

DF51 Series

2mm Pitch, Positive Lock, Wire-to-Board Connector (UL, C-UL Standard Certified Product)



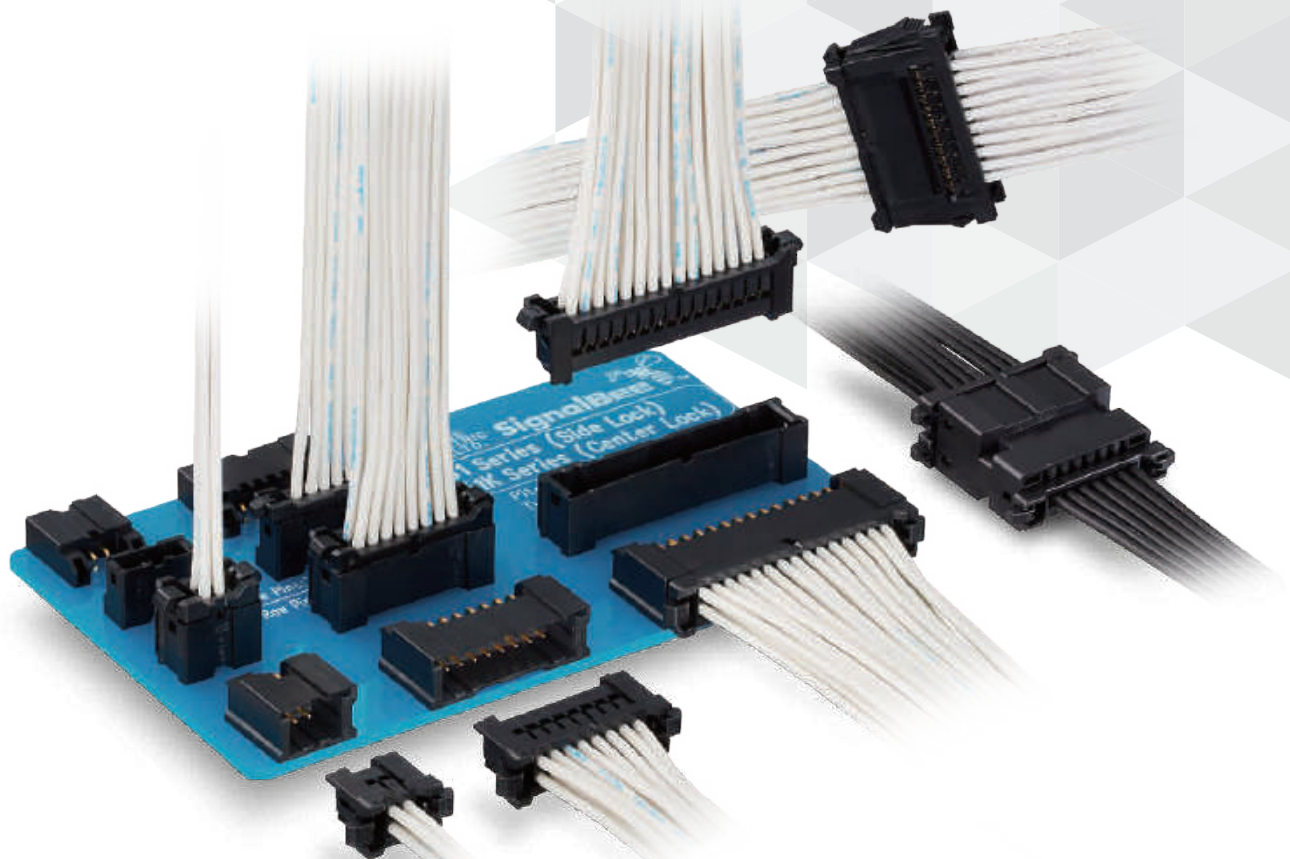
Positive-Lock



P=2.0 mm



Wide Variation



Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35

Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(7172)727-132

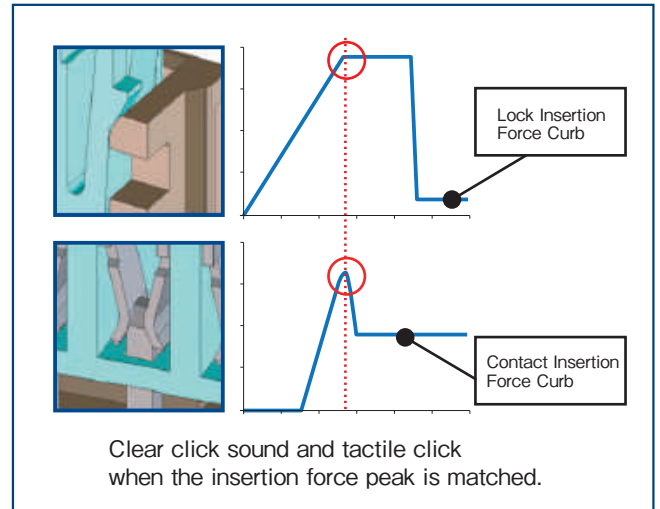
Киргизия +996(312)96-26-47

<https://hirose.nt-rt.ru/> || hes@nt-rt.ru

Features

1. Positive lock provides clear tactile click and secures reliable connection.

The lock delivers a clear tactile click during peak insertion force, preventing incomplete mating.



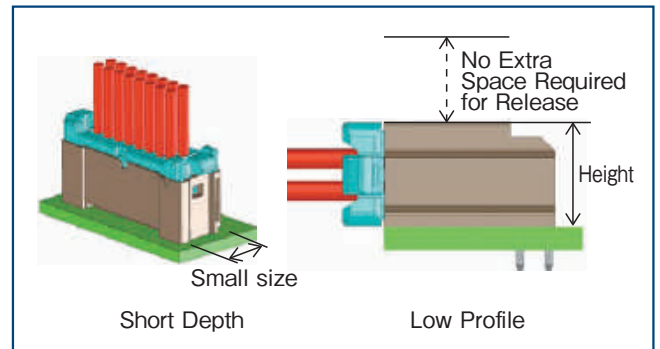
Secure Mating

2. Wide variation

Each of the straight/right angle/in-line configurations are available in single-row and dual-row for flexible design. Gold and Tin plating options support various application needs.

3. Secure Side-locking design

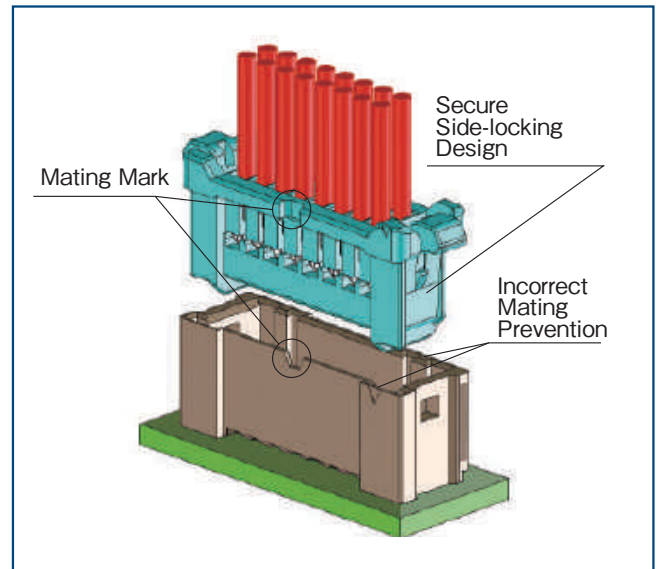
The straight type with short depth and the low profile right angle type are well suited for compact/thin equipment.



Reduces overall system size.

4. Prevents incorrect mating

Visual and mechanical polarized features will prevent reverse mating and incorrect mating between the different number of positions.

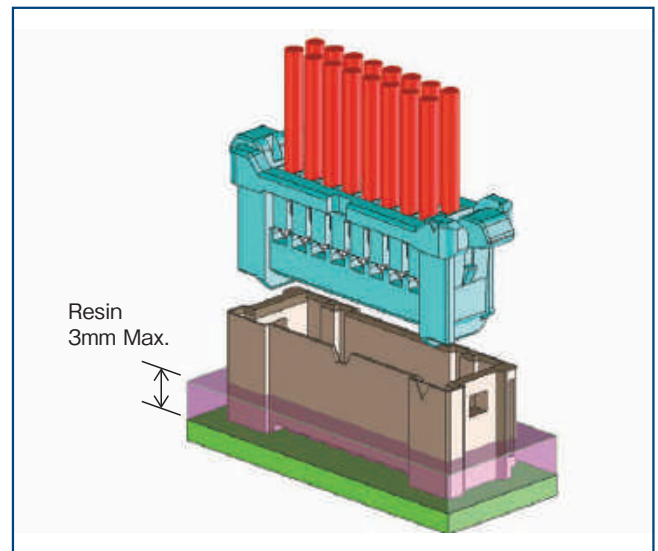


5. Uses the same contacts and crimping tools as DF11 Series

Wide applicable cable range: 22 to 30 AWG.

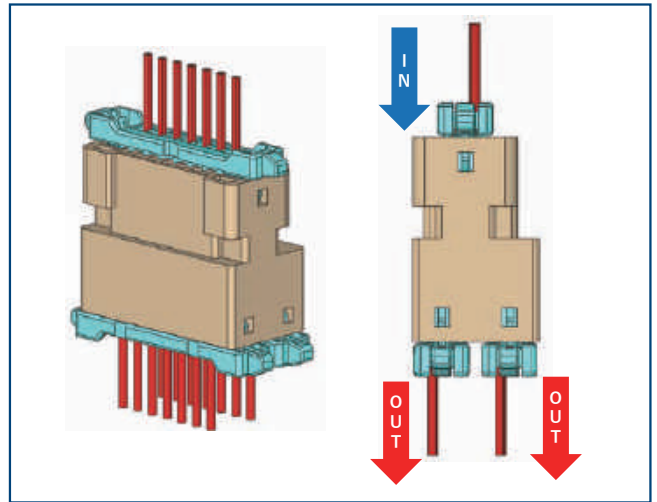
6. Suitable for potting

The straight header can be potted up to 3mm.



7. Branch Adapter

Branch types are also available.



8. UL, C-UL Certified

Applications

Office automation, Industrial machinery, Industrial robots, Amusement equipment, Medical equipment.

Product Specifications

Ratings	Rated Current (Note 1)		Pos.	22 AWG	24 AWG	26 AWG	28 AWG	30 AWG	Operating Temperature (Note 2)	-55 to +105℃
		Single- Row	2	3A	2.5A	2A	1A	0.5A	Operating Humidity Range (Note 3)	20 to 80%
			3-7	2A	2A				Storage Temperature Range (Note 4)	-10 to +60℃
		Dual- Row	4	3A	2.5A				Storage Humidity Range (Note 4)	40 to 70%
			6-30	2A	2A	1.5A				
	Rated Voltage	250V AC/DC								

UL, C-UL Safety Standard Approved Specification	Rated Current (Note 1)	22 AWG	24 to 28 AWG	30 AWG
		2A	1A	0.5A
	Rated Voltage	30V AC/DC		

UL/C-UL File No. and Recognition No.UL, C-UL: E52653

Note 1 : The rated current depends on the wire size used.

Note 2 : Includes temperature rise due to current flow.

Note 3 : Use without condensation on parts.

Note 4 : The storage condition refers to long-term storage of the product on the shelf before assembly. The operating temperature and humidity are applicable after assembly when the product is not energized and during transportation.

Note 5 : For a branch adapter, the current is the maximum value before branching.

Item	Specification	Condition
Insulation Resistance	1,000M Ω Min.	Measured at 500V DC
Withstand Voltage	No flashover or breakdown	650V AC is applied for 1 min.
Contact Resistance	30m Ω Max.	Measured at 1mA (DC or 1000Hz), 20mV Max.
Vibration Resistance	No electrical discontinuity of 1 μ s or greater	Frequency 10 to 55 Hz, half amplitude 0.75mm, 10 times in each of the 3 directions
Shock Resistance	No electrical discontinuity of 1 μ s or greater	Accelerated velocity : 490 m/s ² for 11ms, half-sine wave in 3 directions, 3 times for each direction
Moisture-resistance	Contact resistance : 30m Ω Max. Insulation resistance : 500M Ω Min.	Temperature : 40 $\pm$ 2°C ; humidity: 90 to 95%, left as it is for 96 hours
Temperature cycles	Contact resistance : 30m Ω Max. Insulation resistance : 1,000M Ω Min.	-55°C :30 minutes $\rightarrow$ 105°C : 30 minutes 5 cycles
Durability	Contact resistance : 30m Ω Max.	Tin plated : 30 mating cycles, Gold plated: 50 mating cycles
Solder heat resistance	The resin parts should withstand the temperature and resist melting.	Flow : 260°C , 5 sec Hand soldering : temperature of soldering iron at 270°C for 3 seconds

Materials / Finish

Product	Part	Material	Finish	Specification
Header	Insulator	PBT (glass-reinforced)	Black	UL94V-0
	Contact	Brass	Tin Plated or Gold Plated	-
Crimp Socket	Insulator	PBT (glass-reinforced)	Black	UL94V-0
Socket Contact	Contact	Phosphor Copper	Tin Plated or Gold Plated	-
In-line Plug	Insulator	PBT (glass-reinforced)	Black	UL94V-0
In-line Plug Contact	Contact	Phosphor Copper	Tin Plated or Gold Plated	-
Adapter	Insulator	PBT (glass-reinforced)	Black	UL94V-0
	Contact	Brass	Gold 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

DF51 # - # P - 2 DSA

① ② ③ ④ ⑤ ⑥

■ Crimp Contact

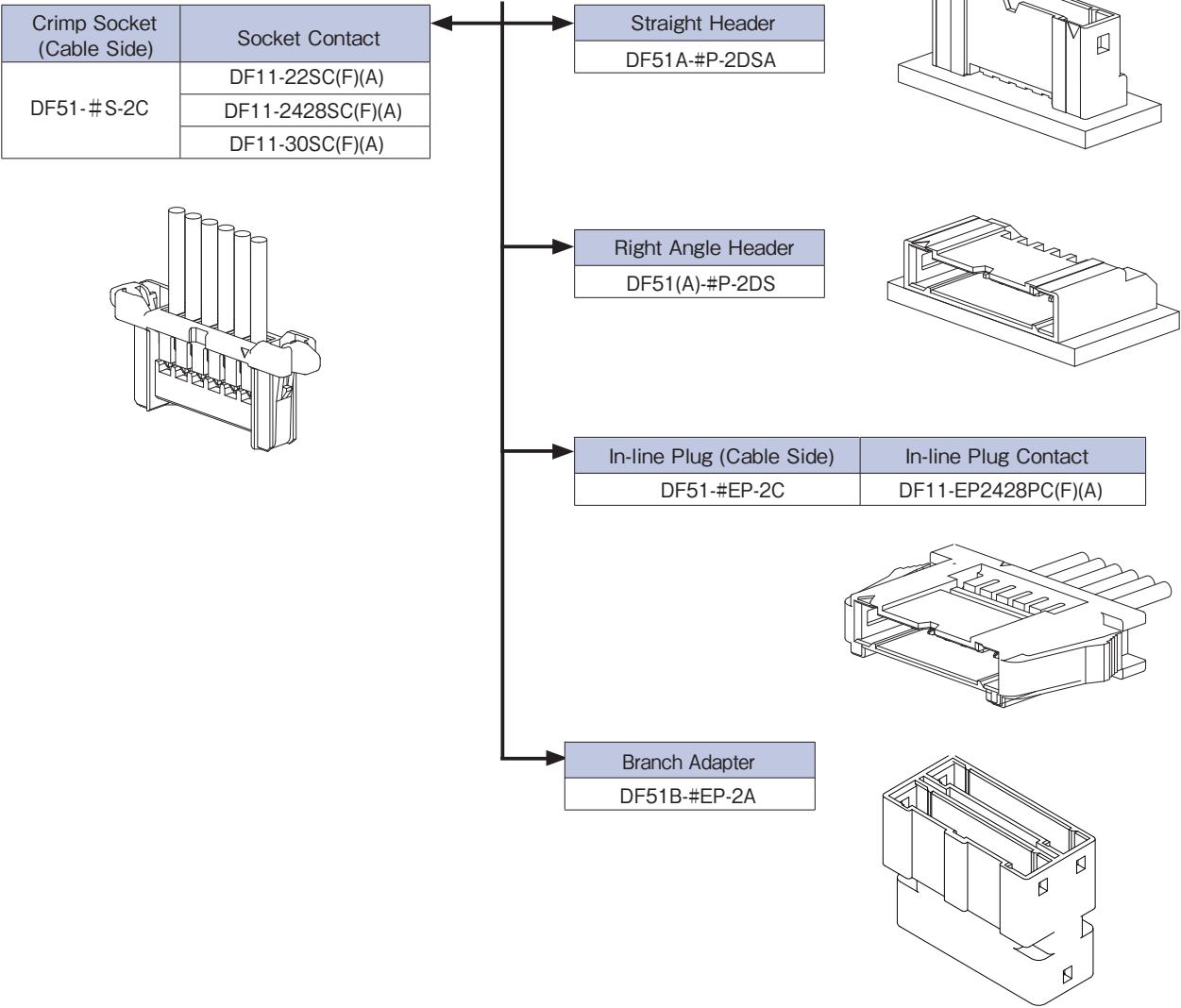
DF11 - EP 2428 PCF A

① ⑦ ⑧ ⑨ ⑩

① Series name	DF51	⑥ Housing Type	DSA : Straight Header DS : Right Angle Header C : Crimp Socket A : Adapter
② Form Type	Blank : Guide-boss Type A : Without Guide-boss B : Branch Type	⑦ Contact Type	EP : In-line Plug
③ Number of Positions	Single-row : 2 to 6 Dual-row : 4 to 30 Branch Adapter : 2 to 4, 6, 7	⑧ Applicable Conductor	22 : 22 AWG 2428 : 24 to 28 AWG 30 : 30 AWG
④ Connector Type	P : Single-row Pin Header S : Single-row Crimp Socket DP : Dual-row Pin Header DS : Dual-row Crimp Socket EP : Single-row In-line Plug DEP : Dual-row In-line Plug	⑨ Packaging Style	SCF : Socket Contacts/Reel SC : Socket Contacts/Bag PCF : In-line Plug Contacts/Reel PC : In-line Plug Contacts/Bag
⑤ Contact Pitch	2mm	⑩ Plating Specifications	Blank : Tin Plated A : Gold Plated

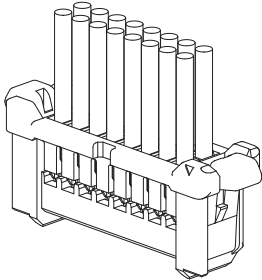
Diagram of Connector Mating Combinations

Single-row

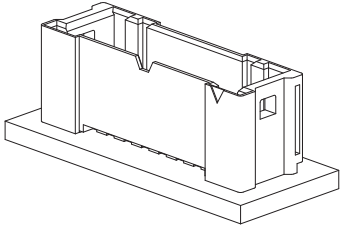


Dual-row

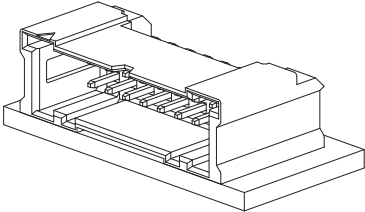
Crimp Socket (Cable Side)	Socket Contact
DF51-#DS-2C	DF11-22SC(F)(A)
	DF11-2428SC(F)(A)
	DF11-30SC(F)(A)



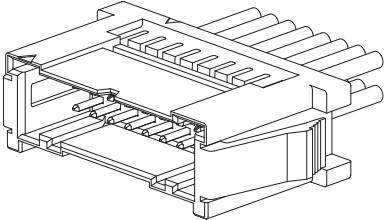
Straight Header DF51A-#DP-2DSA



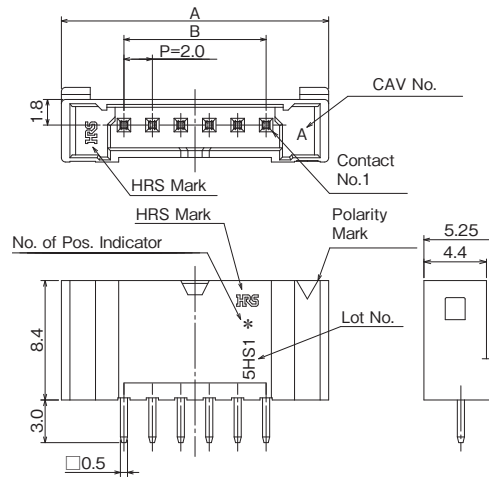
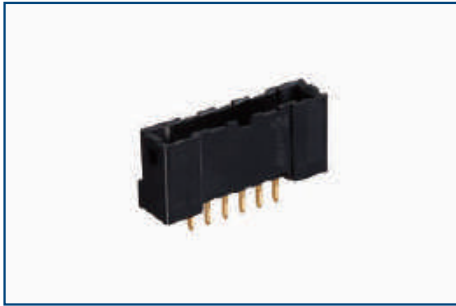
Right Angle Header DF51(A)-#DP-2DS



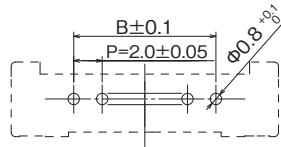
In-line Plug (Cable Side) DF51-#DEP-2C	In-line Plug Contact DF11-EP2428PC(F)(A)



Single-row Straight Header



Recommended PCB Layout (t=1.6mm)



Unit : mm

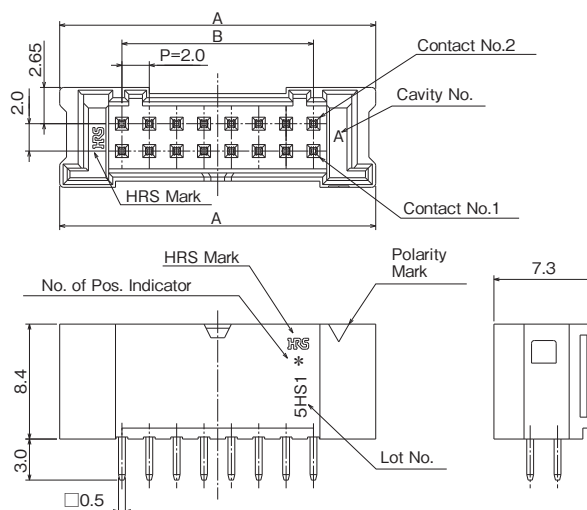
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF51A-2P-2DSA(##)	CL0543-5105-0-##	2	10.8	2.0	100pcs per bag
DF51A-3P-2DSA(##)	CL0543-5106-0-##	3	12.8	4.0	
DF51A-4P-2DSA(##)	CL0543-5107-0-##	4	14.8	6.0	
DF51A-5P-2DSA(##)	CL0543-5108-0-##	5	16.8	8.0	
DF51A-6P-2DSA(##)	CL0543-5109-0-##	6	18.8	10.0	

【Specification number】 - ##、(##)

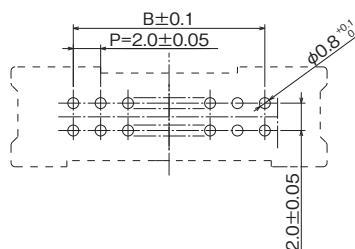
Blank : Tin plated

(01) : Gold plated

Dual-row Straight Header



Recommended PCB Layout (t=1.6mm)



Unit : mm

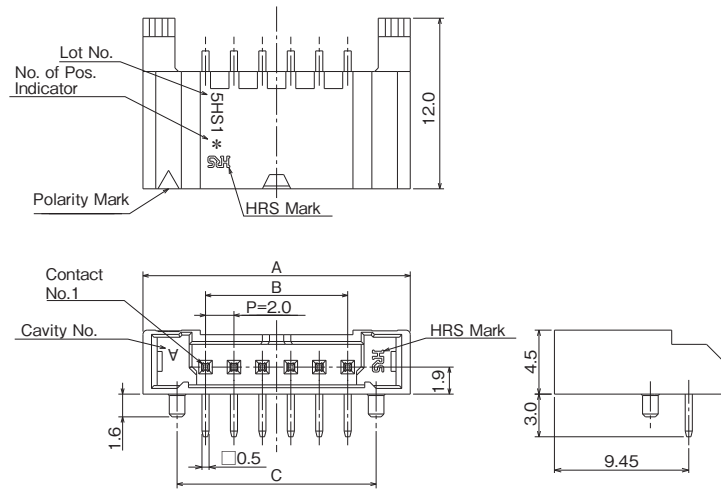
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF51A-4DP-2DSA(##)	CL0543-5015-0-##	4	11.1	2.0	100pcs per bag
DF51A-6DP-2DSA(##)	CL0543-5044-0-##	6	13.1	4.0	
DF51A-8DP-2DSA(##)	CL0543-5045-0-##	8	15.1	6.0	
DF51A-10DP-2DSA(##)	CL0543-5046-0-##	10	17.1	8.0	
DF51A-12DP-2DSA(##)	CL0543-5047-0-##	12	19.1	10.0	
DF51A-14DP-2DSA(##)	CL0543-5048-0-##	14	21.1	12.0	
DF51A-16DP-2DSA(##)	CL0543-5049-0-##	16	23.1	14.0	
DF51A-18DP-2DSA(##)	CL0543-5050-0-##	18	25.1	16.0	
DF51A-20DP-2DSA(##)	CL0543-5051-0-##	20	27.1	18.0	
DF51A-22DP-2DSA(##)	CL0543-5052-0-##	22	29.1	20.0	
DF51A-24DP-2DSA(##)	CL0543-5053-0-##	24	31.1	22.0	
DF51A-26DP-2DSA(##)	CL0543-5054-0-##	26	33.1	24.0	
DF51A-28DP-2DSA(##)	CL0543-5055-0-##	28	35.1	26.0	
DF51A-30DP-2DSA(##)	CL0543-5056-0-##	30	37.1	28.0	

[Specification number] - ##、(##)

Blank : Tin plated

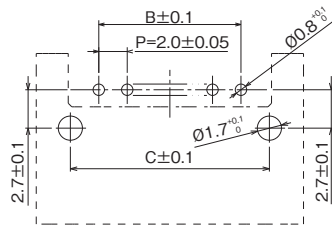
(01) : Gold plated

Single-row Right Angle Header



Above drawing is guide-boss type.

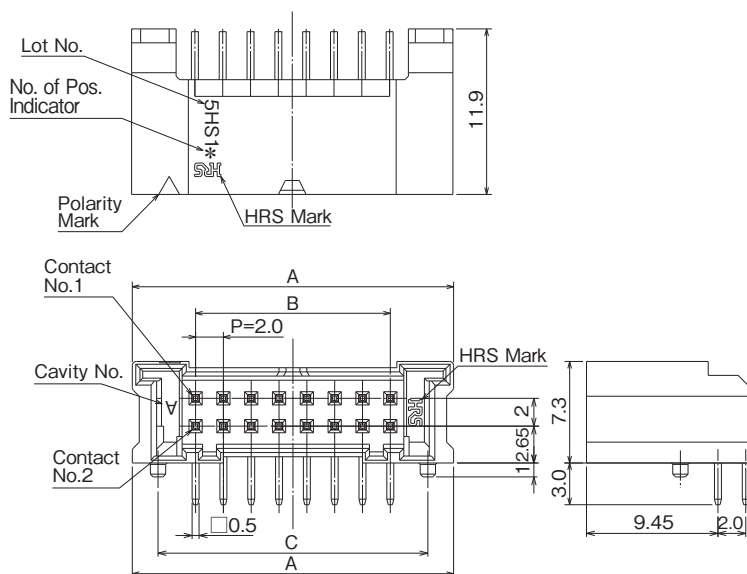
Recommended PCB Layout (t=1.6mm)



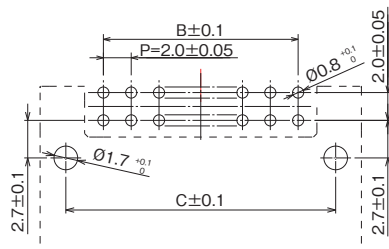
Unit : mm

Part No.	HRS No.	Guide-boss	No. of Pos.	A	B	C	Purchase Unit
DF51-2P-2DS(##)	CL0543-5110-0-##	With boss	2	10.8	2.0	6.0	243pcs per tray
DF51-3P-2DS(##)	CL0543-5111-0-##	With boss	3	12.8	4.0	8.0	207pcs per tray
DF51A-4P-2DS(##)	CL0543-5117-0-##	Without boss	4	14.8	6.0	-	171pcs per tray
DF51A-5P-2DS(##)	CL0543-5118-0-##	Without boss	5	16.8	8.0	-	153pcs per tray
DF51A-6P-2DS(##)	CL0543-5119-0-##	Without boss	6	18.8	10.0	-	135pcs per tray

[Specification number] - ##, (##)
 (20) : Tin plated, tray packaging
 (50) : Gold plated, tray packaging



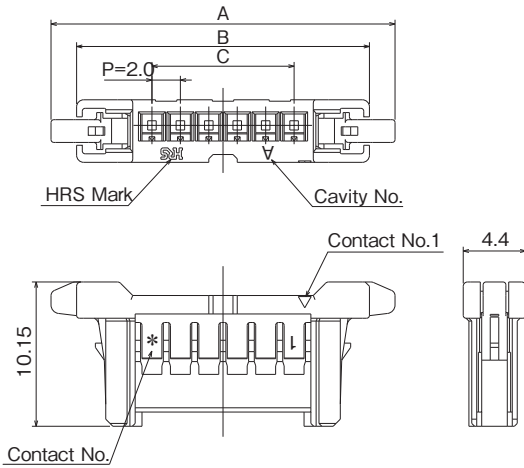
Recommended PCB Layout (t=1.6mm)



Part No.	HRS No.	Guide-boss	No. of Pos.	A	B	C	Purchase Unit
DF51-4DP-2DS(##)	CL0543-5016-7-##	With boss	4	11.1	2.0	7.4	234pcs per tray
DF51-6DP-2DS(##)	CL0543-5017-0-##	With boss	6	13.1	4.0	9.4	198pcs per tray
DF51A-8DP-2DS(##)	CL0543-5059-0-##	Without boss	8	15.1	6.0	-	171pcs per tray
DF51A-10DP-2DS(##)	CL0543-5060-0-##	Without boss	10	17.1	8.0	-	153pcs per tray
DF51A-12DP-2DS(##)	CL0543-5061-0-##	Without boss	12	19.1	10.0	-	135pcs per tray
DF51A-14DP-2DS(##)	CL0543-5062-0-##	Without boss	14	21.1	12.0	-	126pcs per tray
DF51A-16DP-2DS(##)	CL0543-5063-0-##	Without boss	16	23.1	14.0	-	108pcs per tray
DF51A-18DP-2DS(##)	CL0543-5064-0-##	Without boss	18	25.1	16.0	-	99pcs per tray
DF51A-20DP-2DS(##)	CL0543-5065-0-##	Without boss	20	27.1	18.0	-	90pcs per tray
DF51A-22DP-2DS(##)	CL0543-5066-0-##	Without boss	22	29.1	20.0	-	90pcs per tray
DF51A-24DP-2DS(##)	CL0543-5067-0-##	Without boss	24	31.1	22.0	-	81pcs per tray
DF51A-26DP-2DS(##)	CL0543-5068-0-##	Without boss	26	33.1	24.0	-	72pcs per tray
DF51A-28DP-2DS(##)	CL0543-5069-0-##	Without boss	28	35.1	26.0	-	72pcs per tray
DF51A-30DP-2DS(##)	CL0543-5070-0-##	Without boss	30	37.1	28.0	-	72pcs per tray

12

Single-row Crimp Socket

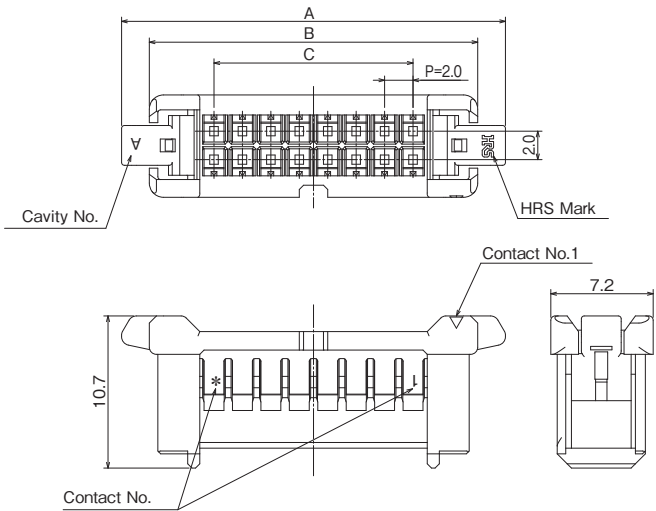


Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF51-2S-2C	CL0543-5120-0-00	2	16.2	12.6	2.0	100pcs per bag
DF51-3S-2C	CL0543-5121-0-00	3	18.2	14.6	4.0	
DF51-4S-2C	CL0543-5122-0-00	4	20.2	16.6	6.0	
DF51-5S-2C	CL0543-5123-0-00	5	22.2	18.6	8.0	
DF51-6S-2C	CL0543-5124-0-00	6	24.2	20.6	10.0	
DF51-7S-2C	CL0543-5131-0-00	7	26.2	22.6	12.0	

Note : The 7 pos. mating partner is only a branch adapter.

