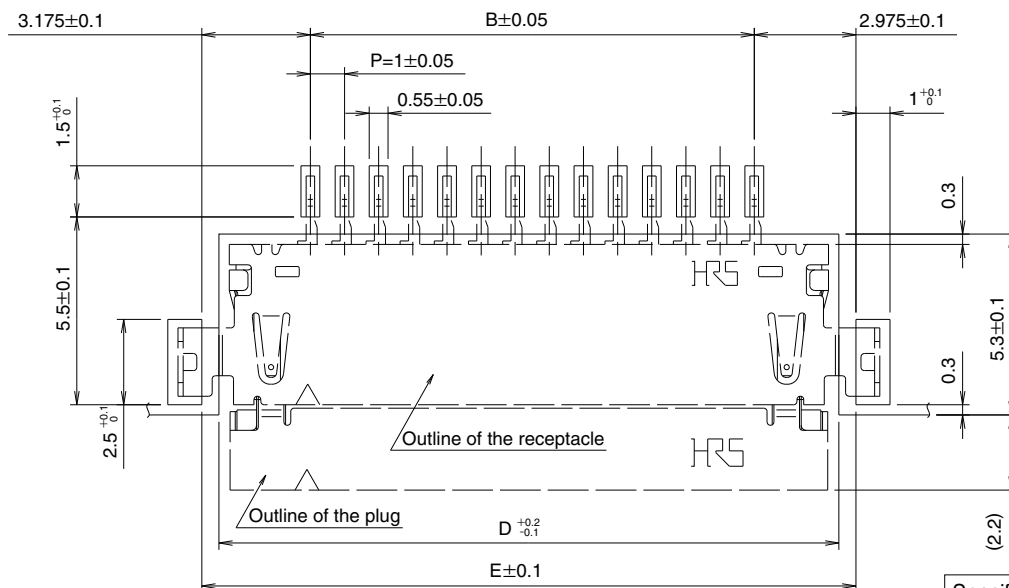
| Part No.          | HRS No.       | No. of contacts | A     | B  | C     | Remarks     | RoHS |
|-------------------|---------------|-----------------|-------|----|-------|-------------|------|
| DF19G- 8P-1H (54) | 685-0021-0 54 | 8               | 11.55 | 7  | 11.95 | 1.65mm high | YES  |
| DF19G-14P-1H (54) | 685-0004-0 54 | 14              | 17.55 | 13 | 17.95 |             |      |
| DF19G-20P-1H (54) | 685-0006-6 54 | 20              | 23.55 | 19 | 23.95 |             |      |
| DF19G-30P-1H (54) | 685-0015-7 54 | 30              | 33.55 | 29 | 33.95 |             |      |

Note : Order by number of reels.

## Right angle receptacle, offset mounting



## PCB mounting pattern



Specification  
(54) : Tape & reel packaging  
(1,000 pcs/reel)

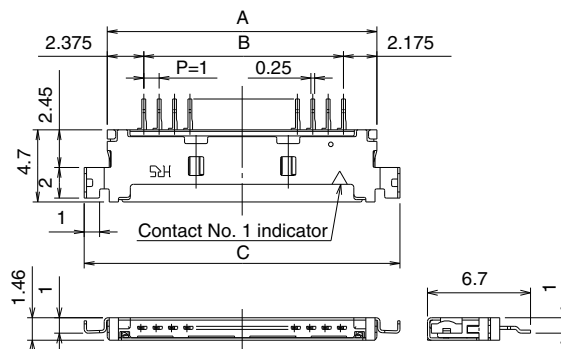
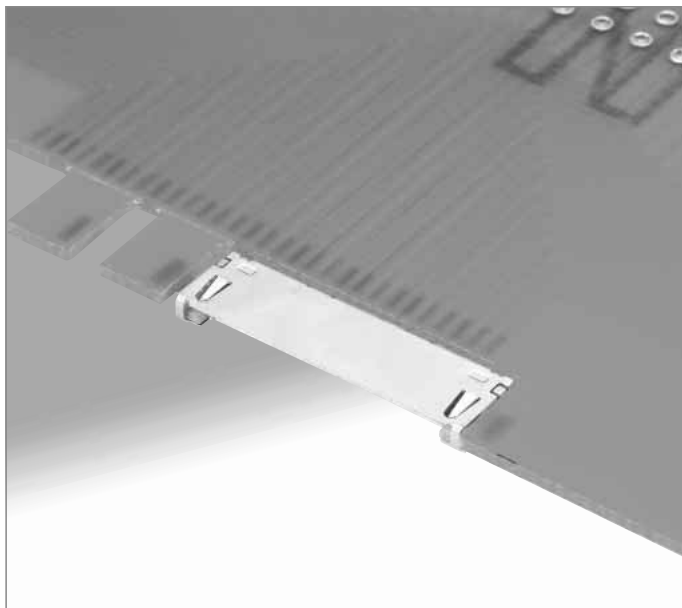
Unit : mm

| Part No.          | HRS No.       | No. of contacts | A     | B  | C     | D     | E     | F   | Remarks    | RoHS |
|-------------------|---------------|-----------------|-------|----|-------|-------|-------|-----|------------|------|
| DF19K-20P-1H (54) | 685-0008-1 54 | 20              | 23.55 | 19 | 26.55 | 24.15 | 25.15 | 0.1 | 1.0mm high | YES  |
| DF19K-30P-1H (54) | 685-0032-6 54 | 30              | 33.55 | 29 | 36.55 | 34.15 | 35.15 | 0.1 |            |      |

