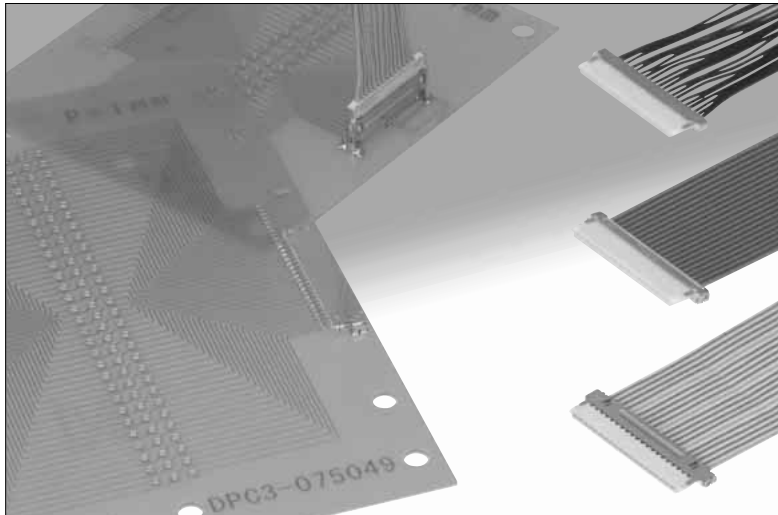


# 1mm Contact Pitch, Board-to-Cable, Board-to-FPC, Board-to-Micro-coaxial Cable Connectors

## DF19 Series



### Overview

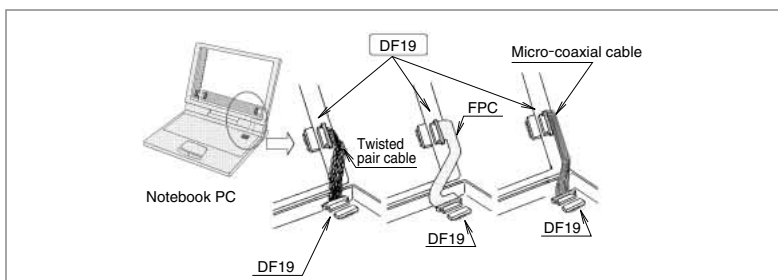
Industry and market accepted as “De facto” standard for LCD panel connections (panels under 12 inches). High-performance connectors for LVDS high-speed differential signals.

### Features

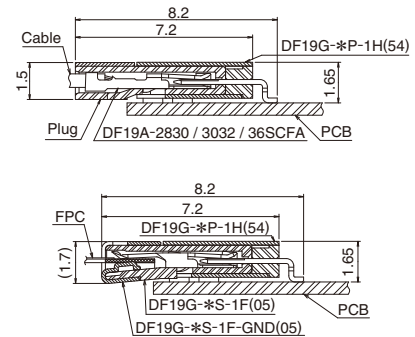
- Small configuration and board space**  
Thin design accepts discrete wire, thin micro-coaxial cable ( $\phi 1.5\text{mm}$ ,  $\phi 1.6\text{mm}$  max.) and FPC 1.7mm maximum thick.
- Common use of receptacle**  
The same receptacle will accept plugs terminated with discrete wire, FPC or micro-coaxial 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

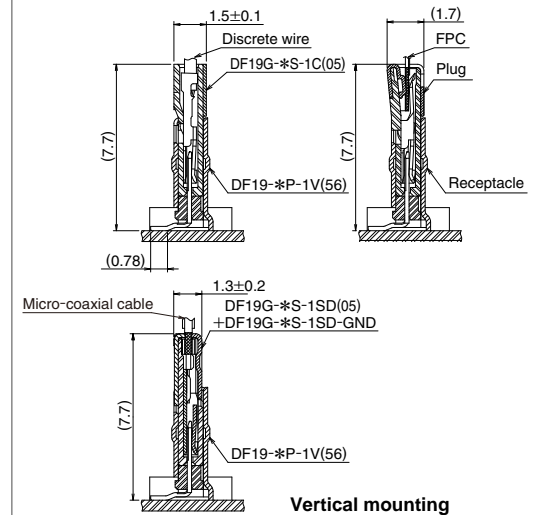
LCD connections in small consumer devices : digital cameras, notebook computers, PDA's. Any device requiring high-density interconnection for consistent high speed transmission data rates.



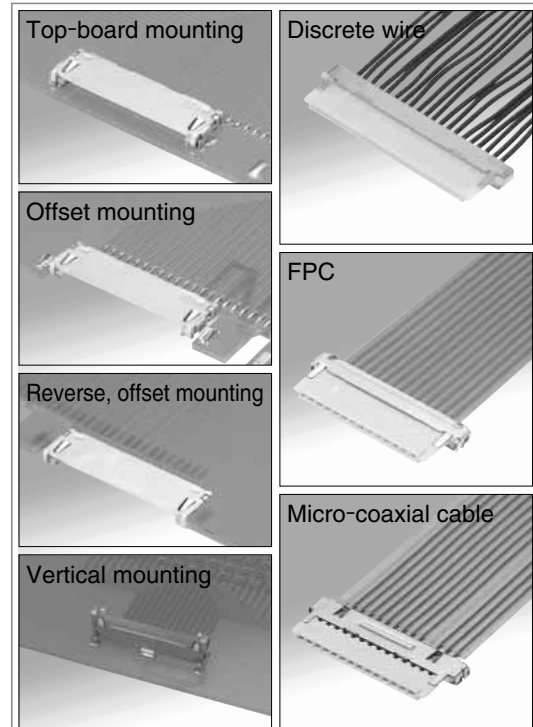
### Small configuration and board space



### Horizontal mounting



### Vertical mounting



## Product Specifications

Rating	Current rating	28 AWG : 1A 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	-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	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) 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) Insulation resistance : 500MΩ min.	Temperature : -55°C → +5°C to +35°C → +85°C → +5°C to +35°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°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