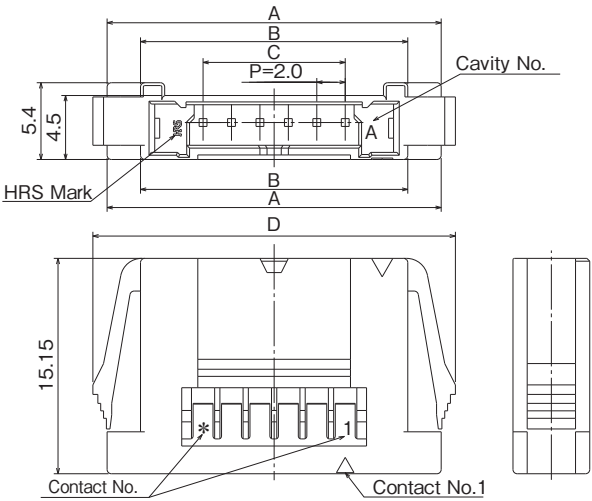
Dual-row Crimp Socket



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF51-4DS-2C	CL0543-5030-8-00	4	15.0	11.1	2.0	100pcs per bag
DF51-6DS-2C	CL0543-5031-0-00	6	17.0	13.1	4.0	
DF51-8DS-2C	CL0543-5032-3-00	8	19.0	15.1	6.0	
DF51-10DS-2C	CL0543-5033-6-00	10	21.0	17.1	8.0	
DF51-12DS-2C	CL0543-5034-9-00	12	23.0	19.1	10.0	
DF51-14DS-2C	CL0543-5035-1-00	14	25.0	21.1	12.0	
DF51-16DS-2C	CL0543-5036-4-00	16	27.0	23.1	14.0	
DF51-18DS-2C	CL0543-5037-7-00	18	29.0	25.1	16.0	
DF51-20DS-2C	CL0543-5038-0-00	20	31.0	27.1	18.0	
DF51-22DS-2C	CL0543-5039-2-00	22	33.0	29.1	20.0	
DF51-24DS-2C	CL0543-5040-1-00	24	35.0	31.1	22.0	
DF51-26DS-2C	CL0543-5041-4-00	26	37.0	33.1	24.0	
DF51-28DS-2C	CL0543-5042-7-00	28	39.0	35.1	26.0	
DF51-30DS-2C	CL0543-5043-0-00	30	41.0	37.1	28.0	

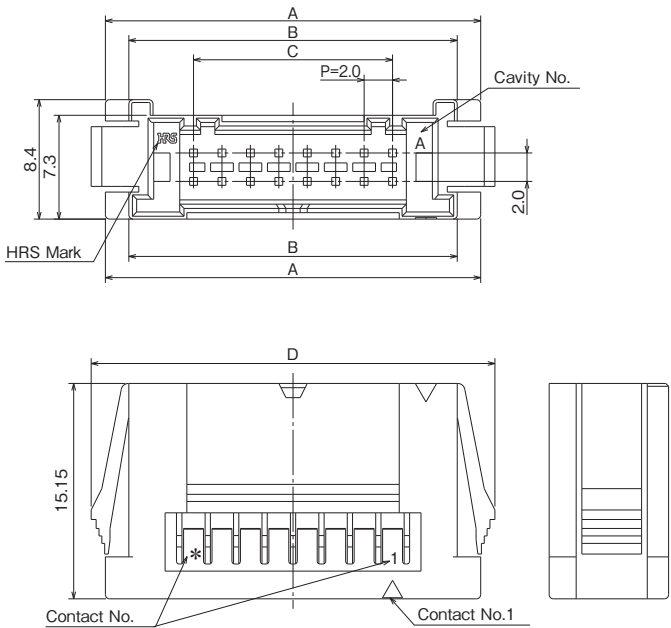
Single-Row In-line Plug



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	Purchase Unit
DF51-2EP-2C	CL0543-5125-0-00	2	15.5	10.8	2.0	17.5	100pcs per bag
DF51-3EP-2C	CL0543-5126-0-00	3	17.5	12.8	4.0	19.5	
DF51-4EP-2C	CL0543-5127-0-00	4	19.5	14.8	6.0	21.5	
DF51-5EP-2C	CL0543-5128-0-00	5	21.5	16.8	8.0	23.5	
DF51-6EP-2C	CL0543-5129-0-00	6	23.5	18.8	10.0	25.5	

Dual-row In-line Plug

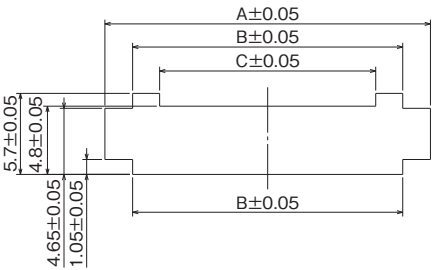


Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	Purchase Unit
DF51-4DEP-2C	CL0543-5071-0-00	4	14.4	11.1	2.0	16.4	100pcs per bag
DF51-6DEP-2C	CL0543-5072-0-00	6	16.4	13.1	4.0	18.4	
DF51-8DEP-2C	CL0543-5073-0-00	8	18.4	15.1	6.0	20.4	
DF51-10DEP-2C	CL0543-5074-0-00	10	20.4	17.1	8.0	22.4	
DF51-12DEP-2C	CL0543-5075-0-00	12	22.4	19.1	10.0	24.4	
DF51-14DEP-2C	CL0543-5076-0-00	14	24.4	21.1	12.0	26.4	
DF51-16DEP-2C	CL0543-5077-0-00	16	26.4	23.1	14.0	28.4	
DF51-18DEP-2C	CL0543-5078-0-00	18	28.4	25.1	16.0	30.4	
DF51-20DEP-2C	CL0543-5079-0-00	20	30.4	27.1	18.0	32.4	
DF51-22DEP-2C	CL0543-5080-0-00	22	32.4	29.1	20.0	34.4	
DF51-24DEP-2C	CL0543-5081-0-00	24	34.4	31.1	22.0	36.4	
DF51-26DEP-2C	CL0543-5082-0-00	26	36.4	33.1	24.0	38.4	
DF51-28DEP-2C	CL0543-5083-0-00	28	38.4	35.1	26.0	40.4	
DF51-30DEP-2C	CL0543-5084-0-00	30	40.4	37.1	28.0	42.4	

In-line Plug Panel Cutouts

●Single-row

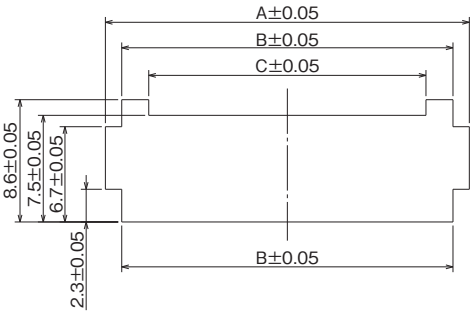


Unit : mm

Part No.	HRS No.	No. of Pos.	A				B	C
			Panel Board Thickness (Note 1)					
			0.5 to 0.8	0.9 to 1.3	1.4 to 1.8	1.9 to 2.3		
DF51-2EP-2C	CL0543-5125-0-00	2	14.9	15.2	15.6	16.0	11.0	7.2
DF51-3EP-2C	CL0543-5126-0-00	3	16.9	17.2	17.6	18.0	13.0	9.2
DF51-4EP-2C	CL0543-5127-0-00	4	18.9	19.2	19.6	20.0	15.0	11.2
DF51-5EP-2C	CL0543-5128-0-00	5	20.9	21.2	21.6	22.0	17.0	13.2
DF51-6EP-2C	CL0543-5129-0-00	6	22.9	23.2	23.6	24.0	19.0	15.2

Note 1 : The A dimension of the mounting hole varies based on panel board thickness.
Note 2 : Do not use a rounded surface at the panel tab portion.

●Dual-row

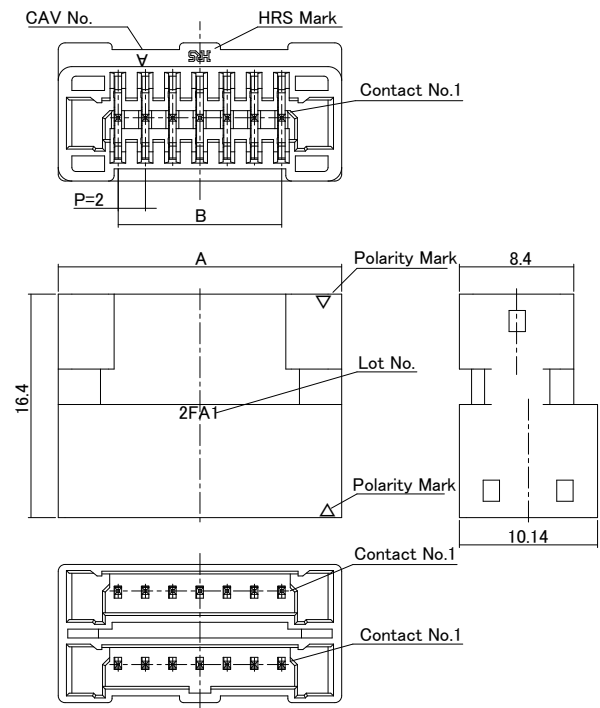


Unit : mm

Part No.	HRS No.	No. of Pos.	A				B	C
			Panel Board Thickness (Note 1)					
			0.5 to 0.8	0.9 to 1.3	1.4 to 1.8	1.9 to 2.3		
DF51-4DEP-2C	CL0543-5071-0-00	4	13.6	14.1	14.5	14.9	11.3	7.5
DF51-6DEP-2C	CL0543-5072-0-00	6	15.6	16.1	16.5	16.9	13.3	9.5
DF51-8DEP-2C	CL0543-5073-0-00	8	17.6	18.1	18.5	18.9	15.3	11.5
DF51-10DEP-2C	CL0543-5074-0-00	10	19.6	20.1	20.5	20.9	17.3	13.5
DF51-12DEP-2C	CL0543-5075-0-00	12	21.6	22.1	22.5	22.9	19.3	15.5
DF51-14DEP-2C	CL0543-5076-0-00	14	23.6	24.1	24.5	24.9	21.3	17.5
DF51-16DEP-2C	CL0543-5077-0-00	16	25.6	26.1	26.5	26.9	23.3	19.5
DF51-18DEP-2C	CL0543-5078-0-00	18	27.6	28.1	28.5	28.9	25.3	21.5
DF51-20DEP-2C	CL0543-5079-0-00	20	29.6	30.1	30.5	30.9	27.3	23.5
DF51-22DEP-2C	CL0543-5080-0-00	22	31.6	32.1	32.5	32.9	29.3	25.5
DF51-24DEP-2C	CL0543-5081-0-00	24	33.6	34.1	34.5	34.9	31.3	27.5
DF51-26DEP-2C	CL0543-5082-0-00	26	35.6	36.1	36.5	36.9	33.3	29.5
DF51-28DEP-2C	CL0543-5083-0-00	28	37.6	38.1	38.5	38.9	35.3	31.5
DF51-30DEP-2C	CL0543-5084-0-00	30	39.6	40.1	40.5	40.9	37.3	33.5

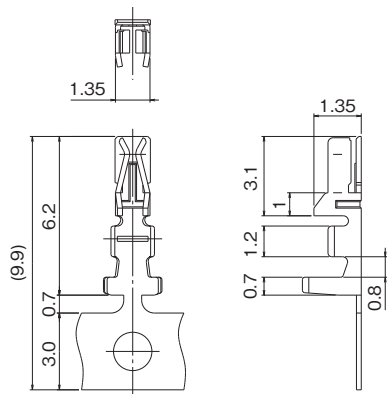
Note 1 : The A dimension of the mounting hole varies based on panel board thickness.
Note 2 : Do not use a rounded surface at the panel tab portion.

Branch Adapter



Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF51B-2EP-2A	CL0543-5133-0-00	2	10.8	2.0	100pcs per bag
DF51B-3EP-2A	CL0543-5134-0-00	3	12.8	4.0	
DF51B-4EP-2A	CL0543-5135-0-00	4	14.8	6.0	
DF51B-6EP-2A	CL0543-5136-0-00	6	18.8	10.0	
DF51B-7EP-2A	CL0543-5132-0-00	7	20.8	12.0	

Socket Contact



Part No.	HRS No.	Category	Purchase Unit	Finish
DF11-22SCF	CL0543-0601-0-00	Reel Contact	10,000pcs per reel	Tin Plated
DF11-22SC	CL0543-0602-2-00	Loose Contact	100pcs per bag	
DF11-2428SCF	CL0543-0500-2-00	Reel Contact	10,000pcs per reel	
DF11-2428SC	CL0543-0501-5-00	Loose Contact	100pcs per bag	
DF11A-2428SCF	CL0543-0634-9-00	Reel Contact	10,000pcs per reel	
DF11A-2428SC	CL0543-0635-1-00	Loose Contact	100pcs per bag	
DF11-30SCF	CL0543-0605-0-00	Reel Contact	10,000pcs per reel	
DF11-30SC	CL0543-0606-3-00	Loose Contact	100pcs per bag	
DF11-22SCFA(04)	CL0543-0603-5-04	Reel Contact	10,000pcs per reel	Gold Plated
DF11-22SCA	CL0543-0604-8-00	Loose Contact	100pcs per bag	
DF11-2428SCFA(04)	CL0543-0550-0-04	Reel Contact	10,000pcs per reel	
DF11-2428SCA	CL0543-0551-3-00	Loose Contact	100pcs per bag	
DF11-30SCFA(04)	CL0543-0607-6-04	Reel Contact	10,000pcs per reel	
DF11-30SCA	CL0543-0608-9-00	Loose Contact	100pcs per bag	

Note : DF11A-2428SCF/SC is the tin plated low insertion/extraction force type.

◆Applicable Wire (Tinned, Annealed Copper Wire)

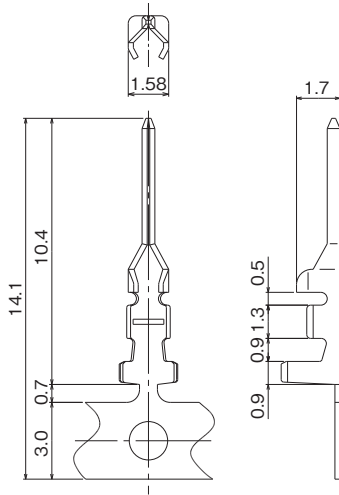
- Recommended Wire
UL1061, UL1007 (Note 2)
- Strip Length
1.7 to 2.3mm

Wire Size (Stranded Wire Conductor)	Jacket Diameter
22 AWG (17/0.16)	φ 1.2-1.45mm
24 AWG (11/0.16)	φ 0.9-1.45mm
26 AWG (7/0.16)	
28 AWG (7/0.127)	
30 AWG (7/0.1)	φ 0.75-1.2mm

Note 1 : Contact your Hirose representative when using a cable other than those specified.

Note 2 : DF11-22SCF/SC/SCFA/SCA is for UL1061.

In-line Plug Contact



Part No.	HRS No.	Category	Purchase Unit	Finish
DF11-EP2428PCF	CL0543-0615-4-00	Reel Contact	10,000pcs per reel	Tin Plated
DF11-EP2428PC	CL0543-0616-7-00	Loose Contact	100pcs per bag	
DF11-EP2428PCFA	CL0543-0617-0-00	Reel Contact	10,000pcs per reel	Gold Plated
DF11-EP2428PCA	CL0543-0618-2-00	Loose Contact	100pcs per bag	

◆Applicable Wire (Tinned, Annealed Copper Wire)

- Recommended Wire
UL1061, UL1007
- Strip Length
1.9 to 2.3mm

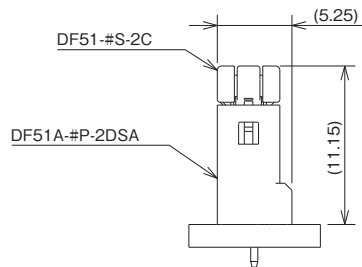
Wire Size (Stranded Wire Conductor)	Jacket Diameter
24 AWG (11/0.16)	φ 0.9-1.45mm
26 AWG (7/0.16)	
28 AWG (7/0.127)	

Note : Contact your Hirose representative when using a cable other than those specified.

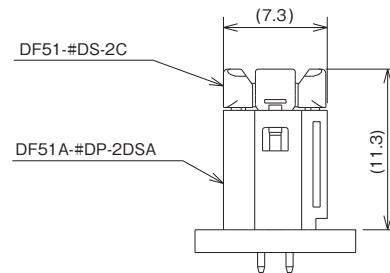
Mated Dimensions

● Wire-to-Board Connection (Straight Header)

【Single-row】

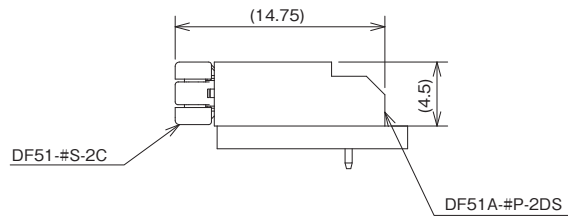


【Dual-row】

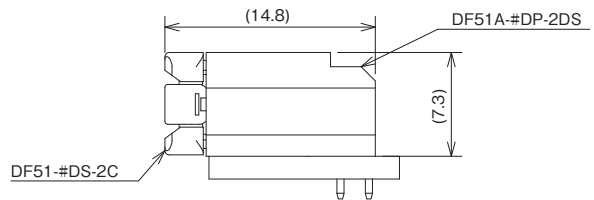


● Wire-to-Board Connection (Right Angle Header)

【Single-row】

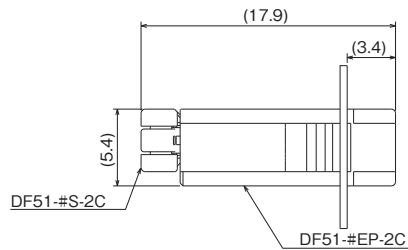


【Dual-row】

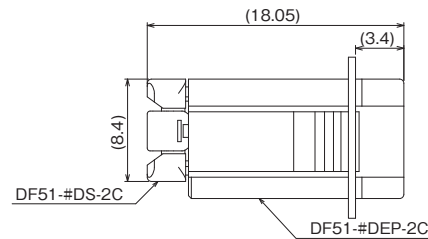


● Wire-to-Wire Connection

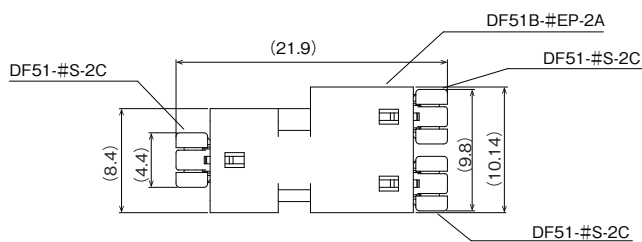
【Single-row】



【Dual-row】



【Adapter】



Applicable Crimping Tool

Type	Part No.	HRS No.	Wire Type	Applicable Contacts
Applicator	AP105-DF11-22S	CL0901-4529-7-00	UL1061 (Note 3, 5)	DF11-22SCF/SCFA(04)
	AP105-DF11-2428S	CL0901-4511-1-00	UL1007 (Note 3) UL1061 (Note 3)	DF11-2428SCF/SCFA(04) DF11A-2428SCF
	AP105-DF11-30S	CL0901-4532-1-00	UL1007 (Note 3) UL1061 (Note 3)	DF11-30SCF/SCFA(04)
	AP105-DF11-EP2428P	CL0901-4528-4-00	UL1007 (Note 3) UL1061 (Note 3)	DF11-EP2428PCF/PCFA
Press Unit	CM-105C	CL0901-0001-0-00	-	
Hand Tool	HT801/DF11-22S(A)	CL0550-0407-5-00	UL1061 (Note 4, 5)	DF11-22SC/SCA
	HT801/DF11-2428S(A)	CL0550-0403-4-00	UL1007 (Note 4) UL1061 (Note 4)	DF11-2428SC/SCA DF11A-2428SC
	HT801/DF11-30S(A)	CL0550-0408-8-00	UL1007 (Note 4) UL1061 (Note 4)	DF11-30SC/SCA
	HT801/DF11-EP2428P(A)	CL0550-0409-0-00	UL1007 (Note 4) UL1061 (Note 4)	DF11-EP2428PC/PCA
Contact Extraction Tool	DF-C-PO(B)	CL0550-0179-2-00	-	DF11-####SCF DF11-EP####PCF

Note 1 : Please conduct crimping based on the "Crimp Quality Standard" and "Crimp Condition" table.

Note 2 : Any problems that occur from using tools other than those specified by Hirose are not covered by warranty.

Note 3 : Applicator dies can be switched to crimp other wire sizes and types. The additional dies are sold separately.

Note 4 : Hand tool dies cannot be switched.

Note 5 : The compatible wire is limited to UL1061, 22 AWG

Precautions for Use

- The connector could be damaged if it is pulled out forcibly. When it is hard to pull out, push it in slightly first and then depress the lock and un-mate.
Please refer to the "DF51 Series Mating/Unmating Operation Instruction Manual" (ETAD-H0847-00) for handling precautions during mating.
- When inserting a crimped contact into a socket, please refrain from inserting at a diagonal as doing so may affect performance reliability.
Refer to the "DF51 Series Cable Assembly Procedure" (ETAD-H0923-00) for precautions during cable assembly.

Operating Environment

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

2mm Pitch, Positive lock, Wire-to-Board Connector (UL, C-UL Listed)

DF51K Series



■ Features

1. Positive lock provides clear tactile click and secures reliable connection

The locking mechanism delivers a clear tactile click, which prevents incomplete mating. (Fig.1)

2. Wide variation

Straight and right angle types are available in single row and double row contact arrangements for flexible board design. Gold and Tin plating options support various application needs.

3. Easy Lock Release

The width of the center lock lever increases as the pin count increases for easy extraction. Additionally, the center lock design does not need side-to-side spacing to un-mate the connector, which enables high density mounting. (Fig.2)

4. Prevents incorrect mating

Visually and mechanically polarized design prevents reverse mating and incorrect mating between different number of positions. (Fig.3)

5. Suitable for potting

Capable of being potted up to 3mm. (Fig.3)

6. Uses the same crimp tools as DF11 Series

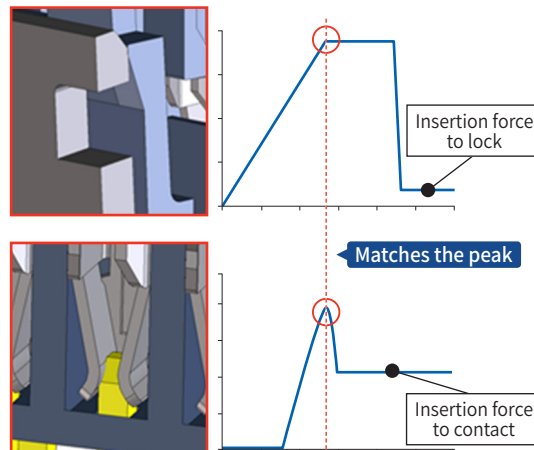
Wide applicable cable range : 22 to 30 AWG.
(However, the crimp contact of DF51K and DF11 are not compatible with each other.)

7. UL, C-UL certified

■ Applications

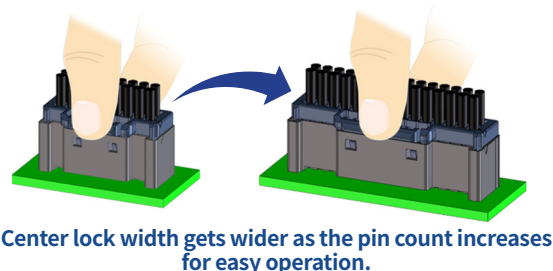
Office equipment, Industrial machinery,
Industrial robots, Amusement equipment,
Medical equipment.

Secure mating with clear tactile click

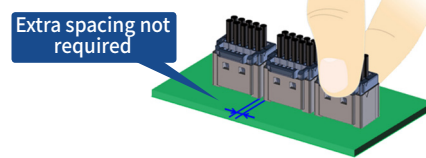


Matching peak insertion forces provides a clear click sound and tactile click

Fig.1



Center lock width gets wider as the pin count increases for easy operation.



High workability and high density mounting due to center lock design

Fig.2

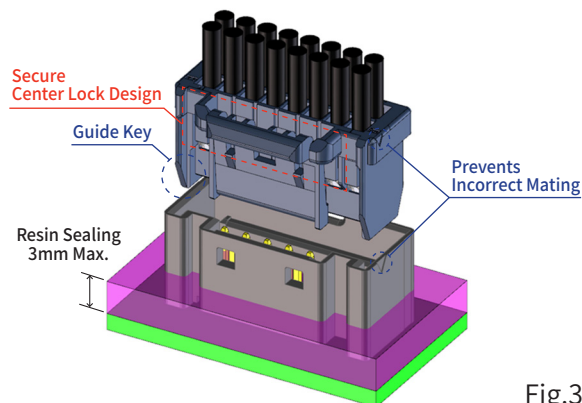


Fig.3

Product Specifications

Ratings	Rated Current (Note 1)		Number of Contacts	22 AWG	24 AWG	26 AWG	28 AWG	30 AWG	Operating Temperature	-55 to +105°C (Note 2)
		Single Row	2	3A	2.5A	2A	1A	0.5A	Operating Humidity Range	20 to 80% (Note 3)
			3-6	2A	2A					
		Double Row	4	3A	2.5A				Storage Temperature	-10 to +60°C (Note 4)
			6-30	2A	2A	1.5A				
	Rated Voltage	250V AC/DC							Storage Humidity Range	40 to 70% (Note 4)

Ratings	Rated Current (Note 1)	22 AWG	24 to 28 AWG	30 AWG	UL/C-UL File No., and Recognition No. UL, C-UL : E132750
		2A	1A	0.5A	
	Rated Voltage	30V AC/DC			

Items	Specifications	Conditions
1. Insulation Resistance	No less than 1,000MΩ	Measured at 500V DC
2. Withstanding Voltage	No flashover or breakdown	650V AC is applied for 1 minute
3. Contact Resistance	No more than 30mΩ	Measured at 1mA and no higher than 20mV
4. Vibration Resistance	No electrical discontinuity of 1μs or greater	Frequency : 10 to 55Hz, half amplitude 0.75mm, 10 times in each of the 3 directions
5. Shock Resistance	No electrical discontinuity of 1μs or greater	Acceleration velocity : 490m/s ² for 11ms, half-sine wave in 3 directions, 3 times for each directions
6. Moisture Resistance	Contact resistance : no more than 30mΩ Insulation resistance : no less than 500MΩ	Temperature : 40±2°C, humidity : 90 to 95%, left as it is for 96 hours
7. Temperature Cycles	Contact resistance : no more than 30mΩ Insulation resistance : no less than 1,000MΩ	-55°C: 30 minutes → 105°C : 30 minutes 5 cycles
8. Mating Durability	Contact resistance: no more than 30mΩ	Tin plated : 30 mating cycles, Gold plated : 50 mating cycles
9. Soldering Heat Resistance	The resin parts should withstand the temperature and resist melting.	Flow : 260°C, 5 sec. Hand soldering : temperature of soldering iron at 270°C for 3 seconds

Note 1 : The rated current varies based on the cable size used.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : Use without condensation on parts.

Note 4 : The storage condition refers to long-term storage of the product on the shelf before assembly. Please use the operating temperature for temporary storage such as pre-assembly and during shipping.

Material / Finish

Product	Part	Material	Finish	UL Regulation
Header	Insulator	Straight : PA66 Right Angle : PBT (glass-reinforced)	Black	UL94V-0
	Contact	Brass	Tin Plated or Gold Plated	—
Crimp Socket	Insulator	PBT (glass-reinforced)	Black	UL94V-0
Socket Contact	Contact	Phosphor bronze	Tin Plated or Gold 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

DF51K # - * P - 2 DSA
① ② ③ ④ ⑤ ⑥

Crimp Contact

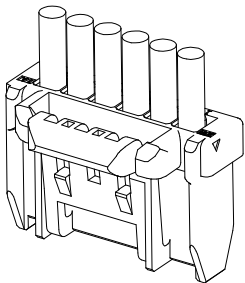
DF51K - 2428 SCF A
① ⑦ ⑧ ⑨

① Series Name : DF51K	⑥ Type of Housing DSA : Straight header DS : Right angle header C : Crimp socket
② Form Type Blank : Without guide-boss B : Guide-boss type	⑦ Applicable Conductor 22 : 22 AWG 2428 : 24 to 28 AWG 30 : 30 AWG
③ Number of Contacts Single-row : 2 to 6 Double-row : 4 to 30	⑧ Packaging SC : Socket contacts/pack SCF : Socket contacts/reel
④ Connector type P : Single-row pin header S : Single-row crimp socket DP : Double-row pin header DS : Double-row crimp socket	⑨ Plating Specifications Blank : Tin plated A : Gold plated
⑤ Contact Pitch : 2mm	

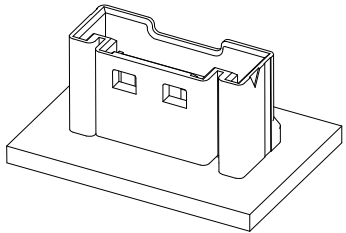
Diagram of Connector Mating Combinations

Single-row

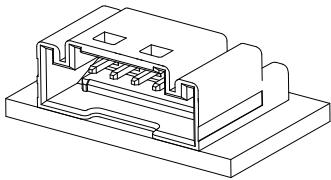
Crimp Socket	Socket Contact
DF51K-*S-2C	DF51K-22SC(F)(A)
	DF51K-2428SC(F)(A)
	DF51K-30SC(F)(A)



Straight Header
DF51K-*P-2DSA

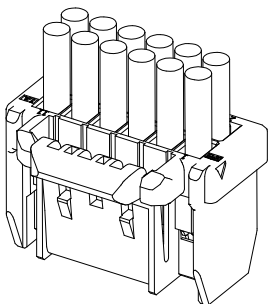


Right Angle Header
DF51K(B)-*P-2DS

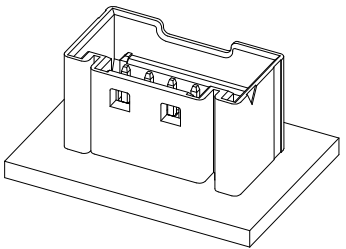


Double-row

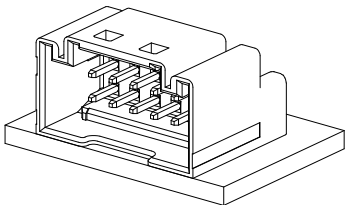
Crimp Socket	Socket Contact
DF51K-*DS-2C	DF51K-22SC(F)(A)
	DF51K-2428SC(F)(A)
	DF51K-30SC(F)(A)



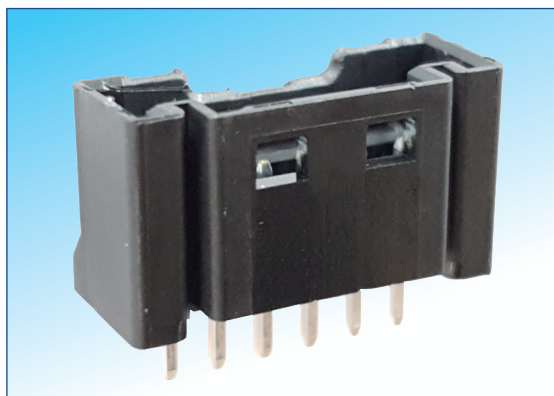
Straight Header
DF51K-*DP-2DSA



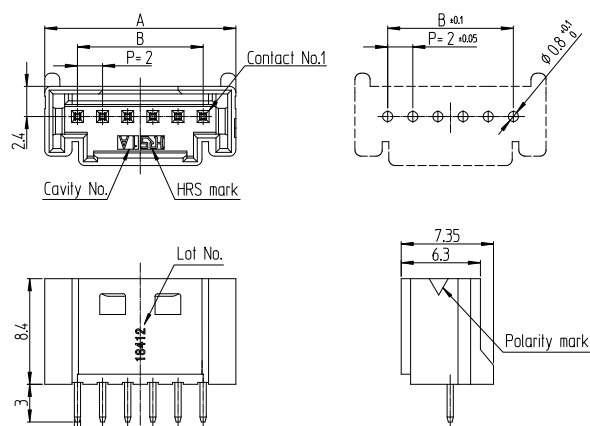
Right Angle Header
DF51K(B)-*DP-2DS



Single-row Straight Header



Recommended PCB Layout (t=1.6mm)

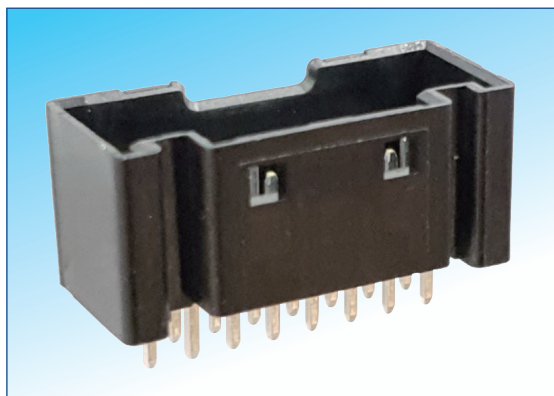


[Specification number] - **, (8**)
00 : Tin plated
05 : Gold plated

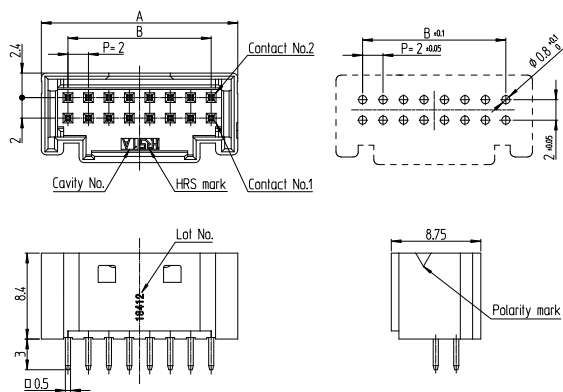
Part No.	HRS No.	No. of Contacts	A	B
DF51K-2P-2DSA(8**)	480-0542-0 **	2	7.2	2.0
DF51K-3P-2DSA(8**)	480-0543-0 **	3	9.2	4.0
DF51K-4P-2DSA(8**)	480-0544-0 **	4	11.2	6.0
DF51K-5P-2DSA(8**)	480-0545-0 **	5	13.2	8.0
DF51K-6P-2DSA(8**)	480-0546-0 **	6	15.2	10.0

Note : The sales unit is one pack(100pcs/pack). Order by number of packs.

Double-row Straight Header



Recommended PCB Layout (t=1.6mm)



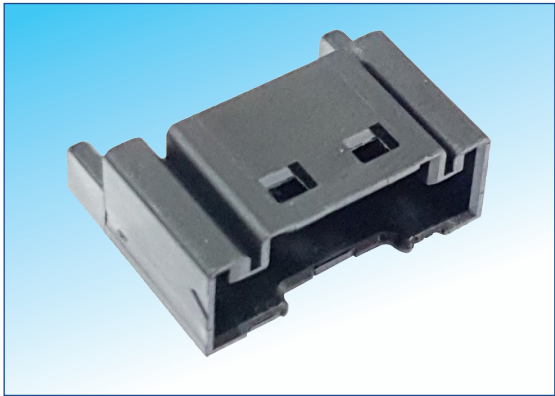
[Specification number] - **, (8**)
00 : Tin plated
05 : Gold plated

Part No.	HRS No.	No. of Contacts	A	B
DF51K-4DP-2DSA(8**)	480-0547-0 **	4	7.2	2.0
DF51K-6DP-2DSA(8**)	480-0548-0 **	6	9.2	4.0
DF51K-8DP-2DSA(8**)	480-0549-0 **	8	11.2	6.0
DF51K-10DP-2DSA(8**)	480-0550-0 **	10	13.2	8.0
DF51K-12DP-2DSA(8**)	480-0551-0 **	12	15.2	10.0
DF51K-14DP-2DSA(8**)	480-0552-0 **	14	17.2	12.0
DF51K-16DP-2DSA(8**)	480-0553-0 **	16	19.2	14.0

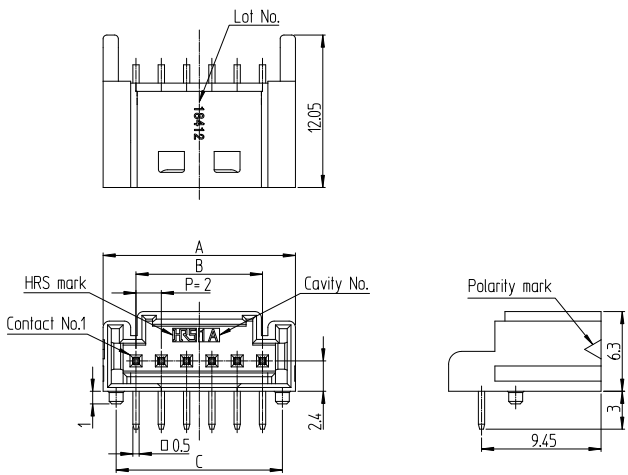
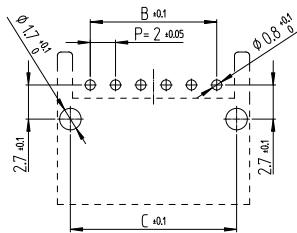
Part No.	HRS No.	No. of Contacts	A	B
DF51K-18DP-2DSA(8**)	480-0554-0 **	18	21.2	16.0
DF51K-20DP-2DSA(8**)	480-0555-0 **	20	23.2	18.0
DF51K-22DP-2DSA(8**)	480-0556-0 **	22	25.2	20.0
DF51K-24DP-2DSA(8**)	480-0557-0 **	24	27.2	22.0
DF51K-26DP-2DSA(8**)	480-0558-0 **	26	29.2	24.0
DF51K-28DP-2DSA(8**)	480-0559-0 **	28	31.2	26.0
DF51K-30DP-2DSA(8**)	480-0560-0 **	30	33.2	28.0

Note : The sales unit is one pack (100pcs/pack). Order by number of packs.

Single-row Right Angle Header



Recommended PCB Layout (t=1.6mm)



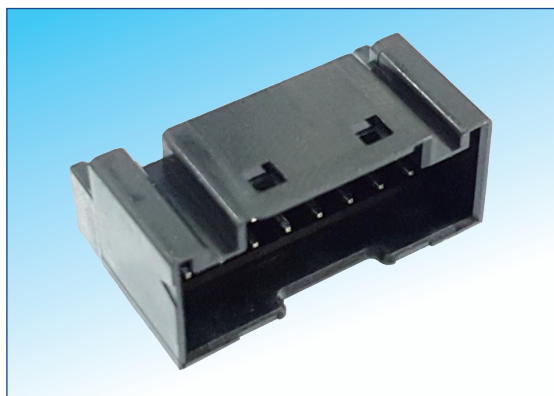
*The above drawing is of guide-boss type.

[Specification number] - **, (8**)
00 : Tin plated, tray packaging
05 : Gold plated, tray packaging

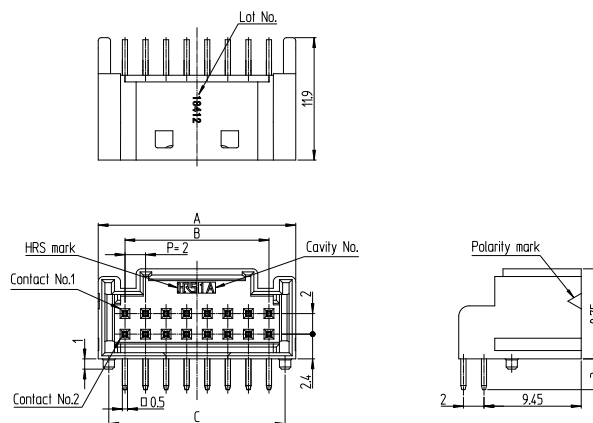
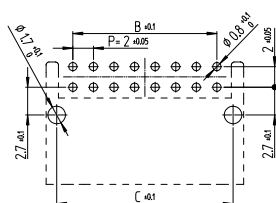
Part No.	HRS No.	Guide-Boss	No. of Contacts	A	B	C	Quantity per Package
DF51KB-2P-2DS(8**)	480-0587-0 **	With boss	2	7.2	2.0	5.14	420
DF51KB-3P-2DS(8**)	480-0588-0 **	With boss	3	9.2	4.0	7.14	330
DF51K-4P-2DS(8**)	480-0589-0 **	Without boss	4	11.2	6.0	—	270
DF51K-5P-2DS(8**)	480-0590-0 **	Without boss	5	13.2	8.0	—	230
DF51K-6P-2DS(8**)	480-0591-0 **	Without boss	6	15.2	10.0	—	200

Note : The sales unit is one tray. Order by number of trays.

