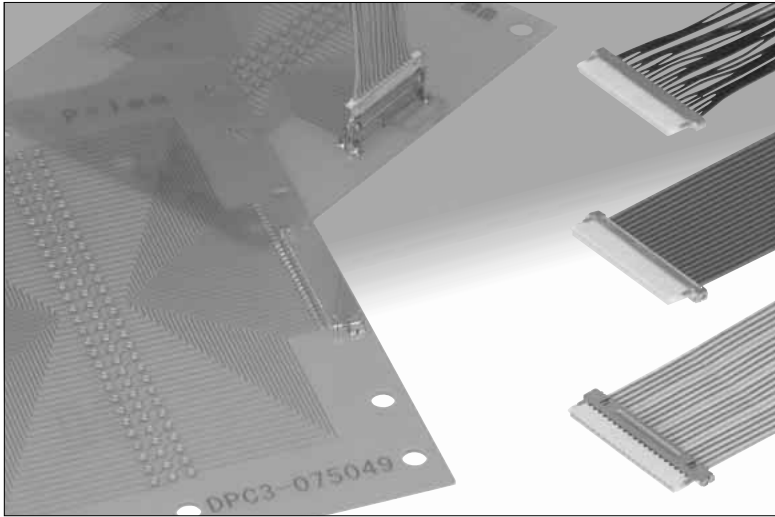


# 1 mm Contact Pitch, Board-to-Cable, Board-to-FPC, Board-to-Micro-coaxial Cable Connectors

## 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 1.7 mm 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

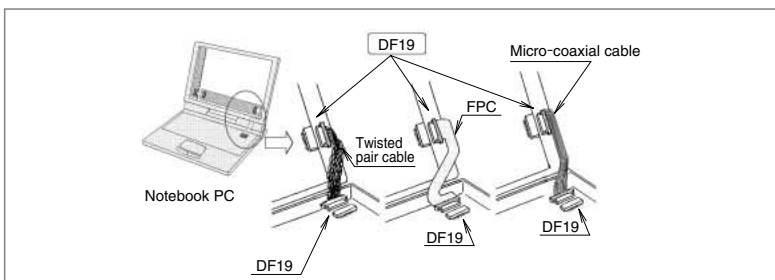
Device design engineers have a choice of mounting styles: top-board, offset, reverse mount offset and vertical.

#### 5. Ground connection

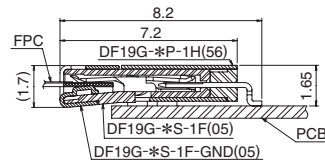
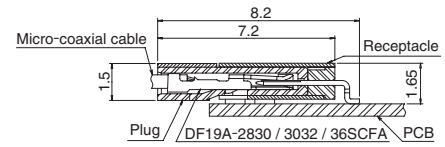
Metal grounding plates connect with the common ground line.

### Applications

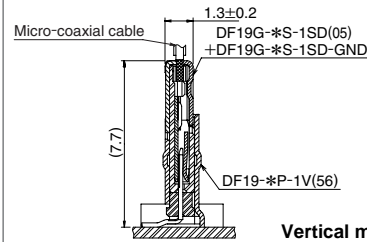
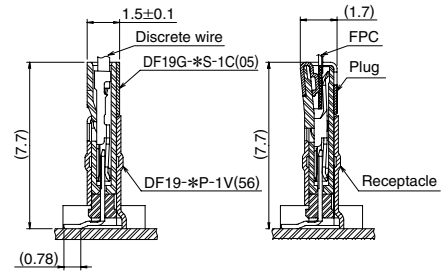
LCD connections in small consumer devices: digital cameras, notebook computers, PDA's. Any device requiring high-density interconnection for consistent high speed transmission data rates.



#### Small configuration and board space



#### Horizontal mounting

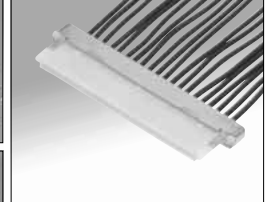


#### Vertical mounting

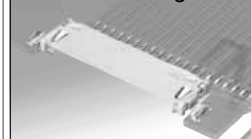
#### Top-board mounting



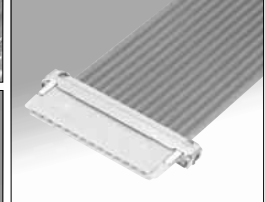
#### Discrete wire



#### Offset mounting



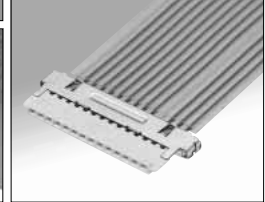
#### FPC



#### Reverse, offset mounting



#### Micro-coaxial cable



#### Vertical mounting



**DF19 Series 0.1 mm Contact Pitch, Board-to-Cable, Board-to-FPC, Board-to-Micro-coaxial Cable Connectors**

**Product Specifications**

Rating	Current rating	AWG#28 : 1A AWG#30 : 0.9A AWG#32 : 0.8A AWG#36 : 0.5A FPC : 0.5A Micro-coaxial cable AWG# 40: 0.3A	Operating temperature range	-35°C to 85°C Note 1 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	500 MΩ min.	100 V DC
2. Withstanding voltage	No flashover or insulation breakdown.	300 V AC / one minute
3. Contact resistance	30 mΩ max. (50 mΩ 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 0.75 mm, 2 hours in each of the 3 directions.
6. Humidity (Steady state)	Contact resistance: 30 mΩ max. (50 mΩ max. for FPC) Insulation resistance: 500 MΩ min.	96 hours at temperature of 40 $\pm$ 2°C and humidity of 90% to 95%
7. Temperature cycle	Contact resistance: 30 mΩ max. (50 mΩ max. for FPC) Insulation resistance: 500 MΩ min.	Temperature: -55°C $\rightarrow$ +5°C to +35°C $\rightarrow$ +85°C $\rightarrow$ +5°C to +35°C Time (Minutes): 30 $\rightarrow$ 10 $\rightarrow$ 30 $\rightarrow$ 10 5 cycles
8. Durability (insertion/ withdrawal)	Contact resistance: 30 mΩ max. (50 mΩ 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°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.