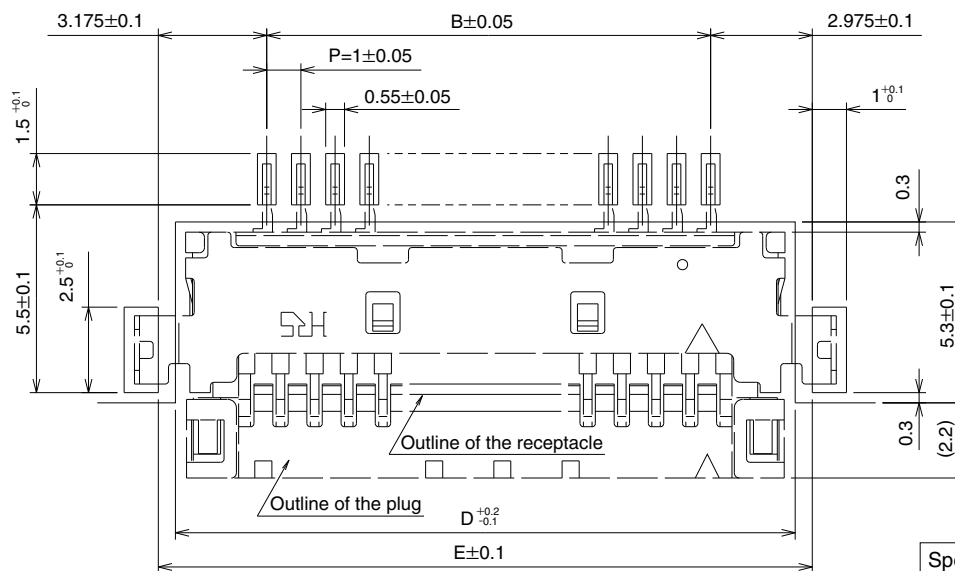
| Part No.          | HRS No.       | No. of contacts | A     | B  | C     | D     | E     | F   | Remarks    | RoHS |
|-------------------|---------------|-----------------|-------|----|-------|-------|-------|-----|------------|------|
| DF19L-14P-1H (54) | 685-0003-8 54 | 14              | 17.55 | 13 | 20.55 | 18.15 | 19.15 | 1.1 | 1.1mm high | YES  |
| DF19L-20P-1H (54) | 685-0019-8 54 | 20              | 23.55 | 19 | 26.55 | 24.15 | 25.15 | 1.1 |            |      |
| DF19L-30P-1H (54) | 685-0016-0 54 | 30              | 33.55 | 29 | 36.55 | 34.15 | 35.15 | 1.1 |            |      |

Note : Order by number of reels.

## Right angle receptacle, reverse offset mounting



## PCB mounting pattern



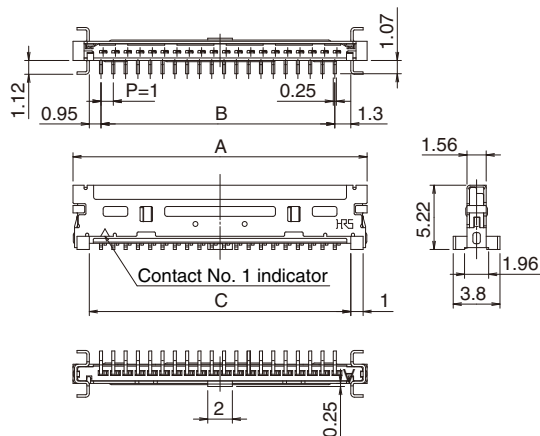
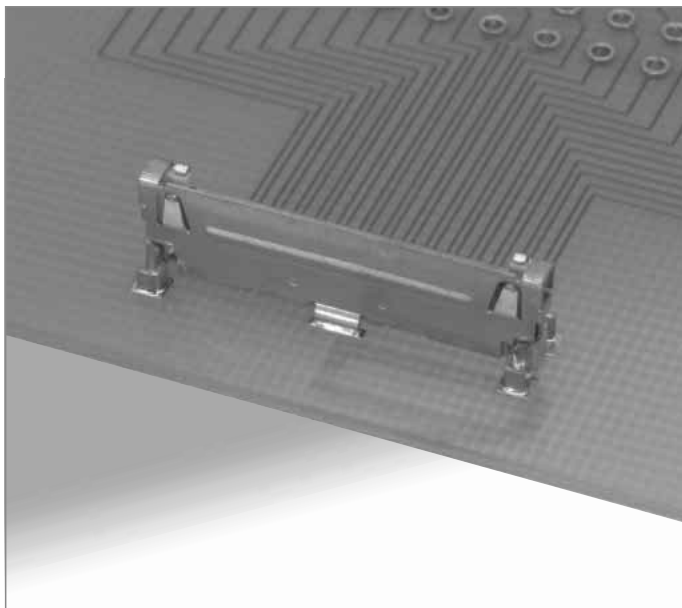
Specification  
(54) : Tape & reel packaging  
(1,000 pcs/reel)