Double-row Right Angle Header



Recommended PCB Layout (t=1.6mm)



*The above drawing is of guide-boss type.

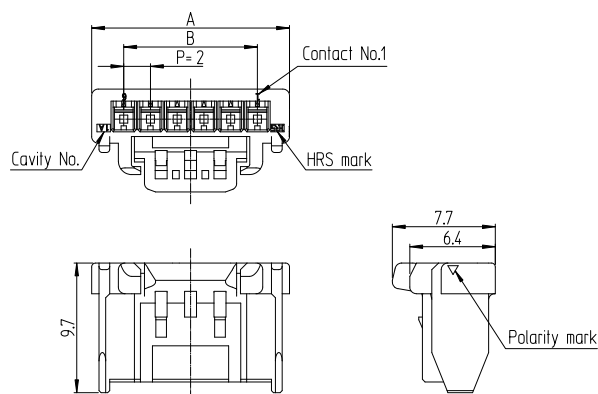
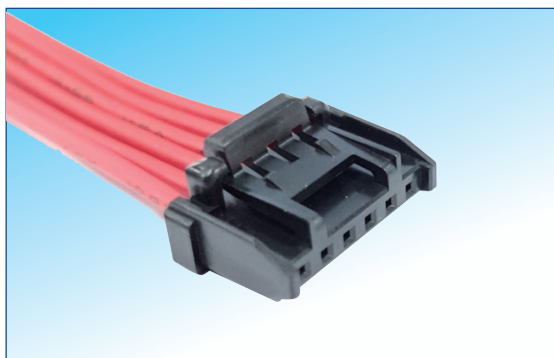
[Specification number] - **, (8**)
00 : Tin plated, tray packaging
05 : Gold plated, tray packaging

Part No.	HRS No.	Guide-Boss	No. of Contacts	A	B	C	Quantity per Package
DF51KB-4DP-2DS(8**)	480-0592-0 **	With boss	4	7.2	2.0	5.14	420
DF51KB-6DP-2DS(8**)	480-0593-0 **	With boss	6	9.2	4.0	7.14	330
DF51K-8DP-2DS(8**)	480-0594-0 **	Without boss	8	11.2	6.0	—	270
DF51K-10DP-2DS(8**)	480-0595-0 **	Without boss	10	13.2	8.0	—	230
DF51K-12DP-2DS(8**)	480-0596-0 **	Without boss	12	15.2	10.0	—	200
DF51K-14DP-2DS(8**)	480-0597-0 **	Without boss	14	17.2	12.0	—	170
DF51K-16DP-2DS(8**)	480-0598-0 **	Without boss	16	19.2	14.0	—	150
DF51K-18DP-2DS(8**)	480-0599-0 **	Without boss	18	21.2	16.0	—	140
DF51K-20DP-2DS(8**)	480-0600-0 **	Without boss	20	23.2	18.0	—	130
DF51K-22DP-2DS(8**)	480-0601-0 **	Without boss	22	25.2	20.0	—	120
DF51K-24DP-2DS(8**)	480-0602-0 **	Without boss	24	27.2	22.0	—	110
DF51K-26DP-2DS(8**)	480-0603-0 **	Without boss	26	29.2	24.0	—	100
DF51K-28DP-2DS(8**)	480-0604-0 **	Without boss	28	31.2	26.0	—	90
DF51K-30DP-2DS(8**)	480-0605-0 **	Without boss	30	33.2	28.0	—	90

Note : The sales unit is one tray. Order by number of trays.

■ Crimp Socket

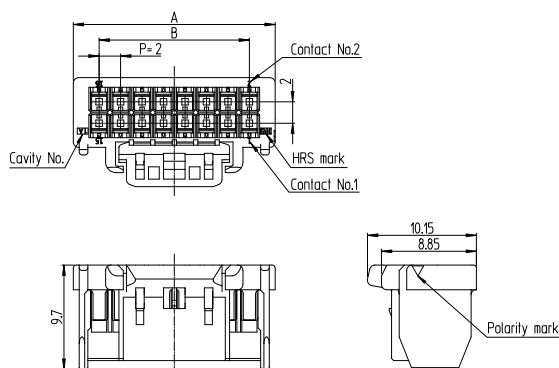
● Single-row



Part No.	HRS No.	No. of Contacts	A	B
DF51K-2S-2C(800)	480-0561-0 00	2	6.8	2.0
DF51K-3S-2C(800)	480-0562-0 00	3	8.8	4.0
DF51K-4S-2C(800)	480-0563-0 00	4	10.8	6.0
DF51K-5S-2C(800)	480-0564-0 00	5	12.8	8.0
DF51K-6S-2C(800)	480-0565-0 00	6	14.8	10.0

Note : The sales unit is one pack (100pcs/pack). Order by number of packs.

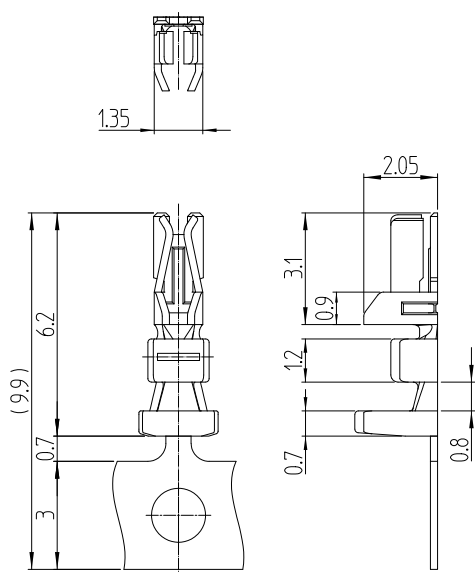
● Double-row



Part No.	HRS No.	No. of Contacts	A	B
DF51K-4DS-2C(800)	480-0567-0 00	4	6.8	2.0
DF51K-6DS-2C(800)	480-0568-0 00	6	8.8	4.0
DF51K-8DS-2C(800)	480-0569-0 00	8	10.8	6.0
DF51K-10DS-2C(800)	480-0570-0 00	10	12.8	8.0
DF51K-12DS-2C(800)	480-0571-0 00	12	14.8	10.0
DF51K-14DS-2C(800)	480-0572-0 00	14	16.8	12.0
DF51K-16DS-2C(800)	480-0573-0 00	16	18.8	14.0
DF51K-18DS-2C(800)	480-0574-0 00	18	20.8	16.0
DF51K-20DS-2C(800)	480-0575-0 00	20	22.8	18.0
DF51K-22DS-2C(800)	480-0576-0 00	22	24.8	20.0
DF51K-24DS-2C(800)	480-0577-0 00	24	26.8	22.0
DF51K-26DS-2C(800)	480-0578-0 00	26	28.8	24.0
DF51K-28DS-2C(800)	480-0579-0 00	28	30.8	26.0
DF51K-30DS-2C(800)	480-0580-0 00	30	32.8	28.0

Note : The sales unit is one pack (100pcs/pack). Order by number of packs.

■ Socket Contact



Part No.	HRS No.	Packaging	Finish
DF51K-22SCF(800)	480-0581-0 00	10,000/reel	Tin plated
DF51K-22SC(800)	480-0582-0 00	100/pack	
DF51K-2428SCF(800)	480-0583-0 00	10,000/reel	
DF51K-2428SC(800)	480-0584-0 00	100/pack	
DF51K-30SCF(800)	480-0585-0 00	10,000/reel	
DF51K-30SC(800)	480-0586-0 00	100/pack	
DF51K-22SCFA(800)	480-0612-0 00	10,000/reel	Gold plated
DF51K-22SCA(800)	480-0613-0 00	100/pack	
DF51K-2428SCFA(800)	480-0614-0 00	10,000/reel	
DF51K-2428SCA(800)	480-0615-0 00	100/pack	
DF51K-30SCFA(800)	480-0616-0 00	10,000/reel	
DF51K-30SCA(800)	480-0617-0 00	100/pack	

● Applicable wire (Tinned, Annealed copper wire)

UL	Wire Size (Stranded Wire Structure)	Jacket Diameter
1061	22 AWG (17 pieces / 0.16mm)	Ø1.2 to Ø1.45mm
1007	24 AWG (11 pieces / 0.16mm)	Ø0.9 to Ø1.45mm
	26 AWG (7 pieces / 0.16mm)	
	28 AWG (7 pieces / 0.127mm)	
1061	30 AWG (7 pieces / 0.1mm)	Ø0.8mm

Note 1 : Applicable Tool : Applicator

Note 2 : Contact your Hirose representative when considering usage of non-applicable wires.

◆ Applicable Crimping Tool

Type	Part No.	HRS No.	Wire Type	Applicable Contacts
Applicator	AP105-DF11-22S	901-4529-7 00	UL1061 (22 AWG)	DF51K-22SCF/SCFA
	AP105-DF11-2428S	901-4511-1 00	UL1007 (24 to 28 AWG)	DF51K-2428SCF/SCFA
	AP105-DF11-30S	901-4532-1 00	UL1061 (30 AWG)	DF51K-30SCF/SCFA
Press Unit	CM-105C	901-0001-0 00		
Hand Tool	HT801/DF11-22S(A)	550-0407-5 00	UL1061 (22 AWG)	DF51K-22SC/SCA
	HT801/DF11-2428S(A)	550-0403-4 00	UL1007 (24 to 28 AWG)	DF51K-2428SC/SCA
	HT801/DF11-30S(A)	550-0408-8 00	UL1061 (30 AWG)	DF51K-30SC/SCA
Contact Extraction Tool	DF-C-PO(B)	550-0179-2 00		DF51K-****SCF/SCFA

Note 3 : Please conduct crimping work according to the "Crimping work standards" and "Crimping condition table".

Note 4 : Any problems that occur from using tools other than those specified by Hirose are not covered by warranty.

Note 5 : Please contact Hirose for information about hand tooling.

DF52 Series

0.8mm Pitch, Compact and Robust Wire-to-Board Connectors



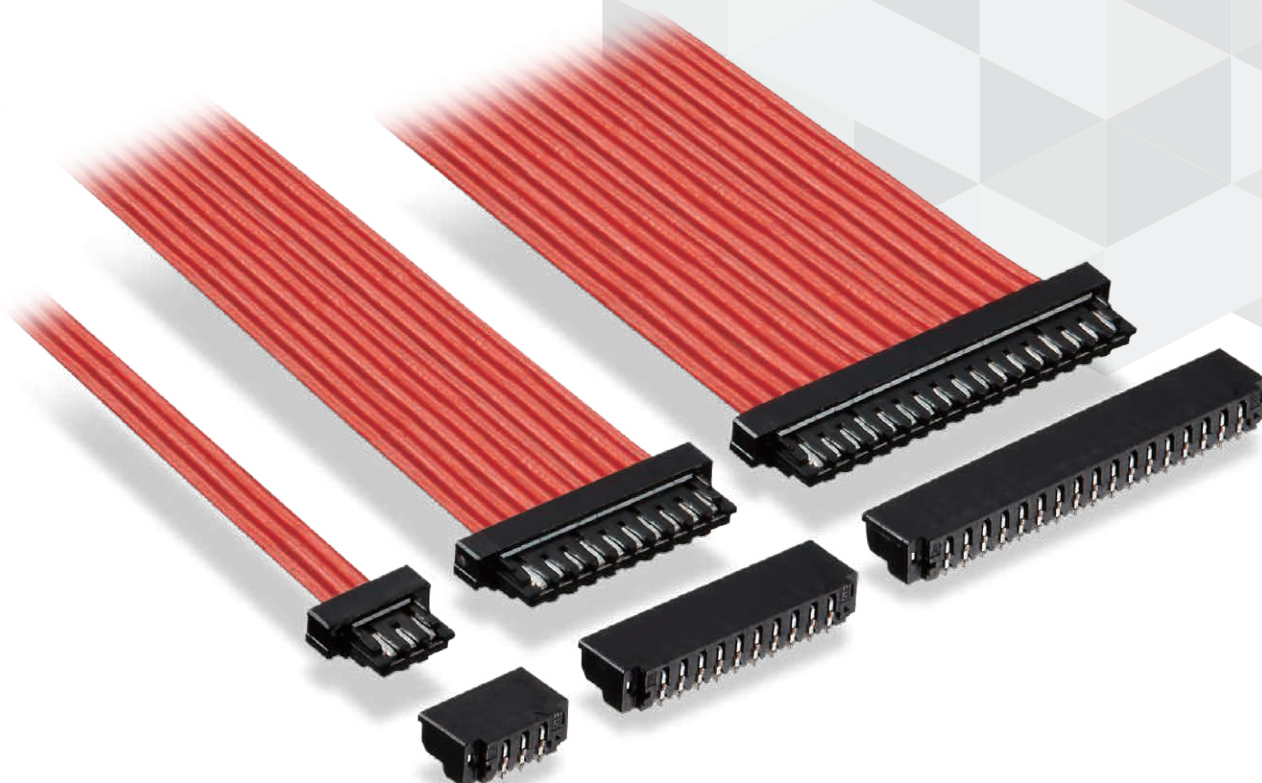
Power Supply



Robust



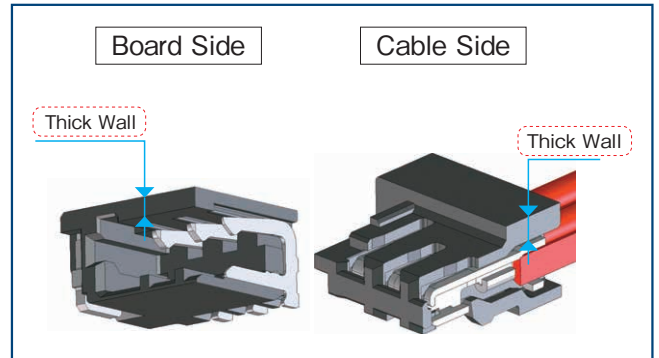
Compact



Features

1. Small-Sized Connector

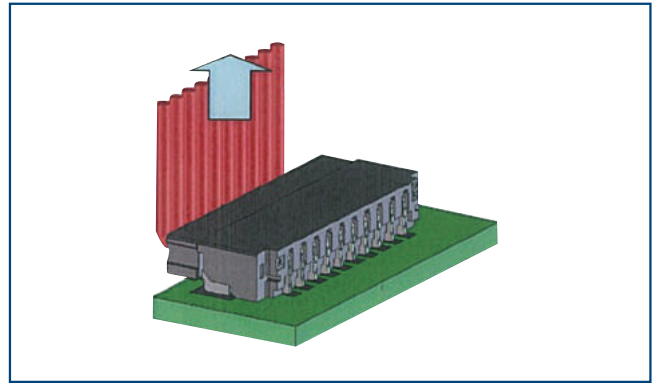
0.8mm Pitch, 1.75mm Height, 4.1mm Depth.
Suitable for small-sized applications.



Thick Housing Walls and Compact Size.

2. Compact yet Robust Design

The housing wall thickness is secured in necessary areas while maintaining a compact size, resulting in a robust design despite its small size.



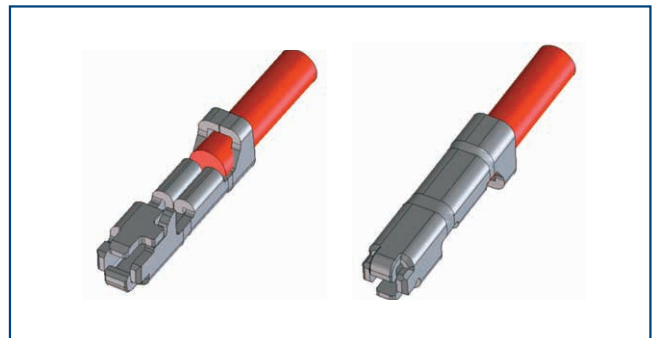
Robust design prevents damage while wire routing.

3. Suitable for High Current Applications (2.5A Max. : using 2pos. and 28 AWG)

High current in small size is supported by the use of highly conductive materials and an optimized contact force to lower contact resistance value.

4. Box shaped contact prevents deformation.

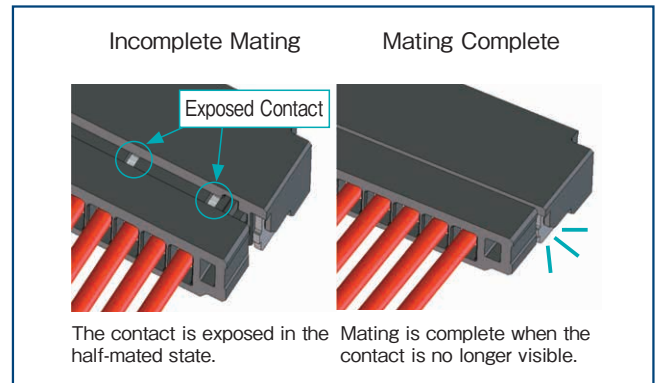
The box shaped crimp contact prevents deformation during assembly and contributes to the overall stability and robustness.



Box Shaped Contact Design

5. Visual check insures fully mated Plug and Receptacle

The housing is designed with an open side that allows for visual inspection to insure the connectors are fully mated, preventing accidental disconnect.



Allows for visual inspection of the mating process
(The mated condition can be visually checked)

6. Halogen-free

No chlorine or bromine exceeding the standard values are used in this connector.

* As defined by IEC 61249-2-21

Br : 900ppm Max. , Cl : 900ppm Max. ,

Br+Cl : 1500ppm Max.

Product Specifications

Rated Current	No. of Pos.	28 AWG	30 AWG	32 AWG	Operating Temperature (Note 1)	-40 to +85℃
	2	2.5A/pin	2A/pin	1.5A/pin	Storage Temperature Range (Note 2)	-10 to +60℃
	3	2A/pin	1.5A/pin	1A/pin	Operating Humidity Range (Note 3)	20 to 80%
	4	2A/pin	1.5A/pin	1A/pin	Storage Humidity Range (Note 2)	40 to 70%
	5	2A/pin	1.5A/pin	1A/pin		
	6	1.5A/pin	1.2A/pin	0.8A/pin		
	8	1.5A/pin	1.2A/pin	0.8A/pin		
	10	1.5A/pin	1.2A/pin	0.8A/pin		
	12	1.2A/pin	1A/pin	0.8A/pin		
	14	1.2A/pin	1A/pin	0.8A/pin		
	15	1.2A/pin	1A/pin	0.8A/pin		
	16	1.2A/pin	1A/pin	0.8A/pin		
	17	1.2A/pin	1A/pin	0.8A/pin		
	20	1.2A/pin	1A/pin	0.8A/pin		
Rated Voltage	100V AC/DC					

Note 1 : Includes the temperature rise caused by current flow.

Note 2 : The term "storage" refers to the long-term storage condition of unused products before PCB mounting.

Operating temperature/humidity range is applied to the deenergized state after mounting of PCB and the temporary storage state during transportation.

Note 3 : Use without condensation.

Note 4 : Information contained in this catalog represents general requirements for this Series.

Please contact us for the drawings and specifications for a specific part number shown.

Items	Specifications	Conditions
Insulation Resistance	100M Ω Min.	Measured at 100V DC
Withstanding Voltage	No flashover dielectric breakdown	300V AC applied for 1 min.
Contact Resistance (Under Low Voltage and Current)	10 m Ω Max.	Measured at 20mV DC, 1mA (DC or 1000Hz)
Vibration Resistance	No electrical discontinuity of 1 μ s or more.	10 cycles in each of three axis at frequency 10-55Hz, half amplitude 0.75mm
Shock Resistance	No electrical discontinuity of 1 μ s or more.	Acceleration of 490 m/s ² , 11ms, half-sine wave 3 directions 3 times each
Moisture Resistance	Contact Resistance : 20m Ω Max. Insulation Resistance : 100M Ω Min.	Temperature : 40 $\pm$ 2°C ; Humidity : 90 to 95%, for 96 hours
Temperature Cycle	Contact Resistance : 20m Ω Max. Insulation Resistance : 100M Ω Min.	(-55°C : 30 min. $\rightarrow$ +5 to +35°C : 2 to 3 min. $\rightarrow$ +85°C : 30 min. $\rightarrow$ +5 to +35°C : 2 to 3 min.) 5 cycles
Mating Durability	Contact Resistance : 20m Ω Max.	20 times
Solder Heat Resistance	No dissolution of housing parts that affect performance.	Reflow : according to the Recommended Temperature Profile Manual soldering : temperature of soldering iron at 350 $\pm$ 10°C for 3 seconds

Materials / Finish

Product	Part	Materials	Finish	Remarks
Receptacle	Insulator	Polyamide	Black	UL94V-0
	Contact	Copper Alloy	Tin Plating	-
Crimp Plug	Insulator	Polyamide	Black	UL94V-0
Crimp Contact	Contact	Copper Alloy	Tin Plating	-

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.

■ Receptacle

DF52 - # S - 0.8 H
① ② ③ ④ ⑤

① Series Name	DF52	③ Connector Type	S : Receptacle
② No. of Pos.	2, 3, 4, 5, 6, 8, 10, 12, 14, 15, 16, 17, 20	④ Contact Pitch	0.8mm
		⑤ Termination Style	H : SMT Right Angle Type

■ Plug Connector

DF52 - # P - 0.8 C
① ② ③ ④ ⑤

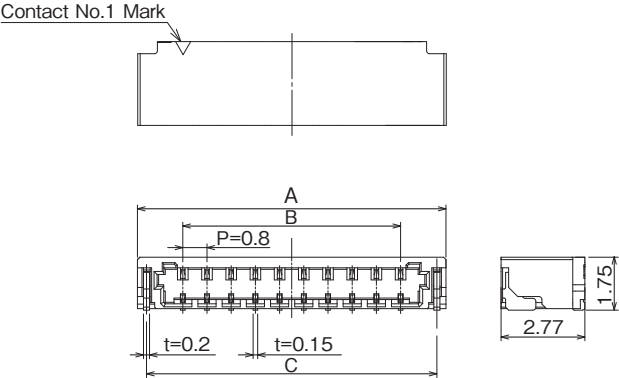
① Series Name	DF52	③ Connector Type	P : Crimp Plug
② No. of Pos.	2, 3, 4, 5, 6, 8, 10, 12, 14, 15, 16, 17, 20	④ Contact Pitch	0.8mm
		⑤ Termination Style	C : Crimp Plug

■ Crimp Contact

DF52 - 2832 PCF
① ② ③

① Series Name	DF52	② Applicable Wire Size	2832 : 28 to 32 AWG
		③ Type Classification/ Packaging	PCF : Plug Crimp Contact / reel

Right Angle Receptacle

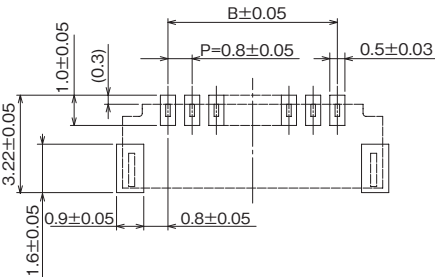


Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF52-2S-0.8H(21)	CL0668-0004-5-21	2	3.8	0.8	3.2	5,000pcs per reel
DF52-3S-0.8H(21)	CL0668-0022-7-21	3	4.6	1.6	4.0	
DF52-4S-0.8H(21)	CL0668-0005-8-21	4	5.4	2.4	4.8	
DF52-5S-0.8H(21)	CL0668-0023-0-21	5	6.2	3.2	5.6	
DF52-6S-0.8H(21)	CL0668-0006-0-21	6	7.0	4.0	6.4	
DF52-8S-0.8H(21)	CL0668-0007-3-21	8	8.6	5.6	8.0	
DF52-10S-0.8H(21)	CL0668-0008-6-21	10	10.2	7.2	9.6	
DF52-12S-0.8H(21)	CL0668-0009-9-21	12	11.8	8.8	11.2	
DF52-14S-0.8H(21)	CL0668-0024-2-21	14	13.4	10.4	12.8	
DF52-15S-0.8H(21)	CL0668-0010-8-21	15	14.2	11.2	13.6	
DF52-16S-0.8H(21)	CL0668-0025-5-21	16	15.0	12.0	14.4	
DF52-17S-0.8H(21)	CL0668-0001-7-21	17	15.8	12.8	15.2	
DF52-20S-0.8H(21)	CL0668-0011-0-21	20	18.2	15.2	17.6	

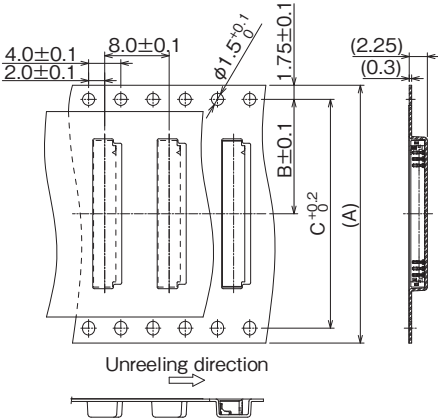
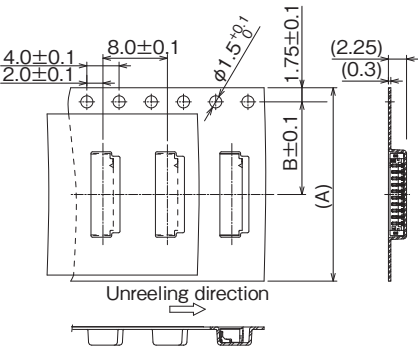
[Specification Number] (21) : Tin plating, embossed packaging

Recommended PCB Layout

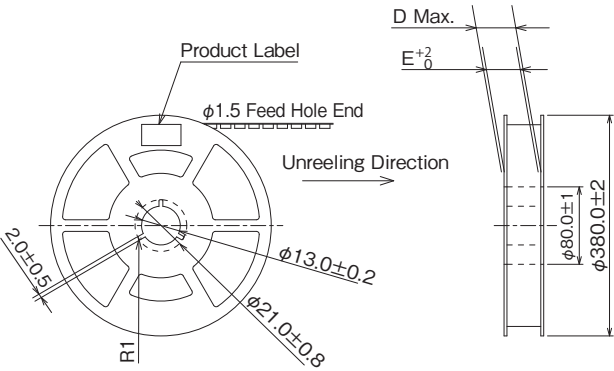


■ Packaging Specification

- 2 to 17pos.
- 20pos.

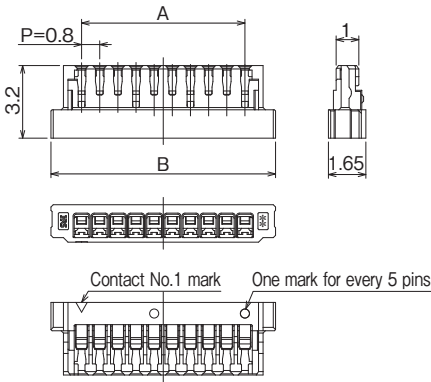


● Reel Dimensions



Unit : mm						
Part No.	No. of Pos.	A	B	C	D	E
DF52-2S-0.8H(21)	2	16.0	7.5		22.4	16.4
DF52-3S-0.8H(21)	3					
DF52-4S-0.8H(21)	4					
DF52-5S-0.8H(21)	5					
DF52-6S-0.8H(21)	6	24.0	11.5		30.4	24.4
DF52-8S-0.8H(21)	8					
DF52-10S-0.8H(21)	10					
DF52-12S-0.8H(21)	12					
DF52-14S-0.8H(21)	14					
DF52-15S-0.8H(21)	15					
DF52-16S-0.8H(21)	16					
DF52-17S-0.8H(21)	17					
DF52-20S-0.8H(21)	20	32.0	14.2	28.4	38.4	32.4

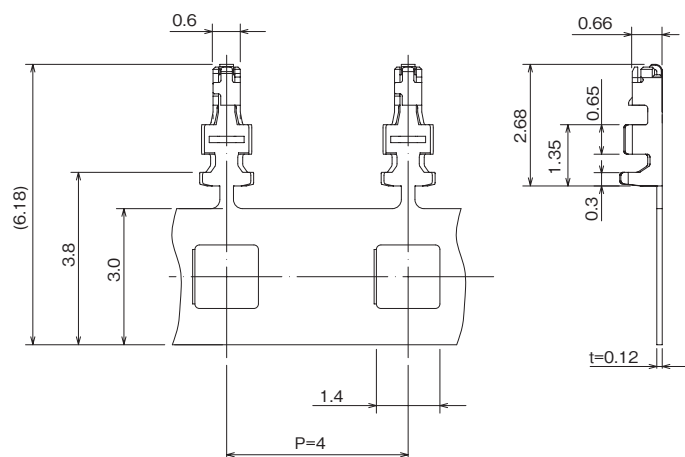
Crimp Plug



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF52-2P-0.8C	CL0668-0013-6-00	2	0.8	3.5	100pcs per bag
DF52-3P-0.8C	CL0668-0026-8-00	3	1.6	4.3	
DF52-4P-0.8C	CL0668-0014-9-00	4	2.4	5.1	
DF52-5P-0.8C	CL0668-0027-0-00	5	3.2	5.9	
DF52-6P-0.8C	CL0668-0015-1-00	6	4.0	6.7	
DF52-8P-0.8C	CL0668-0016-4-00	8	5.6	8.3	
DF52-10P-0.8C	CL0668-0017-7-00	10	7.2	9.9	
DF52-12P-0.8C	CL0668-0018-0-00	12	8.8	11.5	
DF52-14P-0.8C	CL0668-0028-3-00	14	10.4	13.1	
DF52-15P-0.8C	CL0668-0019-2-00	15	11.2	13.9	
DF52-16P-0.8C	CL0668-0029-6-00	16	12.0	14.7	
DF52-17P-0.8C	CL0668-0002-0-00	17	12.8	15.5	
DF52-20P-0.8C	CL0668-0020-1-00	20	15.2	17.9	

Crimp Contact



Part No.	HRS No.	Type	Purchase Unit
DF52-2832PCF	CL0668-0030-5-00	Reel Contact	40,000pcs per reel

● Applicable Wire (Tinned Annealed Copper Wire)

Conductor Size (Core Wire Configuration)	Jacket Outer Diameter	Recommended Wire	Strip Length
28 AWG (7pcs/0.127mm in diameter)	φ 0.5 to 0.6mm	UL1571 (thin line)	0.9 to 1.3mm
30 AWG (7pcs/0.102mm in diameter)			
32 AWG (7pcs/0.08mm in diameter)			

Note 1 : Please contact a Hirose sales representative when using wires other than applicable wires.

Note 2 : The strip length is a reference value. Please adjust the strip length accordingly for specifications and requirements.

Refer to the Crimp Quality Standard (ETAD-H0789-00) for details.

Applicable Crimping Tools

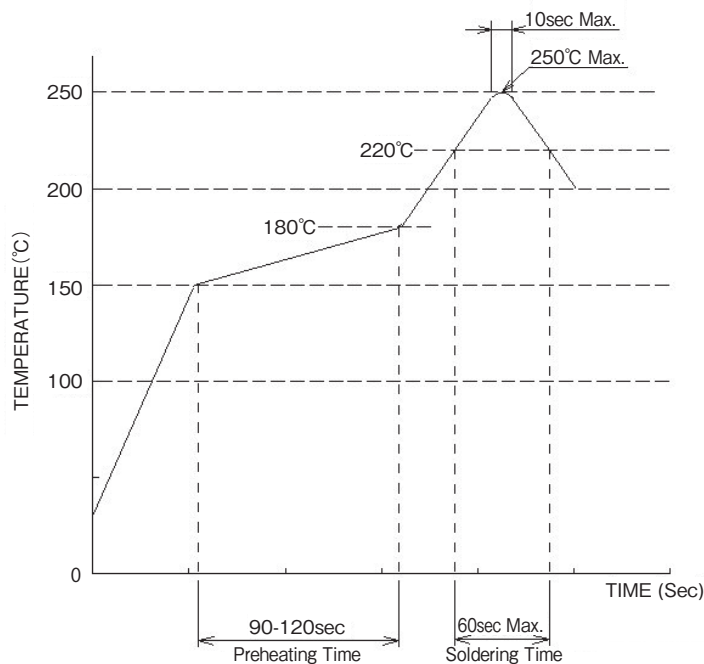
Type	Part No.	HRS No.	Applicable Contact	Remarks
Applicator	AP105-DF52-2832P	CL0901-4636-7-00	DF52-2832PCF	
	DHS877900H-UP	-	DF52-2832PCF	(Note 2) Manufactured by Japan Automatic Machine Co.,Ltd.
Press Body	CM-105C	CL0901-0001-0-00	-	
Extraction Tool	DF-C-PO(B)	CL0550-0179-2-00	DF52-2832PCF	

Note 1 : Issues caused by using tools other than those specified by Hirose are not covered by warranty.

Note 2 : Applicator manufactured by JAPAN AUTOMATIC MACHINE (J.A.M.). Please visit the J.A.M homepage, if you have inquiries about the applicator or crimp

Precautions

Recommended
Temperature Profile
(Compatible With Lead-free
Soldering)



[Applicable Conditions]

1. Peak temperature : 250°C Max.
2. Heating area : 220°C Min. for less than 60 seconds
3. Preheating area : 150°C to 180°C for 90 to 120 seconds
4. Number of Reflow Cycles : 2 cycles Max.

*Measurement is conducted at the contact lead part.

Soldering results may change depending on conditions such as solder paste type, manufacturer, PCB size, and other soldering materials.

Please determine all mounting conditions before use.

Note : This temperature profile is a recommended value.

Recommended Manual Soldering
Conditions

Soldering Iron Temperature : $350 \pm 10^{\circ}\text{C}$, soldering time : within 3 seconds

Recommended Screen
Thickness and
Aperture Ratio (Pattern surface
ratio)

Thickness : 0.1mm, aperture opening ratio : 100%

Board Warpage

A maximum of 0.02mm at the center of connector, as measured from either end of the connector.

Cleaning Conditions

Cleaning is not recommended.
If you clean this product, please evaluate its performance before using it.
(Cleaning may impair the mating/unmating properties and lower resistance to environmental factors.)

Notes

- Please note that any mating operation of the connector when not mounted on the board may cause damage or deformation of the contacts.
- Do not apply excessive amounts of flux during hand soldering as it may cause excess solder and flux wicking.
- This housing color may have slight variations depending on the production lot. This color variation does not affect performance.
- Please refer to "DF52 mating and unmating Procedure Document (ETAD-H0788-00)" for points in handling regarding mating operations.

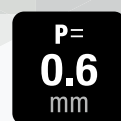
Precautions

Please refer to the following documents.