<p>① Series Name : DF19</p> <p>② Configuration</p> <ul style="list-style-type: none"> <li>■ Receptacle           <ul style="list-style-type: none"> <li>G : Top-board mounting (1.65mm high)</li> <li>K : Offset mounting (1.0mm high)</li> <li>L : Offset mounting (1.1mm high)</li> <li>KR: Reverse offset mounting version of DF19K (1.0mm high)</li> </ul> </li> <li>■ Plug for discrete wire           <ul style="list-style-type: none"> <li>Blank : No grounding plate</li> <li>G : With grounding plate</li> </ul> </li> <li>■ Plug for FPC           <ul style="list-style-type: none"> <li>G : With grounding plate</li> </ul> </li> <li>■ Grounding plate for FPC           <ul style="list-style-type: none"> <li>G : With grounding plate</li> </ul> </li> <li>■ Plug for micro-coaxial cable           <ul style="list-style-type: none"> <li>G : With grounding plate</li> </ul> </li> <li>■ Grounding plate for micro-coaxial cable           <ul style="list-style-type: none"> <li>G : With grounding plate</li> </ul> </li> </ul>	<p>③ Number of contacts : 8,14,20,30 (Note 1)</p> <p>④ Connector type</p> <ul style="list-style-type: none"> <li>S : Plug</li> <li>P : Receptacle</li> </ul> <p>⑤ Contact pitch : 1mm</p> <p>⑥ Mounting type/Termination type</p> <ul style="list-style-type: none"> <li>H : Horizontal SMT</li> <li>V : Vertical SMT</li> <li>C : Plug – discrete wire (crimp contact)</li> <li>F : Plug – FPC</li> <li>SD : Plug – micro-coaxial cable</li> </ul> <p>⑦ Additional separate component</p> <ul style="list-style-type: none"> <li>GND : Ground plate (Note 2)</li> </ul>
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Note 1 : Number of contacts will differ depending on the connector style.

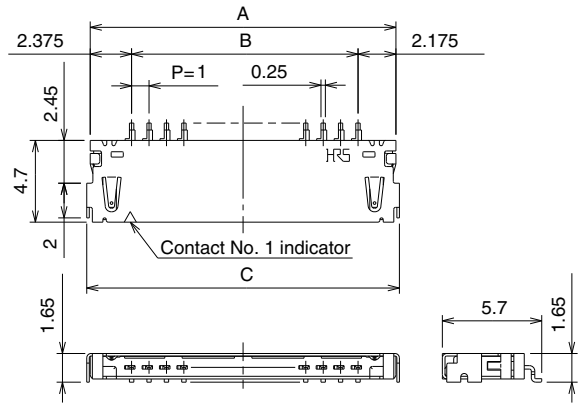
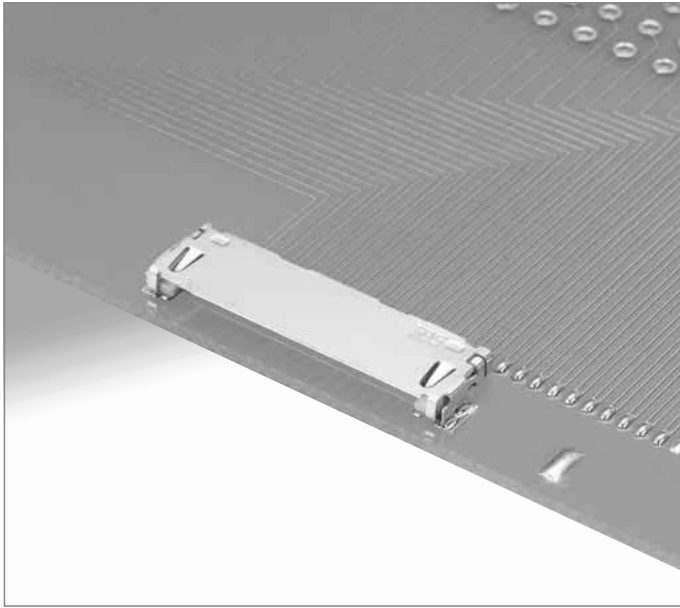
Note 2 : Grounding plates are required when terminating with the FPC and micro-coaxial cable.

### ● Contact

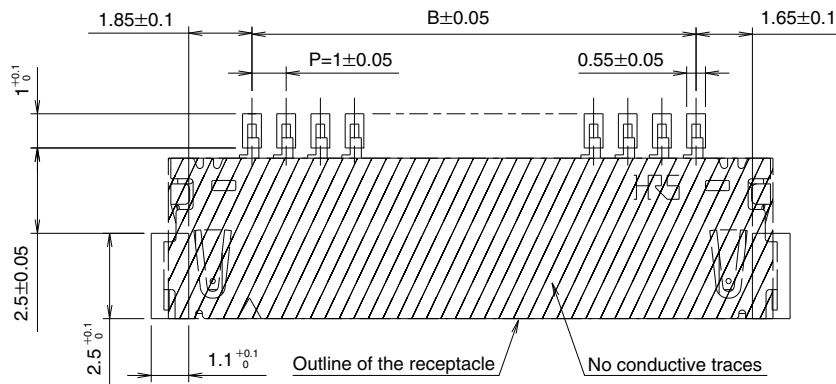
<b>DF19A</b>	<b>-</b>	<b>2830</b>	<b>SCF</b>	<b>A</b>	<b>(**)</b>
①		②	③		④