Unit : mm

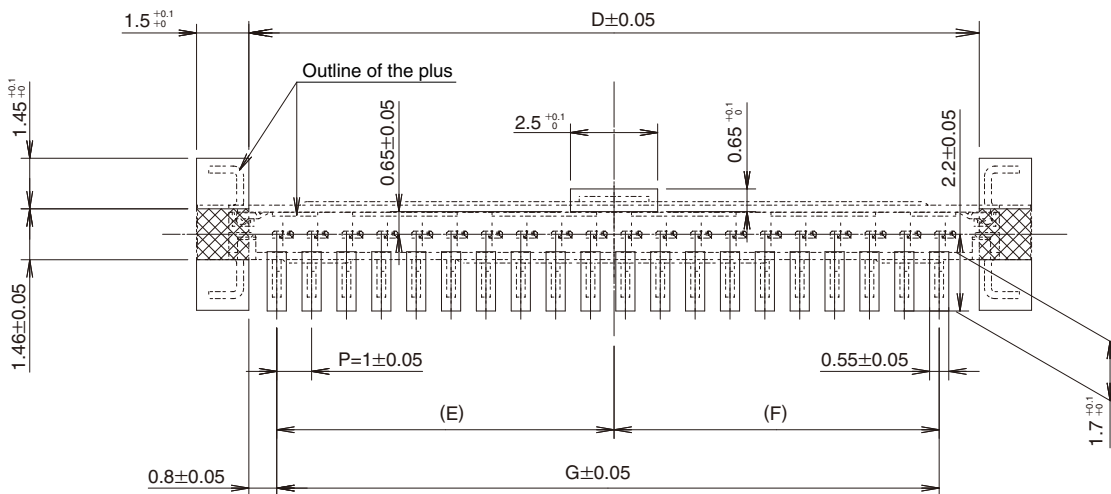
| Part No.           | HRS No.       | No. of contacts | A     | B  | C     | D     | E     | Remarks    | RoHS |
|--------------------|---------------|-----------------|-------|----|-------|-------|-------|------------|------|
| DF19KR-14P-1H (54) | 685-0024-8 54 | 14              | 17.55 | 13 | 20.55 | 18.15 | 19.15 | 1.0mm high | YES  |
| DF19KR-20P-1H (54) | 685-0023-5 54 | 20              | 23.55 | 19 | 26.55 | 24.15 | 25.15 |            |      |

Note : Order by number of reels.

## Vertical receptacle



## PCB mounting pattern



Conductive traces in this area must be covered by dielectric compound.

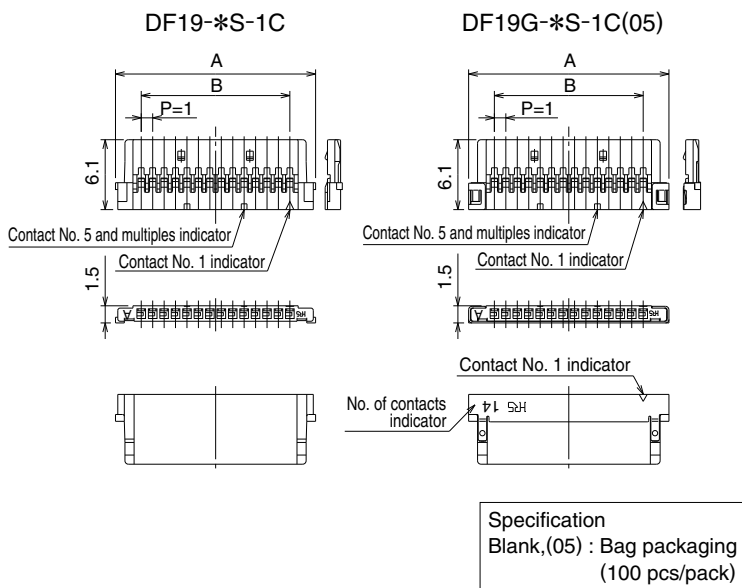
Specification  
 (56) : Tape & reel packaging  
 (1,000 pcs/reel)

Unit : mm

| Part No.         | HRS No.       | No. of contacts | A    | B  | C     | D     | E     | F     | G  | RoHS |
|------------------|---------------|-----------------|------|----|-------|-------|-------|-------|----|------|
| DF19-14P-1V (56) | 685-0036-7 56 | 14              | 17.9 | 13 | 15.25 | 14.95 | 6.675 | 6.325 | 13 | YES  |
| DF19-20P-1V (56) | 685-0037-0 56 | 20              | 23.9 | 19 | 21.25 | 20.95 | 9.675 | 9.325 | 19 |      |

Note : Order by number of reels.

## ■Plug (Discrete wire)



Unit : mm

| Part No.     | HRS No.    | No. of contacts | A    | B  | RoHS |
|--------------|------------|-----------------|------|----|------|
| DF19 - 8S-1C | 685-0029-1 | 8               | 11.5 | 7  | YES  |
| DF19 -14S-1C | 685-0012-9 | 14              | 17.5 | 13 |      |
| DF19 -20S-1C | 685-0011-6 | 20              | 23.5 | 19 |      |
| DF19 -30S-1C | 685-0013-1 | 30              | 33.5 | 29 |      |

| Part No.          | HRS No.       | No. of contacts | A    | B  | RoHS |
|-------------------|---------------|-----------------|------|----|------|
| DF19G - 8S-1C(05) | 685-0022-2 05 | 8               | 11.5 | 7  | YES  |
| DF19G -14S-1C(05) | 685-0005-3 05 | 14              | 17.5 | 13 |      |
| DF19G -20S-1C(05) | 685-0007-9 05 | 20              | 23.5 | 19 |      |
| DF19G -30S-1C(05) | 685-0014-4 05 | 30              | 33.5 | 29 |      |

Note: Order by number of bags.