- Board-to-Wire Connector Guidelines (ETAD-H1023-00)
- Cable Assembly Procedure (ETAD-H0791-00)
- Crimp Quality Standard (ETAD-H0789-00)
- Mating/Unmating Operation Instruction Manual (ETAD-H0788-00)

DF53 Series

0.6mm Pitch, Small & Robust, Wire-to-Board Connector



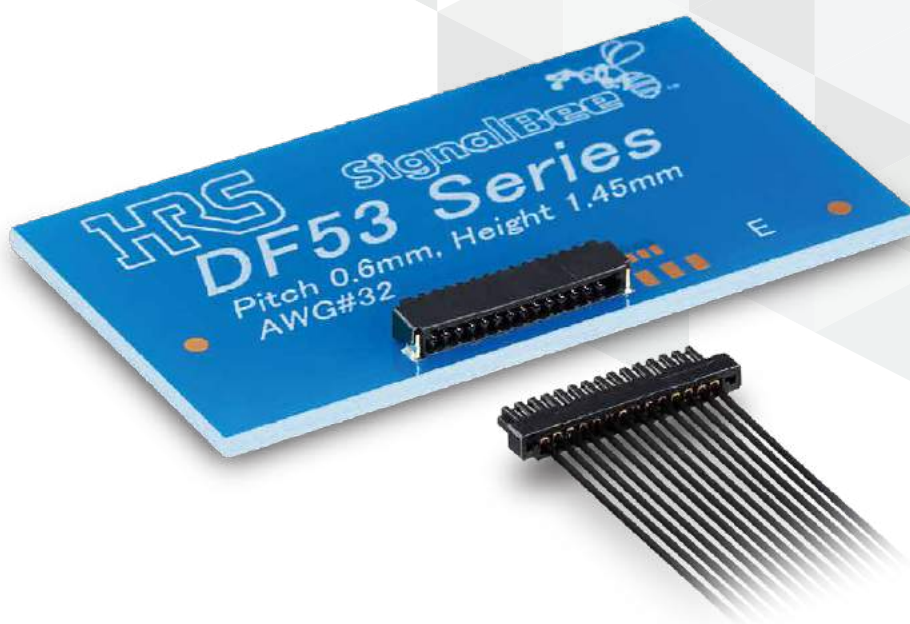
P = 0.6mm



Compact



Robust

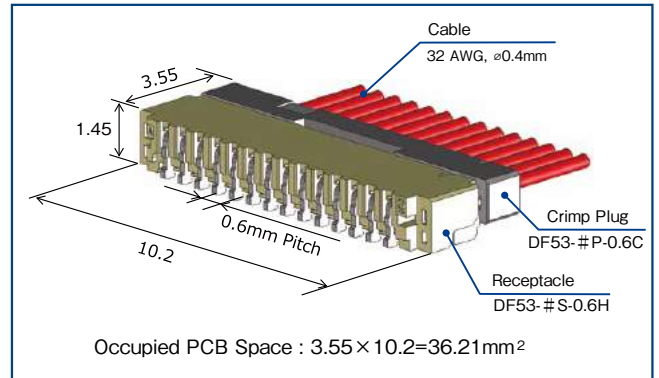


NEW

Features

1. Compact and Low Profile Connector

Industry's smallest 0.6mm pitch crimp connector with 1.45mm height and 3.55mm depth

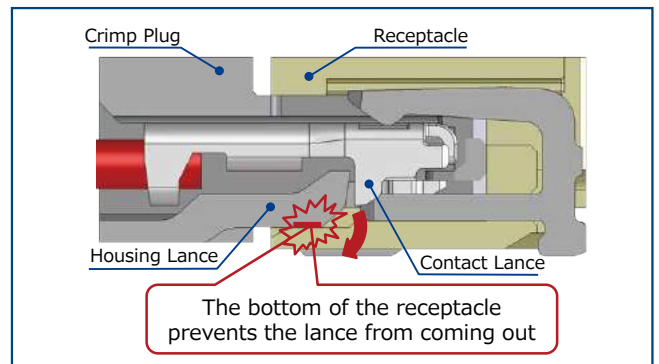


2. Up to 1.3A Max. when using 2 positions for power.

0.6mm pitch connector that supports 32 AWG cable size. Can be used to supply power in compact devices.

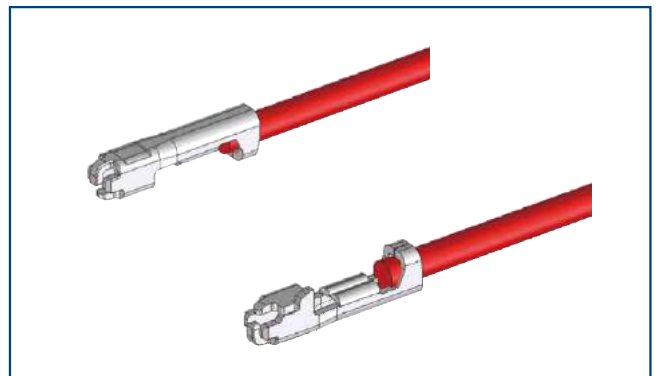
3. Robust Design for Cable Wiring

The robust design secures high lance strength and prevents cable disconnect during wiring. The double lock design with friction lock and contact lock ensures high mating retention force. Prevents connector disconnect due to cable wiring.



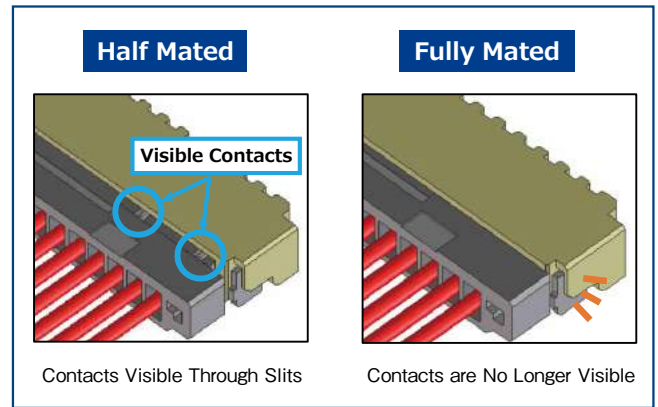
4. Box-shaped Contact Design

Use of a box-shaped contact on the cable side prevents deformation when handling the cable assembly.



5. Prevents Incomplete Mating

During mating, part of the contact is visible from the crimp case slits, allowing for confirmation of the mating condition and preventing incomplete mating.



6. Halogen Free

No chlorine or bromine above the standard value is used in the connector.

*Defined according to IEC 61249-2-21

Br : 900ppm maximum, Cl : 900ppm maximum,

Br+Cl : 1500ppm maximum

Product Specifications

Rated Current	When Using All Positions	When Using 2 Positions (Power)	Operating Temperature (Note 1)	-55 to +85°C
	0.7A	Power : 1.3A, Signal : 0.5A	Operating Humidity Range (Note 2)	20 to 80%
Rated Voltage	50V AC/DC		Storage Temperature Range (Note 3)	-10 to +60°C
			Storage Humidity Range (Note 2)(Note 3)	40 to 70%

Applicable Cable	Conductor Size : 32 AWG

Item	Specifications	Conditions
Insulation Resistance	100M Ω Min.	100V DC
Withstanding Voltage	No flashover or insulation breakdown	200V AC for 1 min.
Contact Resistance	20m Ω Max.	20mV Max., 1mA (DC or 1000Hz)
Mating Durability	Contact Resistance : 40m Ω Max. No damage, cracks, or parts dislocation	20 times
Vibration Resistance	No electrical discontinuity of 1 μ s or more No damage, cracks, or parts dislocation	Frequency 10 to 55 Hz, half amplitude 0.75 mm, 10 times in each of the 3 directions
Shock	No electrical discontinuity of 1 μ s or more No damage, cracks, or parts dislocation	Accelerated velocity : 500 m/s ² for 11ms, half-sine wave in 3 directions, 3 times for each direction
Steady State Moisture Resistance	Contact resistance : 40m Ω Max. Insulation resistance : 100M Ω Min. No damage, cracks, or parts dislocation	96 hours at temperature of +40 $\pm$ 2°C and humidity of 90 to 95%
Temperature Cycle	Contact resistance : 40m Ω Max. Insulation resistance : 100M Ω Min. No damage, cracks, or parts dislocation	Temperature : -55 $\rightarrow$ +85°C Time : 30 $\rightarrow$ 30 min. 5 cycles
Solder Heat Resistance	No melting of resin affecting product performance.	Reflow : See temperature profile

Note 1 : Includes temperature rise caused by current flow.

Note 2 : Use without condensation on parts.

Note 3 : The term "storage" refers to products stored for long period of time prior to mounting and use. Operating Temperature and Humidity Range are applicable when non-powered after PCB mounting and when temporarily stored during transportation.

Materials / Finish

Item	Component	Materials	Color / Finish	UL Standard
Receptacle	Housing	Polyamide	Black	UL94V-0
	Contact	Copper Alloy	Tin Plating	-
	Retention Tab	Copper Alloy	Tin Plating	-
Crimp Plug	Housing	Polyamide	Black	UL94V-0
Crimp Contact	Contact	Copper Alloy	Tin Plating	-

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.

●Receptacle

DF53 - 14 S - 0.6 H

① ② ③ ④ ⑤

① Series Name	DF53	④ Contact Pitch	0.6mm
② No. of Pos.	14	⑤ Terminal Style	H : SMT Right Angle Type
③ Connector Type	S : Receptacle		

●Crimp Plug

DF53 - 14 P - 0.6 C

① ② ③ ④ ⑤

① Series Name	DF53	④ Contact Pitch	0.6mm
② No. of Pos.	14	⑤ Terminal Style	C : Crimp Case
③ Connector Type	P : Plug		

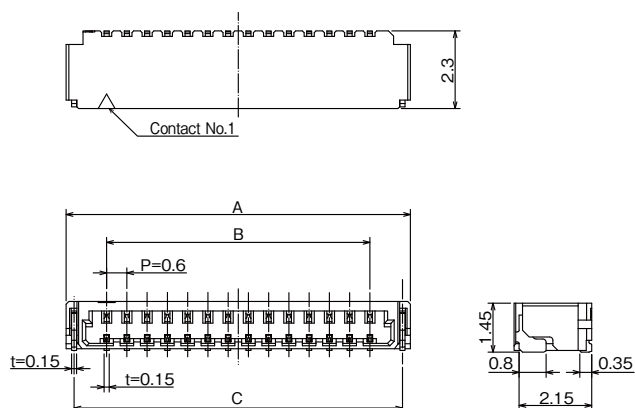
●Crimp Contact

DF53 - 32 PCF

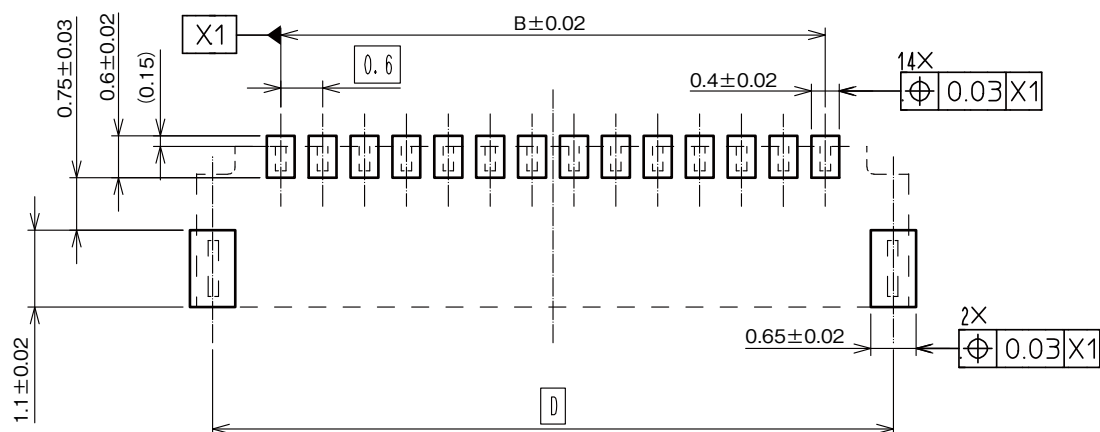
① ② ③

① Series Name	DF53	③ Packaging Method/Type	PCF : Plug Crimp Contact, Reel, Tin Plating
② Applicable Wire Size	32 AWG		

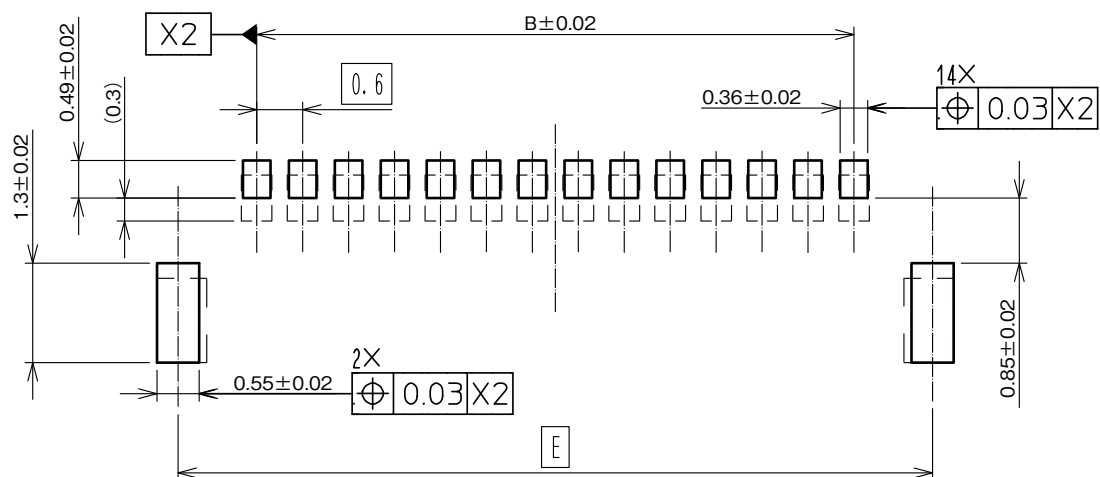
Receptacle



Recommended PCB Layout



Recommended Metal Mask Dimensions

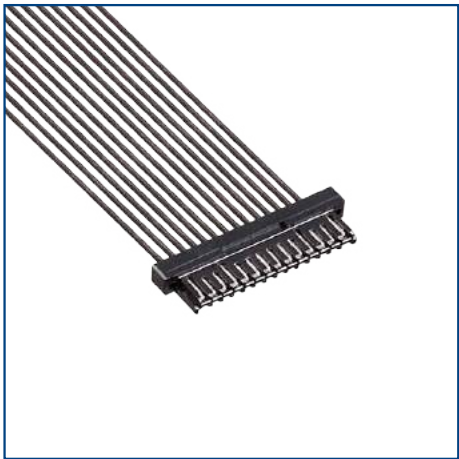


Recommended Metal Mask Thickness : 0.1mm

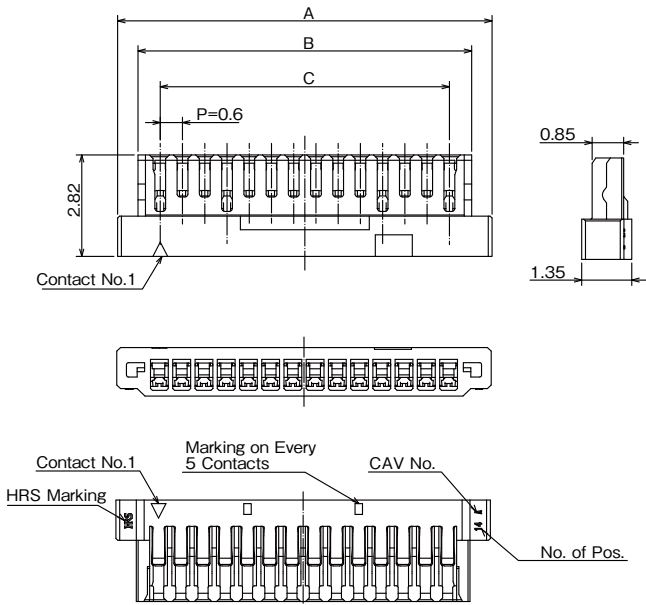
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF53-14S-0.6H	CL0668-1009-0-00	14	10.2	7.8	9.73	9.75	9.85	5,000pcs per reel

Crimp Plug



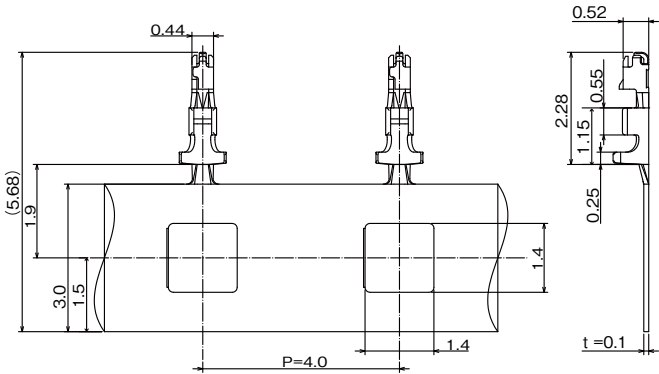
Shown with contacts installed.



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF53-14P-0.6C	CL0668-1021-0-00	14	10.1	9.0	7.8	100pcs per bag

Crimp Contact



Part No.	HRS No.	Purchase Unit
DF53-32PCF	CL0668-1025-0-00	40,000pcs per reel

●Applicable Wire (Tin Plated Annealed Copper)

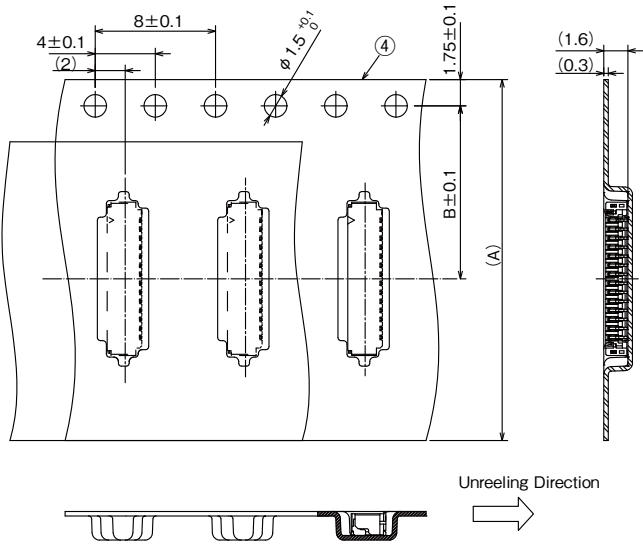
Wire Size (Stranded Wire Structure)	Jacket Diameter	Recommended Wire	Strip Length
32 AWG (7/ ϕ 0.08)	ϕ 0.38	UL1867	0.8 to 1.0mm

Note 1 : When using cables not specified by Hirose, please contact a Hirose sales representative.
 Note 2 : The strip length is for reference. Adjust each dimension after crimping so that the specified value is satisfied.
 For details refer to the Crimp Quality Standard (ETAD-H0921-00).

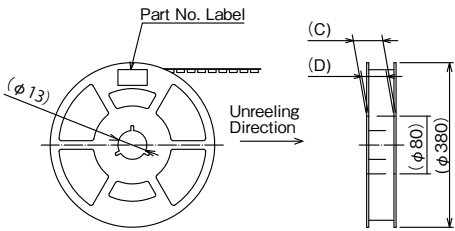
Packaging Method

Receptacle

● Embossed Carrier Tape Dimensions



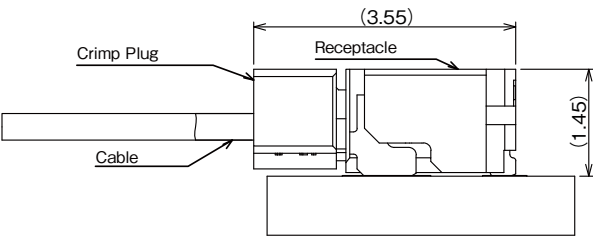
● Reel Dimensions



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D
DF53-14S-0.6H	CL0668-1009-0-00	14	24.0	11.5	29.4	25.4

Mated Dimensions



Applicable Tools

Type	Part No.	HRS No.	Applicable Contact
Automatic Crimp Press	CM-105C	CL0901-0001-0-00	-
Applicator	AP105-DF53-32P	CL0901-4657-0-00	DF53-32PCF
Extraction Tool	DF-C-PO(B)	CL0550-0179-2-00	

Note 1 : This applicator is for fully automatic crimp machines that supply, strip and crimp the cable. It is not compatible with semi-automatic machines that require manual crimping of the cable.

Note 2 : For details on the applicator, refer to the instruction manual (ETAD-P0388).

Note 3 : Please conduct crimping work according to the Crimp Quality Standard ETAD-H0921-00) and crimp condition table.

Note 4 : Any problems that occur from using tools other than those specified by Hirose are not covered by warranty.

Note 5 : When non-authorized tools are used, please consult with a Hirose sales representative regarding requests for the hand tool die drawing.

Crimping Precautions

■ Items Required Prior to Crimping

The work-related documents shown below are required before starting the harness assembly.

(The ● mark represents required documents.)

Please contact your Hirose sales representative if you do not have these documents.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
① Main unit of crimping machine instruction manual	Explanation for main press machine unit	●	-	Bundled with the purchase of the main press machine unit.
② Applicator instruction manual	Crimping work method	●	-	Bundled with the purchase of applicator.
③ Applicator Spare Parts Identification	Explanation for Applicator installation	●	-	
④ Crimp Conditions	Standard values of : Crimp height Tensile strength	●	-	
⑤ Crimp Quality Standards	Various standards for crimping conditions	●	-	

■ Tools

- Use tools designated by Hirose when crimping.
- Crimping performed using tools other than those specified is outside the scope of warranty.
- The operating instructions are available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before beginning work.

■ Applicable Cables

Check that the cables to be used are within the applicable range.

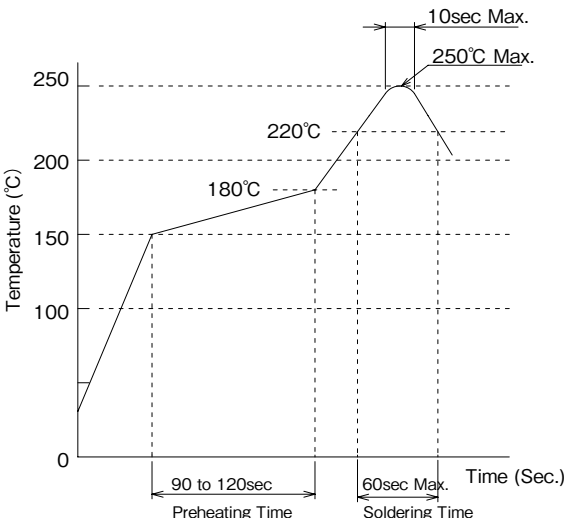
If you intend to use a cable other than those recommended, contact a sales representative.

[Precautions]

- Cables applicable to crimp connectors are tin-plated, soft copper stranded wires.
- Avoid crimping solid wire, wires with polyester threads or tin coated wires.
- Avoid crimping two cables together.
- The crimp height setting values (Note) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note : The crimp height is an important item that determines crimp quality. Hirose conducts crimp testing on each wire in order to set the optimum crimp height accurately.

Usage Precautions

Temperature Profile	 Temperature (°C) 250 220°C 180°C 150 100 0 Time (Sec.) 90 to 120sec Preheating Time 60sec Max. Soldering Time 10sec Max. 250°C Max. 【Applicable Conditions】 1. Peak Temperature : 250°C Max. 2. Heating Area : 220°C Min., for less than 60 seconds 3. Preheating area : 150 to 180°C for 90 to 120 seconds 4. Number of Times : No more than 2 times Note : Measurement is conducted at the contact lead part Soldering results may change depending on conditions such as solder paste type, manufacturer, PCB size, and other soldering materials. Please determine all mounting conditions before use.
Warpage of the Board	A maximum of 0.02mm at the center of connector, as measured from either end of the connector
Cleaning Conditions	IPA cleaning is allowed. (Cleaning is not recommended due to potential changes in mating action and other variables. Please contact us if you use other cleaning agents.)
Cautions	■ Please note that any mating operation of the connector when not mounted on the board may cause damage or deformation of the contacts. ■ The housing color may have slight variations depending on the production lot. This color variation does not affect performance. ■ Please refer to "DF53 Series Mating/Unmating Operation Instruction Manual (ETAD-H0788)" for handling points during mating.

While Taking into Consideration

Specifications mentioned in this catalog are reference values.

When considering to order or use this product, please confirm the Drawing and Product Specifications sheets.

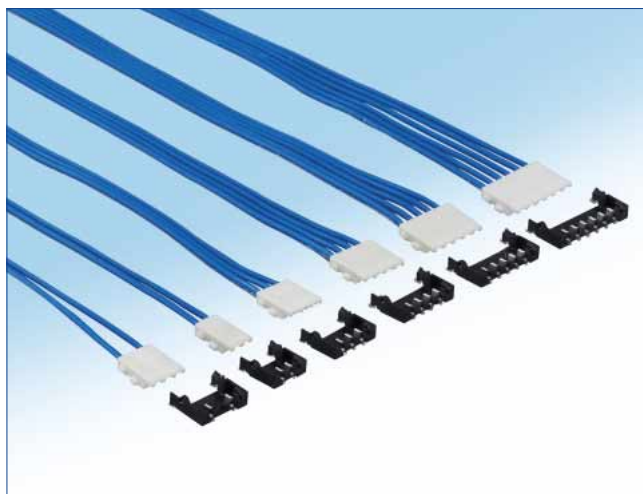
Use an appropriate cable when using the connector in combination with cables.

If considering usage of a non-specified cable, please contact your sales representative.

If assembly process is done by jigs & tools which are not identified by Hirose, assurance will not be given.

If considering usage for below mentioned applications, please contact your sales representative.

In cases where the application will demand a high level of reliability, such as automotive, medical instruments, public infrastructure, aerospace/ defense etc. Hirose must review before assurance of reliability can be given.



■ Features

1.Reinforced lock structure with swing lock

A swing-lock structure, featuring our own unique connection method, reinforces the lock structure of the electric cable side, with a structure resistant to tough electric cable routing and disengagement of cables under load.

In addition, the connection surface has a guide insertion to facilitate insertability (patented)

2.Header lock improves plug retention

When connecting, the header connector secures the molded-lance. Play of molded lance is prevented for added strength. (patented)

3.Highly reliable contact structure

Despite the low-profile design, with a stacking height of 1.4mm, an effective mating length of 0.42mm is achieved. The structure features two-point contact terminal geometry with high contact reliability.

4.Insert guide key prevents misalignment

Insert guide key guides the crimp socket to the correct mating position and prevents misalignment, which improves mating operation and prevents possible connector breakage with incorrect mating.

5.Solder wicking prevention

The integral molding eliminates any gap between the terminals and case to prevent solder wicking.

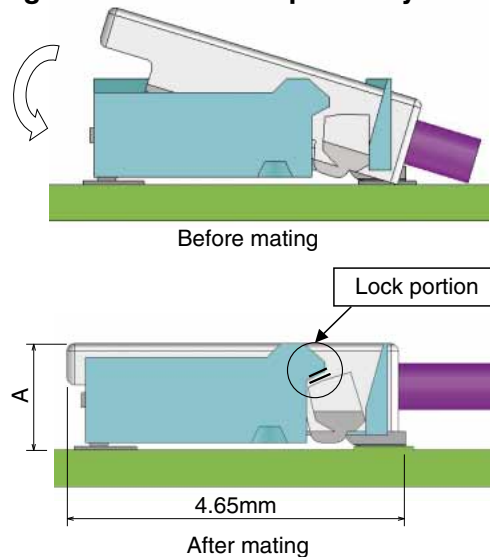
6.Case disengagement prevention

Reinforcing hardware (metal fittings) are integrated in the molding, which help prevent the case from disengaging with the terminals due to tough electric cable routing and load.

7.Cost effective

Terminals and metal fittings are collectively integrated into the molding to reduce assembly cost.

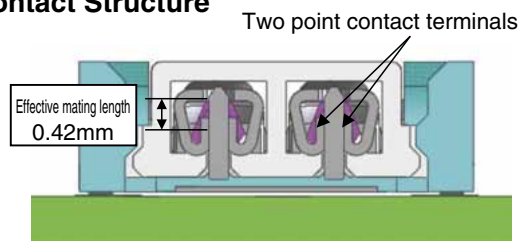
Swing-Lock Structure explanatory drawing



Mating Height A : DF57H 1.4mm
DF57AH 1.6mm

Fig.1

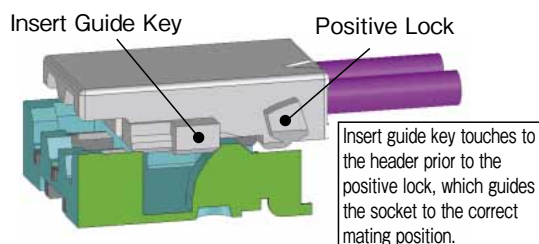
Contact Structure



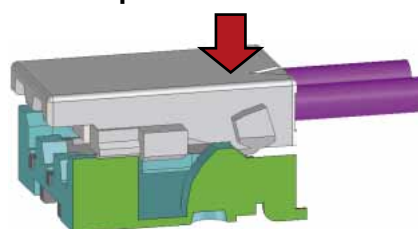
Cross-sectional view of the contact surface

Fig.2

Incorrect Positioning



Starts mating after the socket is aligned to the correct position



Insert Guide Key Structure

Fig.3

■ Specifications

Rating	Current rating (Note 1)		2pos.	3pos.	4pos.	5,6pos.	Operating temperature range -35℃ to 85℃ (Note 2) Operating humidity range 20% to 80% (Note 3)
		AWG#26	3.0A/pin	—	1.5A/pin	1.5A/pin	
		AWG#28	2.5A/pin	2.0A/pin	1.5A/pin		
		AWG#30	1.5A/pin		1.0A/pin		
		AWG#32	1.0A/pin		0.8A/pin		
		AWG#34	0.8A/pin		0.5A/pin		
	Voltage rating	2 to 6 pos. : 50V AC/DC					Storage temperature range -10℃ to 60℃ (Note 4) Storage humidity range 40% to 70% (Note 4)
		2 pos. (Middle pin of 3 pos. is removed) : 100V AC/DC					

UL, C-UL certified specifications						
Rating	Current rating (Note 1)		2pos.	3pos.	4pos.	5,6pos.
		AWG#26	3.0A/pin	—	1.5A/pin	1.5A/pin
		AWG#28	2.5A/pin	2.0A/pin	1.5A/pin	
		AWG#30	1.5A/pin		1.0A/pin	
		AWG#32	1.0A/pin		0.8A/pin	
		AWG#34	0.8A/pin		0.5A/pin	
	Voltage rating	2 - 6 pos. : 29V AC/DC				

Item	Specification	Conditions
1. Insulation resistance	100MΩ min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown	500V AC / 1 minute
3. Contact resistance	10mΩ max.	20mV max., at 1mA.
4. Vibration	No electrical discontinuity of 1μs or longer No damage, cracks or parts dislocation.	Frequency : 10 to 55Hz, single amplitude of 0.75mm, 10 cycles, 3 direction
5. Shock	No electrical discontinuity of 1μs or longer No damage, cracks or parts dislocation.	Acceleration of 490m/s ² , 11ms duration, sine half-wave, 3 cycles in each of the 3 axis
6. Humidity	Contact resistance : 20mΩ max., Insulation resistance : 500MΩ min. No damage, cracks or parts dislocation.	96 hours at 40 ±2°C, and humidity of 90 to 95%
7. Temperature cycle	Contact resistance : 20mΩ max., Insulation resistance : 500MΩ min. No damage, cracks or parts dislocation.	-55°C → 5 to 35°C → 85°C → 5 to 35°C Times : 30 min. → 2 min. to 3 min. → 30 min. → 2 min. to 3 min. 5 cycles
8. Durability	Contact resistance : 20mΩ max., No damage, cracks or parts dislocation.	30 cycles
9. Resistance to soldering heat	No deformation of components affecting performance	Reflow : At the recommended temperature profile Manual soldering : 350°C for 3 seconds

Note 1 : This is the maximum current rating while all pins are powered or used as all power lines. When isolating power lines into multiple circuits, current ratings may go above the stated current ratings. Please consult Hirose for specific details before doing this.

Note 2 : Includes the temperature rise of power lines.

Note 3 : The connector should be completely dry. (no condensation present)

Note 4 : The term “storage” refers to the long-term storage condition of unused products before PCB mounting. The operating temperature and humidity ranges are applied while in a non-energized state, while in transport or after PCB mounting.

Note 5 : Information contained in this catalog represents general requirements for this Series.

Please contact us for the drawings and specifications for a specific part number shown.

■ Material / Finish

Item	Component	Material	Finish	UL Flammability rating	RoHS2
Header	Insulator	LCP	Black	UL94V-0	YES
			Beige		
	Contact	Brass	Tin plating or gold plating	—	YES
Crimp socket	Insulator	PBT	White	UL94V-0	YES
			Black		
		LCP	Beige		
			Black		
Crimp contacts	Contact	Phosphor bronze	Tin plating or gold plating	—	YES

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.

● Header

DF 57 H - * P - 1.2 V

① ② ③ ④ ⑤ ⑥ ⑦

① Series name : DF	⑤ Connector type P : Plug
② Series No. : 57	⑥ Contact pitch : 1.2mm
③ Insert guide key H : Yes	⑦ Termination section V : Straight SMT
④ Number of contacts : 2, 3, 4, 5, 6	

DF 57 H - 2 P - 2.4 V

④ ⑥

④ Number of contacts : 2	⑥ Contact pitch : 2.4mm (Middle pin of 3 pos. is removed, and rated voltage is 100 V)

● Socket

DF 57 H - * S - 1.2 C

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Series name : DF	⑤ Number of contacts : 2, 3, 4, 5, 6
② Series No. : 57	⑥ Connector type S : Crimp socket
③ Applicable wire size : Blank : 28 to 34 AWG	⑦ Contact pitch : 1.2mm
④ Insert guide key H : Yes	⑧ Termination section C : Crimp socket

DF 57 A H - * S - 1.2 C

③ ⑤

③ Applicable wire size : A : 26 to 28 AWG	⑤ Number of contacts : 2, 4, 5, 6

● Crimp contact

DF 57 - 2830 SCF A

① ② ③

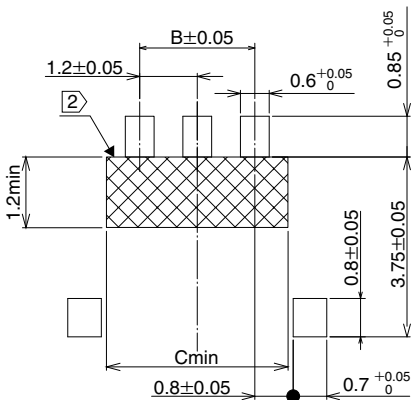
① Applicable wire size : 2628 : 26 to 28 AWG 2830 : 28 to 30 AWG 3234 : 32 to 34 AWG	② Packaging SCF : SCF : Female crimp contact / reel
	③ Plating type Blank : Tin plating A : Gold plating

■Header(SMT)

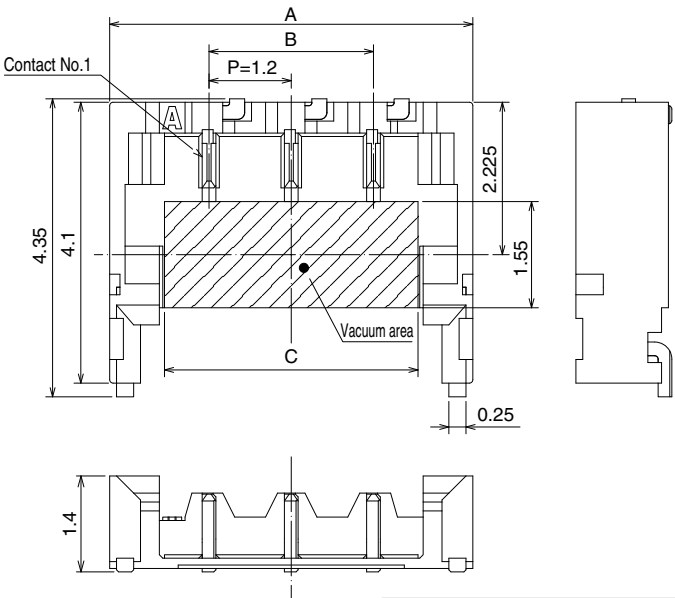
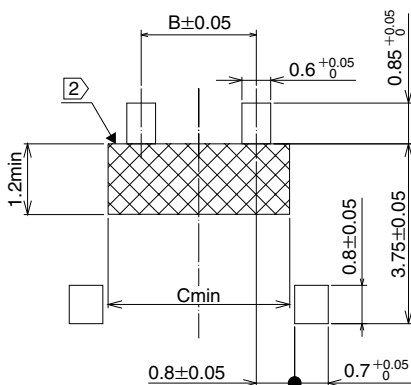


Above image is 3 pos.

Recommended PCB layout
(Thickness : 1.0mm)



Recommended PCB layout
(Thickness : 1.0mm)

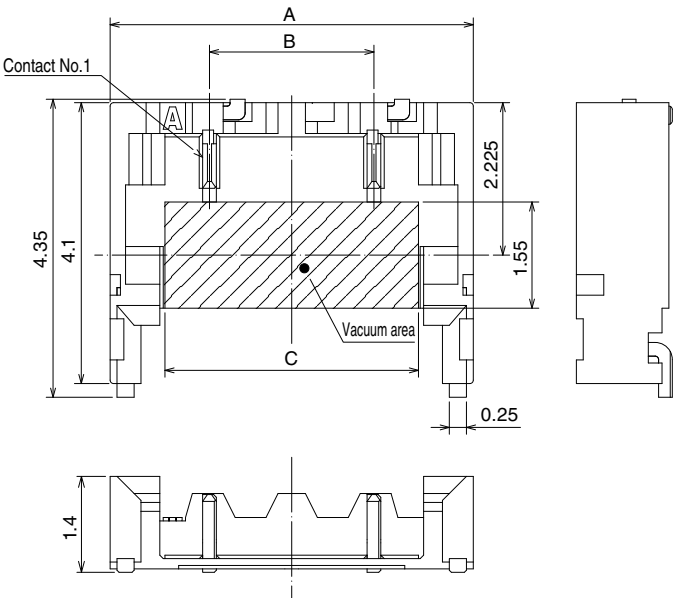


[Specification number] **
(21) : Tin plated, color : black
(23) : Tin plated, color : beige
(51) : Gold plated, color : black

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Specification No. (Note 3)		
						(21)	(23)	(51)
DF57H-2P-1.2V(**)	666-0104-7 **	2	4.1	1.2	2.5	✓	✓	✓
DF57H-3P-1.2V(**)	666-0105-0 **	3	5.3	2.4	3.7	✓	✓	
DF57H-4P-1.2V(**)	666-0106-2 **	4	6.5	3.6	4.9	✓	✓	✓
DF57H-5P-1.2V(**)	666-0107-5 **	5	7.7	4.8	6.1	✓	✓	
DF57H-6P-1.2V(**)	666-0108-8 **	6	8.9	6.0	7.3	✓	✓	

Note 1 : Embossed tape reel packaging (5,000 pcs/reel).
Note 2 : The crossed-shaded area is a no conductive trace area.
Note 3 : For items whose specification number is blank, please contact a Hirose sales representative.



