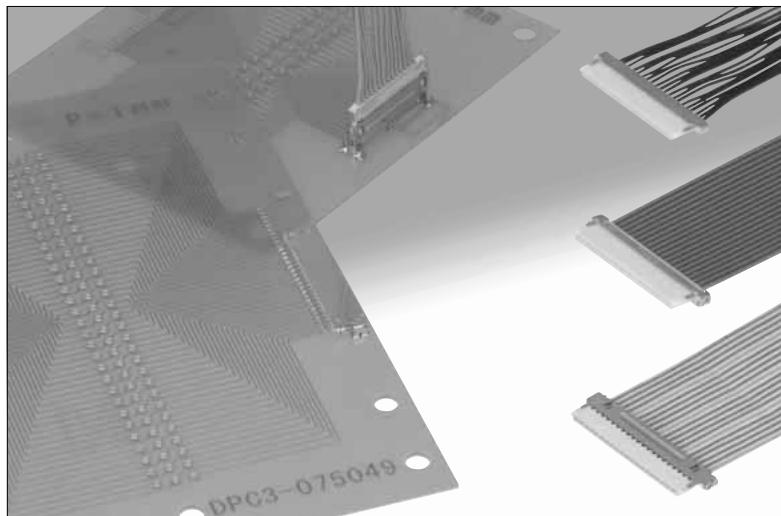


1mm Contact Pitch, Board-to-Cable, Board-to-FPC, Board-to-Micro-coaxial Cable Connectors

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

1. 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.

2. Common use of receptacle

The same receptacle will accept plugs terminated with discrete wire, FPC or micro-coaxial cable.

3. Uniform external dimensions

The plug assembly external dimensions remain the same when is terminated with discrete wire, FPC or micro-coaxial cable.

4. Variety of mounting styles

Device design engineers have a choice of mounting styles : top-board, offset, reverse mount offset and vertical.

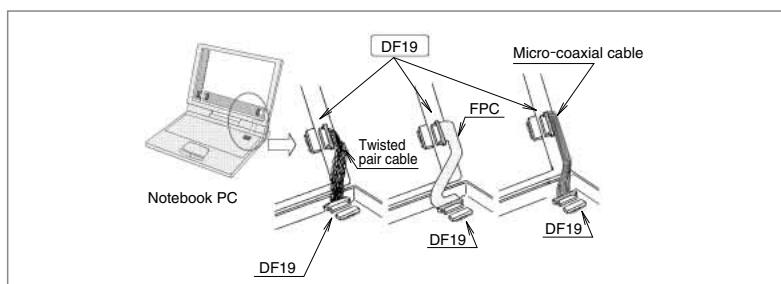
5. Ground connection

Metal grounding plates connect with the common ground line.

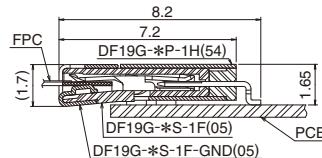
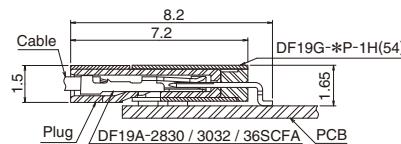
6. Glow wire compliance (Compliant with IEC60695-2-11)

Applications

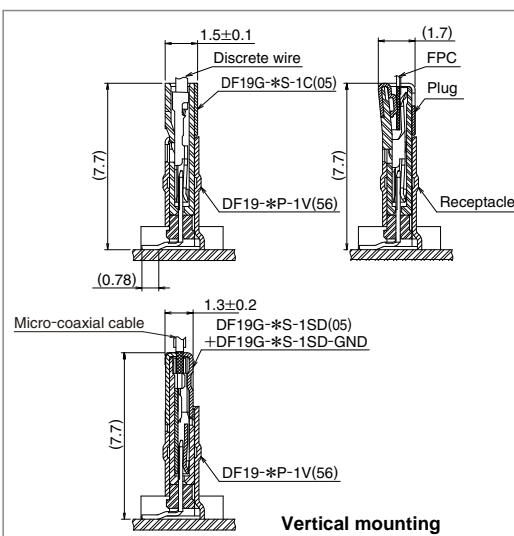
LCD connections in small consumer devices : digital cameras, notebook computers, PDA's. Any device requiring high-density interconnection for consistent high speed transmission data rates.



Small configuration and board space



Horizontal mounting

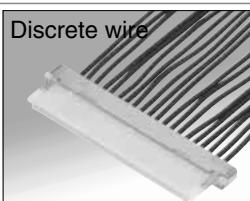


Vertical mounting

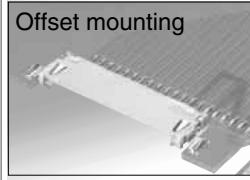
Top-board mounting



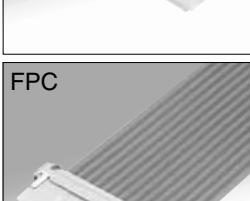
Discrete wire



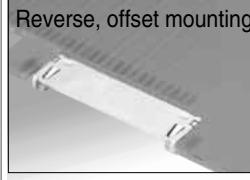
Offset mounting



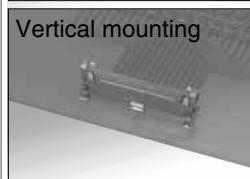
FPC



Reverse, offset mounting



Vertical mounting



Micro-coaxial cable



■Product Specifications

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

| 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 $1\mu s$ 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) Insulation resistance : 500MΩ min. | 96 hours at temperature of $40 \pm 2^\circ C$ and humidity of 90% to 95% |
| 7. Temperature cycle | Contact resistance : 30mΩ max. (50mΩ max. for FPC) Insulation resistance : 500MΩ min. | Temperature : $-55^\circ C \rightarrow +5^\circ C$ to $+35^\circ C \rightarrow +85^\circ C \rightarrow +5^\circ C$ to $+35^\circ C$ 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 Manual soldering : Soldering iron temperature $300^\circ C$, 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

| | | | | | | |
|-------------|----------|----------|----------|----------|----------|-----------------------|
| DF19 | # | * | P | - | 1 | H |
| ① | ② | ③ | ④ | ⑤ | ⑥ | |
| DF19 | # | * | S | - | 1 | F - GND |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