<p>① Conductor size</p> <ul style="list-style-type: none"> <li>2830 : 28 to 30 AWG</li> <li>3032 : 30 to 32 AWG</li> <li>36 : 36 AWG</li> </ul>	<p>③ Plating</p> <ul style="list-style-type: none"> <li>A : Gold</li> </ul>
<p>② Contact type</p> <ul style="list-style-type: none"> <li>SCF : Plug contact, tape and reel packaging</li> </ul>	<p>④ Packaging</p> <ul style="list-style-type: none"> <li>Blank : 10,000 pcs/reel</li> <li>(41) : 20,000 pcs/reel</li> </ul>

## Right angle receptacle, top-board mounting



## PCB mounting pattern



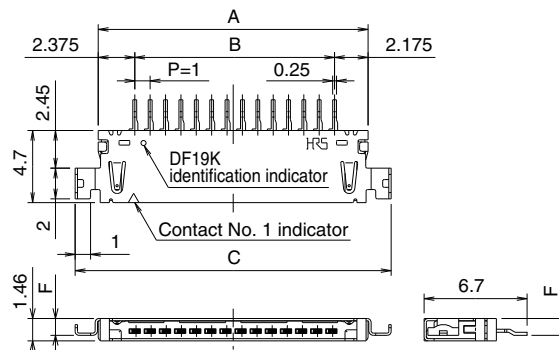
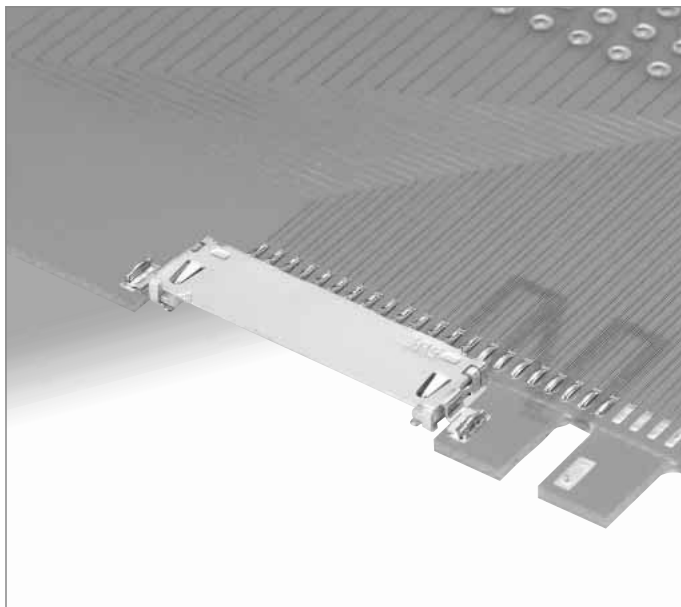
Specification  
 (54) : Tape & reel packaging  
 (1,000 pcs/reel)

Unit : mm

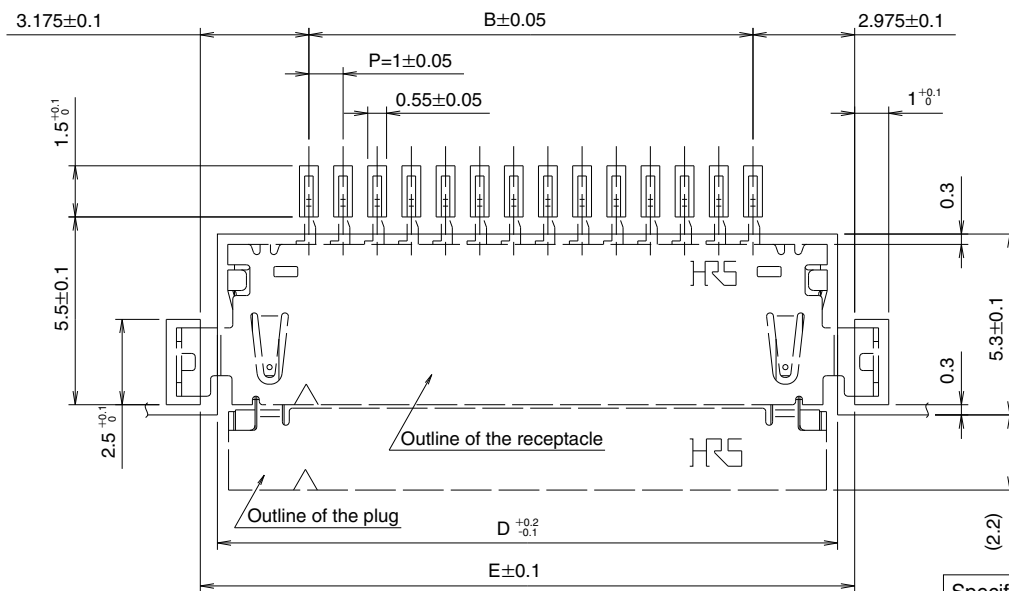
Part No.	HRS No.	No. of contacts	A	B	C	Remarks	RoHS
DF19G- 8P-1H (54)	685-0021-0 54	8	11.55	7	11.95	1.65mm high	YES
DF19G-14P-1H (54)	685-0004-0 54	14	17.55	13	17.95		
DF19G-20P-1H (54)	685-0006-6 54	20	23.55	19	23.95		
DF19G-30P-1H (54)	685-0015-7 54	30	33.55	29	33.95		

Note : Order by number of reels.