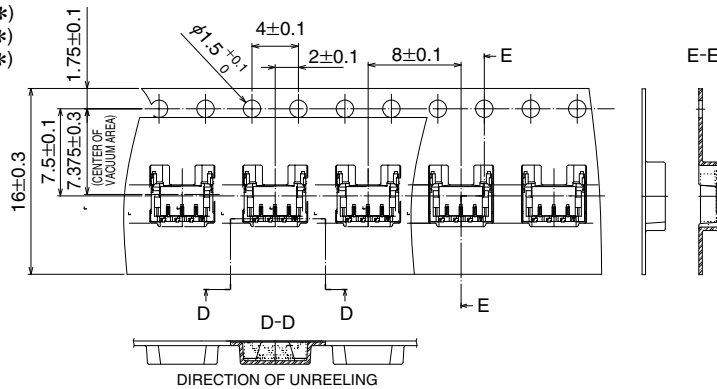
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Specification No.	
						(21)	(23)
DF57H-2P-2.4V(**)	666-0109-0 **	2	5.4	2.4	3.7	✓	✓

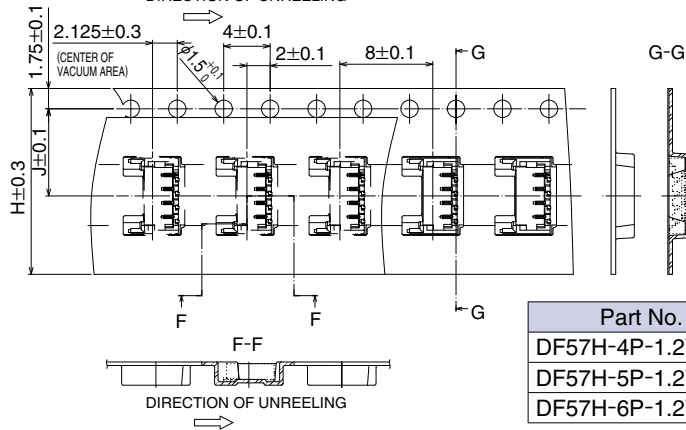
[Specification number] **
(21) : Tin plated, color : black
(23) : Tin plated, color : beige

● Packaging Specification

DF57H-2P-1.2V(**)
DF57H-3P-1.2V(**)
DF57H-2P-2.4V(**)



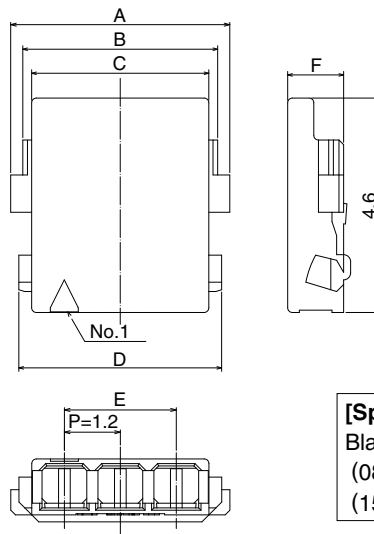
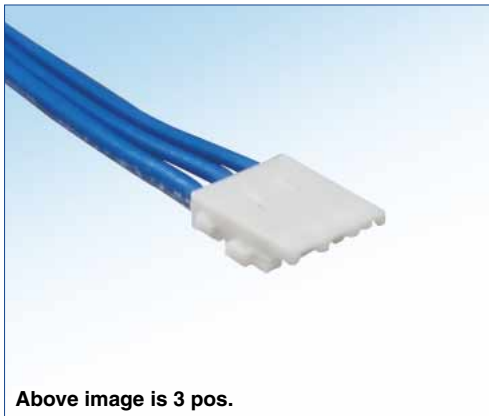
DF57H-4P-1.2V(**)
DF57H-5P-1.2V(**)
DF57H-6P-1.2V(**)



Unit : mm

Part No.	No. of contacts	H	J
DF57H-4P-1.2V(**)	4	16	7.5
DF57H-5P-1.2V(**)	5	16	7.5
DF57H-6P-1.2V(**)	6	24	11.5

■ Crimp socket



[Specification number] **

Blank : Material : PBT, color : white
(08) : Material : LCP, color : beige
(15) : Material : LCP, color : black

Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	E	F	Specification No.		
									Blank	(08)	(15)
DF57H-2S-1.2C(**)	666-0100-6 **	2	3.5	2.98	2.6	3.2	1.2	1.2	✓	✓	✓
DF57H-3S-1.2C(**)	666-0012-0 **	3	4.7	4.18	3.8	4.4	2.4	1.2	✓	✓	✓
DF57H-4S-1.2C(**)	666-0101-9 **	4	5.9	5.38	5.0	5.6	3.6	1.2	✓	✓	✓
DF57H-5S-1.2C(**)	666-0102-1 **	5	7.1	6.58	6.2	6.8	4.8	1.2	✓	✓	✓
DF57H-6S-1.2C(**)	666-0103-4 **	6	8.3	7.78	7.4	8.0	6.0	1.2	✓	✓	✓

Note 1 : The quantity is delivered per pack (1,000 pcs.). Order by number of pack.

■ Socket for 26 AWG

Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	E	F	Specification No. (Note 2)		
									Blank	(10)	(15)
DF57AH-2S-1.2C(**)	666-0112-0 **	2	3.5	2.98	2.6	3.2	1.2	1.4	✓		✓
DF57AH-4S-1.2C(**)	666-0113-0 **	4	5.9	5.4	5.0	5.6	3.6	1.4	✓		
DF57AH-5S-1.2C(**)	666-0110-0 **	5	7.1	6.6	6.2	6.8	4.8	1.4	✓	✓	
DF57AH-6S-1.2C(**)	666-0111-2 **	6	8.3	7.8	7.4	8.0	6.0	1.4	✓	✓	

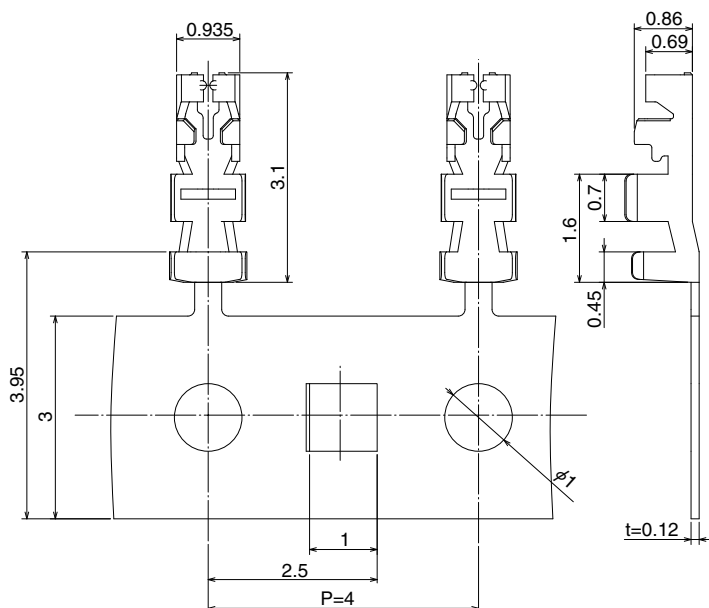
Note 1 : The quantity is delivered per pack (1,000 pcs.). Order by number of pack.

Note 2 : For items whose specification number is blank, please contact a Hirose sales representative.

[Specification number] **

Blank : Material : PBT, color : black
(10) : Material : PBT, color : white
(15) : Material : LCP, color : black

■Crimp contact



[Packaging Specification]

Blank : Embossed tape packaging (40,000 pcs/reel)
(41) : Embossed tape packaging (35,000 pcs/reel)

Part No.	HRS No.	Packaging	Quantity	Finish	Applicable wire	Applicable socket connector
DF57-2628SCF(41)	666-0013-3 41	Reel	35,000	Tin plated	26 to 28 AWG	DF57AH-*S-1.2C(**)
DF57-2628SCFA(41)	666-0033-0 41	Reel	35,000	Gold plated		
DF57-2830SCF	666-0001-4	Reel	40,000	Tin plated	28 to 30 AWG	DF57H-*S-1.2C(**)
DF57-2830SCFA	666-0034-3	Reel	40,000	Gold plated		
DF57-3234SCF	666-0016-1	Reel	40,000	Tin plated	32 to 34 AWG	

Note : Embossed tape reel packaging (40,000 pcs/reel).

Order by number of reels.

●Applicable wire (Tin plated annealed copper wire)

Part No.	Wire size (Stranded wire conductor)	Jacket outer diameter	Recommended cable
DF57-2628SCF(41)	26 AWG (7/φ0.16mm)	φ0.88mm max.	UL3610
DF57-2628SCFA	28 AWG (7/φ0.127mm)		UL1061
DF57-2830SCF	28 AWG (7/φ0.127mm)	φ0.5mm – φ0.63mm	UL1571 (Thin wire), UL10584 (ETFE wire)
DF57-2830SCFA	30 AWG (7/φ0.102mm)		
DF57-3234SCF	32 AWG (7/φ0.08mm)	φ0.32mm – φ0.54mm	UL1571
	34 AWG (Note 2)		—

●Strip length 1.0 to 1.4mm

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

Note 2 : When using 34 AWG wire, please contact a Hirose sales representative.

◆Tools

Type	Part No.	HRS No.	Applicable contact
Applicator	AP105-DF57-2628S	901-4622-2	DF57-2628SCF(41)
			DF57-2628SCFA(41)
	AP105-DF57-2830S	901-4618-5	DF57-2830SCF
	AP105-DF57-2830SA	901-4645-0	DF57-2830SCFA
	AP105-DF57-3234S	901-4629-1	DF57-3234SCF
Press	CM-105C	901-0001-0	—
Hand crimping tool	HT305/DF57-2830HC(Note 2)	902-4635-0	DF57-2830SCF
Contact extraction tool	DF-C-PO(B)	550-0179-2	DF57-****SCF(A)

Note 1 : Please conduct crimping work according to the table in the Crimp Quality Standard (ETAD-H0404-00).

Note 2 : The compatible wire is limited to UL1571 of thin wire type, 28 to 30 AWG when you use the Hand crimping tool.

Note 3 : Problems with tools other than those specified by Hirose are outside the scope of warranty.

Note 4 : When non-authorized tools are used, please consult with Hirose sales representative about provision of the drawing of the crimping tool.

◆ Crimping Precautions

■ Items required prior to start crimping

The work-related documents shown below are required before starting the harness connections.
(The ● mark shows the document required.)

When the documents shown below are not available, ask our sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
(1) Main unit of crimping machine instruction manual	Explanation of main press machine unit	●	—	When purchasing main press machine unit, it is bundled.
(2) Operating Instructions for Hand Tool	Crimp operation	●	—	When purchasing Applicator, it is bundled.
(3) Applicator Spare Parts Identification	Explanation for Applicator installation	●	—	
(4) Crimp Conditions	Standard values of : Crimp height ; Tensile strength	●	—	
(5) Crimp Quality Standards	Various standards for crimping conditions	●	—	When purchasing Hand Tool, it is bundled.
(6) Operating Instructions for Hand Tool	Inspection items of : Crimp height ; Crimp operation Tensile strength	—	●	
(7) Cable Assembly Procedure	Cable Assembly Procedure	●	●	Ask our sales personal to provide them.

■ Tools

When crimping work is applied to our contacts, the tool designated by Hirose should be used.
Crimping work by using tools other than as designated must not be done because it may result in contact failure, disconnection of cable, etc.

*The operating instructions manual is available for the crimping machine and the applicator.

Be sure to carefully read the operating instructions manual before implementing the work.

■ Applicable electric wires

Check that the electric wire to be used is in the range of application.

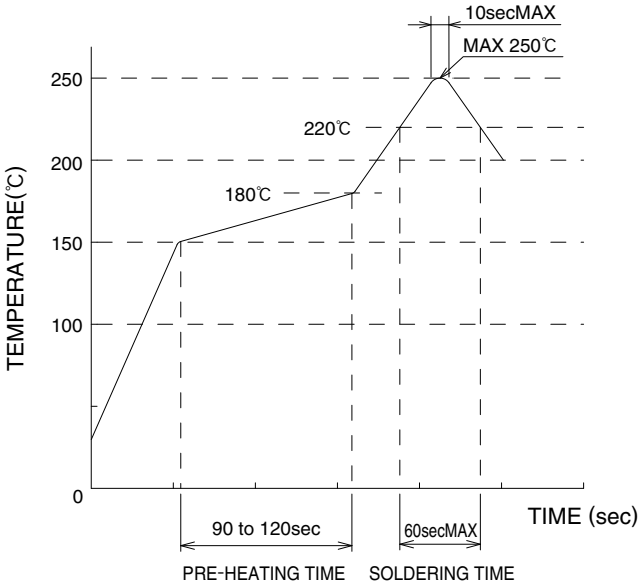
If you intend to use an electric wire other than the recommended one, ask our sales personnel.

[Precautions]

- Electric wires that are applicable for crimping connectors shall, principally, be the tin-plated stranded soft-copper wire.
- Crimping of electric wires wherein single wires, polyester yarns, etc., exist and crimping of tin-coated wires should be avoided.
- Avoid crimping two electric wires together.
- The setting values of crimp height (Note 1) may vary between tin-plated and gold-plated terminals even if the same electric wires are used.
- The setting values of crimp height (Note 1) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note 1 : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

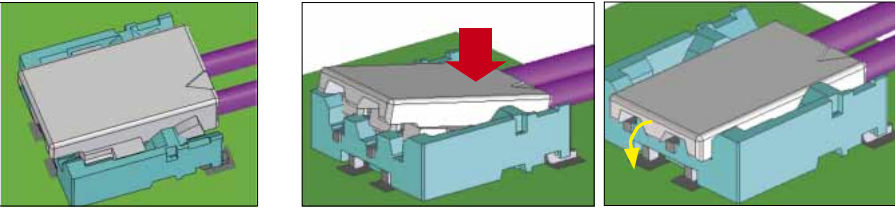
◆ Handling Points

1.Recommended temperature profile	 The temperature profiles are based on the above conditions. In individual applications the actual temperature may vary, depending on solder paste type, volume/thickness and board size/thickness. Consult your solder paste and equipment manufacturer for specific recommendations.
2.Recommended manual soldering	Manual soldering : 350°C ± 10°C for 3 seconds
3.Recommended screen thickness and open area ratio (Pattern area ratio)	Thickness : 0.1mm Open area ratio : 100%
4.Board warpage	Maximum of 0.02mm at the connector center, with both ends of the connector as reference points.
5.Cleaning conditions	Cleaning is not recommended. When cleaning, please evaluate as if can deteriorate the performance including mechanical operation and environmental resistance.
6.Precautions	■When inserting crimp-type (solderless) terminals to crimping (solderless) sockets, to maintain reliable performance, please do not insert obliquely. ■DO NOT mate/un-mate non-terminated plugs with non-mounted receptacles. This may lead to damage or deformation of the contacts. ■Removal of the holding electric cable may cause damage so please be careful. ■DO NOT apply flux to the contact terminals when hand soldering the receptacle to the board. Wicking of the flux into the electrical contact areas may lead to connection failures. ■Slight discoloration on the insulating materials will not affect form, fit or function of the connectors. Black spots may appear on the mold resin but this does not affect the product quality. ■Please refer to the documents "DF57 Series Cable assembly Procedure ETAD-H0421", "Crimp condition" and "DF57-****SCF(A)(**) Crimp quality standards ATAD-H0404" for the cable assembly procedures. ■Please refer to the "DF57H Series Mating/Unmating Operation Instruction Manual (ETAD-H0652)" for the connector operation.
7.Handling procedure	Please refer to the following documents. ■Crimp Quality Standard (ETAD-H0404-00) ■Cable Assembly Procedure (ETAD-H0421-00) ■Mating/Unmating Operation Instruction Manual (ETAD-H0652-00) ■Procedures for Using the Crimp Terminal Extracting Tool (ETAD-H0249-00) ■Board-to-Wire Connector Guidelines (ETAD-H1023-00)

8. Insertion and removal operation method

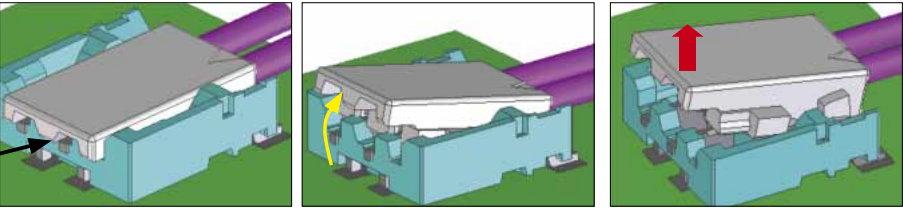
Mating

- ① Determine position, fitting the external form
- ② Insert the cable side
- ③ Push the contact portion side



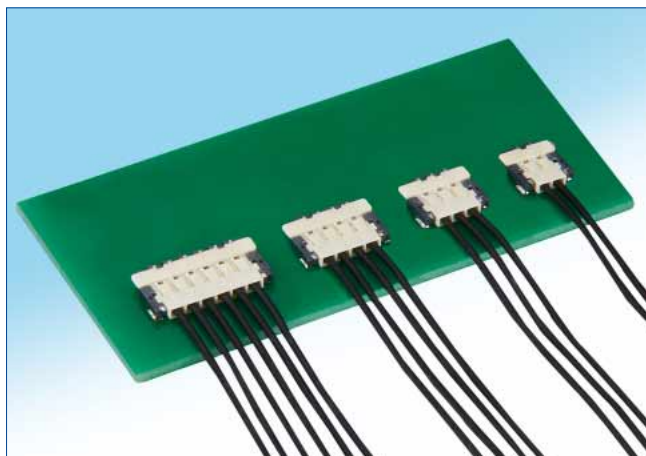
Un-mating

- ① Engage lever
- ② Pull up and release the simple lock
- ③ The reinforced lock is also released and the un-mating is complete



9. Mating compatibility

	DF57H		DF57	
Header				
Socket				
	DF57H	DF57	DF57H	DF57
Mating compatibility	Y	Y	N	Y
Additional guiding keys	Y	N	-	N



Small-sized, low profile connector

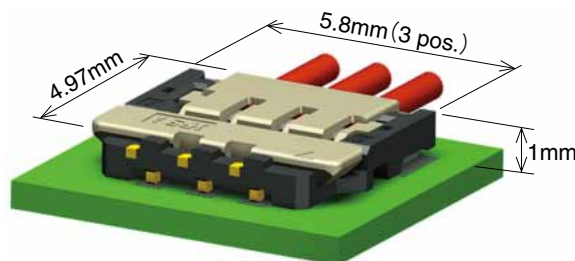


Fig.1

■ Features

1. Small-sized, low profile connector

Low profile design of 1.0mm stacking height, the connector is suitable for small-sized devices.

2. Leveling of the vertical mating cable

Vertical insertion of the connector for mating enhances the assembly operation within device.

3. Proprietary ViSe Lock design

The cable side lock has been strengthened with our proprietary ViSe Lock mechanism*, preventing the cables from being easily disconnected due to tough routing or an excessive load. (*ViSe Lock: Vertical-insertion Swing-extraction)(Fig.2)*Patent pending

4. High current capability up the maximum of 3.0A (2pos. : When 28AWG is used)

By adopting high conductivity material and lowering contact resistance through optimized contact force, high-current capability is achieved in spite of its small size.

5. Highly reliable contact design

Effective mating length of 0.29mm is achieved in spite of low profile 1.0mm stacking height. The 2-point clipping contact stabilizes contact resistance.

6. Halogen-free*

*As defined by IEC 61249-2-21

Br-900ppm max, Cl-900ppm max, Br+Cl-1,500ppm max

Description of the ViSe Lock Design

Insertion operation appears to be vertical mating. However, it is actually inserted at an angle which ensures high retention force in upper direction.

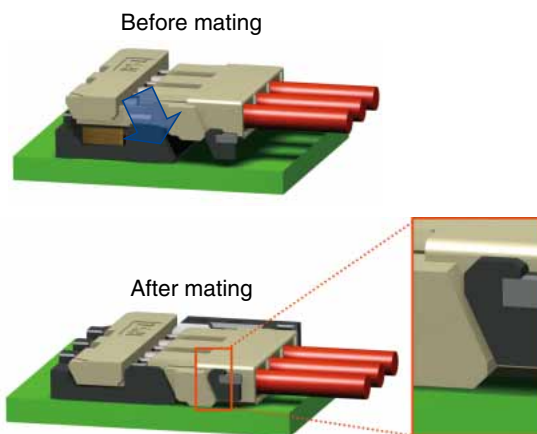
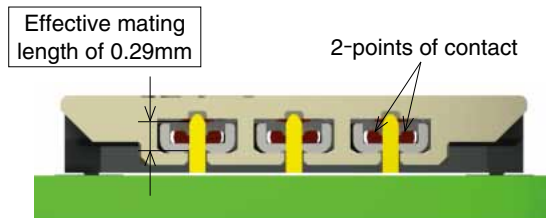


Fig.2

Contact design



Cross sectional view of contact face

Fig.3

Product Specifications

Rating	Current rating		2pos.	3pos.	4pos.	6pos.	Operating temperature range -55°C to 85°C (Note 1) Operating humidity range 20% to 80% (Note 2)
		28AWG	3.0A	2.5A	2.0A		
	Voltage rating	30AWG	2.5A	2.0A	1.5A		Storage temperature range -10°C to 60°C (Note 3) Storage humidity range 40% to 70% (Note 3)
		100V AC/DC					

Item	Specification	Conditions
1. Insulation resistance	100MΩ min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown	500V AC / 1 minute
3. Contact resistance	10mΩ max.	20mV max. at 1mA.
4. Vibration	No electrical discontinuity of 1μs or longer No damage, cracks or parts dislocation.	Frequency : 10 to 55Hz, single amplitude of 0.75mm, 10 cycles, 3 direction
5. Shock	No electrical discontinuity of 1μs or longer No damage, cracks or parts dislocation.	Acceleration of 490m/s ² , 11ms duration, sine half-wave, 3 cycles in each of the 3 axis
6. Humidity	Contact resistance : 20mΩ max., Insulation resistance : 100MΩ min. No damage, cracks or parts dislocation.	96 hours at 40 ±2°C, and humidity of 90 to 95%
7. Temperature cycle	Contact resistance : 20mΩ max., Insulation resistance : 100MΩ min. No damage, cracks or parts dislocation.	-55°C → 5 to 35°C → 85°C → 5 to 35°C Times : 30 min. → 2 min. to 3 min. → 30 min. → 2 min. to 3 min. 5 cycles
8. Durability	Contact resistance : 20mΩ max., No damage, cracks or parts dislocation.	10 cycles
9. Resistance to soldering heat	No deformation of components affecting performance	Reflow : See recommended temperature profile (Page 6) Manual soldering : 350°C for 3 seconds

Note 1 : Includes temperature rise caused by operating current.

Note 2 : Use in environments without condensation.

Note 3 : The term "storage" refers to products stored for a long period prior to soldering or usage.

The operating temperature and humidity range covers the non-conducting condition of installed connectors in storage, shipment or during transportation.

Materials / Finish

Product	Part	Material	Finish	Remarks
Header	Insulator	LCP	Black	UL94V-0
	Contacts	Copper Alloy	Tin Plated	—
Crimp socket	Insulator	LCP	Natural	UL94V-0
Crimp contacts	Contacts	Copper Alloy	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.

●Header

DF 58 – * P 1.2 V

① ② ③ ④ ⑤ ⑥

① Series name : DF	⑤ Contact pitch : 1.2mm
② Series No. : 58	⑥ Termination section V : Straight SMT
③ Number of contacts : 2, 3, 4, 6	
④ Connector type P : Header	

●Crimp socket

DF 58 – * S – 1.2 C

① ② ③ ④ ⑤ ⑥

① Series name : DF	⑤ Contact pitch : 1.2mm
② Series No. : 58	⑥ Termination section C : Crimp socket
③ Number of contacts : 2, 3, 4, 6	
④ Connector type S : Socket	

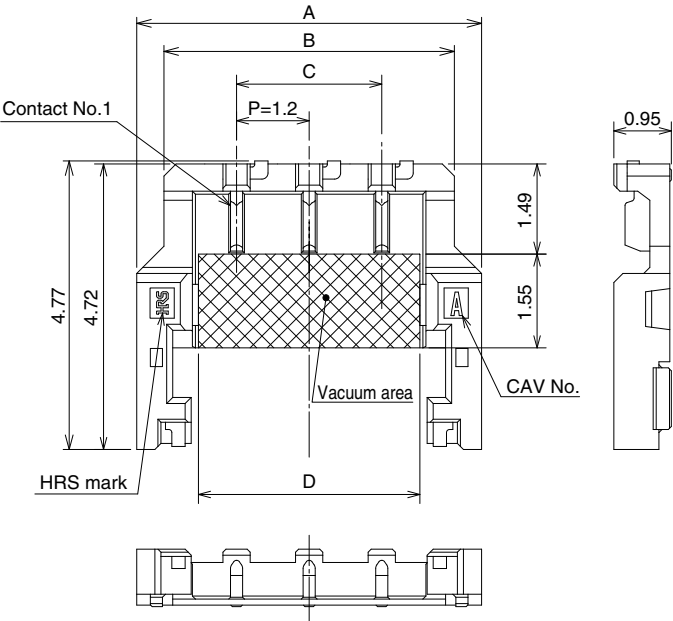
●Crimp contact

DF 58 – 2830 SCF

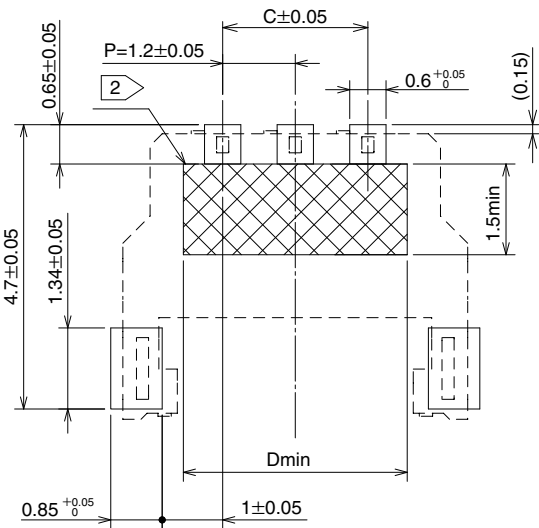
① ②

① Applicable wire size 2830 : 28 to 30AWG	② Packaging SCF : Female crimp contact / reel

Header (SMT)



Recommended PCB layout



[Specification number]

(21) : Tin plated, Embossed tape packaging (6,000pcs/reel)

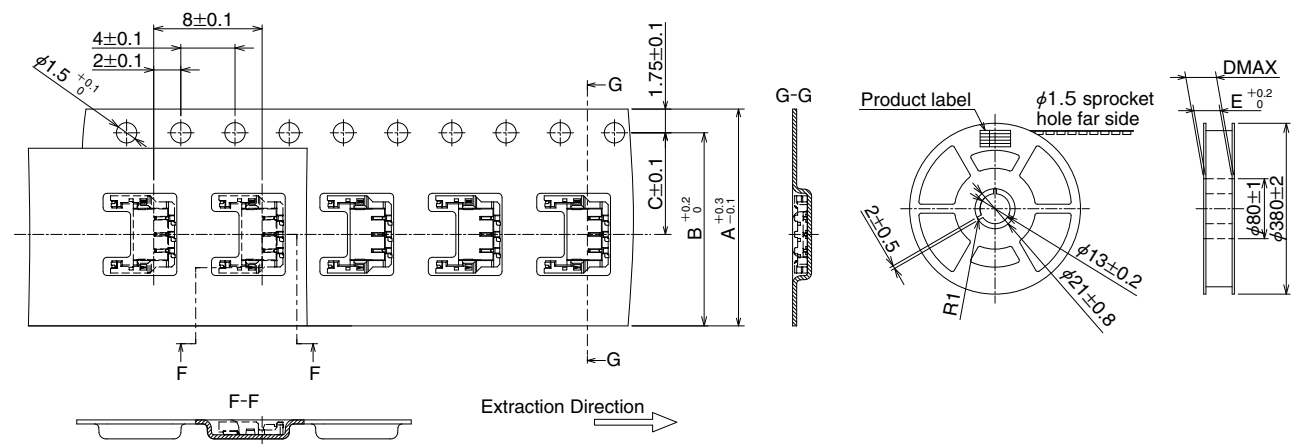
Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D
DF58-2P-1.2V(21)	666-1001-0 21	2	4.5	3.6	1.2	2.5
DF58-3P-1.2V(21)	666-1002-0 21	3	5.7	4.8	2.4	3.7
DF58-4P-1.2V(21)	666-1003-0 21	4	6.9	6.0	3.6	4.9
DF58-6P-1.2V(21)	666-1005-0 21	6	9.3	8.4	6.0	7.3

Note 1 : Embossed tape reel packaging (6,000pcs/reel).

Note 2 : The crossed-hatched area is a no conductive trace area.

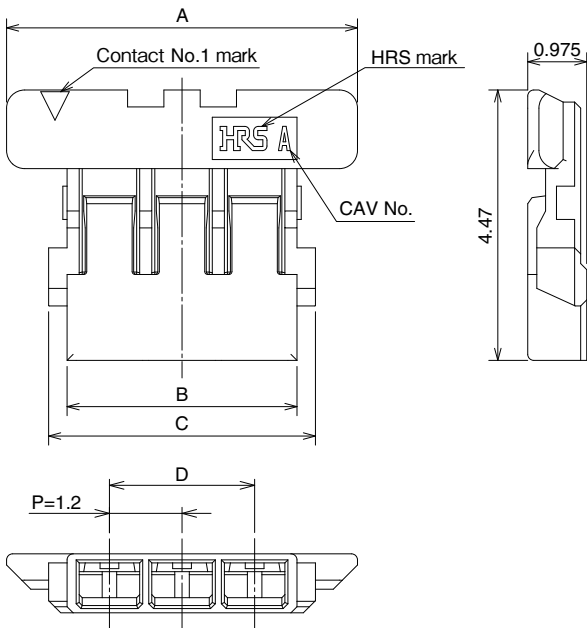
●Packaging Specification



Unit : mm

Part No.	A	B	C	D	E
DF58-2P-1.2V(21)	16	14.25	7.5	22.4	16.4
DF58-3P-1.2V(21)					
DF58-4P-1.2V(21)	24	22.25	11.5	30.4	24.4
DF58-6P-1.2V(21)					

■Crimp socket

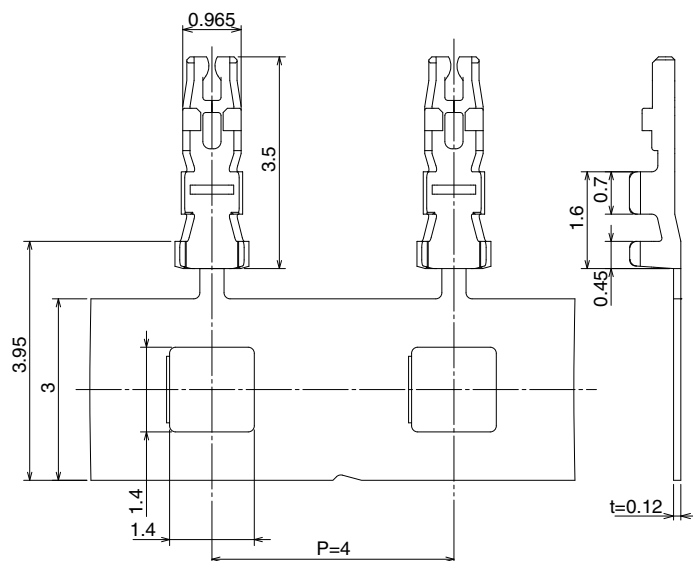


Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D
DF58-2S-1.2C	666-1006-0	2	4.6	2.6	3.21	1.2
DF58-3S-1.2C	666-1007-0	3	5.8	3.8	4.41	2.4
DF58-4S-1.2C	666-1008-0	4	7.0	5.0	5.61	3.6
DF58-6S-1.2C	666-1010-0	6	9.4	7.4	8.01	6.0

Note 1 : Please order by number of packing (1,000pcs/packing).

■ Crimp contact



Unit : mm

Part No.	HRS No.	Packaging	Quantity	Finish
DF58-2830SCF	666-1011-0	Reel	40,000	Tin plated

Note : This product is delivered in 40,000 pieces per reels.

Please place orders in multiples of 40,000 pieces.

● Applicable wire (Tin plated annealed copper wire)

Unit : mm

Wire size (Stranded wire conductor)	Jacket outer diameter	Recommended cable	Strip length
28AWG (7/φ0.127mm)	φ0.5 to 0.6mm	UL1571 (Thin wire)	1.0 to 1.4mm
30AWG (7/φ0.102mm)			

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

Note 2 : The strip length is a reference value. Please make adjustments so finished crimps will meet the specified values.

Refer to the crimping quality standards (ATAD-H0848-00) for details.

◆ Tools

Unit : mm

Type	Part No.	HRS No.	Applicable contact
Applicator	AP105-DF58-2830S	901-4649-0	DF58-2830SCF
Press	CM-105C	901-0001-0	
Hand crimping tool	HT307/DF58-2830HC	902-4671-0	
Contact extraction tool	DF-C-PO(B)	550-0179-2	

Note : If any trouble has occurred due to tools other than the designated tool, Hirose bears no responsibility for any trouble.

◆Operating Precautions

1. Recommended Temperature Profile (Lead-free soldering possible)	[Applicable Conditions] 1. Peak Temperature : MAX 250°C 2. Heated Area : 220°C or above, within 60 sec. 3. Pre-heating Area : 150-180°C, 90-120 sec. 4. Number of Operation : Twice or less * The contact lead area was measured. The conditions may change depending on the types and manufacturers of cream solder, PCB size, and conditions of other materials used for soldering. Please fully check the soldering condition before use. [Remarks 1] This temperature profile is our recommended value.
2. Recommended Hand Solder Conditions	Soldering iron temperature : 350 ± 10°C, soldering time : within 3 seconds
3. Recommended Screen Thickness, Aperture Opening Rate (Pattern Area Ratio)	Thickness 0.1mm, aperture opening rate : 100%
4. PCB Warpage	Max 0.02mm at the center of connector with the both edges of the connector as the baseline.
5. Cleaning Condition	Cleaning with IPA is possible. (Cleaning is not recommended as it may change the feel of insertion/extraction, etc. Please consult with us when using other types of cleaning agents.)
6. Precautions	■ Insertion/extraction of the connector while not mounted to the PCB may cause breakage or deformation to the contact. ■ Do not apply flux at the time of hand soldering, as it may result in flux rise. ■ This product may have slightly different hue on molded items, however, they do not affect the product performance. Black spots may appear on the mold resin but this does not affect the product quality. ■ See the separate “DF58 Insertion/Extraction Procedure Manual” for handling precautions at the time of insertion and extraction.

Oct.1.2023 Copyright 2023 HIROSE ELECTRIC CO., LTD. All Rights Reserved.

◆ Usage Recommendation

7. Insertion
and removal
operation
method

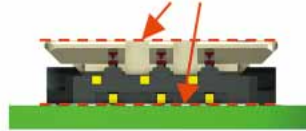
Mating

(1) Placing the crimp socket

Insert the crimp socket by aligning to the housing outline.



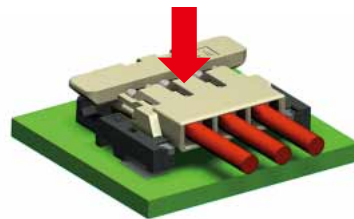
If crimp socket is correctly aligned, the top face of the crimp socket becomes parallel to the PCB.



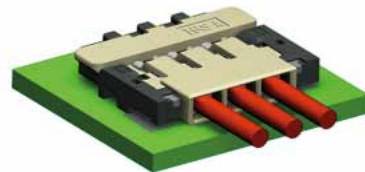
(2) Insertion

Press down in the center of the crimp socket, and mating is complete.

Press down in the center.