Note3: Information contained in this catalog represents general requirements for this Series. Contact us for the drawings and specifications for a specific part number shown.

**Materials / Finish**

Product	Component	Material	Finish/Color	Remarks
Receptacle	Insulator	Polyamide	Beige	UL94V-0
	Contacts	Phosphor bronze	Gold plated	——
	Grounding plate	Phosphor bronze	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	——

## Ordering information

### Connector

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

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

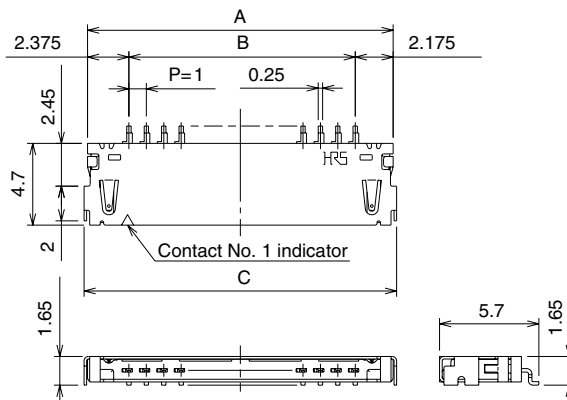
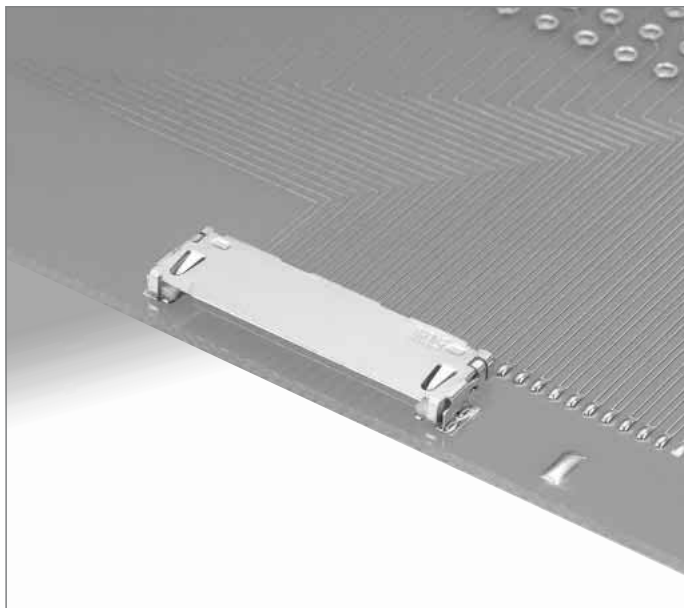
### Contact

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

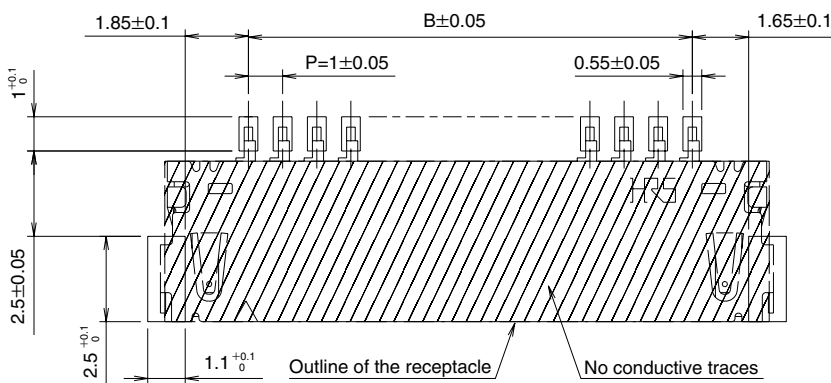
<b>① Conductor size</b> 2830 : AWG#28~#30 3032 : AWG#30~#32 36 : AWG#36	<b>③ Plating</b> A : Gold
<b>② Contact type</b> SCF : Plug contact, tape and reel packaging	<b>④ Packaging</b> Blank : 10,000 pieces / reel (41) : 20,000 pieces / reel