### Right angle receptacle, offset mounting



### PCB mounting pattern



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

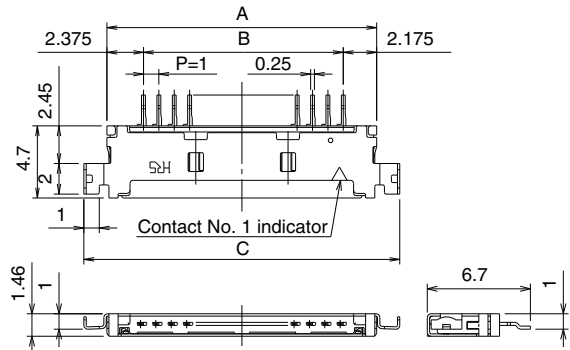
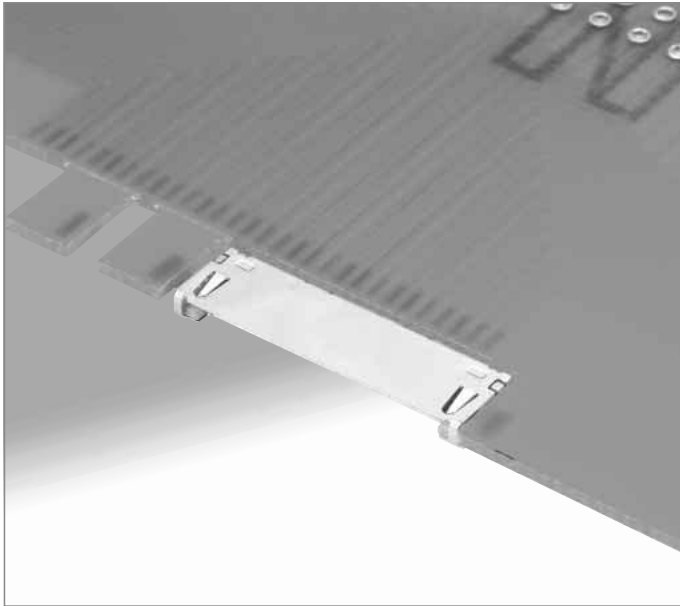
Unit : mm

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		

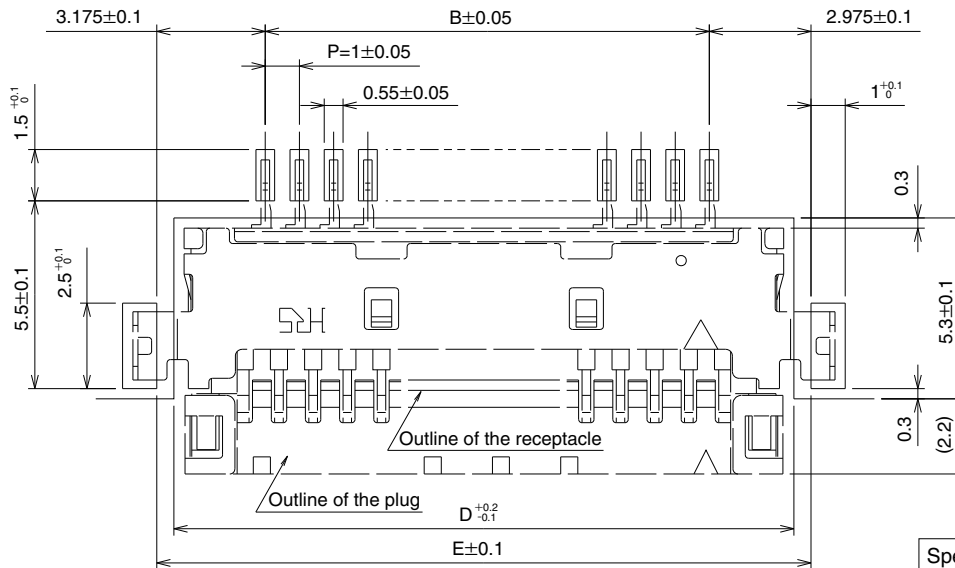
Part No.	HRS No.	No. of contacts	A	B	C	D	E	F	Remarks	RoHS
DF19L-14P-1H (54)	685-0003-8 54	14	17.55	13	20.55	18.15	19.15	1.1	1.1mm high	YES
DF19L-20P-1H (54)	685-0019-8 54	20	23.55	19	26.55	24.15	25.15	1.1		
DF19L-30P-1H (54)	685-0016-0 54	30	33.55	29	36.55	34.15	35.15	1.1		

Note : Order by number of reels.