## ■Crimp contacts

| Part No.            | HRS No.       | Packaging   | Quantity                           | Finish      | RoHS |
|---------------------|---------------|-------------|------------------------------------|-------------|------|
| DF19A-2830SCFA (**) | 685-0048-6 ** | Tape & reel | See Specifications<br>number below | Gold plated | YES  |
| DF19A-3032SCFA (**) | 685-0046-0 ** |             |                                    |             |      |
| DF19A- 36SCFA (**)  | 685-0047-3 ** |             |                                    |             |      |

Specification number \*\*(\*\* \*\*)  
Blank : Tape & reel packaging (10,000 pcs/reel)  
(41) : Tape & reel packaging (20,000 pcs/reel)

### ●Applicable cable (Tin plated annealed conductor)

| Wire size (stranded wire conductor) | Jacket diameter |
|-------------------------------------|-----------------|
| 28 AWG (7/ 0.127mm)                 | 0.5mm to 0.6mm  |
| 30 AWG (7/ 0.1mm)                   |                 |
| 32 AWG (7/ 0.08mm)                  | 0.27mm          |
| 36 AWG (7/ 0.05mm)                  |                 |

### ●Applicable UL style UL1571(thin type) (Note2)

### ●Strip length 1.2mm to 1.9mm

Note 1 : When using other than the recommended wire, contact your Hirose sales representative.

Note 2 : Contact your Hirose sales representative when using 36 AWG.

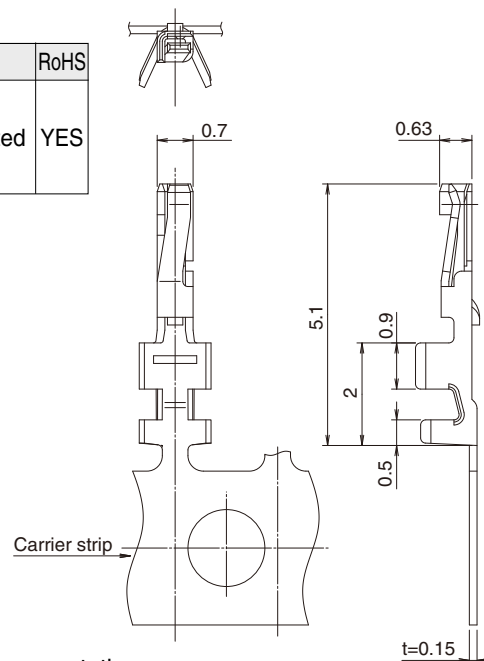
### ●Tools

| Part       | Part No.    | HRS No.    |
|------------|-------------|------------|
| Applicator | AP105-DF19S | 901-4571-3 |
| Press unit | CM-105C     | 901-0001-0 |

Note 1 : Use of other than Hirose Electric approved tools will void the product warranties.

Note 2 : Contact Hirose for the wire stripping, contact crimp and contact insertion instructions.

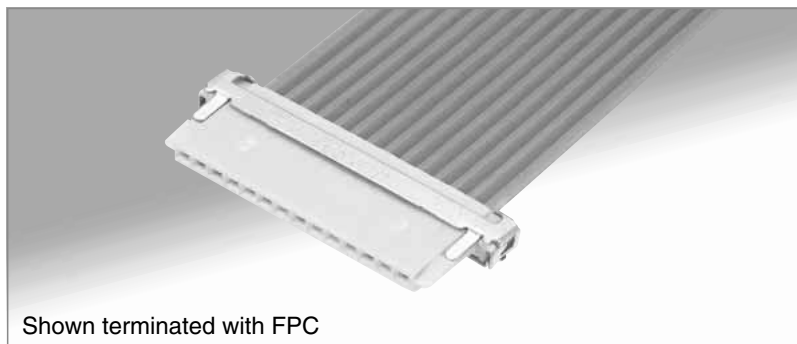
Note 3 : Please do the crimping operations according to the "Crimping quality standard" and "Crimping condition table".



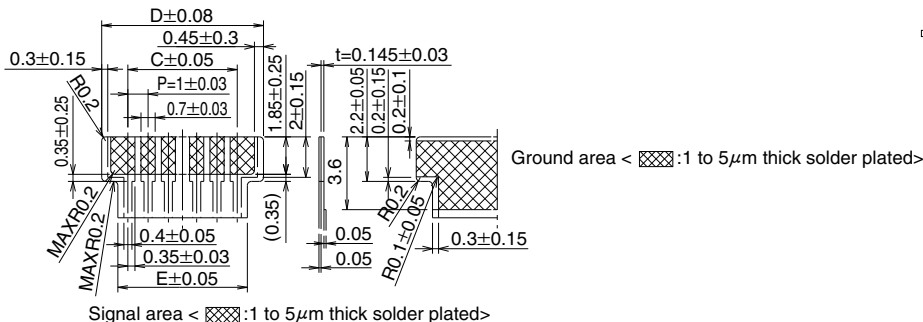
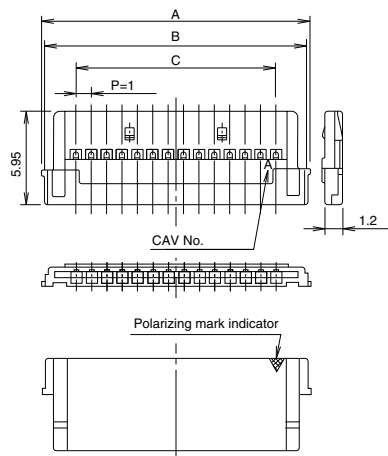


## ■ Plug (Flat Printed Circuit)

Note: Socket and grounding plate is required.