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

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

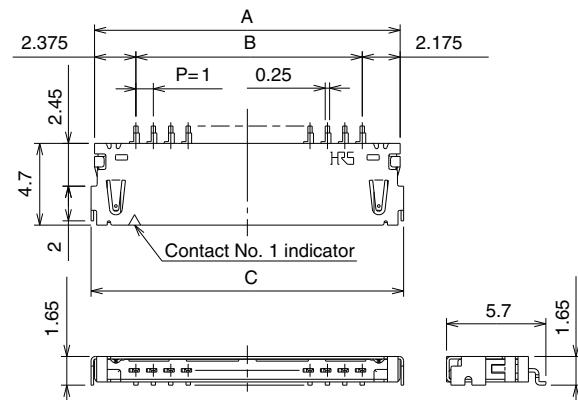
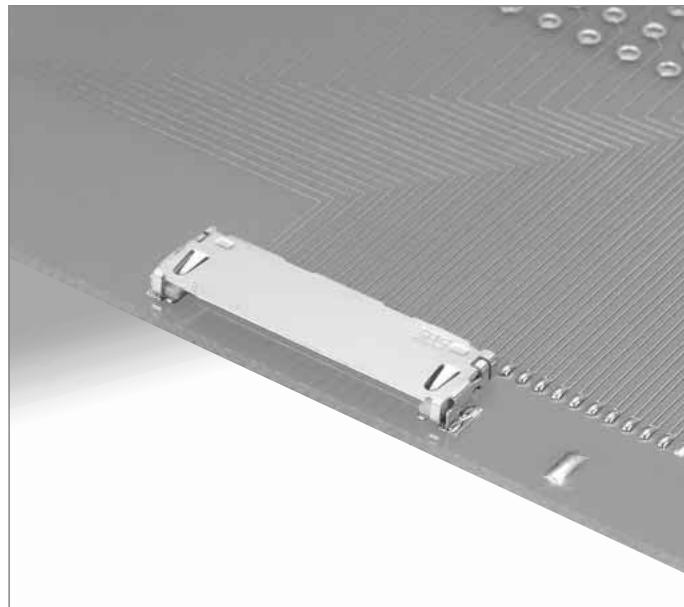
Note 2 : Grounding plates are required when terminating with the FPC and micro-coaxial cable.

● Contact

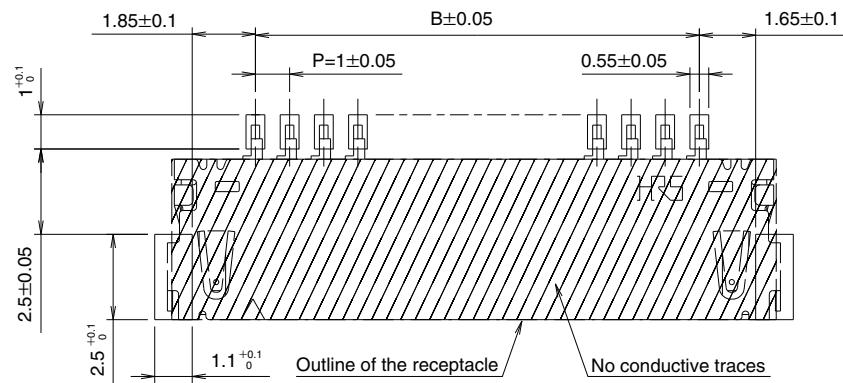
| | | | | | |
|--------------|----------|-------------|------------|----------|-------------|
| DF19A | - | 2830 | SCF | A | (**) |
| ① | ② | ③ | ④ | | |

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

■ Right angle receptacle, top-board mounting



◆ PCB mounting pattern



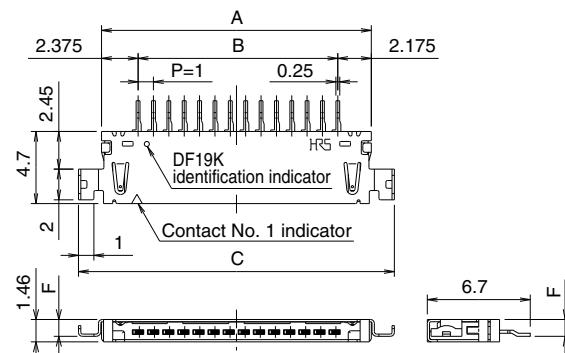
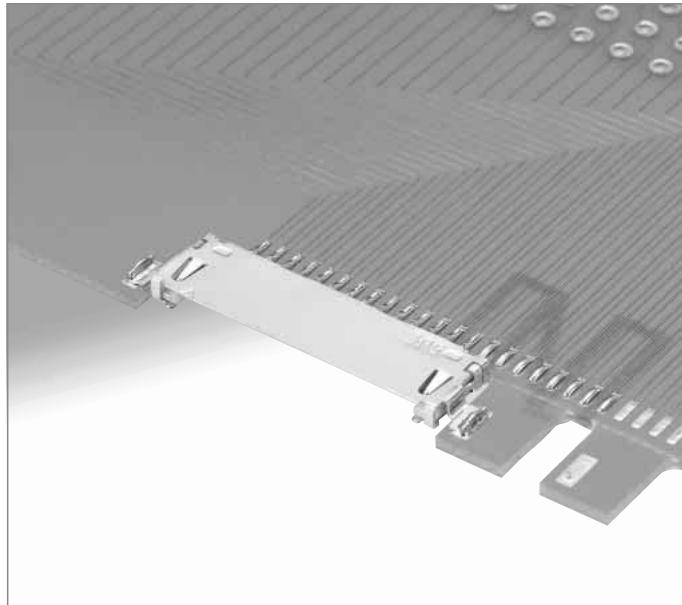
Specification
(54) : Tape & reel packaging
(1,000 pcs/reel)