**DF19 Series 1 mm Contact Pitch, Board-to-Cable, Board-to-PCB, Board-to-Micro-coaxial Cable Connectors**

**Right angle receptacle, top-board mounting**



**PCB mounting pattern**



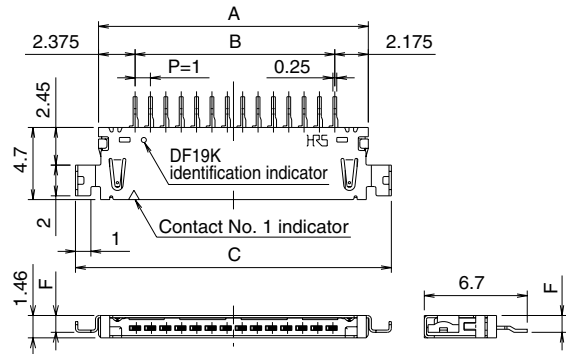
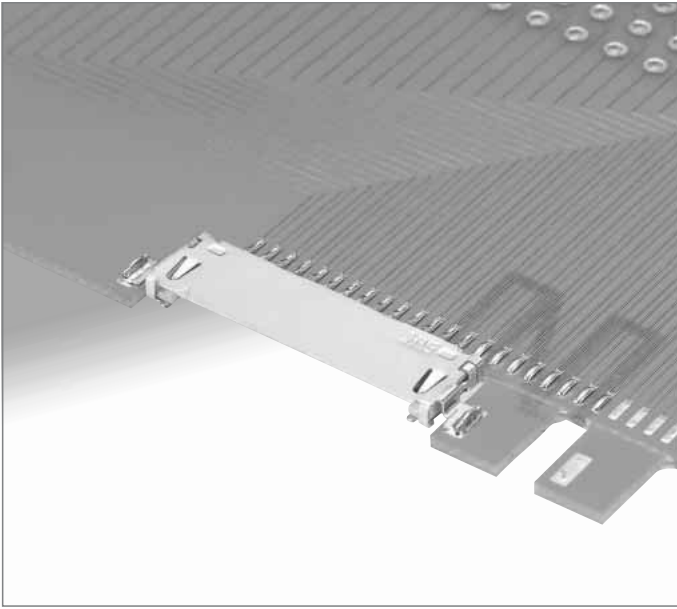
Specification  
 (56): Tape & reel packaging  
 (1,000 pieces per reel)

Unit: mm

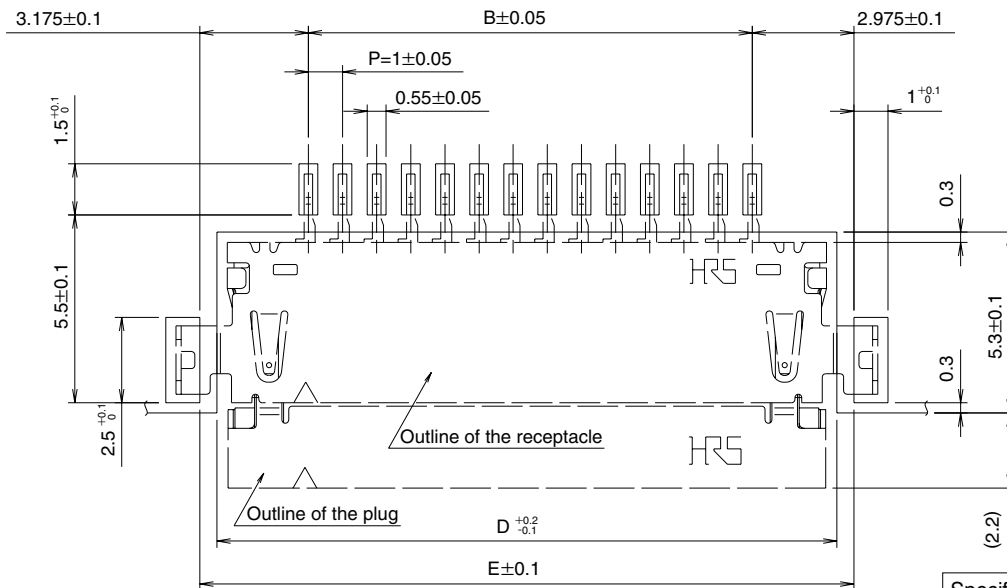
Part number	CL No.	Number of contacts	A	B	C	Remarks	RoHS
DF19G- 8P-1H (56)	685-0021-0-56	8	11.55	7	11.95	1.65mm high	YES
DF19G-14P-1H (56)	685-0004-0-56	14	17.55	13	17.95		
DF19G-20P-1H (56)	685-0006-6-56	20	23.55	19	23.95		
DF19G-30P-1H (56)	685-0015-7-56	30	33.55	29	33.95		

Note: Order by number of reels.

## ■ Right angle receptacle, offset mounting



## ◆ PCB mounting pattern



Specification  
 (56): Tape & reel packaging  
 (1,000 pieces per reel)

Unit: mm

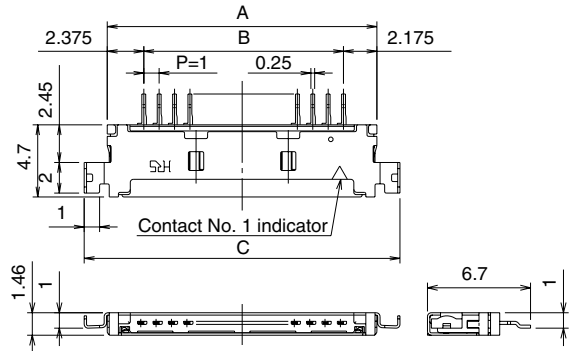
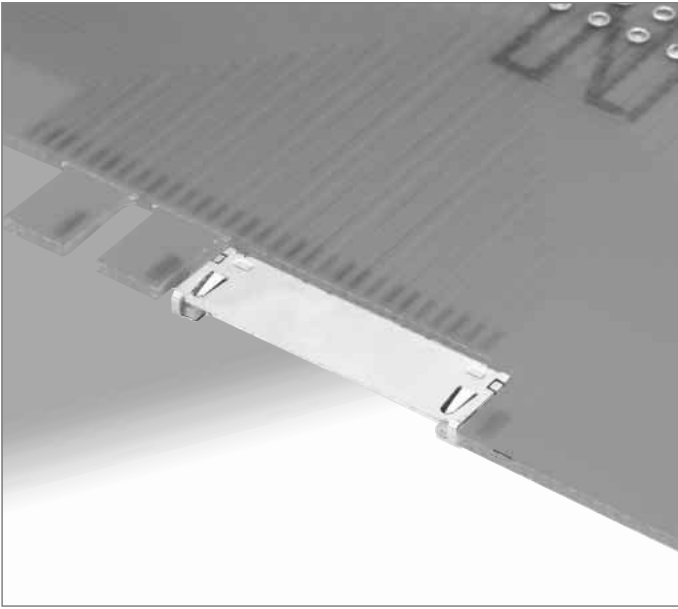
Part number	CL No.	Number of contacts	A	B	C	D	E	F	Remarks	RoHS
DF19K-20P-1H (56)	685-0008-1-56	20	23.55	19	26.55	24.15	25.15	0.1	1.0mm high	YES
DF19K-30P-1H (56)	685-0032-6-56	30	33.55	29	36.55	34.15	35.15	0.1		