Shown terminated with FPC



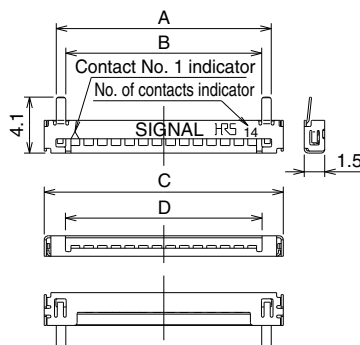
Unit : mm

| Part No.         | HRS No.       | No. of contacts | A    | B    | C  | D    | E  | RoHS |
|------------------|---------------|-----------------|------|------|----|------|----|------|
| DF19G-14S-1F(05) | 685-0017-2 05 | 14              | 17.5 | 17.1 | 13 | 15.6 | 14 | YES  |
| DF19G-20S-1F(05) | 685-0009-4 05 | 20              | 23.5 | 23.1 | 19 | 21.6 | 20 |      |
| DF19G-30S-1F(05) | 685-0033-9 05 | 30              | 33.5 | 33.1 | 29 | 31.6 | 30 |      |

Specification  
(05) : Bag packaging  
(100 pcs/pack)

Note : Order by number of bags.

## ■ Ground plate for FPC



Unit : mm

| Part No.             | HRS No.       | No. of contacts | A     | B     | C    | D    | RoHS |
|----------------------|---------------|-----------------|-------|-------|------|------|------|
| DF19G-14S-1F-GND(05) | 685-0018-5 05 | 14              | 15.75 | 14.35 | 17.5 | 14.4 | YES  |
| DF19G-20S-1F-GND(05) | 685-0010-3 05 | 20              | 21.75 | 20.35 | 23.5 | 20.4 |      |
| DF19G-30S-1F-GND(05) | 685-0034-1 05 | 30              | 31.75 | 30.35 | 33.5 | 30.4 |      |

Specification  
(05) : Bag packaging  
(100 pcs/pack)

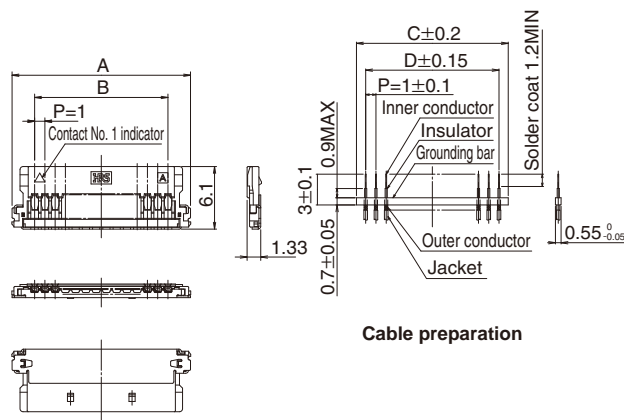
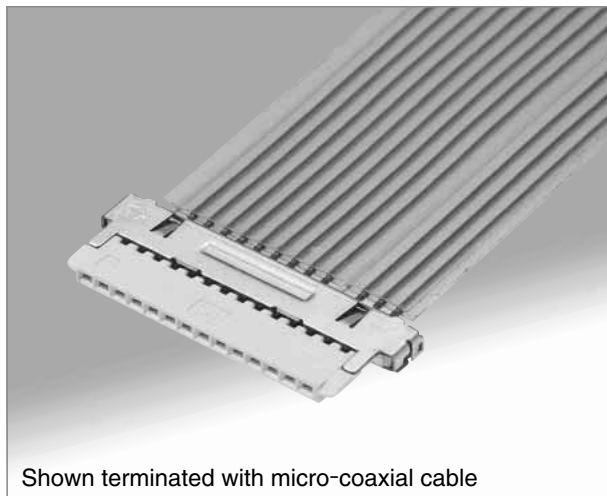
Note : Order by number of bags.

## ● Grounding plate installation tools

| Type                       | Part No.         | HRS No.    |
|----------------------------|------------------|------------|
| Desktop tool (for 14 pos.) | DF19G-14S/PR-MD2 | 902-4514-6 |
| Desktop tool (for 20 pos.) | DF19G-20S/PR-MD2 | 902-4513-3 |
| Desktop tool (for 30 pos.) | DF19G-30S/PR-MD2 | 902-4518-7 |

Note1 : Product is not guaranteed unless Hirose approved tools are used.

## ■ Plug (Micro-coaxial cable)



Note 1 : Connectors are designed to allow termination without cutting of the pitch loss prevention tape.

Note 2 : Required Solder coating for inner conductor.

Note 3 : When using 2-conductor micro-coaxial cable some contact positions will not be used.