Unit : mm

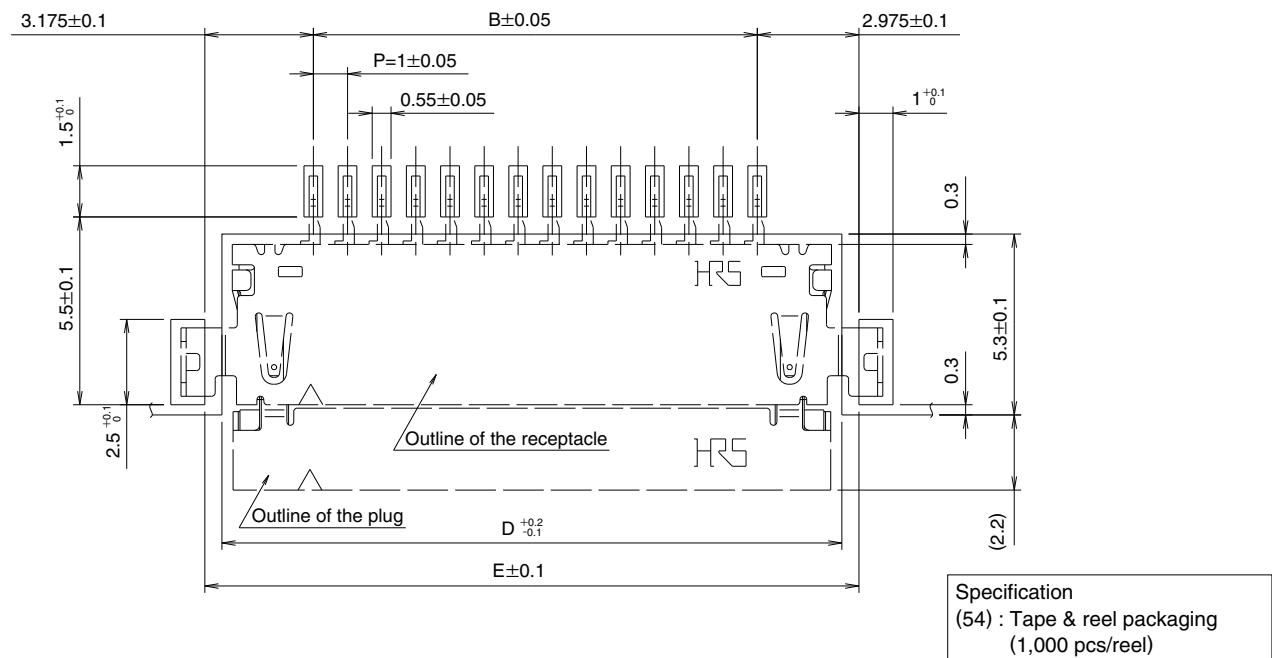
| Part No. | HRS No. | No. of contacts | A | B | C | Remarks | RoHS |
|-------------------|---------------|-----------------|-------|----|-------|-------------|------|
| DF19G- 8P-1H (54) | 685-0021-0 54 | 8 | 11.55 | 7 | 11.95 | 1.65mm high | YES |
| DF19G-14P-1H (54) | 685-0004-0 54 | 14 | 17.55 | 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

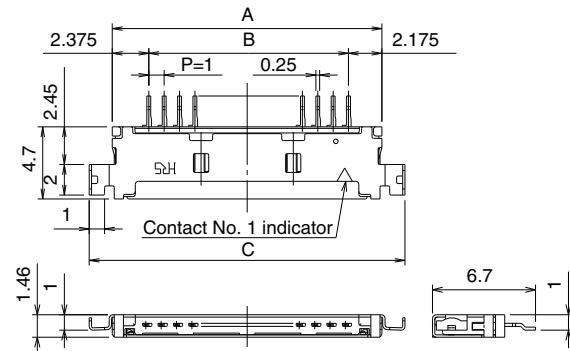
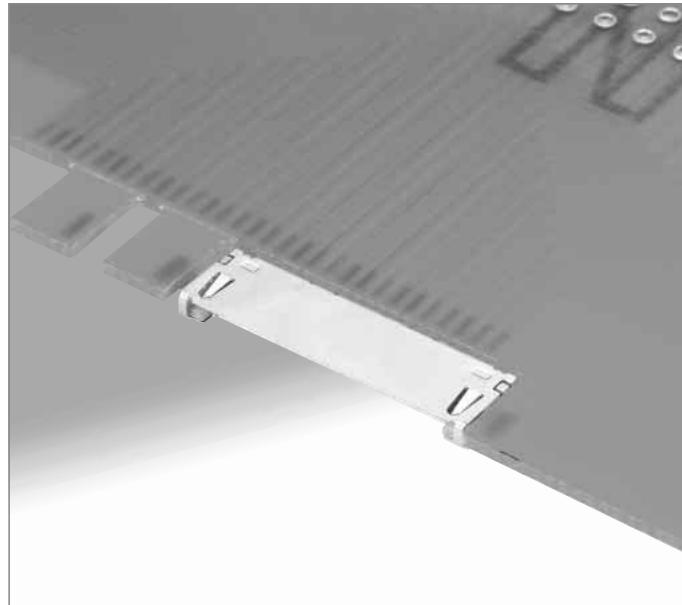


| Unit : mm | | | | | | | | | | |
|-------------------|---------------|-----------------|-------|----|-------|-------|-------|-----|------------|------|
| Part No. | HRS No. | No. of contacts | A | B | C | D | E | F | Remarks | RoHS |
| DF19K-20P-1H (54) | 685-0008-1 54 | 20 | 23.55 | 19 | 26.55 | 24.15 | 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 | | |