Part number	CL No.	Number of contacts	A	B	C	D	E	F	Remarks	RoHS
DF19L-14P-1H (56)	685-0003-8-56	14	17.55	13	20.55	18.15	19.15	1.1	1.1mm high	YES
DF19L-20P-1H (56)	685-0019-8-56	20	23.55	19	26.55	24.15	25.15	1.1		
DF19L-30P-1H (56)	685-0016-0-56	30	33.55	29	36.55	34.15	35.15	1.1		

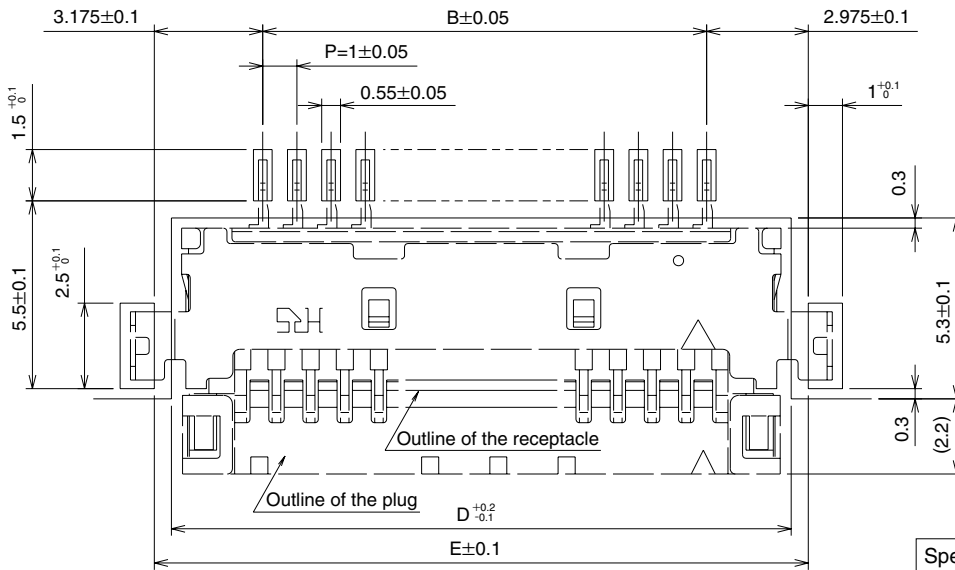
Note: Order by number of reels.

DF19 Series 1 mm Contact Pitch, Board-to-Cable, Board-to-PCB, Board-to-Micro-coaxial Cable Connectors

■ Right angle receptacle, reverse offset mounting



◆ PCB mounting pattern



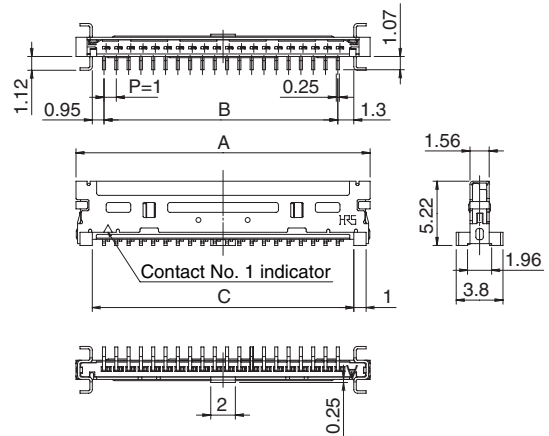
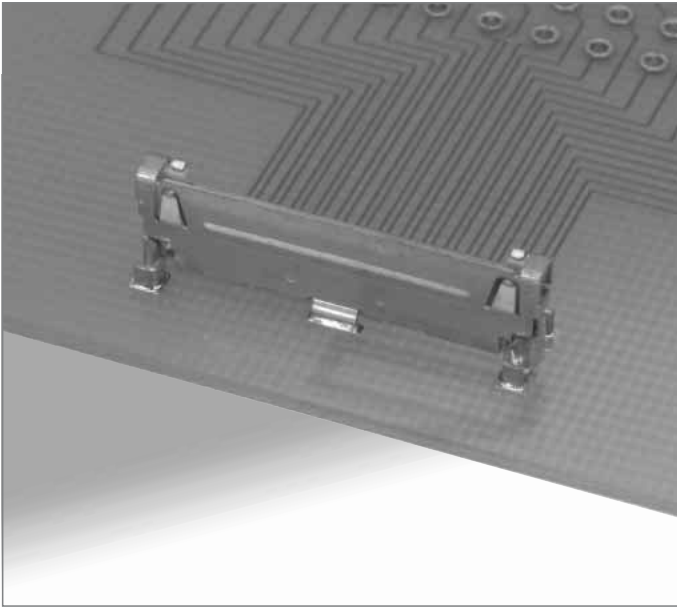
Specification  
 (56): Tape & reel packaging  
 (1,000 pieces per reel)