Contact your Hirose sales representative.

| Part No.          | HRS No.       | No. of contacts | A    | B  | C    | D  | RoHS |
|-------------------|---------------|-----------------|------|----|------|----|------|
| DF19G-14S-1SD(05) | 685-0026-3 05 | 14              | 17.4 | 13 | 14.8 | 13 | YES  |
| DF19G-20S-1SD(05) | 685-0025-0 05 | 20              | 23.4 | 19 | 20.8 | 19 |      |

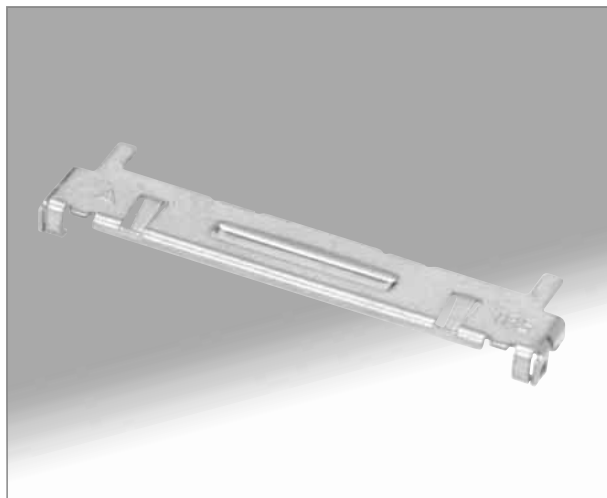
Specification  
(05) : Bag packaging  
(100 pcs/pack)

Note : Order by number of bags.

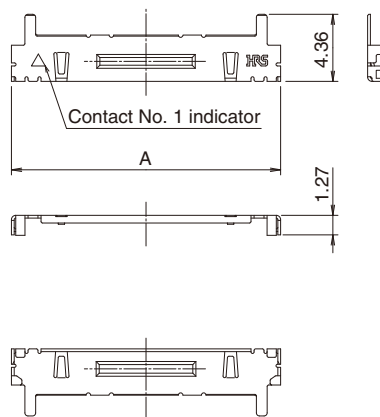
### ● Applicable cable (Micro-coaxial cable)

| Wire size (stranded wire center conductor) | Jacket diameter |
|--|-----------------|
| 40 AWG (7/ 0.03mm)                         | 0.3mm to 0.4mm  |

## ■ Grounding plate for micro-coaxial cable



Specification  
Blank : Bag packaging  
(100 pcs/pack)

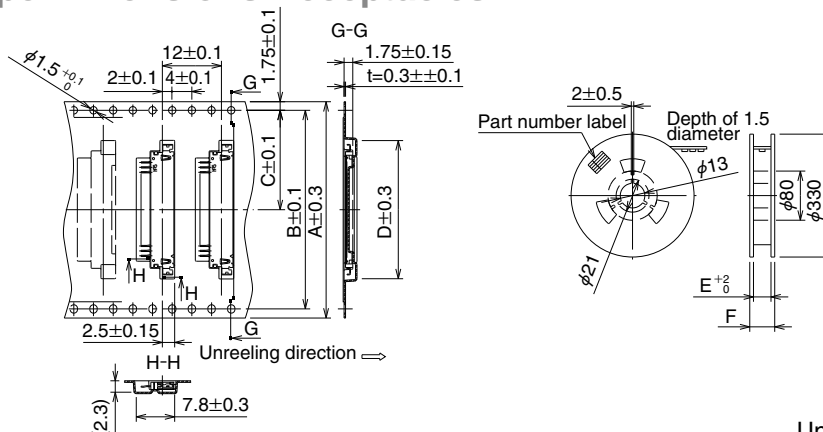


Unit : mm

| Part No.          | HRS No.    | No. of contacts | A    | RoHS |
|-------------------|------------|-----------------|------|------|
| DF19G-14S-1SD-GND | 685-0028-9 | 14              | 17.5 | YES  |
| DF19G-20S-1SD-GND | 685-0027-6 | 20              | 23.5 |      |

### ◆Embossed Carrier Tape Dimensions Receptacles

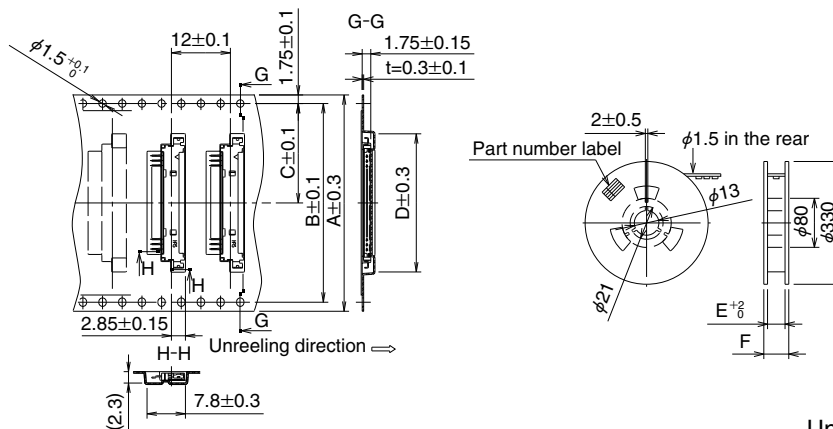
- DF19G- \*P-1H(54)
- DF19K- \*P-1H(54)
- DF19L- \*P-1H(54)