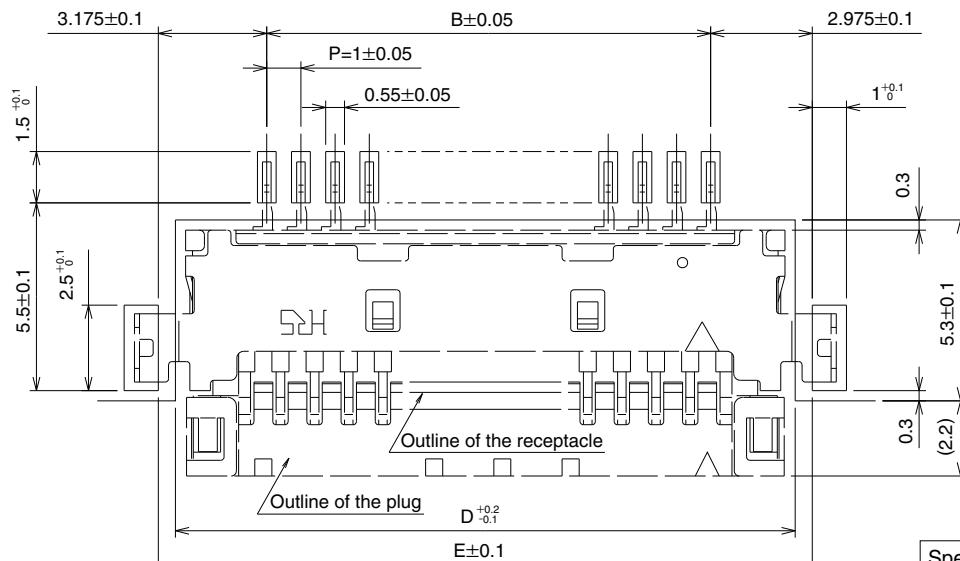
| Part No. | HRS No. | No. of contacts | A | B | C | D | E | F | Remarks | RoHS |
|-------------------|---------------|-----------------|-------|----|-------|-------|-------|-----|------------|------|
| DF19L-14P-1H (54) | 685-0003-8 54 | 14 | 17.55 | 13 | 20.55 | 18.15 | 19.15 | 1.1 | 1.1mm high | YES |
| 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



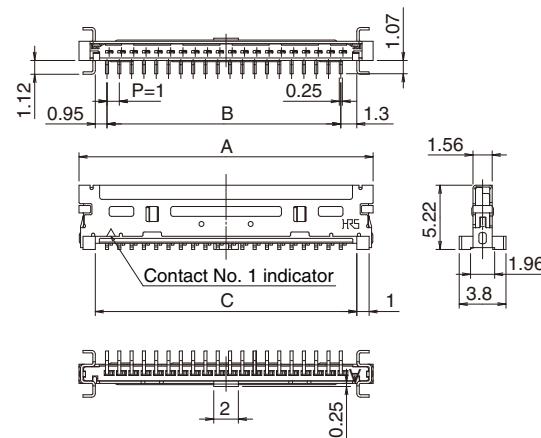
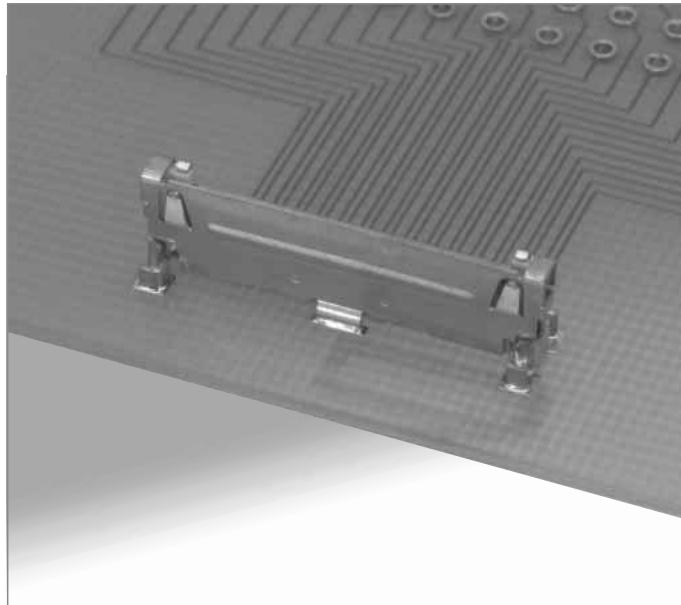
Specification
(54) : Tape & reel packaging
(1,000 pcs/reel)