Unit: mm

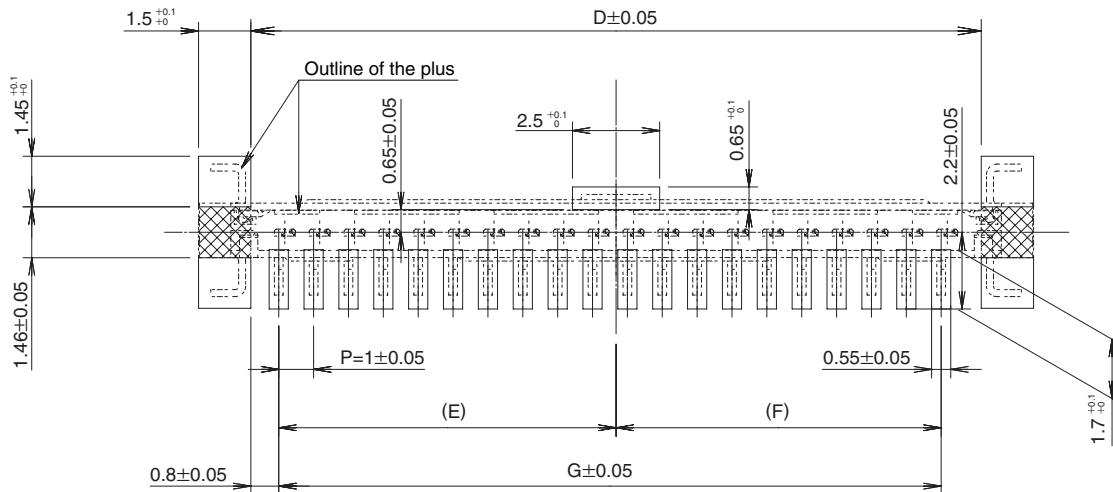
Part number	CL No.	Number of contacts	A	B	C	D	E	Remarks	RoHS
DF19KR-14P-1H (56)	685-0024-8-56	14	17.55	13	20.55	18.15	19.15	1.0mm high	YES
DF19KR-20P-1H (56)	685-0023-5-56	20	23.55	19	26.55	24.15	25.15		


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 pieces per reel)

Unit: mm

Part number	CL No.	Number 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	

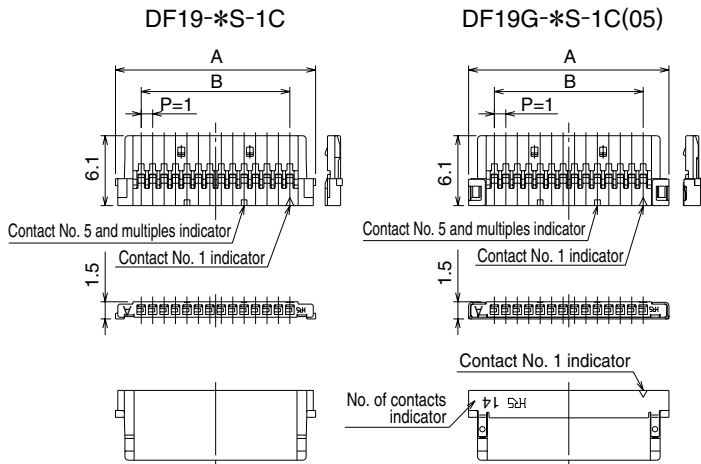
Note: Order by number of reels.

**DF19 Series 0.1 mm Contact Pitch, Board-to-Cable, Board-to-PCB, Board-to-Micro-coaxial Cable Connectors**

**■ Plug (Discrete wire)**



Shown with terminated and installed contacts



Specification  
 Blank,(05): Bag packaging  
 (100 pieces per bag)

Unit: mm

Part number	CL No.	Number 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 number	CL No.	Number 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 number	CL 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 pieces per reel)  
 (41) : Tape & reel packaging (20,000 pieces per reel)

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

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

**● Applicable UL style  
 UL1571 (Note2)**

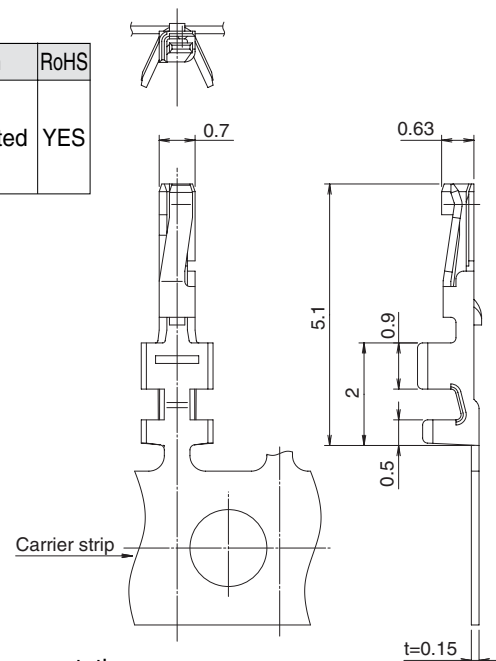
**● Strip length  
 1.2mm to 1.9mm**

Note 1: When using other than the recommended wire, contact your Hirose sales representative.  
 Note 2: Contact your Hirose sales representative when using AWG#36.

**● Tools**

Part	Part number	CL No.
Applicator	AP105-DF19S	901-4571-3
Press unit	CM-105	901-0005-4

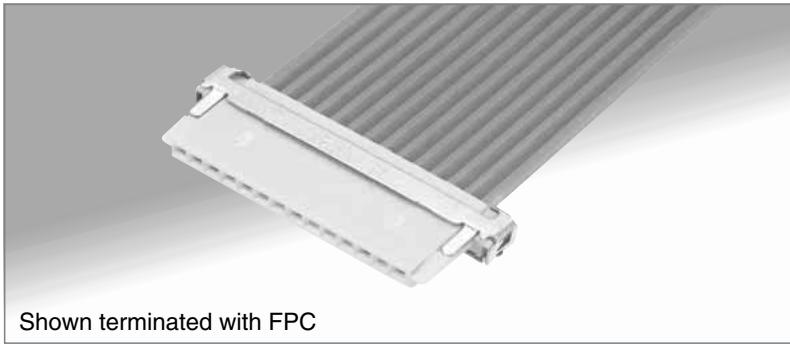
Note 1: Use of other than Hirose Electric approved tools will void the product warranties.  
 Note 2: Contact Hirose for the wire stripping, contact crimp and contact insertion instructions.