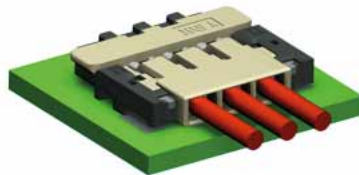
Mating is finished.



(3) Checking the mated state

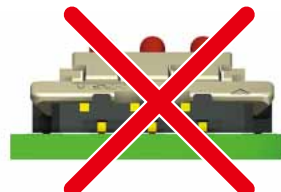
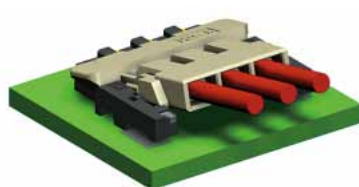
Check if the crimp socket is securely mated.

If one end floats or is mated at an angle, unmate, and mate it again.



If the connector is inserted when the crimp socket isn't placed correctly, only the friction lock on the non-cable side may be inserted as shown in the Figure below. In this case, unmate, and mate it again. Forced mating will lower the retention force.

Insert it over again.



◆Recommended Usage

7. Insertion and removal operation method

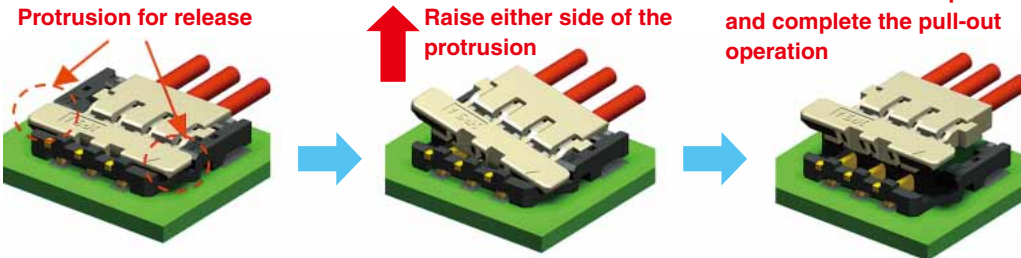
Pull-out operation

Pull-out operation starts by hooking on either side of the protrusion to release the crimp socket and pull up to release the friction lock. Raise the entire crimp socket and complete the operation.

Protrusion for release

Raise either side of the protrusion

Raise the entire crimp socket and complete the pull-out operation



Use the protrusion for release at the time of pull-out operation.
If you forcibly remove it by pulling the cable, cable disconnection and connector breakage will occur.





■ Features

● Common to all series

1. High Operating Temperature

DF59's are rated at temperatures up to 105 °C.

● DF59

2. Swing Lock Structure (Wire-to-Board)

The DF59 features a "swing-lock" mechanism that employs both a positive and friction lock. This helps to prevent accidental unmating by severe wiring and mechanical stress.

3. Short-Circuit Pin

The Short-Circuit Pin allows the termination of an open circuit. Typically used at the end of a series of connected circuit boards.

4. Multi Function Design

The DF59 has the ability to function as either a Board-to-Wire or Board-to-Board System. The PCB mounted receptacle is designed to mate with the W-to-B, B-to-B, and Short Circuit Pin connectors. This multi function ability allows versatility while keeping connectors to a minimum.

5. Contact Design

The terminal design features two-point contact to ensure a highly reliable connection.

6. Common Applicator

Crimping can be performed using the applicator (AP105-DF11-22S) for the existing series DF11-22S C F(A), by replacing the die with the one for DF59 series.

* For crimping quality standards and crimping conditions, crimping needs to be performed in accordance with the specific conditions of DF59-22PCFA.

● Common to DF59/59S

7. Floating Structure (Board-to-Board)

The Board-to-Board connector can be used to connect two PCB together in a co-planar arrangement and features a "Stress free contact" that floats $\pm 0.5\text{mm}$ in the X, Y and Z dimensions.

8. Space Savings

The DF59 series offers high performance in a compact, space saving design; featuring a 2mm pitch and coupled with a mated height of only 2.48mm with AWG#22 cable. The single position floating plug DF59S is specifically designed to save space, and can be mounted in high density applications.

9. Robust locking structure on DF59M (W-to-B Connection)

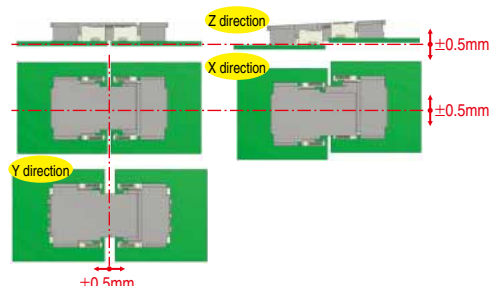
The lock mechanism on compact DF59M provides 16N horizontal lock strength. (Fig.4)

10. Standardization of PCB layout

The DF59S type is used on board-to-board connections, and the DF59M type is intended for wire-to-board connections. Although they have different receptacles, the PCB mounting pattern can be used for these two types. Different combinations of these connectors can be used in the same system with a common PCB. This allows for standardization of PCB. (Fig.5)

Note : Each stencil mask is necessary

DF59 floating amount $\pm 0.5\text{mm}$ (X,Y, Z directions)



DF59S floating amount

$\pm 0.5\text{mm}$ (X,Y direction), $\pm 0.2\text{mm}$ (Z direction)

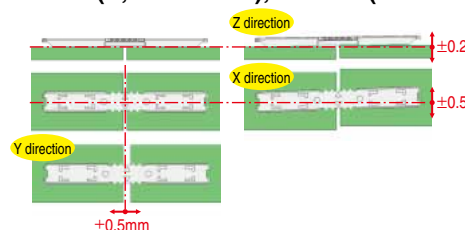


Fig.1

◆ Swing-Lock Structure (Board-to-Wire Type)

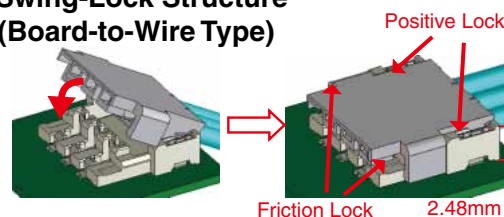


Fig.2

◆ Short-Circuit Pin

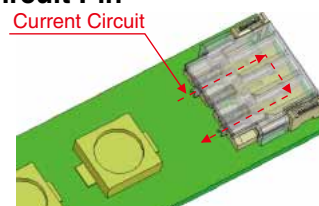


Fig.3

◆ W-to-B structure (DF59M)

Clear tactile click and high locking strength achieved by the robust locking mechanism
Mating force : 16N min. (in a horizontal direction)



Fig.4

◆ Standardization of PCB pattern

DF59S type and DF59M type can be used in the same system by using a common PCB.



Fig.5

Product Specifications

Ratings	Current rating	DF59/S	3A	Operating Temperature : -40 to 105°C (Note 1) Operating Humidity Range : 20 to 80%
		DF59M	6A (22 AWG), 5A (24 AWG) 4A (26 AWG), 3A (28 AWG)	
	Voltage rating	DF59/S	AC/DC 230V (Note 3)	Storage Temperature Range : -10 to 60°C (Note 2) Storage Humidity Range : 40 to 70% (Note 2)
		DF59M	AC/DC 300V (Note 3)	

Items	Specifications		Conditions
1.Contact resistance	DF59-*P-2FC/SP DF59S	50mΩ min.	Under 6V DC, must be measured by 100mA (DC or 1000Hz)
	DF59M-1S-H	45mΩ min.	
	DF59-*P-2C	30mΩ min.	
2.Vibration	No electrical discontinuity over 1μs.		Frequency 10 to 55Hz, single amplitude 0.75mm, 3 directions, 10 cycles each
3.Shock	No electrical discontinuity over 1μs.		Acceleration 490 m/s ² , 11ms; duration, sine half-wave 3 cycles in each of the 3 axis.
4.Humidity		■Contact resistance	Temperature 40 ± 2°C, humidity 90 to 95%, left for 96 hours
	DF59-*P-2FC/SP DF59S	50mΩ min.	
	DF59M	45mΩ min.	
	DF59-*P-2C	30mΩ min.	
5.Temperature cycle		■Contact resistance	(-55°C : 30 min. → 5-35°C : 2 to 3 min. → 85°C : 30 min. → 5-35°C : 2 to 3 min.) 5 cycles
	DF59-*P-2FC/SP DF59S	50mΩ min.	
	DF59M	45mΩ min.	
	DF59-*P-2C	30mΩ min.	
6. Operating Life		■Contact resistance	■Number of insertion and withdrawal force
	DF59-*P-2FC		30 times
	DF59-*P-2FC/SP DF59S	50mΩ min.	10 times
	DF59M	45mΩ min.	20 times
	DF59-*P-2C	30mΩ min.	30 times
7.Resistance to soldering heat	No melting of resin which affect the performance.		Reflow : Depends on recommended temperature profile. Hand soldering : Soldering iron temperature 350 ± 10°C, 3 sec.

Note 1 : Including temperature rise caused by current flow.

Note 2 : The term "storage" refers to products stored for long period of time prior to mounting and use.

Operating temperature and humidity range covers connectors after installation, storage, shipment or during transportation.

Note 3 : The rated voltage is the applied voltage when connectors are mounted parallel to each other on the PCB with a distance of 1.6mm or more between them. Hirose recommends this mounting distance.

This mounting distance is required in order to prevent creepage between the printed wiring to maintain an effective voltage of 300V, according to IEC 60664 and JIS C 60664 standards.

Materials / Finish

Items		Parts	Materials	Treatment	UL Specification
Receptacle	DF59	Insulator	LCP	Natural	UL94V-0
	DF59S	Contact	Phosphor bronze	Gold plated	_____
	DF59M		Copper Alloy	Tin plated	
Floating plug	DF59	Insulator	PBT	White	UL94V-0
		Contact	Brass	Gold plated	_____
	DF59S	Insulator	LCP	Natural	UL94V-0
		Contact	Brass	Tin plated	_____
Crimp contact	DF59M	Contact	Copper Alloy	Tin plated	_____
Short pin		Insulator	PBT	White	UL94V-0
		Contact	Brass	Gold plated	_____
Crimp case		Insulator	PBT	White	UL94V-0
Crimp contact		Contact	Phosphor bronze	Gold 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.

●Receptacle

DF 59 # - * S - * V

① ② ③ ④ ⑤ ⑥ ⑦

① Series Name : DF	⑥ Pitch
② Series No. : 59	None : Single contact type
③ None : Standard S : B-to-B type M : W-to-B type	2 : Standard 2mm (4mm : Without the central contact)
④ Number of contacts : 1, 2, 3, 4	⑦ Termination form
⑤ Type of connector S : Receptacle	V : SMT straight type (B-to-B type) H : SMT right angle type (W-to-B type)

●Plug

DF 59 # - * P - * FC

① ② ③ ④ ⑤ ⑥ ⑦

① Series Name : DF	⑤ Type of connector P : Plug
② Series No. : 59	⑥ Pitch
③ None : Standard S : Single contact type	2 : DF59 : 2mm (4mm : Without the central contact) None : DF59S/M
④ Number of contacts DF59 : 2, 3, 4 DF59S : 1	⑦ Termination form FC : Floating

●Short-Circuit pin

DF 59 - * P - 2 SP

① ② ③ ④ ⑤ ⑥

① Series Name : DF	⑤ Pitch : 2mm
② Series No. : 59	⑥ Termination form
③ Number of contacts : 2, 3, 4	SP : Short Pin
④ Type of connector P : Plug	

●Crimp Socket

DF 59 - * P - 2 C

① ② ③ ④ ⑤ ⑥

① Series Name : DF	⑤ Pitch : 2mm
② Series No. : 59	⑥ Termination form
③ Number of contacts : 2, 3, 4	C : Crimp case
④ Type of connector P : Plug	

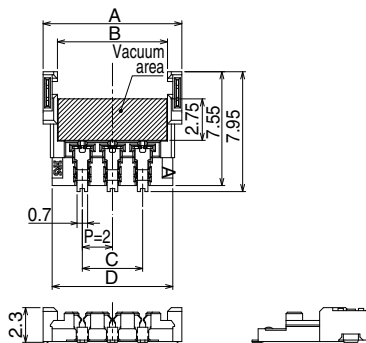
●Contact (W-to-B)

DF 59 M - 2224 PCF

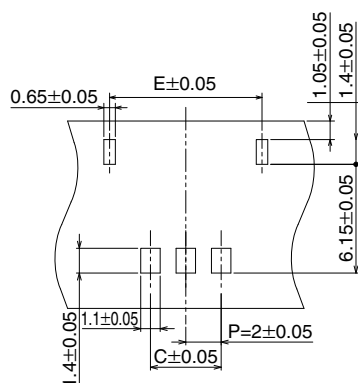
① ② ③ ④ ⑤

① Series Name : DF	⑤ Form Type/Package Type/Plating type
② Series No. : 59	PCFA : Plug crimping contact-Reel contact-Gold plating
③ None : Standard M : Single contact type (W-to-B M=micro)	PCA : Plug crimping contact-Bulk contact-Gold plating
④ Applicable Wire 22 : 22 AWG 2224 : 22 to 24 AWG 2628 : 26 to 28 AWG	PCF : Plug crimping contact-Reel contact-Tin plating PC : Plug crimping contact-Bulk contact-Tin plating

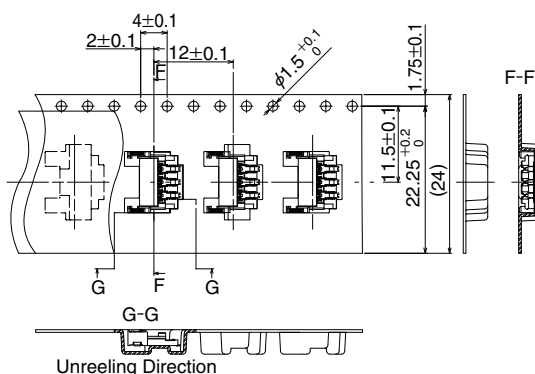
■Straight Receptacle (SMT)



●Recommended PCB Dimensions (t=1.6mm)



●Packaging Dimensions



[Specification No.]

(51) : Gold plating, emboss packaging

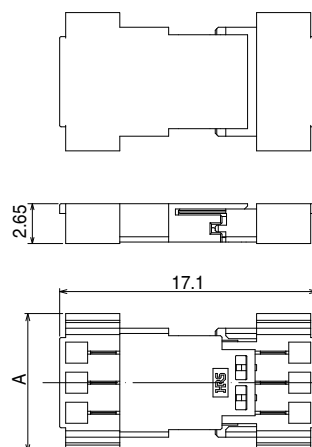
Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	E
DF59-2S-2V(51)	667-0001-0 51	2	7.2	5.3	2.0	6.0	6.62
DF59-3S-2V(51)	667-0002-3 51	3	9.2	7.3	4.0	8.0	8.62
DF59-4S-2V(51)	667-0003-6 51	4	11.2	9.3	6.0	10.0	10.62
DF59-2S-4V(51)	667-0021-8 51	2*	9.2	7.3	4.0	8.0	8.62

* DF59-2S-4V(51) is made by removing the middle pin of DF59-3S-2V(51) at the factory.

Note : Please order in full reel quantities. (2,000 pcs/reel)

■Floating Plug



[Specification No.]

(50) : Gold plating, tray packaging

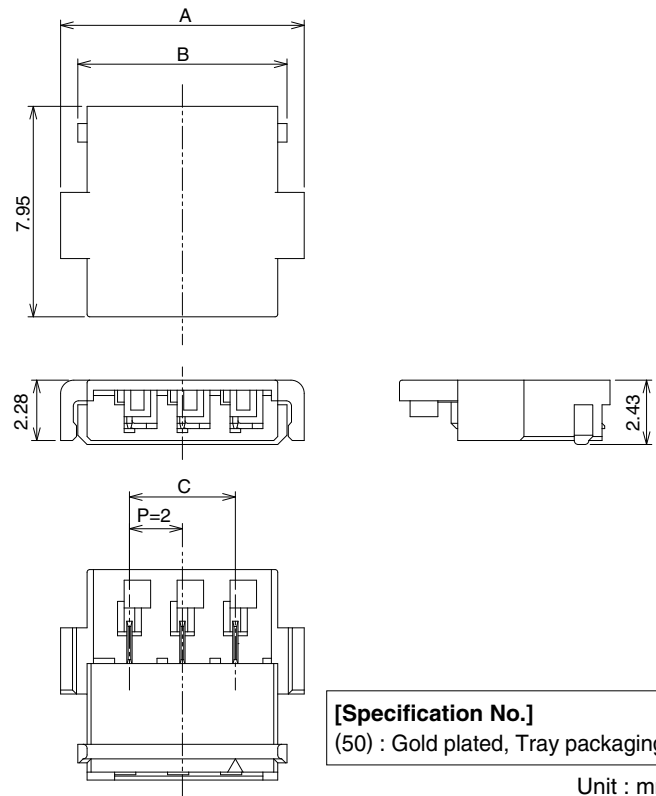
Unit : mm

Part No.	HRS No.	No. of contacts	A	B	Packaged Quantity/Tray
DF59-2P-2FC(50)	667-0006-4 50	2	7.2	2.0	50
DF59-3P-2FC(50)	667-0007-7 50	3	9.2	4.0	
DF59-4P-2FC(50)	667-0008-0 50	4	11.2	6.0	
DF59-2P-4FC(50)	667-0020-5 50	2*	9.2	4.0	

* DF59-2P-4FC(50) is made by removing the middle pin of DF59-3P-2FC(50) at the factory.

Note : Please order in full tray quantities. (50 pcs/tray)

Short-Circuit Pin

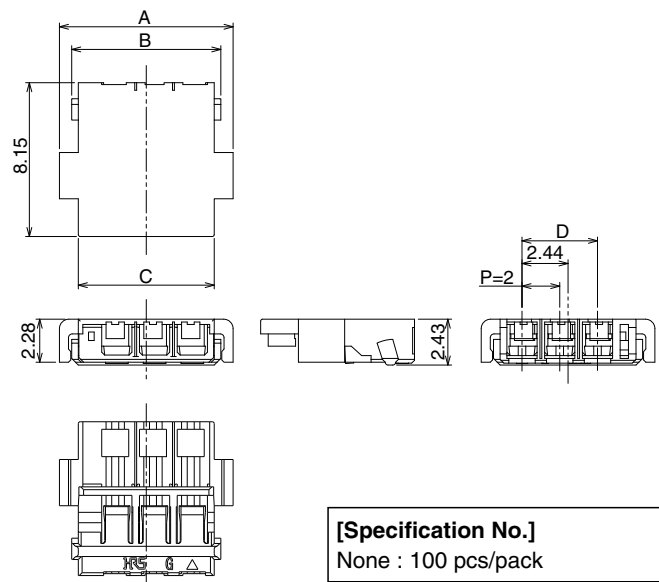
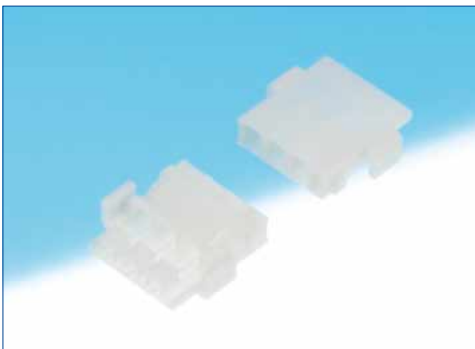


Part No.	HRS No.	No. of contacts	A	B	C	Packaged Quantity/Tray
DF59-2P-2SP(50)	667-0017-0 50	2	7.2	5.9	2.0	100
DF59-3P-2SP(50)	667-0018-3 50	3	9.2	7.9	4.0	
DF59-4P-2SP(50)	667-0046-9 50	4	11.2	9.9	6.0	

Note 1 : Please order in full tray quantities.

Note 2 : For 4 pos. type contact No.1 and 2, No.3 and 4 are connected respectively.

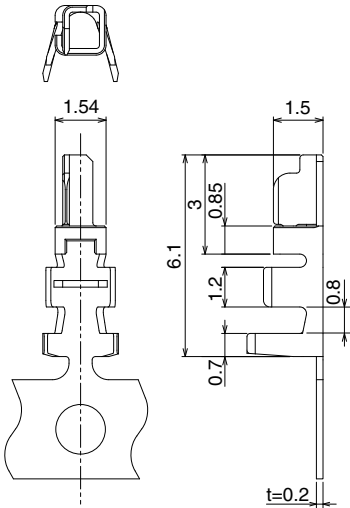
Crimp Socket



Part No.	HRS No.	No. of contacts	A	B	C	D
DF59-2P-2C	667-0011-4 00	2	7.2	5.9	5.2	2.0
DF59-3P-2C	667-0012-7 00	3	9.2	7.9	7.2	4.0
DF59-4P-2C	667-0013-0 00	4	11.2	9.9	9.2	6.0

Note : Please order in full pack quantities. (100 pcs/pack)

■Crimp contact



Part No.	HRS No.	Packaging	Quantity	Treatment
DF59-22PCFA	667-0016-8 00	Reel contact (Note 1)	10,000 contacts / reel	Gold plated
DF59-22PCA	667-0022-0 00	Bulk contact (Note 2)	100 contacts / pack	

Note 1 : Please order reel contacts by full reel quantities. (10,000 pcs/reel)

Note 2 : Please order loose piece contacts in full pack. (100 pcs/pack)

●Applicable Wire (Tin plated soft copper wire)

Conductor Size (Wire Constitution)	Jacket Diameter
22 AWG (17 /φ0.16mm)	UL1061 (φ1.26mm)
	UL3265 (φ1.38mm)

●Recommended Wire

UL1061, UL3265

●Strip Length

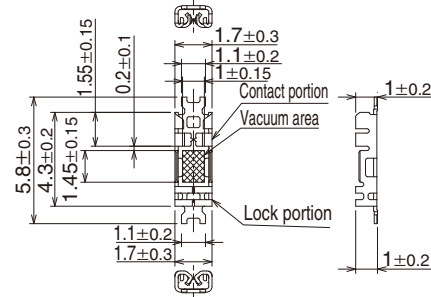
1.7 to 2.3mm

Note 1 : In these cases please contact Hirose Sales Representative.

- Assemble with non-applicable wire.
- LED application usage.

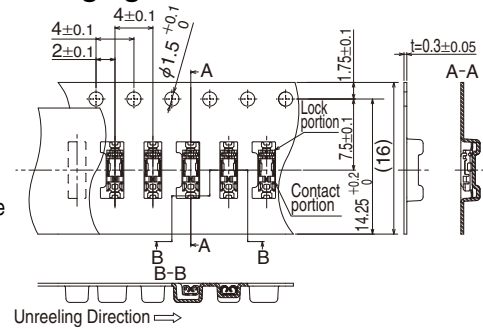
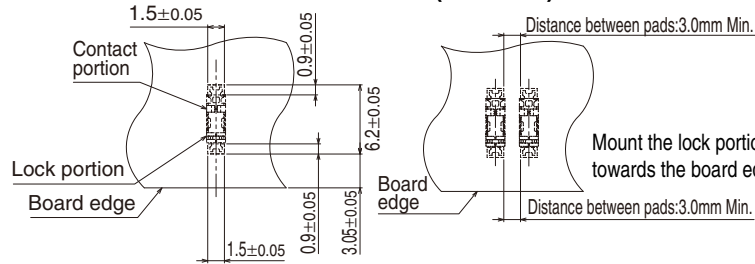
Note 2 : The strip length is a reference value. Please make adjustments to match with dimensional specifications. Refer to the crimping quality standards (ETAD-H0504-00) for details.

Single Contact Type Straight Receptacle (SMT)



●Packaging Dimensions

●Recommended PCB Dimensions (t=1.6mm)



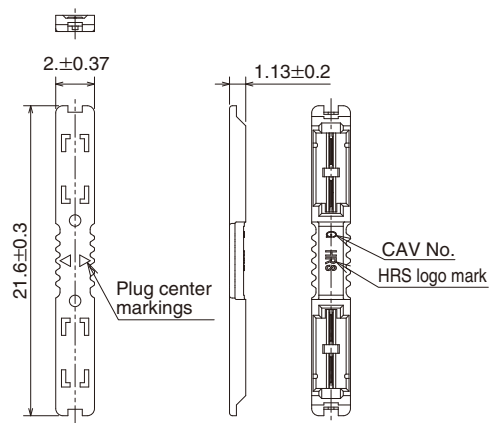
Part No.	HRS No.
DF59S-1S-V(21)	667-0024-6 21

[Specification No.]

(21) : Tin plating, emboss packaging

Note : Please order in full reel quantities. (10,000 pcs/reel)

Single Contact Type Floating Plug



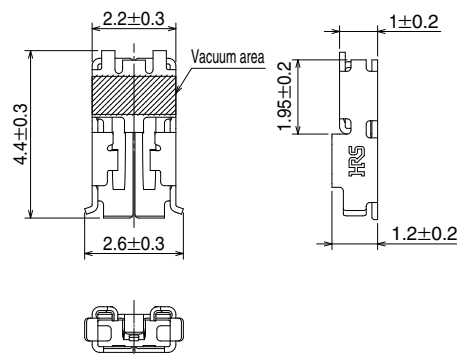
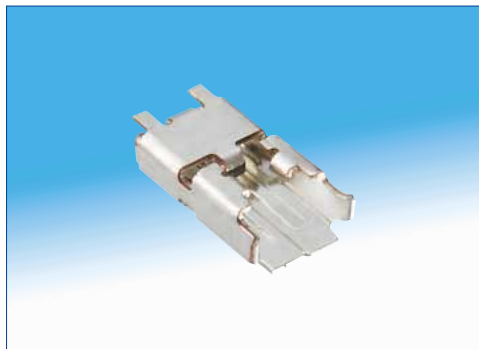
Part No.	HRS No.
DF59S-1P-FC(21)	667-0023-3 21

[Specification No.]

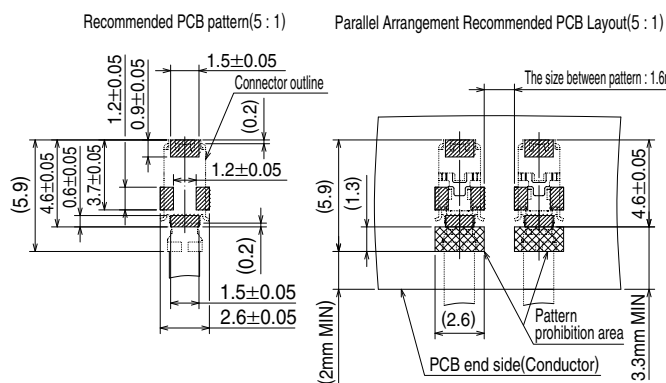
(21) : Tin plating, emboss packaging

Note : Please order in full reel quantities. (10,000 pcs/reel)

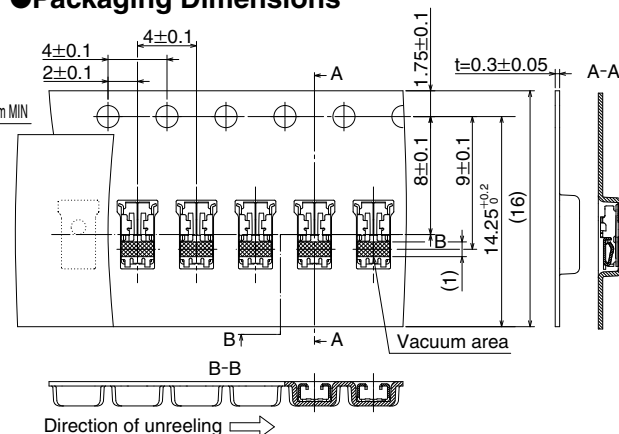
Single Contact Type Right Angle Receptacle (SMT)



Recommended PCB Dimensions (t=1.6mm)



Packaging Dimensions



Part No.	HRS No.
DF59M-1S-H(21)	667-0041-5 21

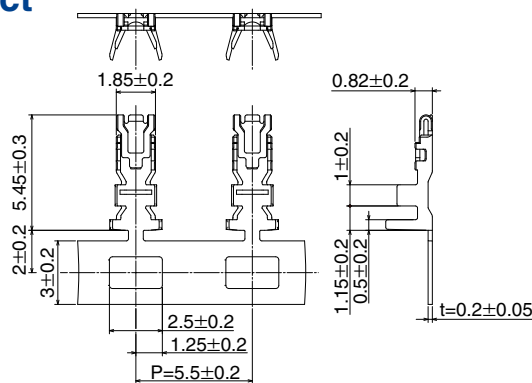
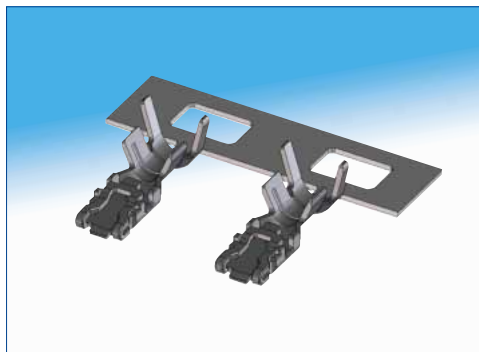
[Specification No.]

(21) : Tin plating, emboss packaging

Note 1 : Please order in full reel quantities. (10,000 pcs/reel)

Note 2 : This connector is designed to mate with Crimp contact of DF59M only. (P.8)

Single Contact Type Crimp Contact



Part No.	HRS No.	Applicable Wire				By Type	Quantity	Treatment
		Recommended Wire	Jacket Diameter	Conductor Size	Wire Constitution			
DF59M-2224PCF	667-0042-8 00	UL10368	φ1.11 to 1.26mm	22 AWG	17/φ0.16mm	Reel contact (Note 1)	15,000/reel	Tin plated
				24 AWG	11/φ0.16mm			
DF59M-2224PC	667-0044-3 00		φ1.26mm	22 AWG	17/φ0.16mm	Bulk contact (Note 2)	100/pack	
			φ1.11mm	24 AWG	11/φ0.16mm			
DF59M-2628PCF	667-0043-0 00		φ0.88 to 0.98mm	26 AWG	7/φ0.16mm	Reel contact (Note 1)	15,000/reel	
				28 AWG	7/φ0.17mm			
DF59M-2628PC	667-0045-6 00	φ0.98mm	26 AWG	7/φ0.16mm	Bulk contact (Note 2)	100/pack		
		φ0.88mm	28 AWG	7/φ0.17mm				

Note 1 : Please order reel contacts by full reel quantities. (15,000 pcs/reel)

Note 2 : Please order loose piece contacts in full pack. (100 pcs/pack)

Note 3 : In these cases please contact Hirose Sales Representative.

• Assemble with non-applicable wire.

• LED application usage.

Note 4 : The strip length is a reference value. Please make adjustments to match with dimensional specifications.

Refer to the crimping quality standards (ETAD-H0778-00) for details.

◆ Applicable Crimping Tool

Types	Part No.	HRS No.	Applicable Contact	Remarks
Applicator	AP105-DF59-22P	901-4619-8	DF59-22PCFA	
	AP105-DF59M-2224P	901-4638-2	DF59M-2224PCF	(Note 2) Manufactured by Japan Automatic Machine Co., Ltd.
	DHS887200H-UP	—		
	AP105-DF59M-2628P	901-4639-5	DF59M-2628PCF	(Note 2) Manufactured by Japan Automatic Machine Co., Ltd.
	DHS887300H-UP	—		
Press Unit	CM-105C	901-0001-0	-	
Hand Tool	HT801/DF59-22P	550-0404-7	DF59-22PCA ※UL1061 AWG#22 Only	
	HT801/DF59M-2224P	550-0420-3	DF59M-2224PC ※UL10368 AWG#22, 24 Only	
	HT801/DF59M-2628P	550-0421-6	DF59M-2628PC ※UL10368 AWG#26, 28 Only	
Extraction Tool (W-to-B)	DF-C-PO(B)	550-0179-2	DF59-22PCFA DF59-22PCA	
	DF-C-PO(A)	550-0170-8	DF59M Series	

Note 1 : Customers are strongly encouraged to utilize HRS application tooling or tooling created by a Hirose tooling partner.

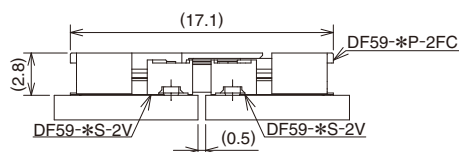
Hirose assumes no liability for customers using tooling from non-recognized sources.

Note 2 : Please contact Japan Automatic Machine Co., Ltd. (hereinafter J.A.M.) through their website regarding crimping issues

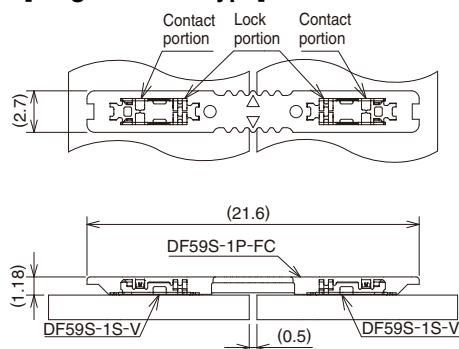
◆ Mating Dimensions

● Board-to-board connection (floating plug)

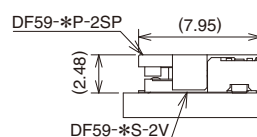
[Standard]



[Single contact type]

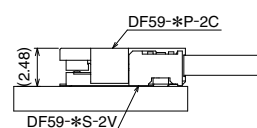


● Short-circuit pin connection

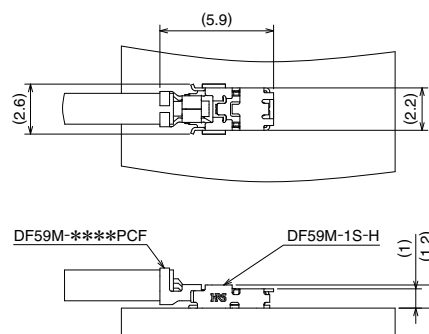


● Wire-to-Board connection

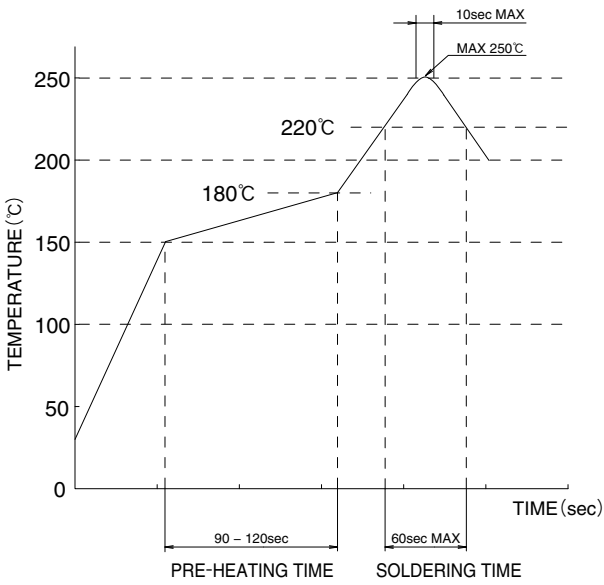
[Standard]



[Single contact type]



Operating Precautions

1. Recommended Temperature Profile (Lead-free soldering possible)	 [Applicable Conditions] 1. Peak Temperature : MAX 250°C 2. Heated Area : 220°C or above, within 60 sec. 3. Pre-heating Area : 150 to 180°C, 90 to 120 sec. 4. Number of Times : within 2 times *Measured at contact lead area Please be noted that the reflow condition may vary depending on soldering paste type, manufacturer of soldering material, board size, as well as conditions of other mounting materials. (*1) Above temperature profile is our recommended value.
2. Recommended Hand Solder Conditions	Soldering iron temperature : $350 \pm 10^{\circ}\text{C}$, soldering time : within 3 seconds
3. Recommended Screen Thickness, Open Ratio (Pattern Area Ratio)	Thickness 0.1mm, Open ratio : 100%
4. Warpage of PC board	Maximum of 0.02mm at the connector center, with both ends of the connector as reference points.
5. Cleaning Condition	Cleaning with IPA is possible. (Cleaning is not recommended. In case of cleaning, please evaluate if it causes a decrease in the performance which includes mechanical operation and environmental resistance.)
6. Precautions	■ When inserting crimp-type (solderless) terminals to crimping (solderless) sockets, to maintain reliable performance, please do not insert obliquely. ■ DO NOT mate/un-mate a non-terminated plug with a non-mounted receptacles. This may lead to damage or deformation of the contacts. ■ Please note that pulling on the wires or cable during un-mating may cause damage. ■ DO NOT apply flux to the contact terminals when hand soldering the receptacle to the board. Flux can wick into the electrical contact areas and may lead to connection failures. ■ Slight discoloration on the insulating materials will not affect form, fit or function of the connectors. Black spots may appear on the mold resin but this does not affect the product quality. ■ Please refer to the following for the points for proper handling regarding mating/unmating operations. “DF59 Insertion and Removal Manual” ETAD-H0496-00 “DF59S Insertion and Removal Manual” ETAD-H0651-00 “DF59M Operation manual” ETAD-H0779-00

DF60 Series

65A 10.16mm pitch Wire-to-Board Connectors for Internal Power Supply (UL, C-UL, TÜV Certified)



Power Supply



Positive-Lock



Compact



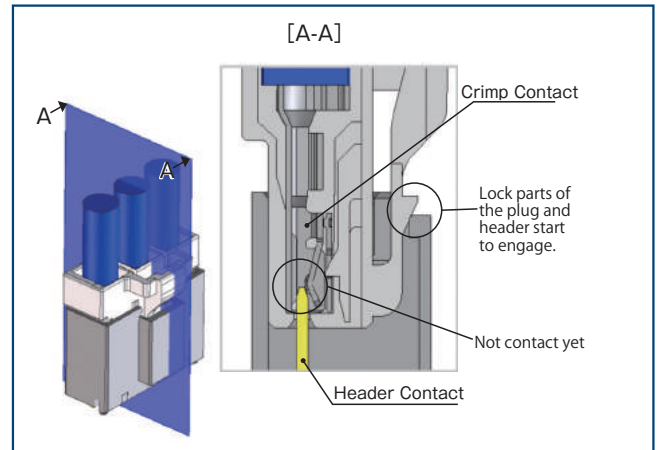
Features

1. Rated for up to 65A

DF60 has the capacity to handle a Max. of 65A when using 8 AWG wire with the single position connector. (Please refer to the chart for the rated current in other pin counts.)