Unit : mm

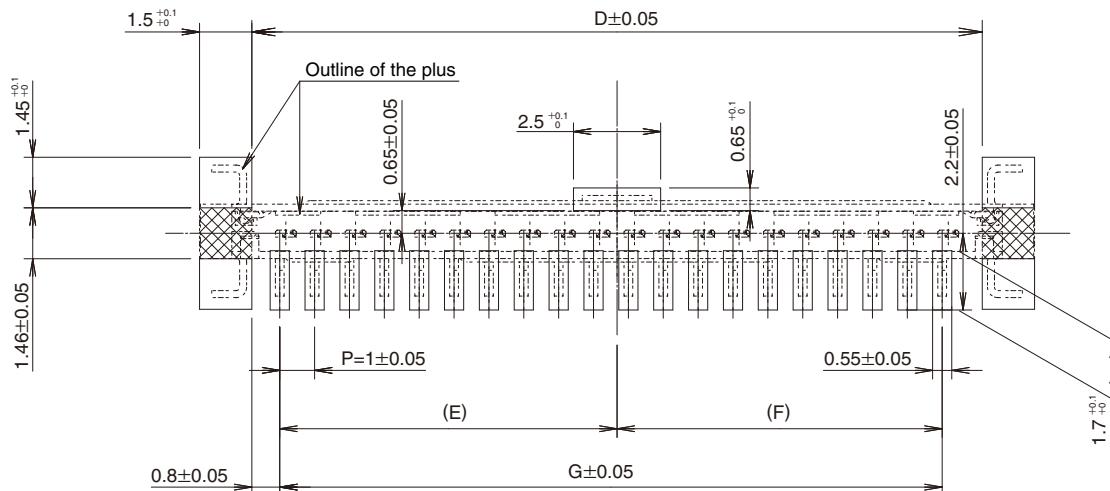
| Part No. | HRS No. | No. of contacts | A | B | C | D | E | Remarks | RoHS |
|--------------------|---------------|-----------------|-------|----|-------|-------|-------|------------|------|
| DF19KR-14P-1H (54) | 685-0024-8 54 | 14 | 17.55 | 13 | 20.55 | 18.15 | 19.15 | 1.0mm high | YES |
| DF19KR-20P-1H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

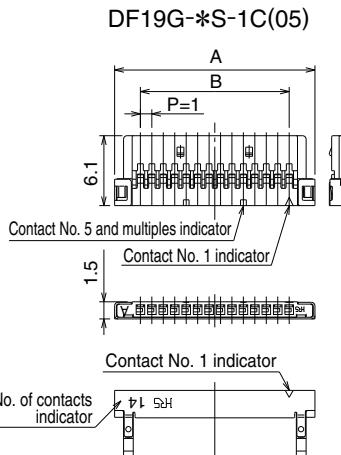
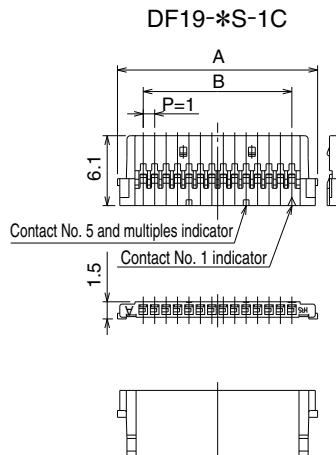
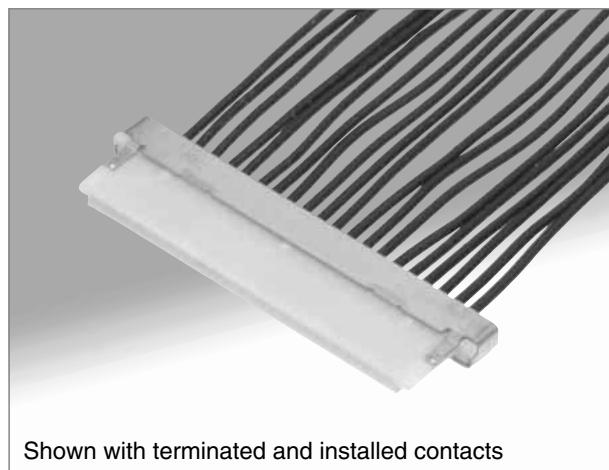
Specification
(56) : Tape & reel packaging
(1,000 pcs/reel)

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)



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

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 | |

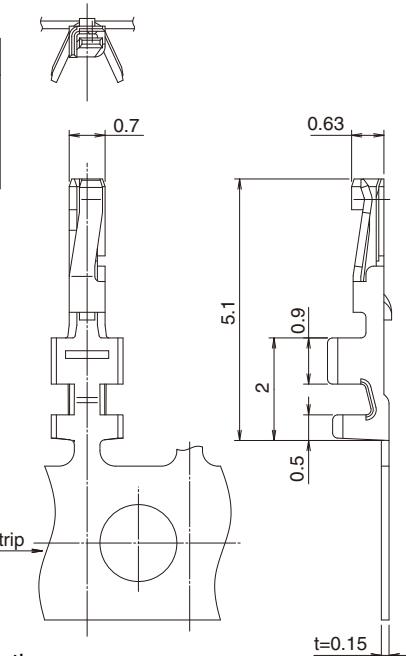
Note: Order by number of bags.

■ Crimp contacts

| Part No. | HRS No. | Packaging | Quantity | Finish | RoHS |
|----------------------|---------------|-------------|---------------------------------|-------------|------|
| DF19A-2830SCFA (* *) | 685-0048-6 ** | Tape & reel | See Specifications 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) | |
| 30 AWG (7/ 0.1mm) | 0.5mm to 0.6mm |
| 32 AWG (7/ 0.08mm) | |
| 36 AWG (7/ 0.05mm) | 0.27mm |

● 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 |

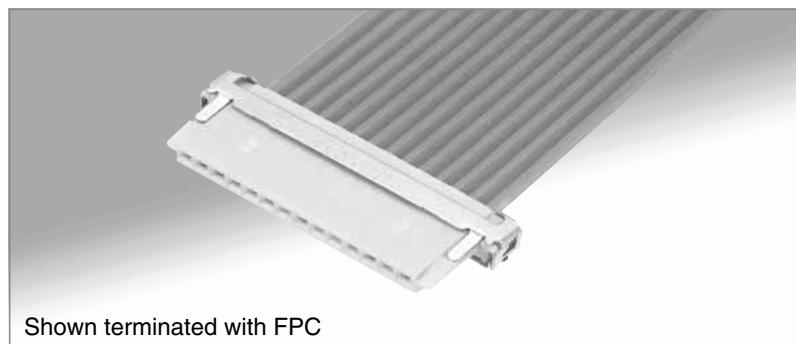
Note 1 : Use of other than Hirose Electric approved tools will void the product warranties.