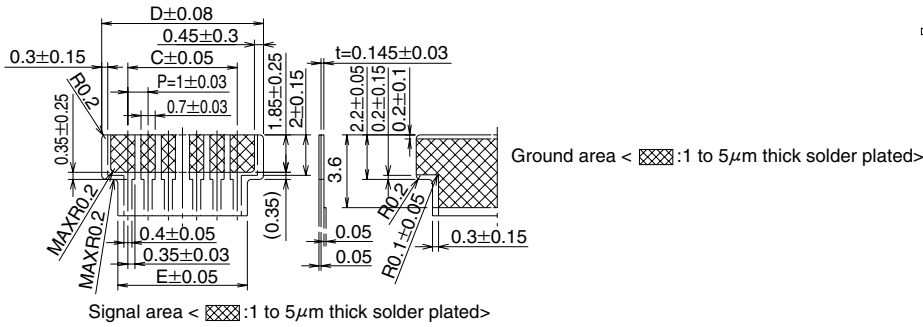
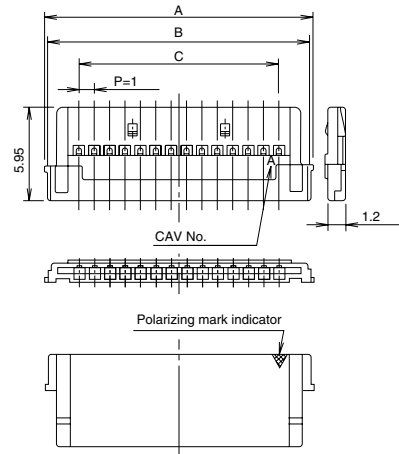


## ■ Plug (Flat Printed Circuit)

Note: Socket and grounding plate is required.



Shown terminated with FPC



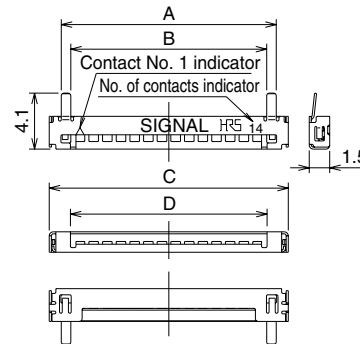
Unit: mm

Part number	CL No.	Number 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 pieces per bag)

Note: Order by number of bags.

## ■ Ground plate for FPC



Unit: mm

Part number	CL No.	Number 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 pieces per bag)

Note: Order by number of bags.

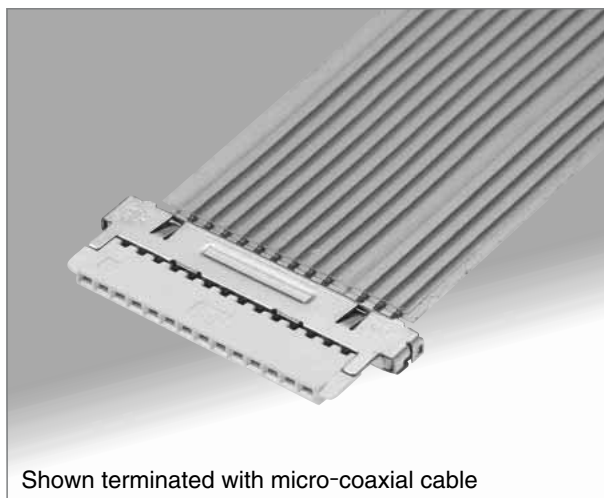
## ● Grounding plate installation tools

Type	Part number	CL 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

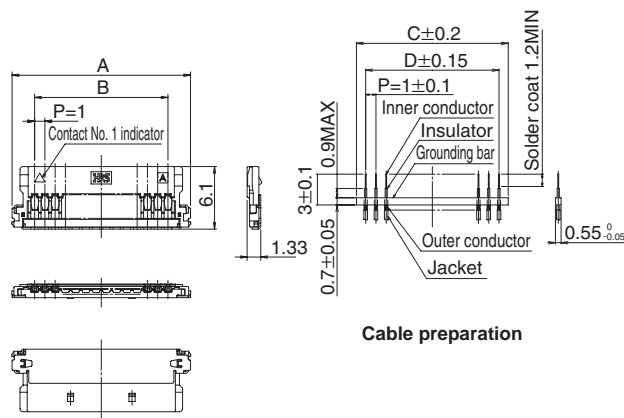
Note1: Product is not guaranteed unless Hirose approved tools are used.