Unit : mm

| Connector        | No. of contacts | A  | B    | C    | D    | E    | F    | Remarks                             |
|------------------|-----------------|----|------|------|------|------|------|-------------------------------------|
| DF19G- 8P-1H(54) | 8               | 24 | —    | 11.5 | 16.1 | 24.4 | 30.4 | Top-board mounting<br>(1.65mm high) |
| DF19G-14P-1H(54) | 14              | 44 | 40.4 | 20.2 | 22.1 | 44.4 | 50.4 |                                     |
| DF19G-20P-1H(54) | 20              | 44 | 40.4 | 20.2 | 28.1 | 44.4 | 50.4 |                                     |
| DF19K-20P-1H(54) | 20              | 44 | 40.4 | 20.2 | 28.1 | 44.4 | 50.4 | Offset mounting<br>(1.0mm high)     |
| DF19K-30P-1H(54) | 30              | 56 | 52.4 | 26.2 | 38.1 | 56.4 | 62.4 |                                     |
| DF19L-14P-1H(54) | 14              | 44 | 40.4 | 20.2 | 22.1 | 44.4 | 50.4 | Offset mounting<br>(1.1mm high)     |
| DF19L-20P-1H(54) | 20              | 44 | 40.4 | 20.2 | 28.1 | 44.4 | 50.4 |                                     |
| DF19L-30P-1H(54) | 30              | 56 | 52.4 | 26.2 | 38.1 | 56.4 | 62.4 |                                     |

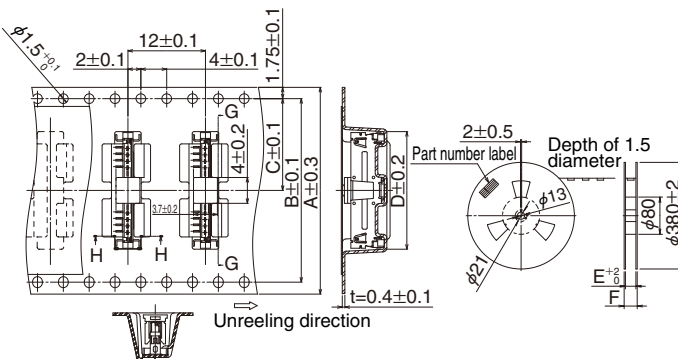
- DF19KR- \*P-1H(54)



Unit : mm

| Connector         | No. of contacts | A  | B    | C    | D    | E    | F    | Remarks                      |
|-------------------|-----------------|----|------|------|------|------|------|------------------------------|
| DF19KR-14P-1H(54) | 14              | 44 | 40.4 | 20.2 | 22.1 | 44.4 | 50.4 | Reverse type of DF19K        |
| DF19KR-20P-1H(54) | 20              | 44 | 40.4 | 20.2 | 28.1 | 44.4 | 50.4 | Offset mounting (1.0mm high) |

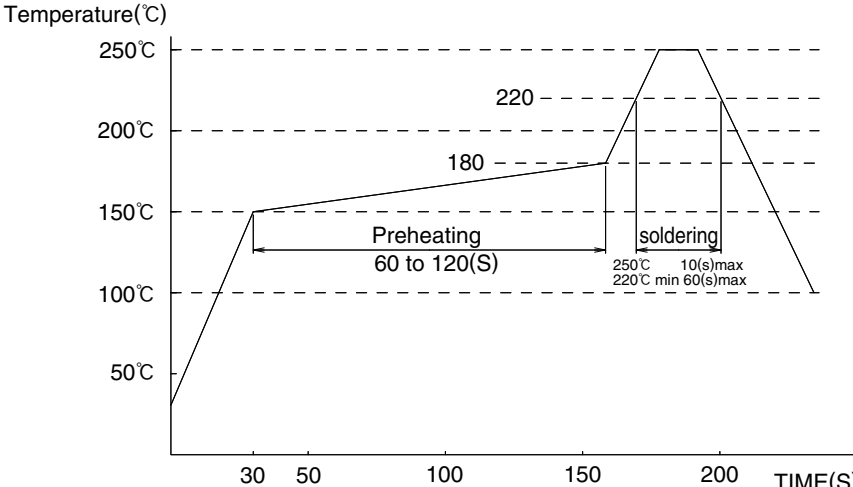
- DF19- \*P-1V(56)