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

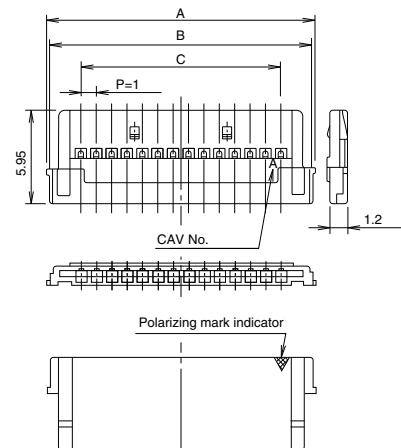
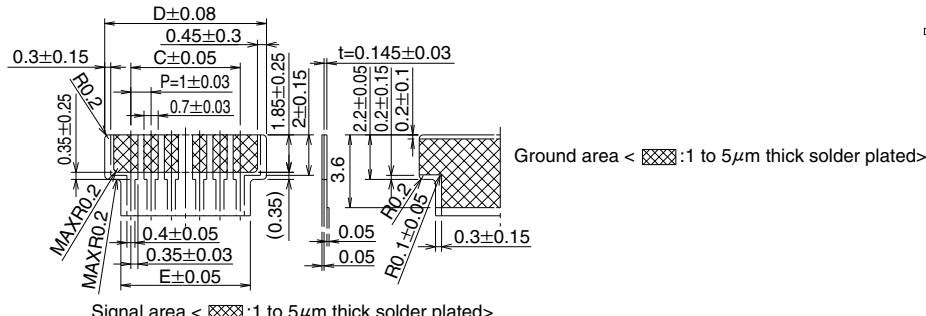
Note 3 : Please do the crimping operations according to the "Crimping quality standard" and "Crimping condition table".

■Plug (Flat Printed Circuit)

Note: Socket and grounding plate is required.



Shown terminated with FPC

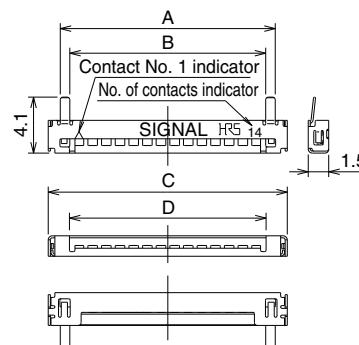


| Part No. | HRS No. | No. of contacts | A | B | C | D | E | RoHS |
|------------------|---------------|-----------------|------|------|----|------|----|------|
| DF19G-14S-1F(05) | 685-0017-2 05 | 14 | 17.5 | 17.1 | 13 | 15.6 | 14 | YES |
| DF19G-20S-1F(05) | 685-0009-4 05 | 20 | 23.5 | 23.1 | 19 |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



| 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)

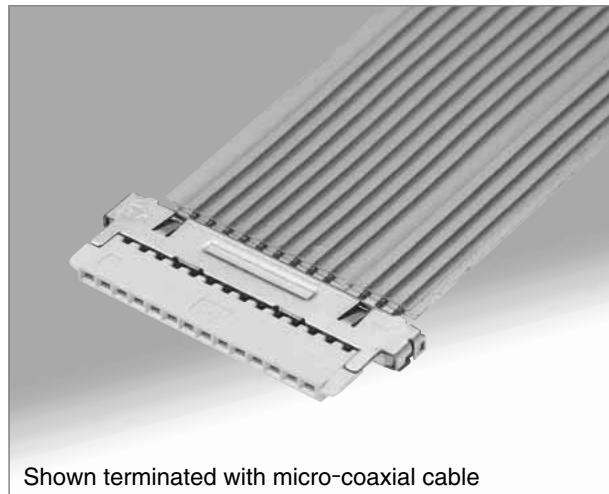
Note : Order by number of bags.

●Grounding plate installation tools

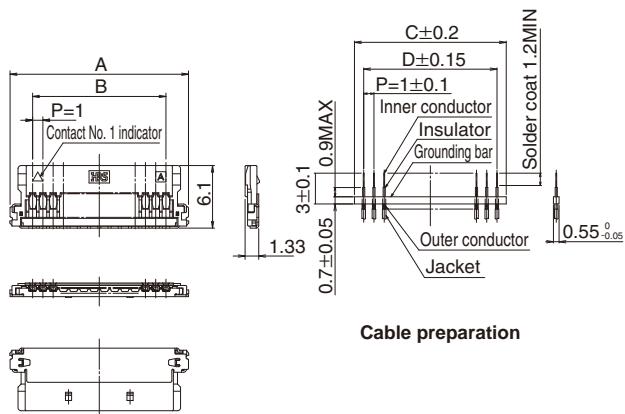
| Type | Part No. | HRS No. |
|----------------------------|------------------|------------|
| Desktop tool (for 14 pos.) | DF19G-14S/PR-MD2 | 902-4514-6 |
| Desktop tool (for 20 pos.) | DF19G-20S/PR-MD2 | 902-4513-3 |
| Desktop tool (for 30 pos.) | DF19G-30S/PR-MD2 | 902-4518-7 |

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

■Plug (Micro-coaxial cable)



Shown terminated with 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 | |

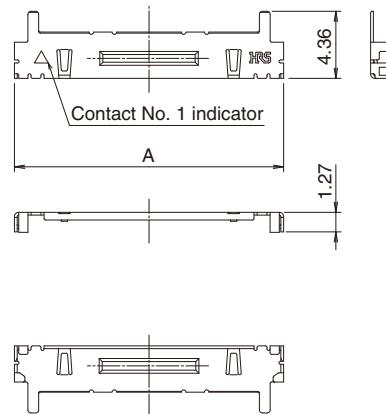
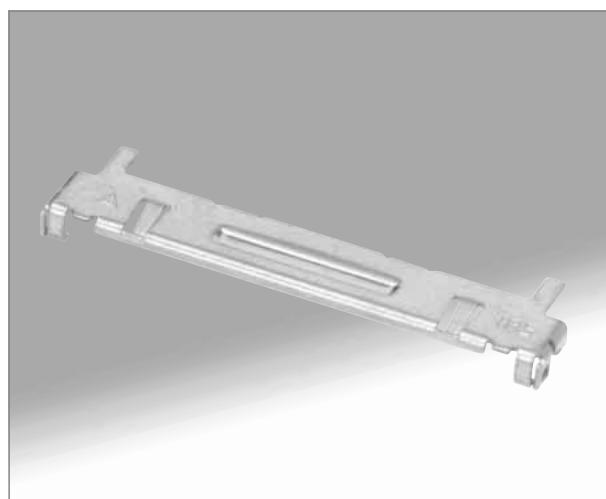
Specification
(05) : Bag packaging
(100 pcs/pack)