DF19 Series 0.1 mm Contact Pitch, Board-to-Cable, Board-to-PCB, Board-to-Micro-coaxial Cable Connectors

■ Plug (Micro-coaxial cable)



Shown terminated with micro-coaxial cable



Cable preparation

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 number	CL No.	Number 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	

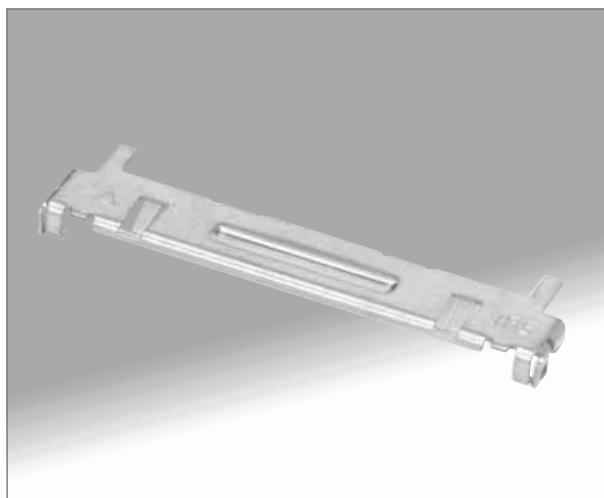
Specification (05): Bag packaging (100 pieces per bag)
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Note: Order by number of bags.

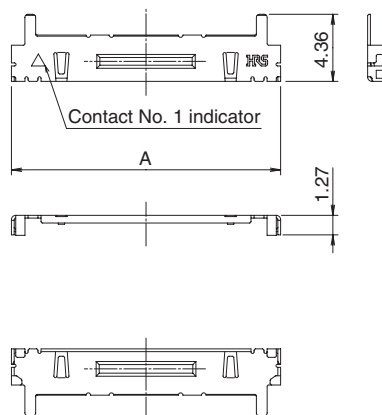
● Applicable cable (Micro-coaxial cable)

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

■ Grounding plate for micro-coaxial cable



Specification Blank: Bag packaging (100 pieces per bag)
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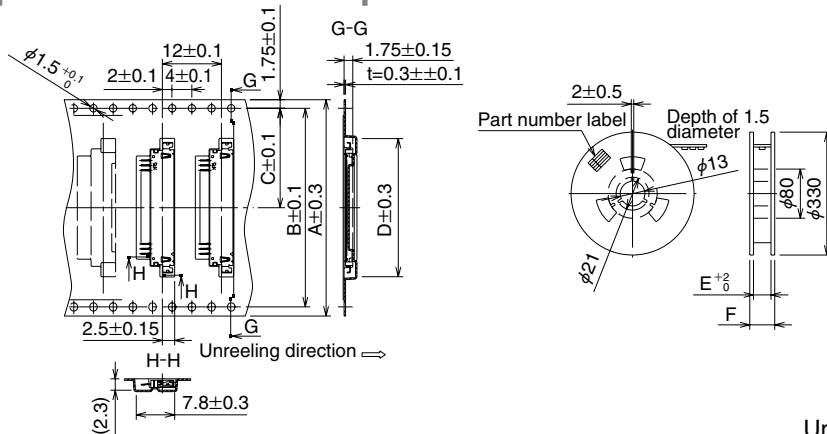


Unit: mm

Part number	CL No.	Number of contacts	A	RoHS
DF19F-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

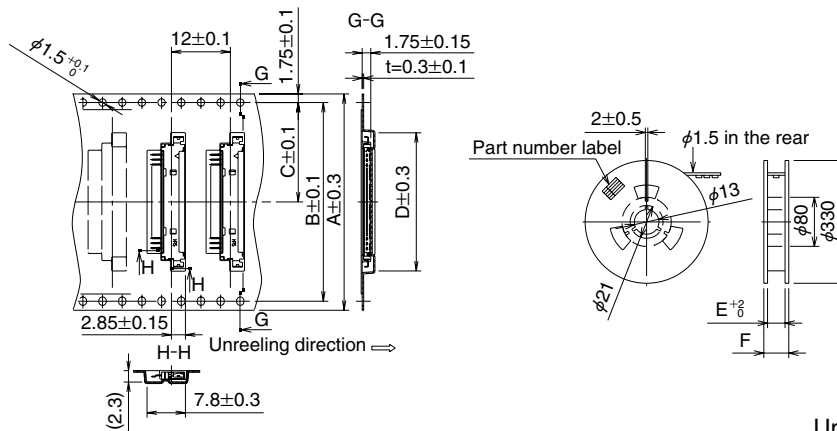
- DF19G-*\*P-1H*(56)
- DF19K-*\*P-1H*(56)
- DF19L-*\*P-1H*(56)



Unit: mm

Connector	Number of contacts	A	B	C	D	E	F	Remarks
DF19G- 8P-1H(56)	8	24	—	11.5	16.1	24.4	30.4	Top-board mounting (1.65mm high)
DF19G-14P-1H(56)	14	44	40.4	20.2	22.1	44.4	50.4	
DF19G-20P-1H(56)	20	44	40.4	20.2	28.1	44.4	50.4	
DF19G-30P-1H(56)	30	56	50.2	26.2	38.1	56.4	62.4	Offset mounting (1.0mm high)
DF19K-20P-1H(56)	20	44	40.4	20.2	28.1	44.4	50.4	
DF19K-30P-1H(56)	30	56	52.4	26.2	38.1	56.4	62.4	Offset mounting (1.1mm high)
DF19L-14P-1H(56)	14	44	40.4	20.2	22.1	44.4	50.4	
DF19L-20P-1H(56)	20	44	40.4	20.2	28.1	44.4	50.4	
DF19L-30P-1H(56)	30	56	52.4	26.2	38.1	56.4	62.4	

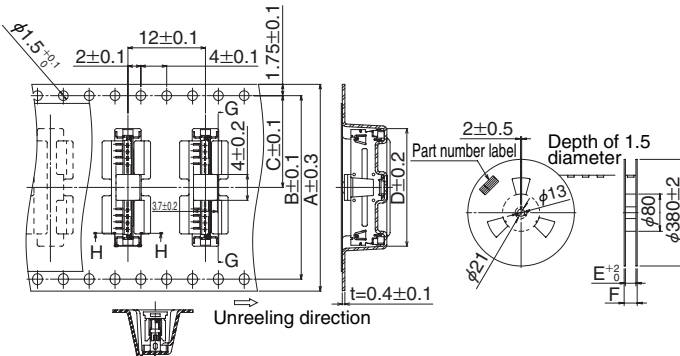
- DF19KR-*\*P-1H*(56)