Unit : mm

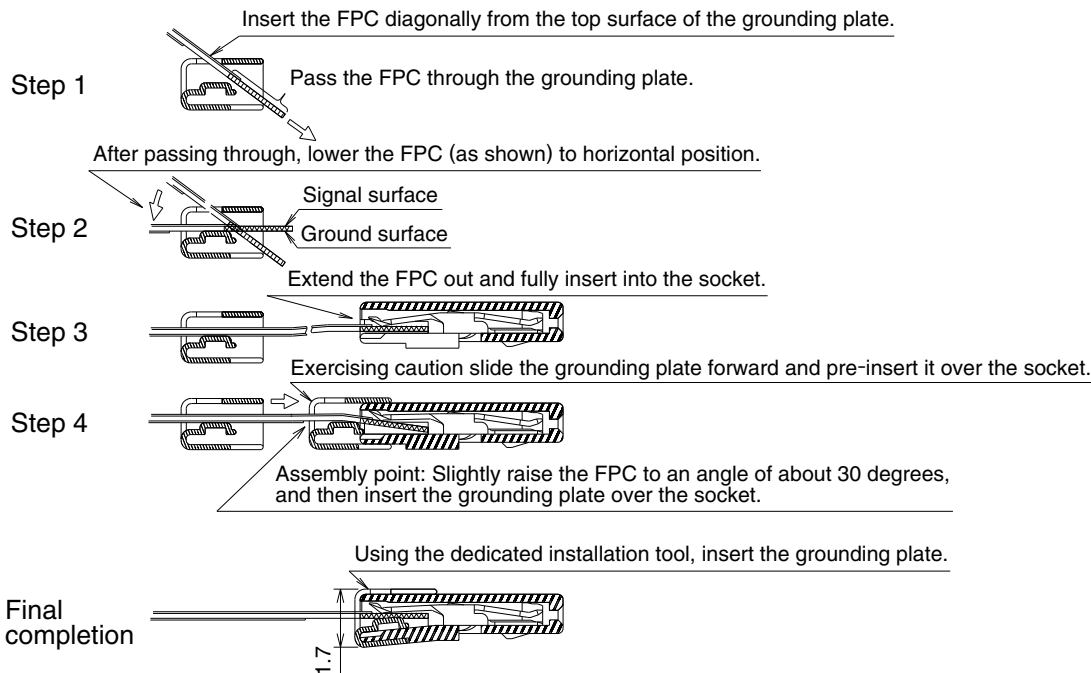
| Connector       | No. of contacts | A  | B    | C    | D    | E    | F    | Remarks             |
|-----------------|-----------------|----|------|------|------|------|------|---------------------|
| DF19-14P-1V(56) | 14              | 32 | 28.4 | 14.2 | 18.2 | 32.4 | 38.4 | Vertical receptacle |
| DF19-20P-1H(56) | 20              | 44 | 40.4 | 20.2 | 24.2 | 44.4 | 50.4 |                     |

◆ Use recommendations

|   |  |
|---|--|
| <p>1. Recommended temperature profile</p> |  <p>Note 1 : Up to 2 cycles of Reflow soldering are possible under the same conditions, provided that there is a return to normal temperature between the first and second cycle.</p> <p>Note 2 : The temperature profile indicates the board surface temperature at the point of contacts with the connector terminals.</p> <p>Note 3 : The product can be used without trouble though the surface of a grounding plate might discolor.</p> |
| <p>2. Manual soldering</p>                | <p>Manual soldering : 290±10°C for 3 seconds</p>   |
| <p>3. Screen thickness</p>                | <p>0.15mm</p>  |
| <p>4. Board warpage</p>                   | <p>Maximum of 0.03mm at the connector center, with both ends of the connector as reference points.</p>   |
| <p>5. Cleaning conditions</p>             | <p>Refer to “Wire-to-Board Connector Use Handbook.”</p>  |
| <p>6. Termination conditions</p>          | <p>Refer to “Wire-to-Board Connector Use Handbook.”</p>  |
| <p>7. Cautions</p>                        | <p>■ Do not twist when mating/un-mating.</p>   |
| <p>8. Precautions</p>                     | <p>Refer to “Wire-to-Board Connector Use Handbook.”</p>  |

Mar. 1. 2020 Copyright 2020 HIROSE ELECTRIC CO., LTD. All Rights Reserved.

## ◆ Plug (FPC Type) Termination Procedures (Dedicated Assembly Tooling is required.)



Note 1 : The grounding plate and the plug are supplied as separate components.

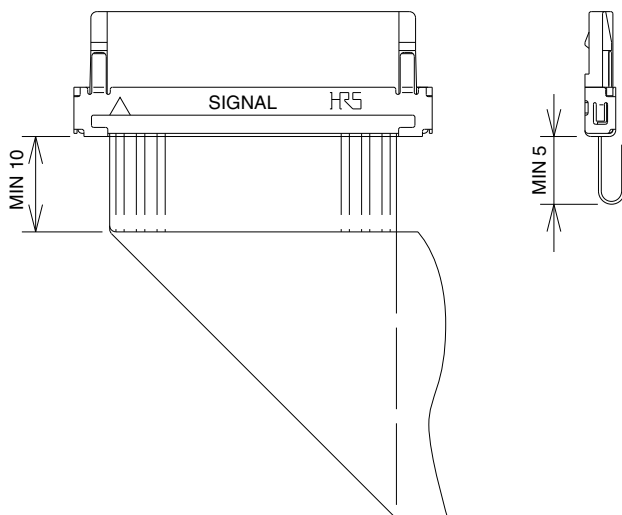
Note 2 : Dedicated assembly fixtures are required at each stage of the termination process. For detail, refer to the instruction manual supplied with the tools.

Note 3 : Do not apply excessive forces to FPC (Bending or twisting) as it may introduce cracks in the copper foil (on the cover film edge).

Note 4 : To protect the FPC, insertion and disconnection of the connectors should be performed parallel to the mating direction.

Note 5 : Do not apply excessive tension to FPC.

Note 6 : Refer to FPC manufacturer for bend radius and other specific recommendation. Distance should be allowed for the bending position, as illustrated below.



Note 7 : Follow the instruction manuals for the termination and assembly fixtures and tools.