### Right angle receptacle, reverse offset mounting



### PCB mounting pattern



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

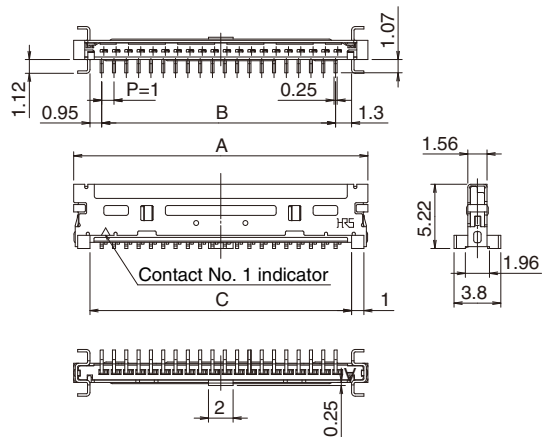
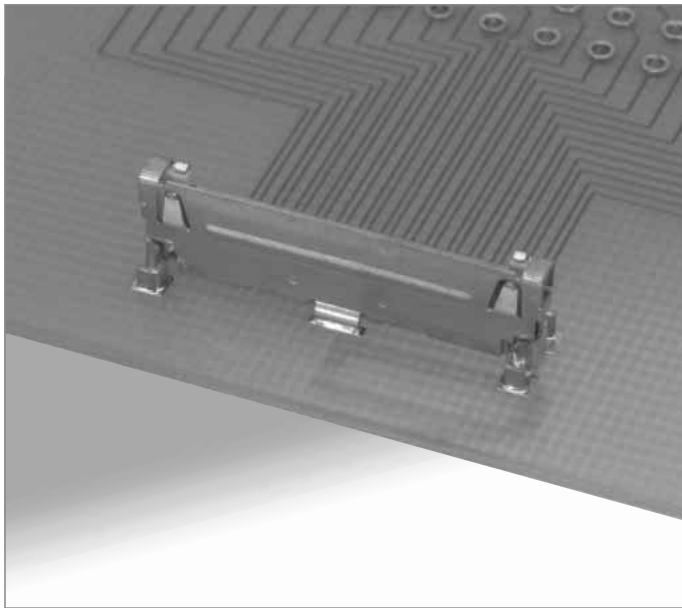
Unit : mm

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		

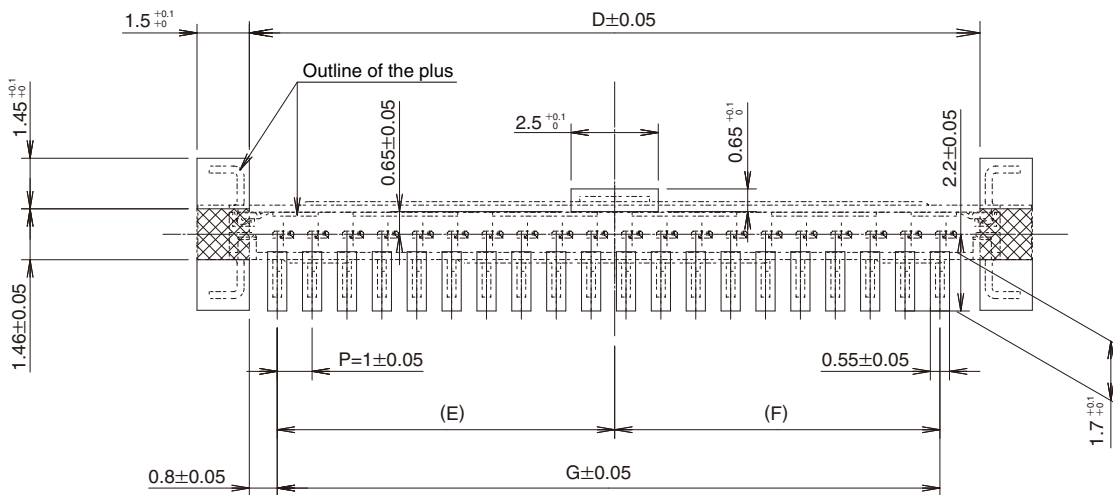
Note : Order by number of reels.

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## Vertical receptacle



## PCB mounting pattern



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

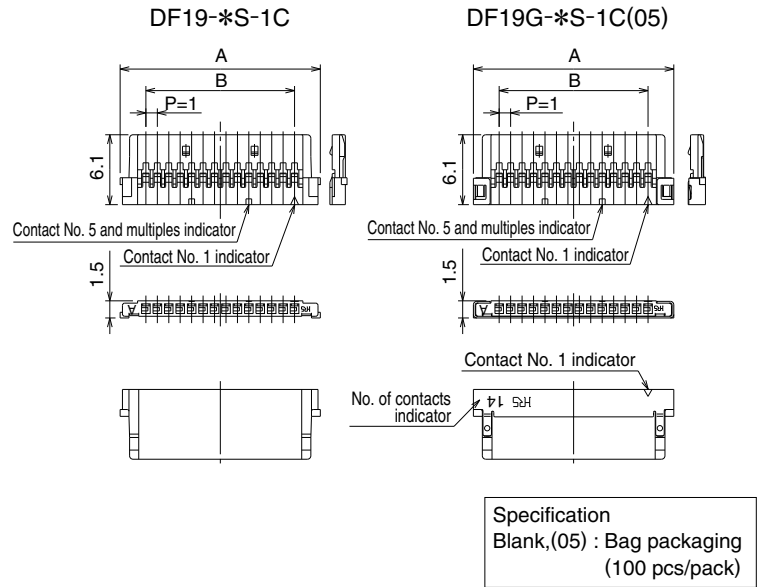
Specification  
(56) : Tape & reel packaging  
(1,000 pcs/reel)

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 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)	
36 AWG (7/ 0.05mm)	0.27mm