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



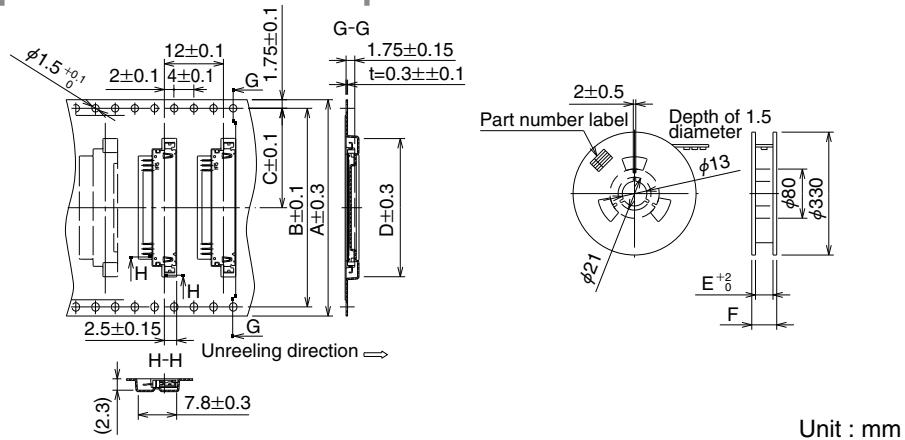
Specification
Blank : Bag packaging
(100 pcs/pack)

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

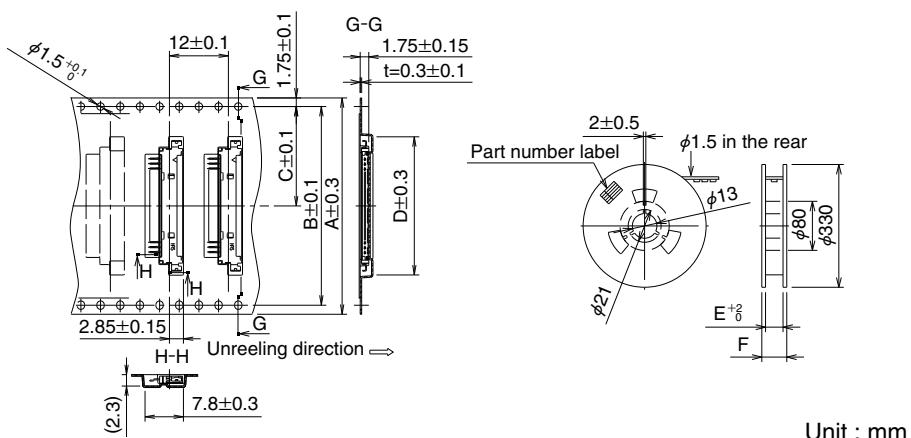
- DF19G-*P-1H(54)
- DF19K-*P-1H(54)
- DF19L-*P-1H(54)



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 (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 | |
| DF19G-30P-1H(54) | 30 | 56 | 50.2 | 26.2 | 38.1 | 56.4 | 62.4 | |
| DF19K-20P-1H(54) | 20 | 44 | 40.4 | 20.2 | 28.1 | 44.4 | 50.4 | Offset mounting (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 (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 | |

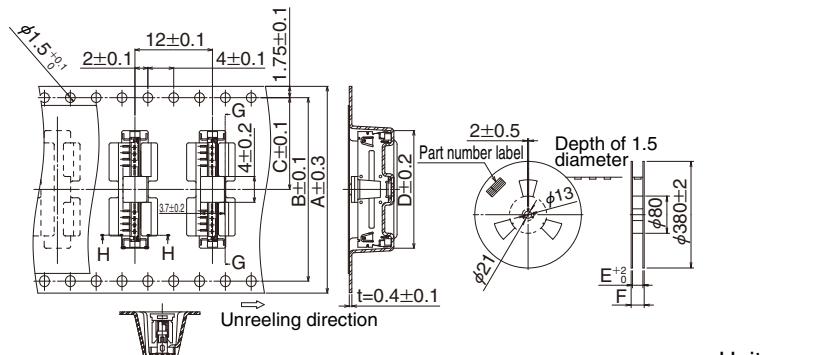
- DF19KR-*P-1H(54)



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 Offset mounting (1.0mm high) |
| DF19KR-20P-1H(54) | 20 | 44 | 40.4 | 20.2 | 28.1 | 44.4 | 50.4 | |