2. Secure Lock Design Ensures Complete Mating

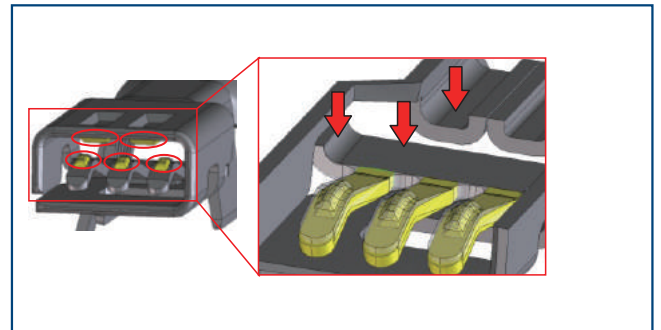
The locking design delivers a clear and tactile click, which prevents incomplete mating and reduces burden on workers for improved work efficiency.



Lock Design

3. Highly Reliable 5-Points Contact Design

Three independent contact springs provide a secure and high contact reliability using 5-Points contact.



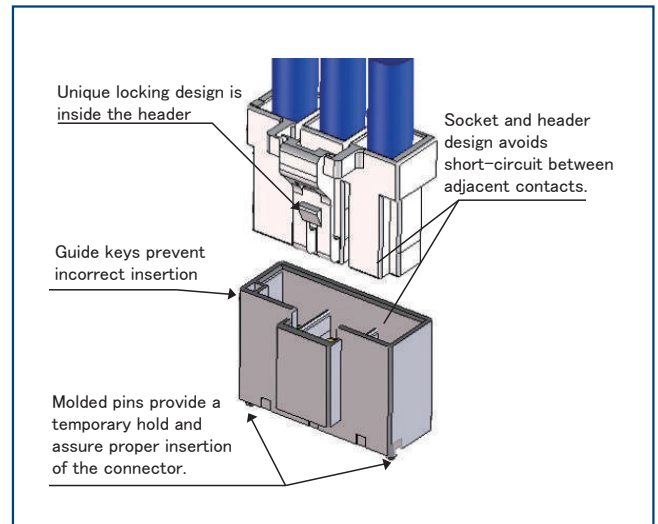
5-Points Contact

4. Molded Lance Design

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

5. Reverse Mounting Prevention to PCB

The addition of a molded pin on the header allows temporary mounting retention and prevents reverse mounting on the PCB. (Right angle pin header has a metal fitting for this purpose.)



6. Short-Circuit Prevention

The wall design between the contacts helps to isolate the contacts and prevent short circuits between contacts.

7. Solder Crack Prevention

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

8. UL, C-UL and TÜV Specifications Certified

9. Glow Wire Compliant (Compliant with IEC 60695-2-11)

10. Finger-Safe (Electric Shock Prevention) Type Available

Product Specifications

Rated Current (Note 1)	No. of Pos.	8 AWG	10 AWG	12 AWG	Operating Temperature	-55 to +105°C (Note 2)
	1	50A / pin	40A / pin	31A / pin	Storage Temperature	-10 to 60°C (Note 3)
	2	45A / pin	35A / pin	28A / pin	Operating Humidity Range	20 to 80%
	3	42A / pin	34A / pin		Storage Humidity Range	40 to 70% (Note 3)
	4		33A / pin	27A / pin		
	5					
	6					
Rated Voltage	1,000V AC/DC					

UL	Rated Current	See below table	Rated Voltage	600V AC/DC
C-UL		See above table (Temperature rise: 30°C)		
TÜV		See above table		

UL/TÜV File No. and Certification No. :
UL : E52653
C-UL : E52653
TÜV : R50244085
: R50400864 (DF60F)

UL Rated Current (At an ambient temp. of 25°C) (Note1)(Note5)	No. of Pos.	8 AWG	10 AWG	12 AWG
	1	65A / pin	55A / pin	45A / pin
	2			40A / pin
	3	55A / pin	50A / pin	
	4		45A / pin	35A / pin
	5			
	6			

Items	Specifications	Conditions
Insulation Resistance	1000M Ω Min.	Measured at 1000V DC
Withstanding Voltage	No flashover or insulation breakdown	3000V AC rms for 1 min
Contact Resistance	2m Ω Max.	Measured at 1A and 6V Max.
Vibration Resistance	No electrical discontinuity of 1 μ s or more.	Frequency : 10 to 500Hz, Acceleration of 98 m/s ² 2 hours in each of the 3 directions
Shock Resistance	No electrical discontinuity of 1 μ s or more.	Acceleration of 490m/s ² , 11ms, Sine halfwave : 3 times each in 3 axial directions
Humidity Resistance	Contact Resistance : 2m Ω Max. Insulation Resistance : 1000M Ω Min	96 hours at temperature of 40 $\pm$ 2°C and humidity of 90% to 95%
Temperature Cycles	Contact Resistance : 2m Ω Max. Insulation Resistance : 1000M Ω Min	-55°C : 30 minutes $\rightarrow$ 85°C : 30 minutes, 25 cycles
Mating Durability	Contact Resistance : 2m Ω Max.	30 times
Solder Heat Resistance	No dissolution of the resin part affecting performance.	Flow : 260°C , 10sec. Hand soldering : temperature of soldering iron at 350 $\pm$ 10°C for 5sec.

Note 1 : This is the maximum current rating while all pins are energized with the stated current rating.

When isolating power lines into multiple circuits, current ratings may go above the stated current ratings.

Please consult Hirose for details before doing this.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The storage condition refers to long-term storage of the product on the shelf before assembly.

Please use the operating temperature for temporary storage such as pre-assembly and during shipping.

Note 4 : Information contained in this catalog represents general requirements for this Series.

Contact us for the drawings and specifications for a specific part number shown.

Note 5 : It shows the current at an ambient temperature of 25°C to the RTI value, the temperature at which performance is halved, of the resin.

Materials / Finish

Item	Component	Material	Color / Finish	Remarks	RoHS2
Header	Insulator	PBT (Glass-reinforced)	Black	UL94V-0	○
	Contact	High Conductivity Copper Alloy	Gold Plating	—	
	Retention Tab	Brass	Tin Plating	—	
Crimp Socket	Insulator	PBT (Glass-reinforced)	Black	UL94V-0	
In-Line Plug	Insulator	PBT (Glass-reinforced)	Black	UL94V-0	
Crimp Contact	Contact	High Conductivity Copper Alloy	Gold Plating	—	

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.

Header Connector

DF60 F R - # P - 10.16 DSA

① ② ③ ④ ⑤ ⑥ ⑦

① Series Name	DF60	⑤ Connector Type	P : Pin Header
② Shape Type	Blank : Standard F : Finger-Safe	⑥ Contact Pitch	10.16mm
③ Guide Key Type	Blank : Standard R : Another Key Shape	⑦ Termination Type	DSA : Straight Pin Header DS : Right Angle Pin Header
④ No. of Pos.	1, 2, 3, 4, 5, 6		

Socket Connector

DF60 F R - # S - 10.16 C

① ② ③ ④ ⑤ ⑥ ⑦

① Series Name	DF60	⑤ Connector Type	S : Socket
② Shape Type	A : Standard F : Finger-Safe	⑥ Contact Pitch	10.16mm
③ Guide Key Type	Blank : Standard R : Another Key Shape	⑦ Termination Type	C : Crimp Socket
④ No. of Pos.	1, 2, 3, 4, 5, 6		

In-Line Plug Connector

DF60 F R - # EP - 10.16 C

① ② ③ ④ ⑤ ⑥ ⑦

① Series Name	DF60	⑤ Connector Type	EP : In-Line Plug
② Shape Type	Blank : Standard A : No Flange F : Finger-Safe	⑥ Contact Pitch	10.16mm
③ Guide Key Type	Blank : Standard R : Another Key Shape	⑦ Termination Type	C : Crimp Socket
④ No. of Pos.	1, 2, 3, 4, 5		

Crimp Contact

DF60 A - 8 SCFA

① ② ③

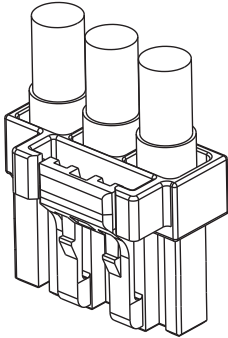
① Connection Type	Blank : Standard A : Sequential	③ Contact Type / Packaging Type	SCFA : Socket Contact/Reel SCA : Socket Contact/Loose Piece PCFA : In-Line Plug Contact/Reel PCA : In-Line Plug Contact/Loose Piece
② Applicable Wire Size	8 : 8 AWG 1012 : 10 to 12 AWG		

Connector Mating Combinations Diagram

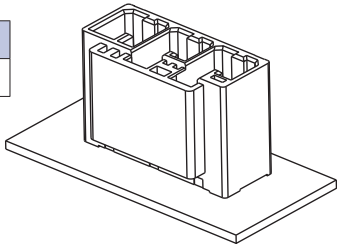
●Finger-Safe Type

Crimp Socket (Cable Side)	Socket Crimp Contact
DF60F(R) -#S-10.16C (Note)	DF60-#SC(F) A

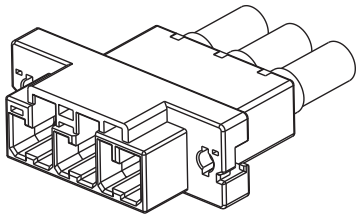
Note : R type (another key shape) socket mates with another key type of R type plug / pin header.



Straight Pin Header
DF60F(R) -#P-10.16DSA



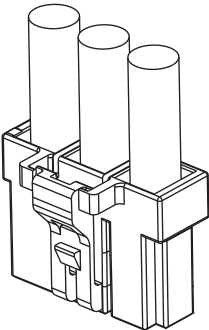
In-Line Plug (Cable Side)	Crimp Contact for In-Line Plug
DF60F(R) -#EP-10.16C	DF60-#PC(F) A



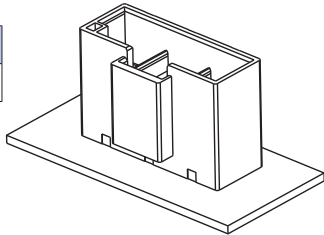
●Standard Type

Crimp Socket (Cable Side)	Socket Crimp Contact
DF60A(R) -#S-10.16C (Note)	DF60-#SC(F) A

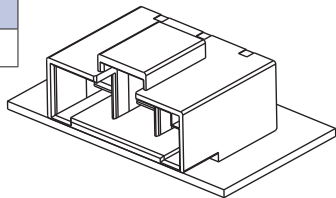
Note : R type (another key shape) socket mates with another key type of R type plug / pin header.



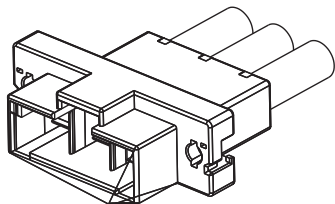
Straight Pin Header
DF60(R) -#P-10.16DSA



Right Angle Pin Header
DF60(R) -#P-10.16DS



In-Line Plug (Cable Side)	Crimp Contact for In-Line Plug
DF60(A) (R) -#EP-10.16C	DF60(A) -#PC(F) A



Straight Pin Header (Finger-Safe Type)



Standard Key Shape (2pos.)



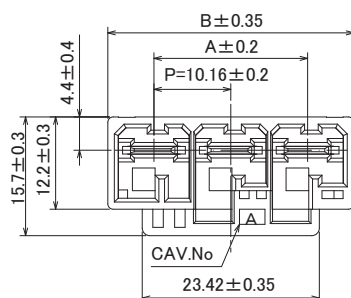
Standard Key Shape (3pos.)



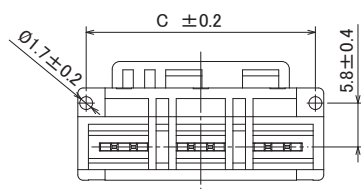
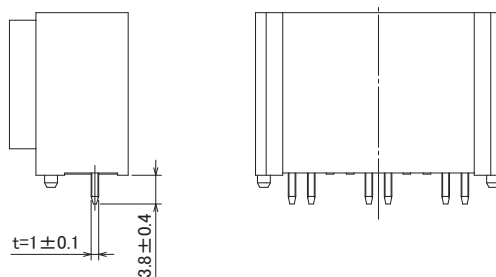
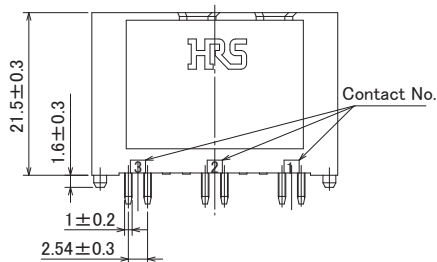
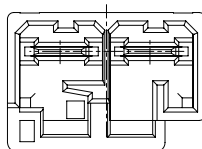
Another Key Shape (2pos.)



Another Key Shape (3pos.)



Mated Portion Shape
(2pos.)



Standard Type (Guide Key : Standard, Color : Black)

Unit : mm

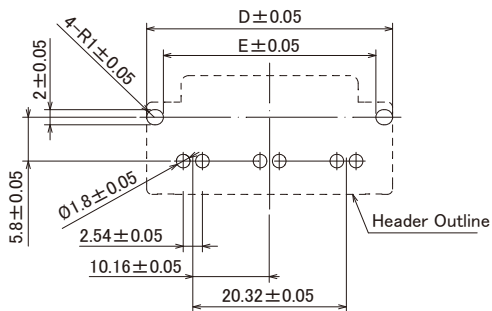
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60F-2P-10.16DSA(50)	CL0680-4007-0-50	2	10.16	22.36	20.15	22.36	17.94	96pcs per tray
DF60F-3P-10.16DSA(50)	CL0680-4001-0-50	3	20.32	32.52	30.31	32.52	28.1	64pcs per tray

R Type (Guide Key : Another Key Shape, Color : Red)

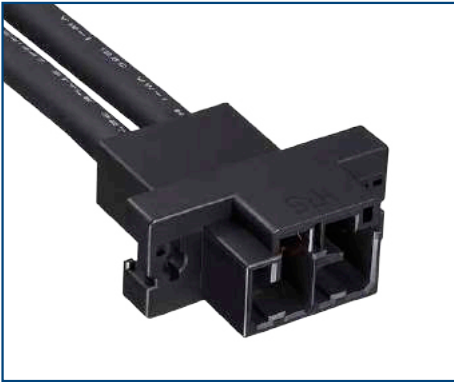
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60FR-2P-10.16DSA(50)	CL0680-4010-0-50	2	10.16	22.36	20.15	22.36	17.94	96pcs per tray
DF60FR-3P-10.16DSA(50)	CL0680-4004-0-50	3	20.32	32.52	30.31	32.52	28.1	64pcs per tray

Note : As for UL, C-UL and TÜV standard of the two positions are in the process of being certified.

■PCB Mounting Pattern (Recommended Board Thickness : $t=1.6\pm0.1$)

In-Line Plug (Finger-Safe Type)



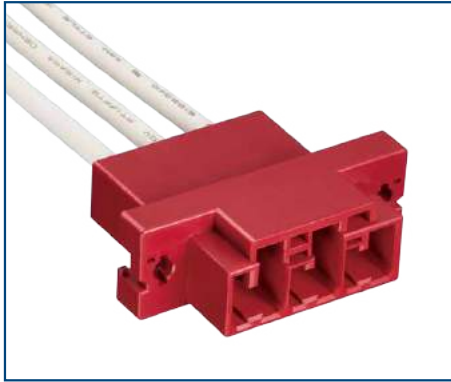
Standard Key Shape (2pos.)



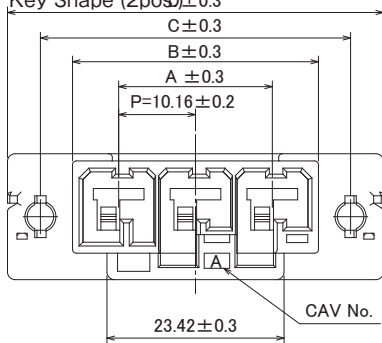
Standard Key Shape (3pos.)



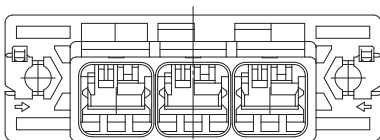
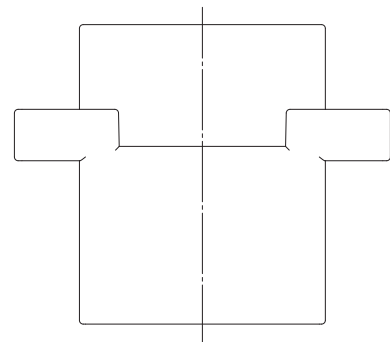
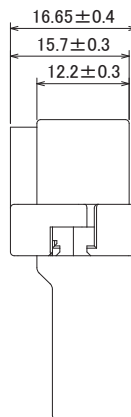
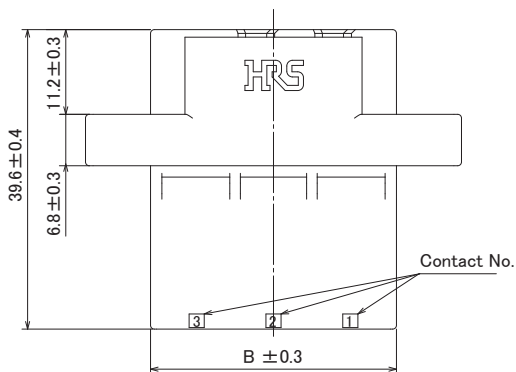
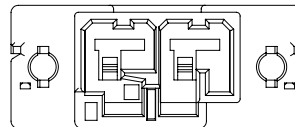
Another Key Shape (2pos.)



Another Key Shape (3pos.)



Mated Portion Shape (2pos.)



Standard Type (Guide Key : Standard, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60F-2EP-10.16C	CL0680-4009-0-00	2	-	22.36	30.86	39.56	22.36	100pcs per tray
DF60F-3EP-10.16C	CL0680-4003-0-00	3	20.32	32.52	41.02	49.72	32.52	

R Type (Guide Key : Another Key Shape, Color : Red)

Unit : mm

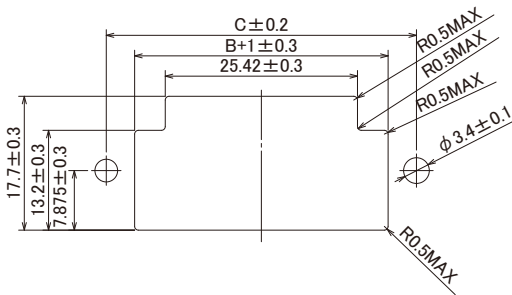
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60FR-2EP-10.16C	CL0680-4012-0-00	2	-	22.36	30.86	39.56	22.36	100pcs per tray
DF60FR-3EP-10.16C	CL0680-4006-0-00	3	20.32	32.52	41.02	49.72	32.52	

Note 1 : For better finger-safe function, heat shrink tube shall be installed to crimp contact of in-line plug.
(Recommended heat shrink tube : Sumitomo Electric Industries, Ltd. F2(Z)8 × 0.25)
For the details, please see DF60 cable assembly procedure. (ETAD-H0653-00)

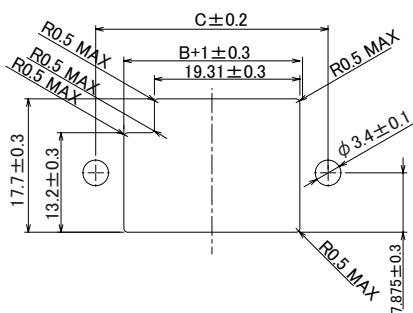
Note 2 : As for UL, C-UL and TÜV standard of the two positions are in the process of being certified.

■Panel Cut-Out Dimensions

[3pos.]



[2pos.]



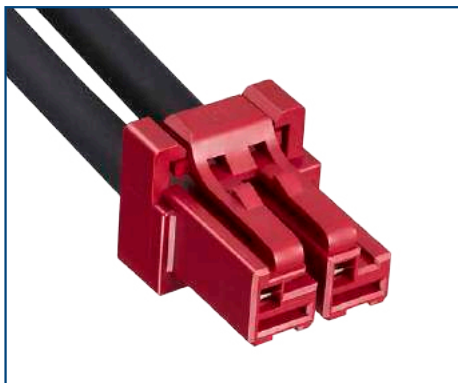
Crimp Socket (Finger-Safe Type)



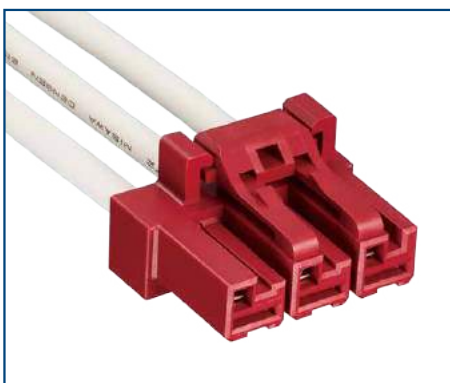
Standard Key Shape (2pos.)



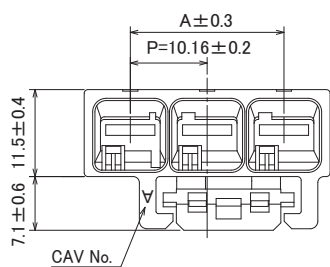
Standard Key Shape (3pos.)



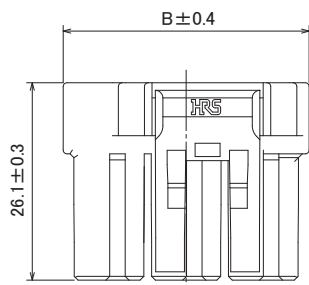
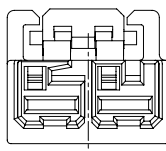
Another Key Shape (2pos.)



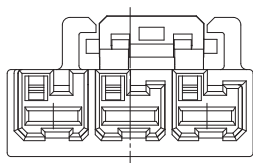
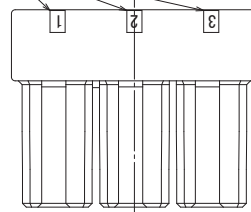
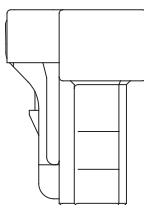
Another Key Shape (3pos.)



Mated Portion Shape (2pos.)



Contact No.



Standard Type (Guide Key : Standard, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF60F-2S-10.16C	CL0680-4008-0-00	2	10.16	22.36	100pcs per tray
DF60F-3S-10.16C	CL0680-4002-0-00	3	20.32	32.52	

R Type (Guide Key : Another Key Shape, Color : Red)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF60FR-2S-10.16C	CL0680-4011-0-00	2	10.16	22.36	100pcs per tray
DF60FR-3S-10.16C	CL0680-4005-0-00	3	20.32	32.52	

Note1 : For better finger-safe function, heat shrink tube shall be installed to crimp contact of socket.

(Recommended heat shrink tube : Sumitomo Electric Industries, Ltd. F2(Z)8 × 0.25)

For the details, please see DF60 cable assembly procedure. (ETAD-H0653-00)

Note 2 : As for UL, C-UL and TÜV standard of the two positions are in the process of being certified.

Straight Pin Header

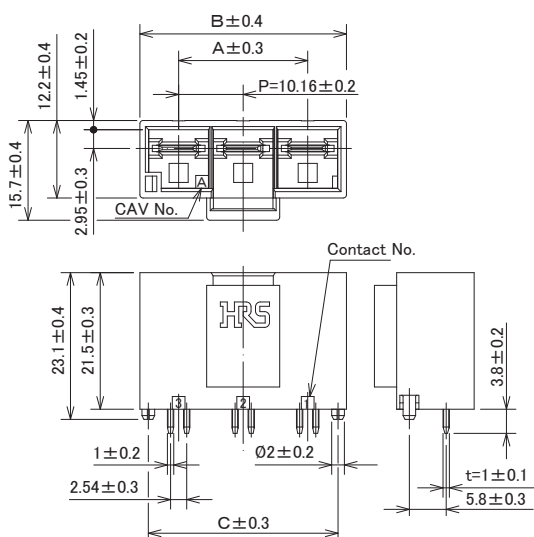


3pos.

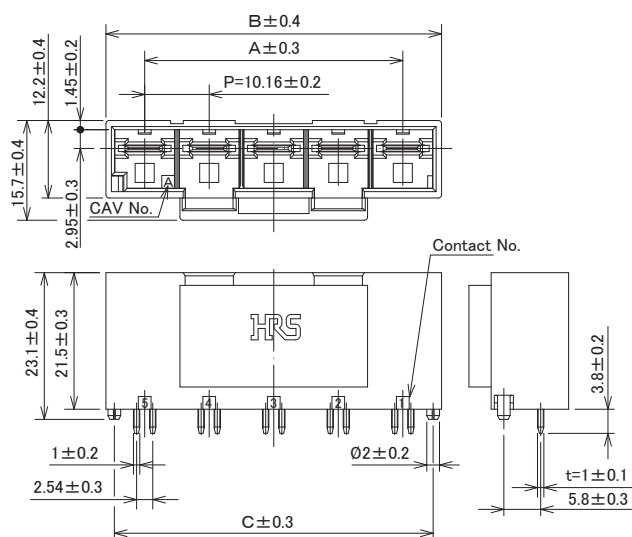


5pos.

1 to 4pos.



5 and 6pos.



Standard Type (Guide Key : Standard, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60-1P-10.16DSA(27)	CL0680-3004-5-27	1	-	15.2	9.55	12.2	7.78	160pcs per tray
DF60-2P-10.16DSA(27)	CL0680-3005-8-27	2	10.16	22.36	19.71	22.36	17.94	96pcs per tray
DF60-3P-10.16DSA(27)	CL0680-3001-7-27	3	20.32	32.52	29.87	32.52	28.1	64pcs per tray
DF60-4P-10.16DSA(27)	CL0680-3006-0-27	4	30.48	42.68	40.03	42.68	38.26	48pcs per tray
DF60-5P-10.16DSA(27)	CL0680-3007-3-27	5	40.64	52.84	50.19	52.84	48.42	32pcs per tray
DF60-6P-10.16DSA(27)	CL0680-3008-6-27	6	50.8	63	60.35	63	58.58	

Standard Type [Colored] (Guide Key : Standard, Color : Red)

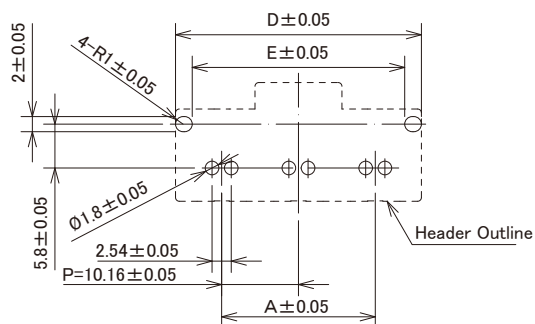
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60-2P-10.16DSA(45)	CL0680-3005-8-45	2	10.16	22.36	19.71	22.36	17.94	96pcs per tray
DF60-3P-10.16DSA(45)	CL0680-3001-7-45	3	20.32	32.52	29.87	32.52	28.1	64pcs per tray

R Type (Guide Key : Another Key Shape, Color : Red)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60R-3P-10.16DSA(27)	CL0680-3038-7-27	3	20.32	32.52	29.87	32.52	28.1	64pcs per tray

■PCB Mounting Pattern (Recommended Board Thickness : $t=1.6\pm0.1$)

Right Angle Pin Header

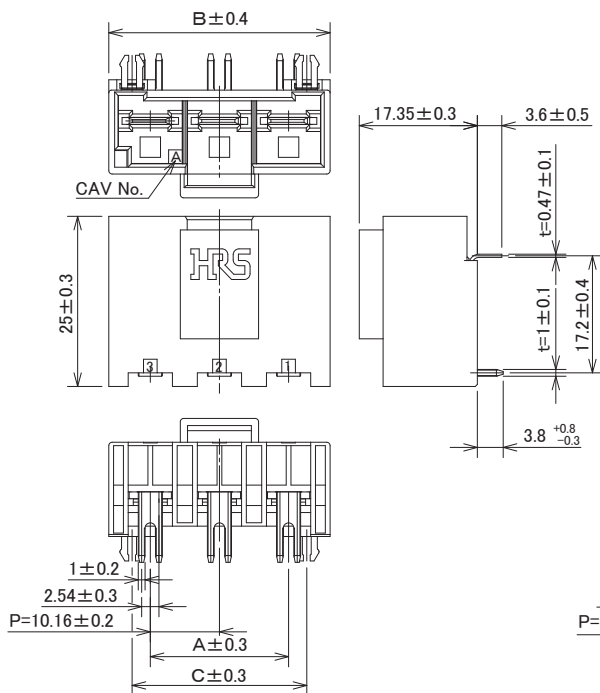


3pos.

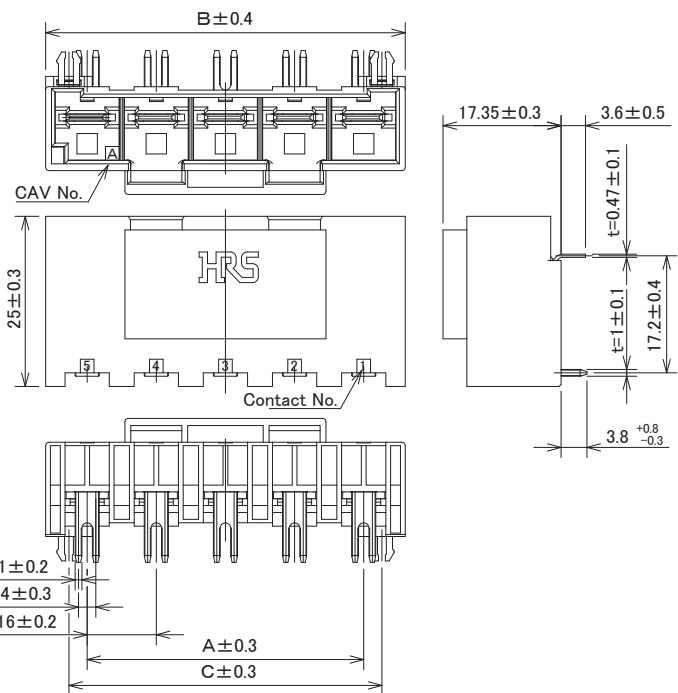


5pos.

1 to 4pos.



5 and 6pos.



Standard Type (Guide Key : Standard, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF60-1P-10.16DS(27)	CL0680-3015-1-27	1	-	15.2	8.35	120pcs per tray
DF60-2P-10.16DS(27)	CL0680-3016-4-27	2	10.16	22.36	15.51	72pcs per tray
DF60-3P-10.16DS(27)	CL0680-3017-7-27	3	20.32	32.52	25.67	48pcs per tray
DF60-4P-10.16DS(27)	CL0680-3018-0-27	4	30.48	42.68	35.83	36pcs per tray
DF60-5P-10.16DS(27)	CL0680-3019-2-27	5	40.64	52.84	45.99	24pcs per tray
DF60-6P-10.16DS(27)	CL0680-3020-1-27	6	50.8	63	56.15	

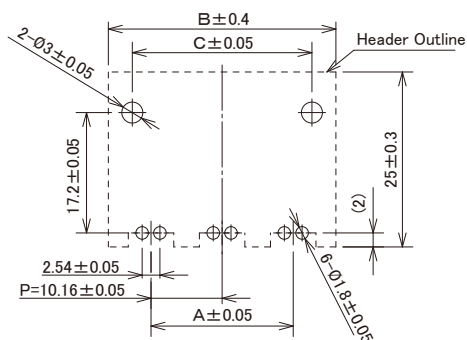
Standard Type [Colored] (Guide Key : Standard, Color : Red)

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF60-2P-10.16DS(45)	CL0680-3016-4-45	2	10.16	22.36	15.51	72pcs per tray

R Type (Guide Key : Another Key Shape, Color : Gray)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF60R-2P-10.16DS(27)	CL0680-3043-7-27	2	10.16	22.36	15.51	72pcs per tray
DF60R-3P-10.16DS(27)	CL0680-3044-0-27	3	20.32	32.52	25.67	48pcs per tray

■PCB Mounting Pattern (Recommended Board Thickness : $t=1.6\pm0.1$)

In-Line Plug

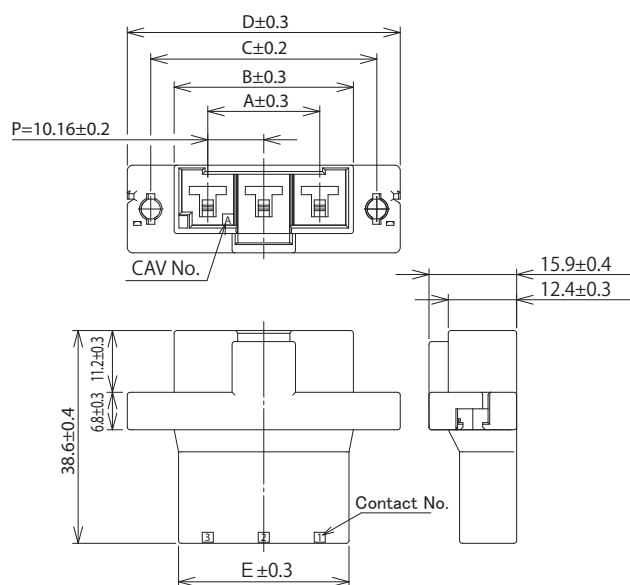


Standard Type (3pos.)

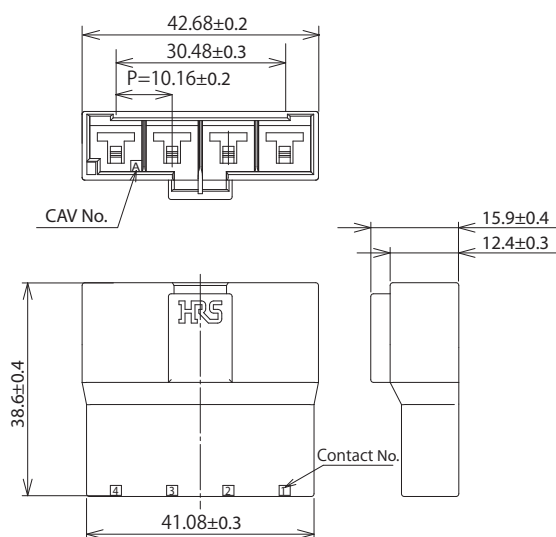


Without Flange Type (4pos.)

Standard Type (1 to 5pos.)



Without Flange Type (4pos.)