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

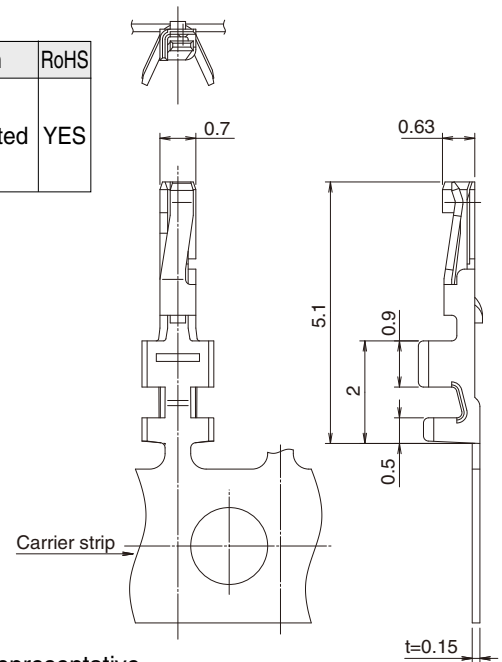
### ●Strip length 1.2mm to 1.9mm

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

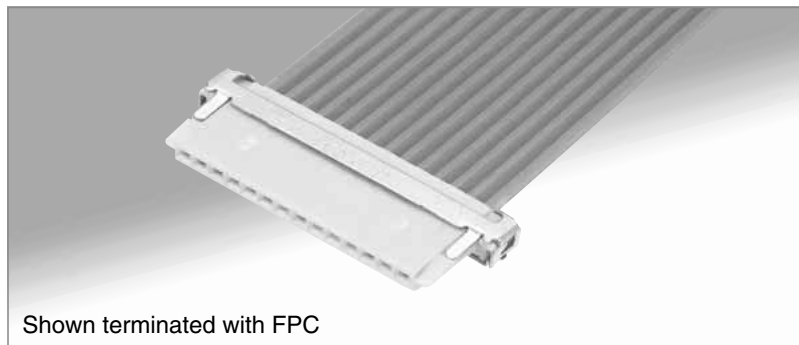
Note 1 : Use of other than Hirose Electric approved tools will void the product warranties.  
 Note 2 : Contact Hirose for the wire stripping, contact crimp and contact insertion instructions.  
 Note 3 : Please do the crimping operations according to the "Crimping quality standard" and "Crimping condition table".



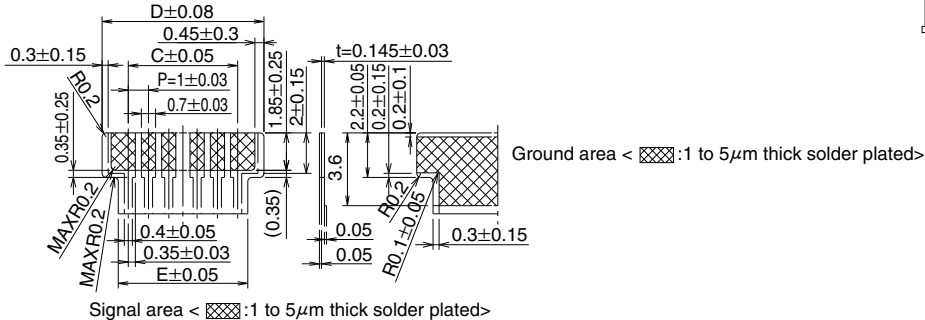
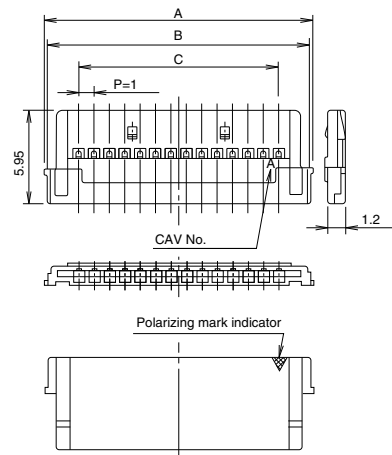


## ■ Plug (Flat Printed Circuit)

Note: Socket and grounding plate is required.



Shown terminated with FPC



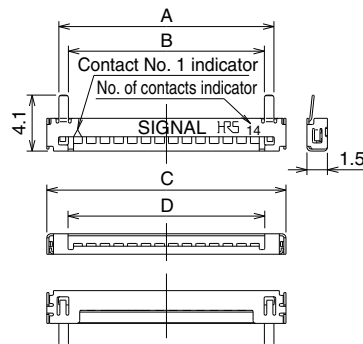
Unit : mm

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)

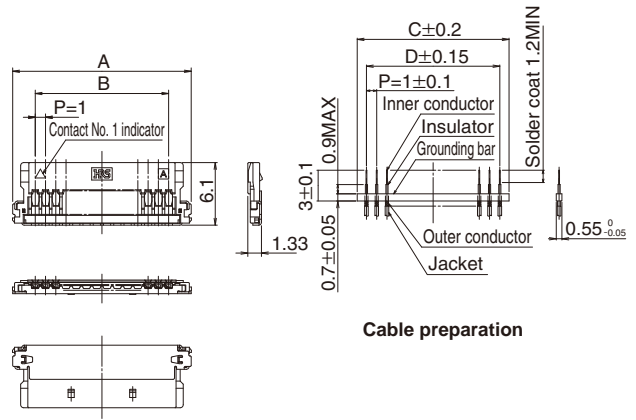
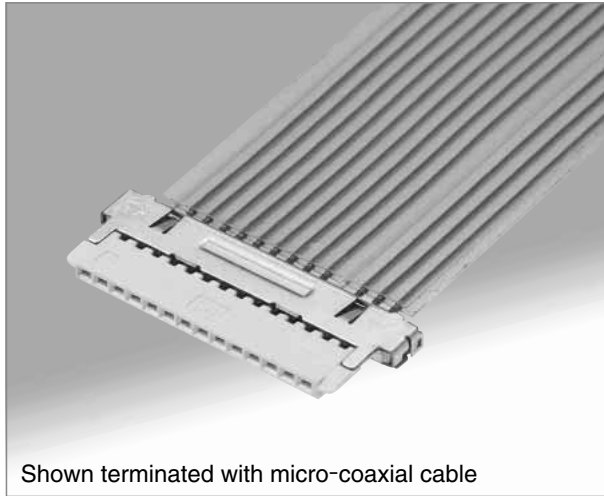
Note : Order by number of bags.