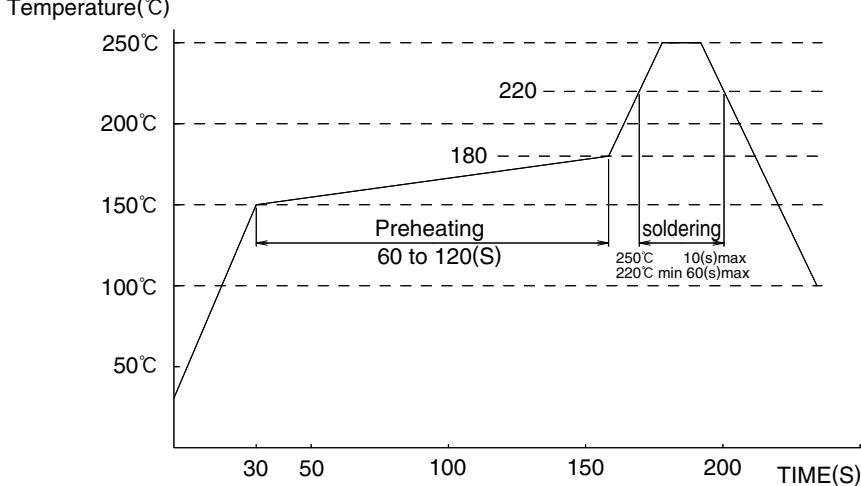
- DF19-*P-1V(56)



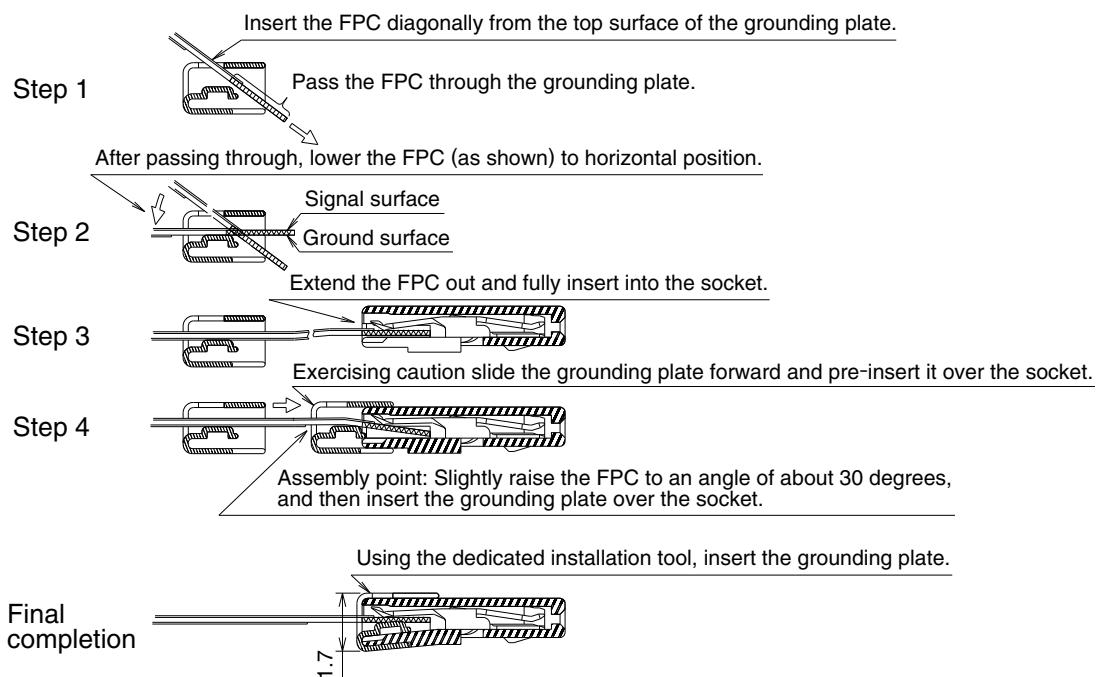
Unit : mm

| 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

| | |
|------------------------------------|---|
| 1. Recommended temperature profile |  <p>Temperature (°C)</p> <p>250°C 200°C 150°C 100°C 50°C</p> <p>250°C 220°C 180°C</p> <p>Preheating 60 to 120(S) soldering 250°C 10(s)max 220°C min 60(s)max</p> <p>30 50 100 150 200 250 300 TIME(S)</p> |
| 2. Manual soldering | Manual soldering : $290 \pm 10^\circ\text{C}$ for 3 seconds |
| 3. Screen thickness | 0.15mm |
| 4. Board warpage | Maximum of 0.03mm at the connector center, with both ends of the connector as reference points. |
| 5. Cleaning conditions | Refer to "Wire-to-Board Connector Use Handbook." |
| 6. Termination conditions | Refer to "Wire-to-Board Connector Use Handbook." |
| 7. Cautions | ■ Do not twist when mating/un-mating. |
| 8. Precautions | Refer to "Wire-to-Board Connector Use Handbook." |

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



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

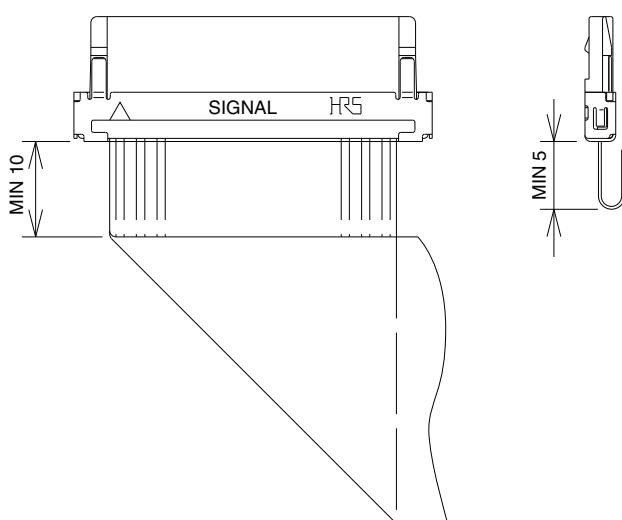
Note 2 : Dedicated assembly fixtures are required at each stage of the termination process. For detail, refer to the instruction manual supplied with the tools.

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.

Mouser Electronics

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[HT302/DF19S\(63\)](#) [AP109A-DF19S-36S\(63\)](#) [AP109A-DF19S-36S\(61\)](#) [AP109A-DF19S-36S\(62\)](#) [AP105-DF19S-36S](#)