Unit: mm

Connector	Number of contacts	A	B	C	D	E	F	Remarks
DF19KR-14P-1H(56)	14	44	40.4	20.2	22.1	44.4	50.4	Reverse type of DF19K
DF19KR-20P-1H(56)	20	44	40.4	20.2	28.1	44.4	50.4	Offset mounting (1.0mm high)

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



Unit: mm

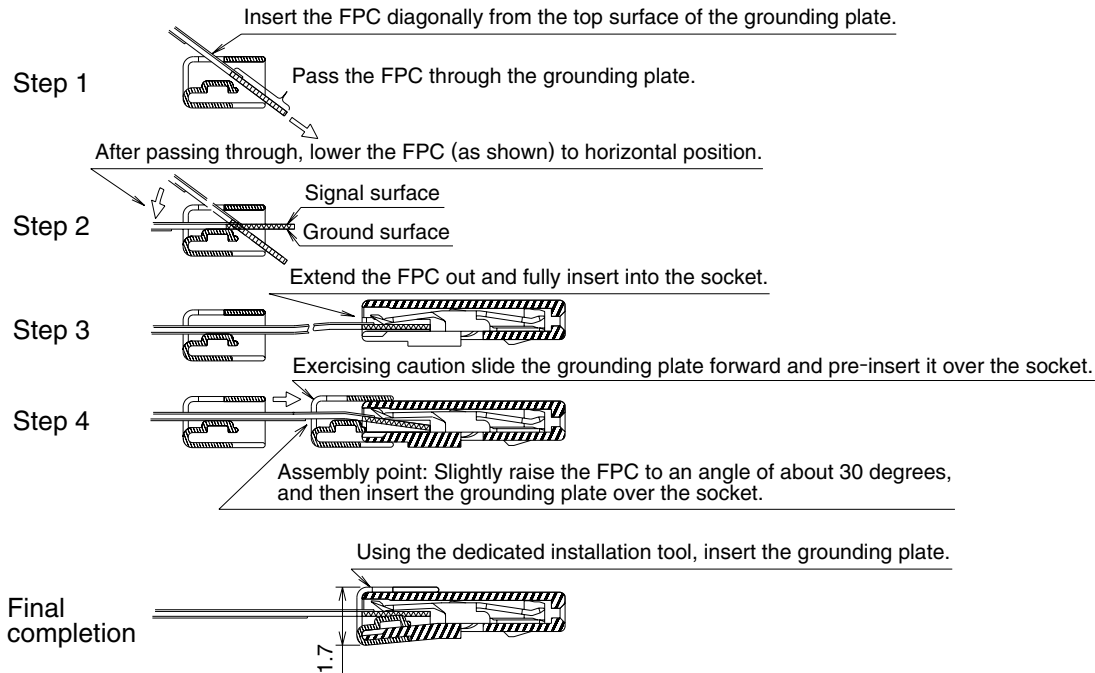
Connector	Number of contacts	A	B	C	D	E	F	Remarks
DF19-14P-1V(56)	14	32	28.4	14.2	18.2	32.4	38.4	Vertical receptacle
DF19-20P-1H(56)	20	44	40.4	20.2	24.2	44.4	50.4	

DF19 Series 0.1 mm Contact Pitch, Board-to-Cable, Board-to-PCB, Board-to-Micro-coaxial Cable Connectors

◆ Use recommendations

<p>1. Recommended temperature profile</p>	<p>Temperature (°C)</p> <p>250°C</p> <p>200°C</p> <p>180</p> <p>150°C</p> <p>Preheating</p> <p>60 to 120(S)</p> <p>soldering</p> <p>250°C 10(s)max</p> <p>220°C min 60(s)max</p> <p>100°C</p> <p>50°C</p> <p>30 50 100 150 200 TIME(S)</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 “Nylon Connector Use Handbook.”</p>
<p>6. Termination conditions</p>	<p>Refer to “Nylon Connector Use Handbook.”</p>
<p>7. Precautions</p>	<p>■ Do not twist when mating/un-mating.</p>
<p>8. Precautions</p>	<p>Refer to “Nylon Connector Use Handbook.”</p>

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



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

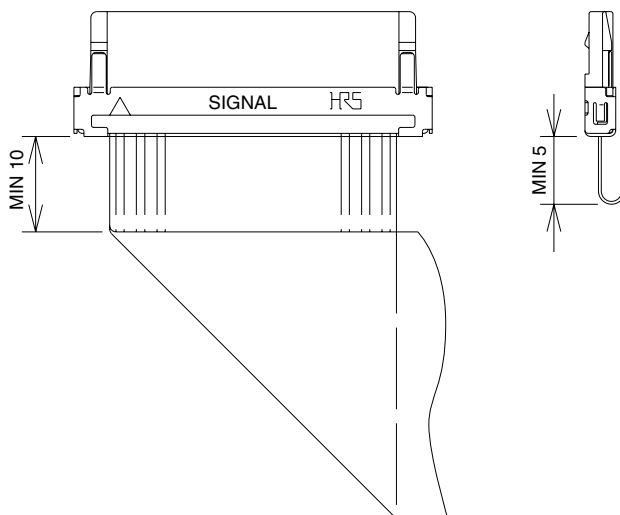
Note 2: Dedicated assembly fixtures are required at each stage of the termination process. For detail, refer to the instruction manual supplied with the tools.

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.