## ● 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

Note 1 : 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	

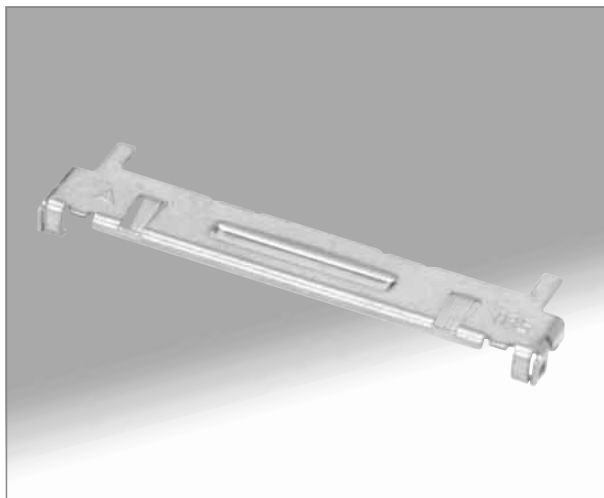
Specification  
(05) : Bag packaging  
(100 pcs/pack)

Note : Order by number of bags.

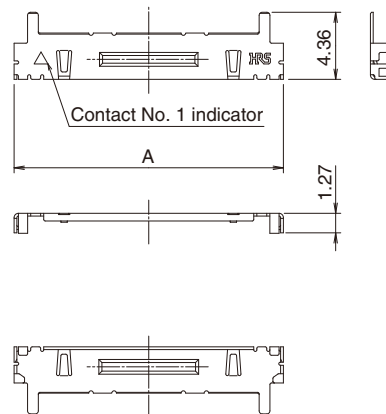
## ●Applicable cable (Micro-coaxial cable)

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)

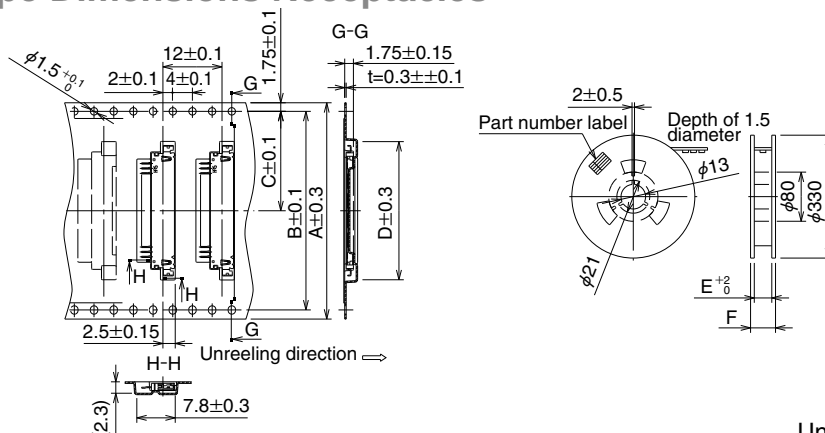


Unit : mm

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

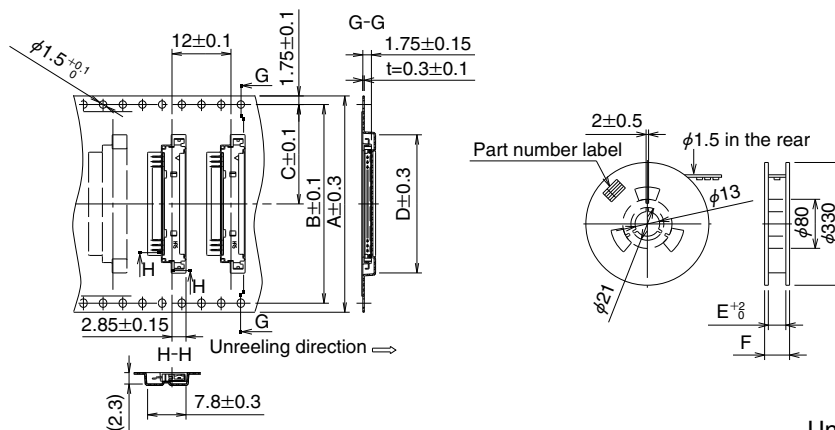
- DF19G- \*P-1H(54)
- DF19K- \*P-1H(54)
- DF19L- \*P-1H(54)



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 (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	Offset mounting (1.0mm high)
DF19K-20P-1H(54)	20	44	40.4	20.2	28.1	44.4	50.4	
DF19K-30P-1H(54)	30	56	52.4	26.2	38.1	56.4	62.4	Offset mounting (1.1mm high)
DF19L-14P-1H(54)	14	44	40.4	20.2	22.1	44.4	50.4	
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	

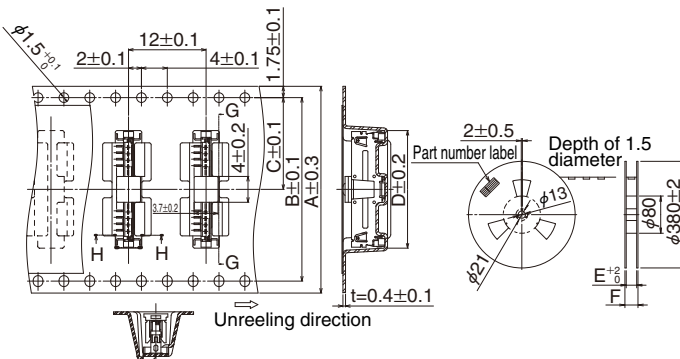
- DF19KR- \*P-1H(54)



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)

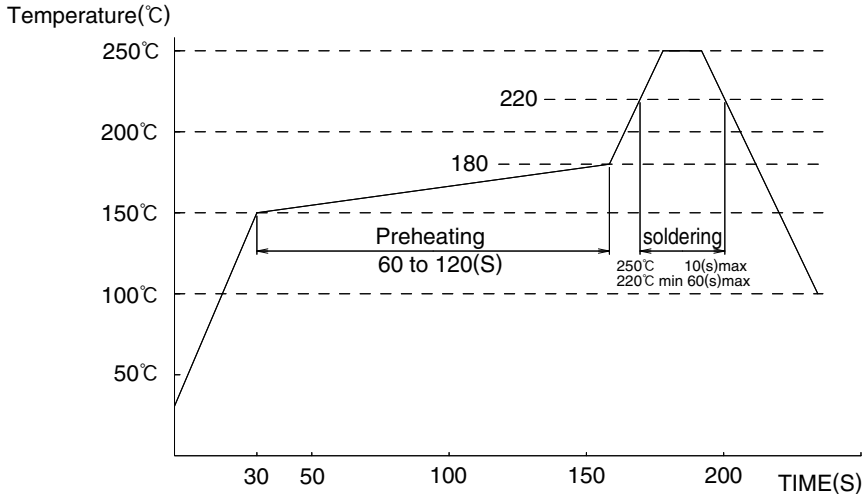
- DF19- \*P-1V(56)



Unit : mm

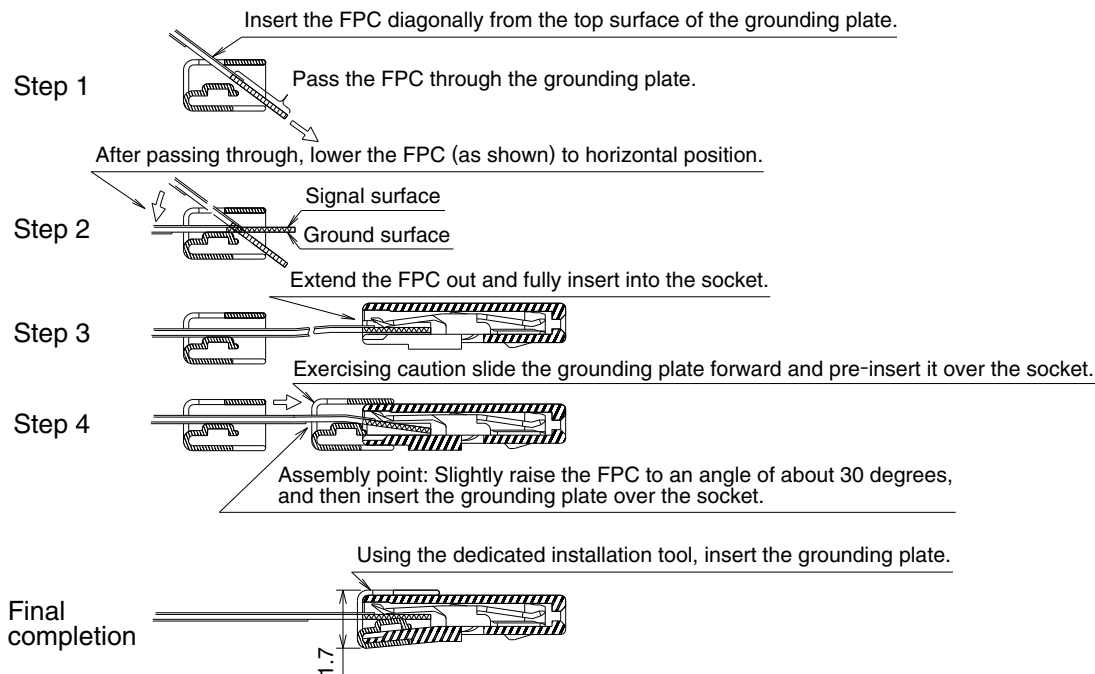
Connector	No. of contacts	A	B	C	D	E	F	Remarks
DF19-14P-1V(56)	14	32	28.4	14.2	18.2	32.4	38.4	Vertical receptacle
DF19-20P-1H(56)	20	44	40.4	20.2	24.2	44.4	50.4	

◆ 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>

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



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

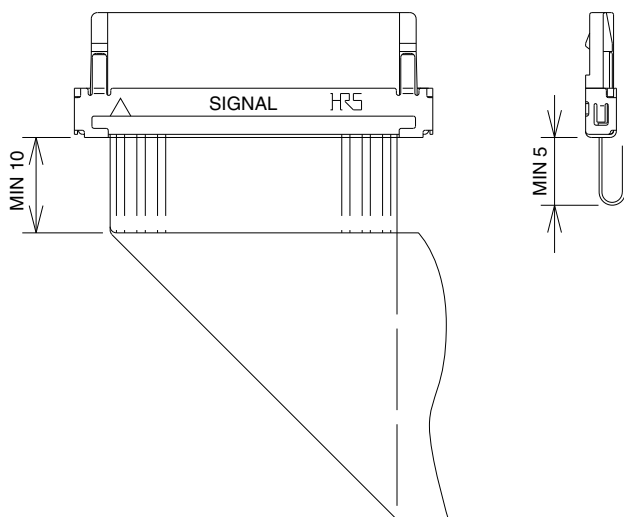
Note 2 : Dedicated assembly fixtures are required at each stage of the termination process. For detail, refer to the instruction manual supplied with the tools.

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.

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