Standard Type (Guide Key : Standard, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60-1EP-10.16C	CL0680-3050-2-00	1	-	15.2	23.7	32.2	10.6	100pcs per bag
DF60-2EP-10.16C	CL0680-3025-5-00	2	-	22.36	30.86	39.36	20.76	
DF60-3EP-10.16C	CL0680-3026-8-00	3	20.32	32.52	41.02	49.52	30.92	
DF60-4EP-10.16C	CL0680-3027-0-00	4	30.48	42.68	51.18	59.68	41.08	
DF60-5EP-10.16C	CL0680-3028-3-00	5	40.64	52.84	61.34	69.84	51.24	

Standard Type [Colored] (Guide Key : Standard, Color : Red)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60-1EP-10.16C(15)	CL0680-3050-2-15	1	-	15.2	23.7	32.2	10.6	100pcs per bag
DF60-2EP-10.16C(15)	CL0680-3025-5-15	2	-	22.36	30.86	39.36	20.76	
DF60-3EP-10.16C(15)	CL0680-3026-8-15	3	20.32	32.52	41.02	49.52	30.92	

R Type (Guide Key : Another Key Shape, Color : Gray)

Unit : mm

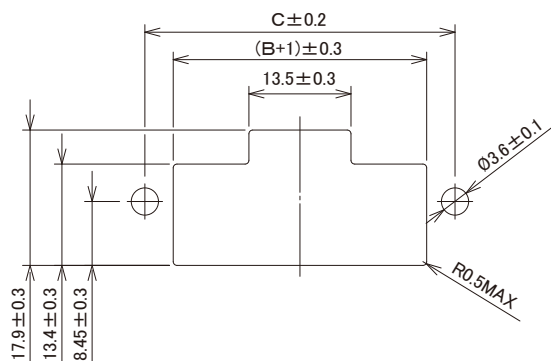
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF60R-2EP-10.16C	CL0680-3053-0-00	2	-	22.36	30.86	39.36	20.76	100pcs per bag
DF60R-3EP-10.16C	CL0680-3054-0-00	3	20.32	32.52	41.02	49.52	30.92	

Without Flange Type (Guide Key : Standard, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	Purchase Unit
DF60A-4EP-10.16C	CL0680-3069-0-00	4	100pcs per bag

■ Panel Cut-Out Dimensions



Crimp Socket

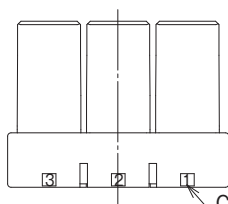
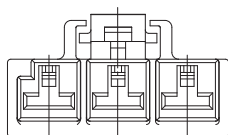
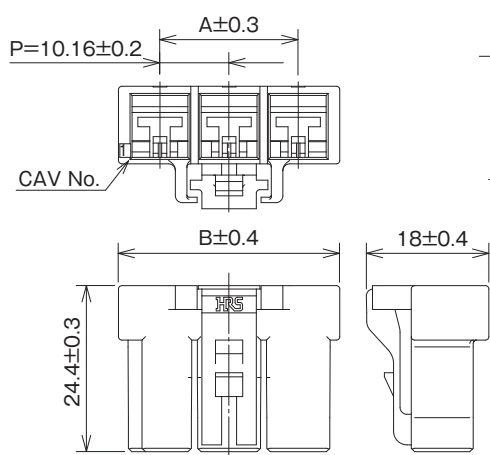


3pos.



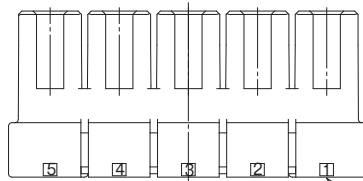
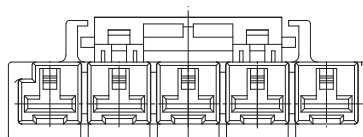
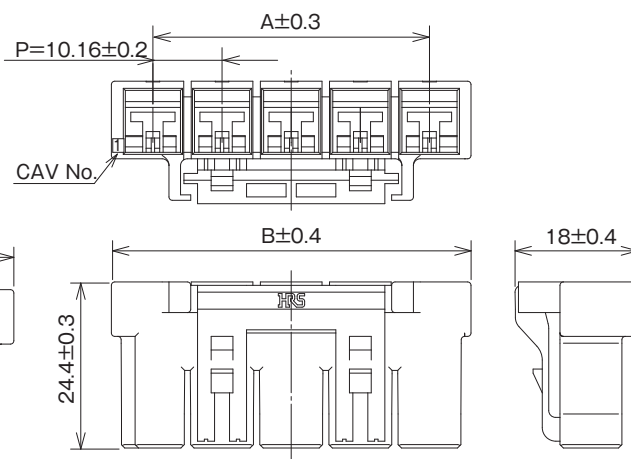
5pos.

1 to 4pos.



Contact No.

5 and 6pos.



Contact No.

Standard Type (Guide Key : Standard, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF60A-1S-10.16C	CL0680-3058-0-00	1	-	15.8	100pcs per bag
DF60A-2S-10.16C	CL0680-3059-0-00	2	10.16	22.36	
DF60A-3S-10.16C	CL0680-3060-0-00	3	20.32	32.52	
DF60A-4S-10.16C	CL0680-3061-0-00	4	30.48	42.68	
DF60A-5S-10.16C	CL0680-3076-0-00	5	40.64	52.84	
DF60A-6S-10.16C	CL0680-3077-0-00	6	50.8	63	

Standard Type [Colored] (Guide Key : Standard, Color : Red)

Unit : mm

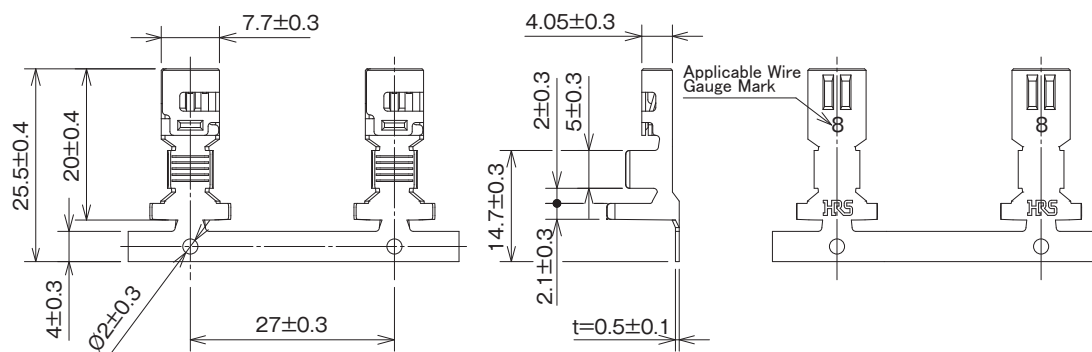
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF60A-1S-10.16C(15)	CL0680-3058-0-15	1	-	15.8	100pcs per bag
DF60A-2S-10.16C(15)	CL0680-3059-0-15	2	10.16	22.36	
DF60A-3S-10.16C(15)	CL0680-3060-0-15	3	20.32	32.52	

R Type (Guide Key : Another Key Shape, Color : Gray)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF60AR-2S-10.16C	CL0680-3063-0-00	2	10.16	22.36	100pcs per bag
DF60AR-3S-10.16C	CL0680-3064-0-00	3	20.32	32.52	

Socket Crimp Contact



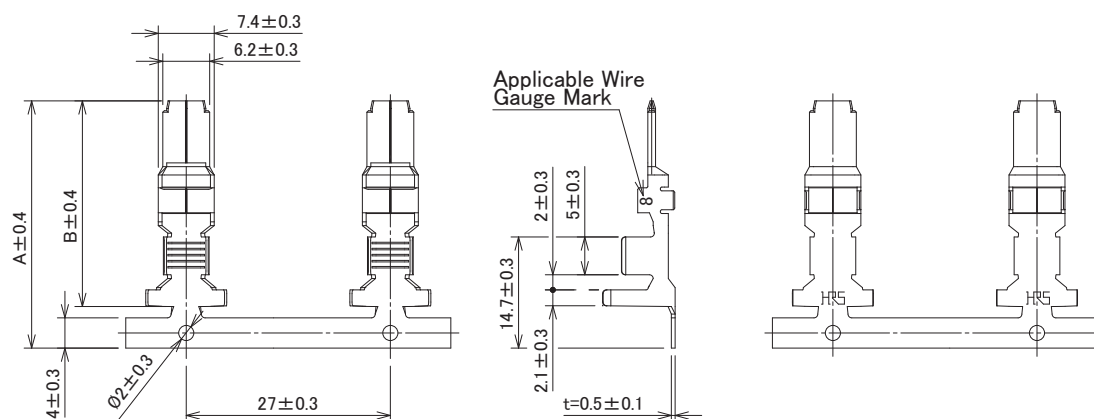
Strip Length : 6.5 to 7.5mm

Unit : mm

Part No.	HRS No.	Applicable Wire (Tin Plated Copper Wire) (Note)					
		UL	Jacket Diameter	AWG	Core Structure	Packing Type	Purchase Unit
DF60-8SCFA	CL0680-3003-2-00	1283	4.9 to 7.8	8	7/24/0.26	Reel	700pcs per reel
DF60-8SCA	CL0680-3021-4-00		7.54			Loose Piece	100pcs per bag
DF60-1012SCFA	CL0680-3014-9-00	1015	4 to 5.2	10	104/0.26	Reel	900pcs per reel
				12	65/0.26		
DF60-1012SCA	CL0680-3022-7-00	1015	4.69	10	104/0.26	Loose Piece	100pcs per bag
			4.04	12	65/0.26		

Note : Please contact our sales department when using wires other than those listed.

Crimp Contact for In-Line Plug



Strip Length : 6.5 to 7.5mm

Unit : mm

Part No.	HRS No.	A	B	Applicable Wire (Tin Plated Copper Wire) (Note 1)					
				UL	Jacket Diameter	AWG	Core Structure	Packing Type	Purchase Unit
DF60A-8PCFA(Note 2)	CL0680-3057-0-00	34.2	28.7	1283	4.9 to 7.8	8	7/24/0.26	Reel	700pcs per reel
DF60-8PCFA(07)	CL0680-3023-0-07	32.7	27.2		7.54			Loose Piece	100pcs per bag
DF60-8PCA(07)	CL0680-3048-0-07								
DF60-1012PCFA(07)	CL0680-3024-2-07	32.7	27.2	1015	4 to 5.2	10	104/0.26	Reel	900pcs per reel
						12	65/0.26		
DF60-1012PCA(07)	CL0680-3049-3-07	32.7	27.2	1015	4.69	10	104/0.26	Loose Piece	100pcs per bag
					4.04	12	65/0.26		

Note 1 : Please contact our sales department when using wires other than those listed.

Note 2 : Not conforming to finger-safe type.

Applicable Crimping Tool

Item	Part No.	HRS No.	Applicable Contact	Remarks
Applicator	AP105-DF60-8	CL0901-4623-5-00	DF60-8SCFA	(Note 4)manufactured by Japan Automatic Machine Co., Ltd.
	QHS895700H-UP	—	DF60-8PCFA(07) DF60A-8PCFA	
	AP105-DF60-1012	CL0901-4624-8-00	DF60-1012SCFA	(Note 4)manufactured by Japan Automatic Machine Co., Ltd.
	QHS888000K-UP	—	DF60-1012PCFA(07)	
Hand tool	HT306/DF60-8	CL0550-0301-4-00	DF60-8SCA DF60-8PCA(07) *Exclusive for UL1283, 8 AWG	
	HT306/DF60-1012	CL0550-0307-0-00	DF60-1012SCA DF60-1012PCA(07) *Exclusive for UL1015, 10 and 12 AWG	

Note 1 : The Hirose Press Unit CM-105C (HRS No.901-0001-0) has a capacity of 1.5 tons and cannot be used.

Please use a press unit which can mount official Hirose's applicators and has a capacity of 3 tons or more.

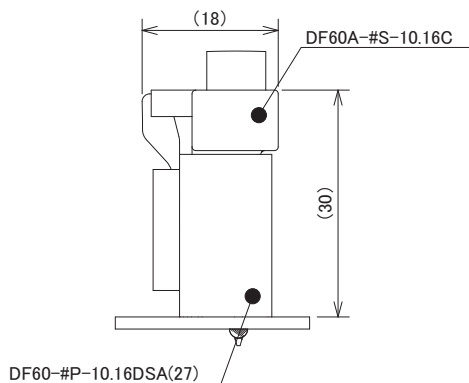
Note 2 : Please contact our Sales Department when you are using crimp tools made by other manufacturers.

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

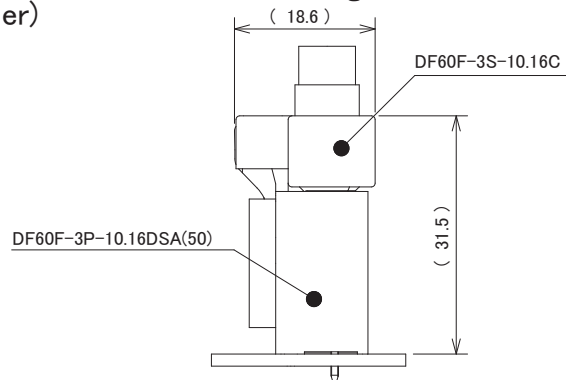
Note 4 : Please contact Japan Automatic Machine Co., Ltd. (hereinafter J.A.M.) through their website regarding crimping issues when using applicators

Mated Dimensions

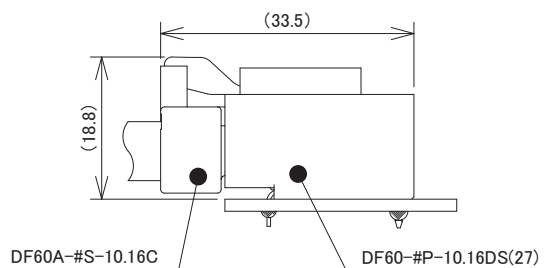
● Wire-to-Board Connection (Straight Pin Header)



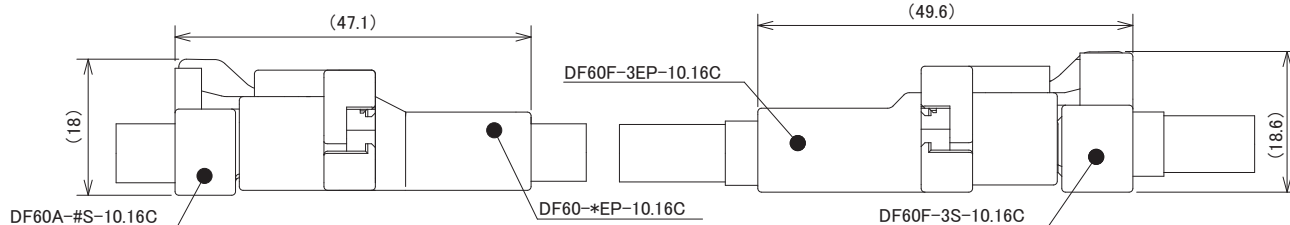
DF60F (Finger-Safe)



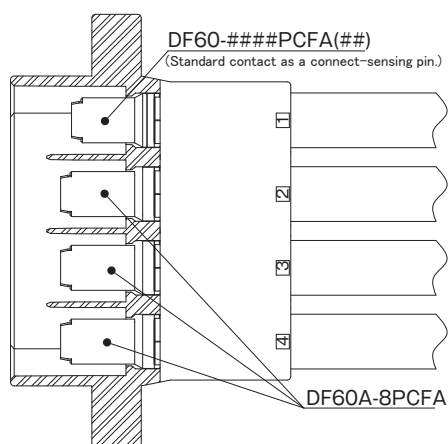
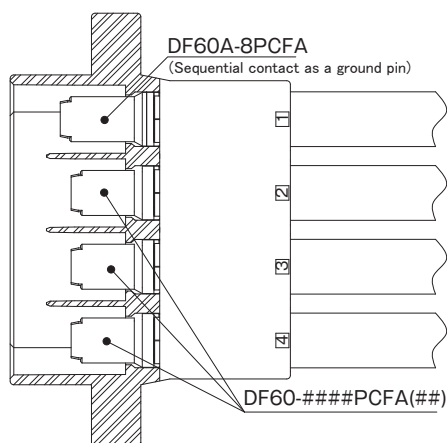
● Wire-to-Board Connection (Right Angle Pin Header)



● In-Line or Wire-to-Wire Connection

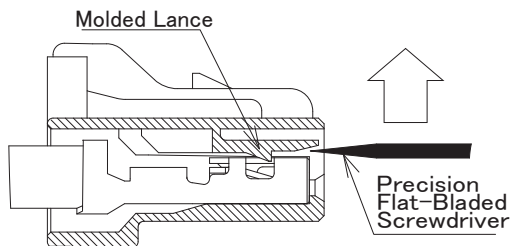


▪ Usage Example of Sequential Contact

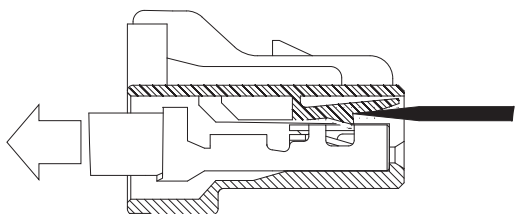


Contact Extraction

- Contact Extraction Tool : Flat-Bladed Screwdriver, 1.4mm blade width.
- Intended Crimp Contacts : DF60-8SC(F)A, DF60-1012SC(F)A, DF60-8PC(F)A, DF60-1012PC(F)A



1. After unmating the parts, position the flat-bladed screwdriver to raise the lance as shown in the illustration.



2. The lance needs to be raised sufficiently to allow the terminated wire to slip past it. The lance needs to be held up while at the same time pulling on the wire.

*Due to any previous repairs, the strength of the lance could have been deteriorated.
Hirose recommends to use new crimp housing to assure proper performance.

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

Rated Values

Please avoid using the connectors above the ratings. Also, do not hot swap (Note 1).

Note 1 : Hot swap refers to insertion while electricity is running.

Precautions

1. Recommended Soldering Conditions

- Soldering profile when using an automatic soldering device
Soldering temperature : 260°C, Soldering time : within 10 seconds
- Hand Soldering Conditions
Temperature of soldering iron : 350±10°C , Soldering time : within 3 seconds

2. Cleaning Conditions

Please refer to the "Wire-to-Board Connector Guide".

Cleaning with IPA is allowed. (Other cleaning agents are not recommended due to may have caused changing the push pull feeling. Please contact us when you use other cleaning agents.)

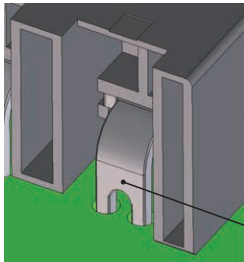
3. Important Notes

1. Caution is required for mating and un-mating the connector without it being mounting on a PCB.
It can damage or deform the contacts.
2. During hand soldering, do not apply flux which can cause creeping-up flux to the connector.
3. This product may have a slight difference in color depending on the production lot.
This difference does not have any influence on the performance.
4. Black spots may appear on the mold resin but this does not affect the product quality.
5. The connector could be damaged if it is pulled out forcibly. When it is hard to pull out, push it in slightly first and then depress the lock and unmate.
Please refer to "DF60 Series mating and unmating Procedure Document (ETAD-H0654-00)" for points in handling regarding mating operations.
6. When thick and short wire are used, the connector could be deformed due to the force of the wire's position.
Route cables in such a way that they do not twist when being installed.
7. Make sure to turn off the power when mating or unmating the connector.
8. Please do not touch any area around the contact part during energizing. It could be very dangerous.
9. Please refer to "Harness procedure manual (ETAD-H0653-00)" for points in harness operations.

4. Precautions for use

Please refer to the "Board-to-Wire Connector Guidelines (ETAD-H1023-00)".

5. Precautions for use of right angle pin header

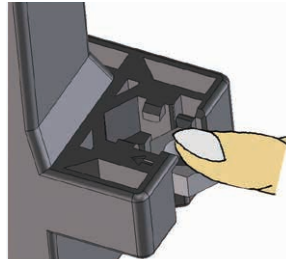
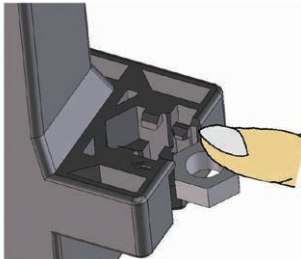


Since the lead mounting part has some exposed parts, please insure sufficient clearance when mounting other parts near this connector.

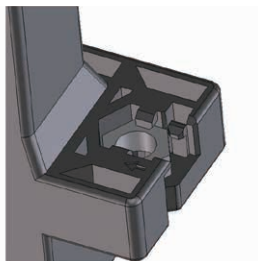
Lead Part

6. Panel fixing operation of In-Line connector

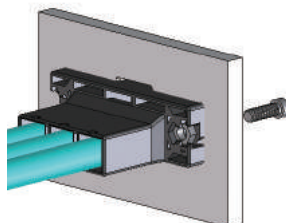
- (1) Insert a M3 nut from the lateral direction. (2) Push the nut in the direction of the arrow.



- (3) Nut insertion is then complete.



- (4) Panel mounting is completed by installing a connector on the panel cutout hole and tightening with a M3 screw.

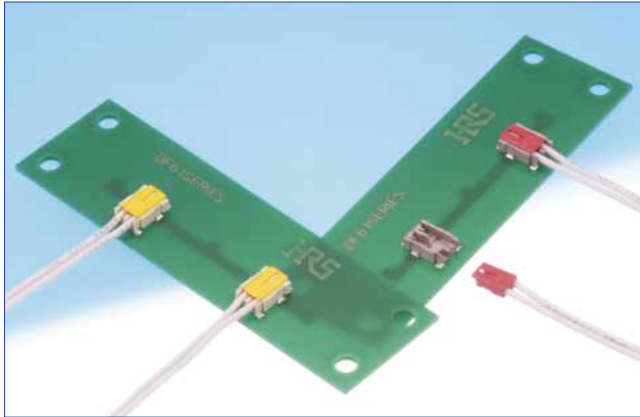


7. Operating Environment

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

Wire-to-Board Swing-Lock Connector for Low-Profile Power Source

DF61 Series



■ Features

1.Reinforced Swing Lock Structure

Our unique swing-lock structure cradles the wire side plug and resists the plug from becoming disengaged due to handling strain or loads.

2.Header Lock Improves Plug Retention

During mating, the header lock engages with the plug assembly. The lock is reinforced with metal which adds strength to the lock and increases the retention between the header and the plug.

3.Compact Size- High Voltage

The compact 2.2mm pitch connector has a voltage rating of 350V due to the long creep distance.

4.Solder Wicking Prevention

Header is molded in one piece. This ensures a tight fit between the contact and the header and prevents solder wicking.

5.High Current of MAX 5 Amps (22AWG)

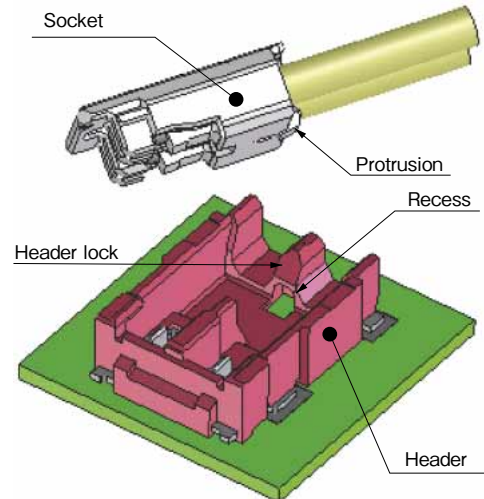
A highly conductive material is used for the contacts. The material provides for a high current flow by reducing the contact resistance.

■ Applications

Digital cameras, digital video cameras, LED lights, laptop computers, tablet computers, portable devices, power supply equipment, etc.

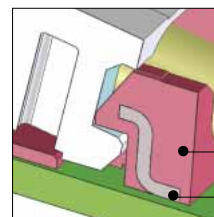
(UL/C-UL Standard Certified Product)

Swing-Lock Structure Illustration



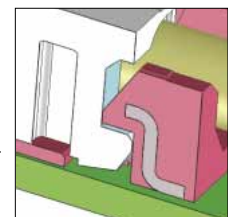
The protrusion on the bottom side of the socket fits into a corresponding recess on the header. This aligns the socket into the correct mating position.

Before Mating



Reinforced with Metal

After Mating

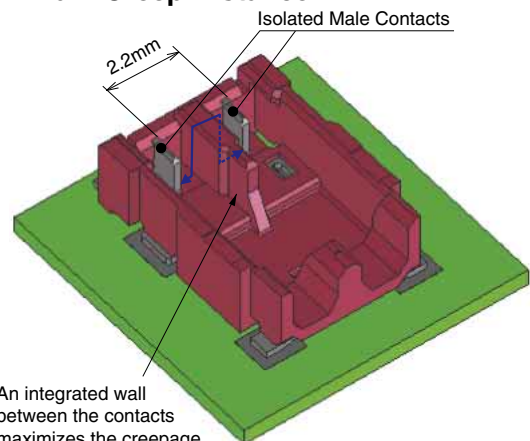


The Header pushes down the protrusion of the socket and locks it in place.

The metal fitting is partly molded in the header's housing lock.

Tensile strength of the cable: 10N or greater

Maximum Creep Distance



An integrated wall between the contacts maximizes the creepage distance for higher voltage capabilities.

■Product Specifications

Ratings	Current rating	3A/pin (with 28AWG) 3.2A/pin (with 26AWG) 4A/pin (with 24AWG) 5A/pin (with 22AWG)	Operating Temperature Range Operating Humidity Range	-55–105℃ (Note 1) 20–80%
	Voltage rating	AC/DC 350V	Storage Temperature Range Storage Humidity Range	-10–60℃ (Note 2) 40–70% (Note 2)

Items	Specifications	Conditions
1. Insulation resistance	1000MΩ or greater	Measured at DC 500V
2. Withstanding voltage	No flashover or breakdown	AC 1700V applied for 1 minute
3. Contact resistance	10mΩ or less	Measured at 20mV or less, 1mA
4. Vibration resistance	No electric outage of 1μs or more	Frequency 10–55Hz, half amplitude 0.75mm, 10 cycles for each of 3 directions
5. Shock resistance	No electric outage of 1μs or more	Acceleration 490 m/s ² , 11ms ; half sin wave : 3 each for 3 directions
6. Humidity resistance	Contact resistance 20mΩ or less, insulation resistance 500MΩ or greater	Temperature 40 ± 2℃, humidity 90–95%, left for 96 hours
7. Temperature cycle	Contact resistance 20mΩ or less insulation resistance 500MΩ or greater	5 cycles (-55℃ : 30 minutes → 5–35℃ : 2–3 minutes → 85℃ : 30 minutes → 5–35℃ : 2–3 minutes)
8. Insertion/extraction life	Contact resistance 20mΩ or less	Insertion/extraction : 30 times
9. Solder heat resistance	No melting of resin part affecting performance	Reflow : Per recommended temperature profile Hand solder : Manual soldering iron 350±10℃ for 3 seconds

Note 1 : Includes temperature elevation by conduction.

Note 2 : Apply to unused product on packaged condition.

Note 3 : The above specifications are representative for this series. Please refer to “delivery specifications” for official individual agreement.

■Materials / Finish

Product	Part	Material	Finish	Specification	RoHS2
Header	Insulator	LCP resin	Red	UL94V-0	YES
			Yellow		
			Beige		
	Contact	Brass	Tin plated	—	
Crimp Socket	Insulator	PBT	Red	UL94V-0	
			Yellow		
			White		
Crimp contact	Contact	Copper Alloy	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.

●Header

DF 61 - * P - 2.2 V

① ② ③ ④ ⑤ ⑥

① Series Name : DF	⑤ Pitch : 2.2mm
② Series No. : 61	⑥ Termination form V : SMT straight type
③ Number of contacts : 2	
④ Type of connector P : Header	

●Crimp Housing

DF 61 - * S - 2.2 C

① ② ③ ④ ⑤ ⑥

① Series Name : DF	⑤ Pitch : 2.2mm
② Series No. : 61	⑥ Termination form C : Crimp case
③ Number of contacts : 2	
④ Type of connector S : Socket	

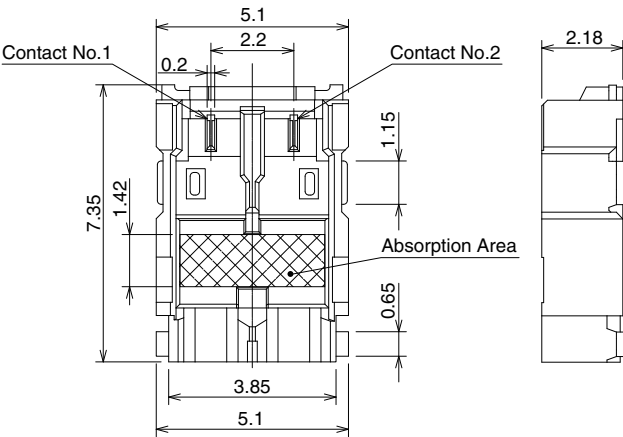
●Contact

DF 61 - 2226 SCF

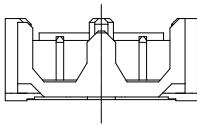
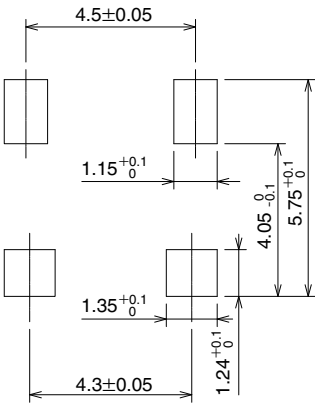
① ②

① Applicable Wire Size 2628 : 26 to 28AWG 2226 : 22 to 26AWG	② Form Type/Package Type SCF : Socket crimp contact/reel

■Straight Header (SMT)



■Recommended PCB Dimensions(t=1mm)



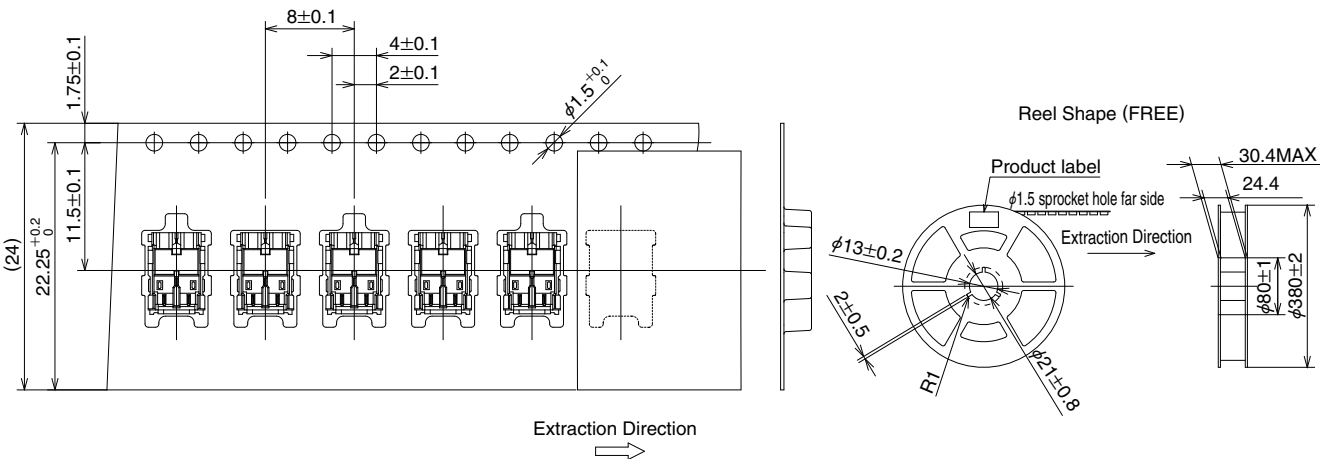
[Specification No.]

- (21) : Tin plated, emboss package, mold color : red
- (22) : Tin plated, emboss package, mold color : yellow
- (23) : Tin plated, emboss package, mold color : beige

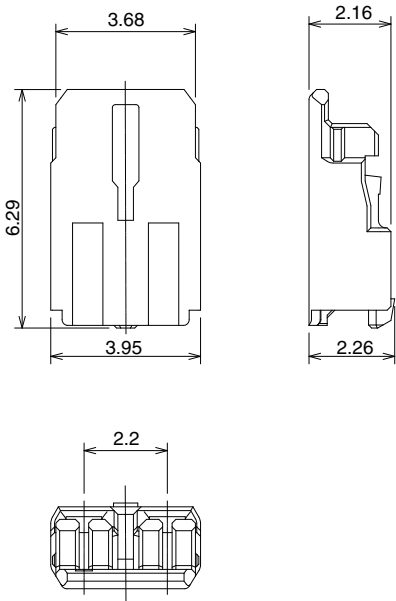
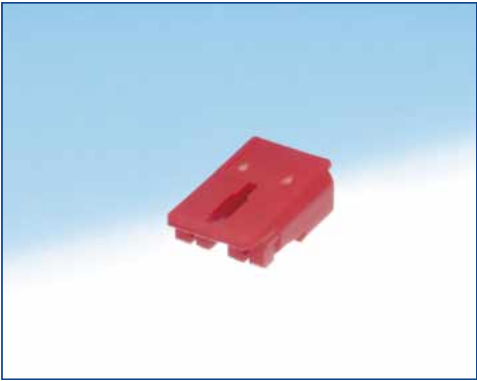
Part No.	HRS No.	No. of contacts	Color
DF61-2P-2.2V(21)	666-5001-1 21	2	Red
DF61-2P-2.2V(22)	666-5001-1 22	2	Yellow
DF61-2P-2.2V(23)	666-5001-1 23	2	Beige

Note : For embossed package products, please order in full reel quantities. (1reel = 3,000pcs.)

●Reel Dimensions



■Socket

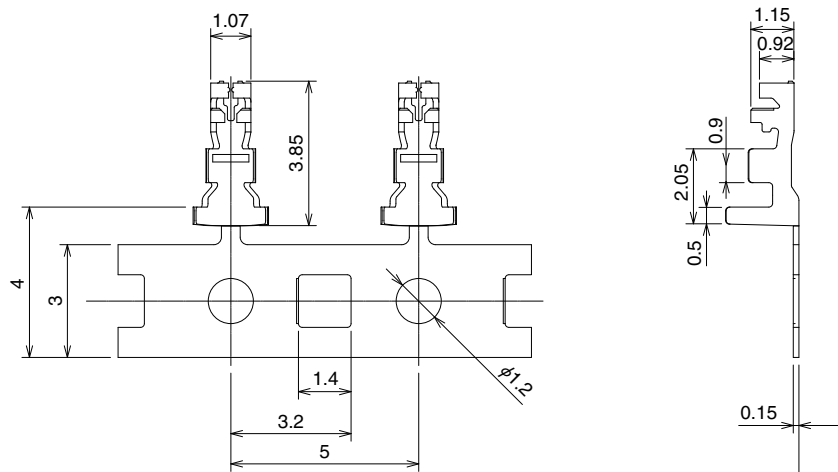


[Specification No.]
(11) : 1,000pcs/pack, mold color : red
(12) : 1,000pcs/pack, mold color : yellow
(13) : 1,000pcs/pack, mold color : white

Unit : mm			
Part No.	HRS No.	No. of contacts	Color
DF61-2S-2.2C(11)	666-5002-4 11	2	Red
DF61-2S-2.2C(12)	666-5002-4 12	2	Yellow
DF61-2S-2.2C(13)	666-5002-4 13	2	White

Note : Please order by full packs. (1,000pcs/pack)

■Crimp contact



Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealing Copper Wire) (Note 2)				
			UL Style	AWG	Wire Construction	Sectional Area	Jacket Diameter (Note 3)
DF61-2226SCF(41)	666-5004-0 41	Tin plated	10368	22 AWG	17cores/0.16mm	0.342mm ²	0.98~1.3mm (1.26mm)
				24 AWG	11cores/0.16mm	0.221mm ²	0.98~1.3mm (1.11mm)
				26 AWG	7cores/0.16mm	0.141mm ²	0.98~1.3mm (0.98mm)
DF61-2628SCF	666-5005-2 00	Tin plated	10368	26 AWG	7cores/0.16mm	0.141mm ²	0.88~0.98mm (0.98mm)
				28 AWG	7cores/0.127mm	0.089mm ²	0.88~0.98mm (0.88mm)

Note 1 : Please order in full reel quantities. (1reel =18,000pcs)
Note 2 : Please consult with our Hirose sales representative in using wires other than these applicable wires.
Note 3 : The wire with jacket diameter in parenthesis is only suitable in crimping with hand tool.

◆Applicable Crimping Tools

Types	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF61-2628S	901-4632-6 00	DF61-2628SCF
	AP105-DF61-2226S	901-4621-0 00	DF61-2226SCF(41)
Press Unit	CM-105C	901-0001-0 00	—
Hand Tool	HT305/DF61-2628S	550-0305-5 00	DF61-2628SCF
	HT305/DF61-2226S	550-0304-2 00	DF61-2226SCF(41)
Extraction Tool	DF-C-PO(B)	550-0179-2 00	DF61-2628SCF, DF61-2226SCF(41)

Note 1 : Problems resulting from the use of non-authorized tools will not be warranted.
Note 2 : When non-authorized tools are used, please consult with Hirose sales representative about provision of the drawing of the crimping tool.

◆ Crimping Precautions

■ Items required prior to start crimping

The work-related documents shown below are required before starting the harness connections.

(The ● mark shows the document required.)

When the documents shown below are not available, ask our sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
(1) Main unit of crimping machine instruction manual	Explanation of main press machine unit	●	—	When purchasing main press machine unit, it is bundled.
(2) Operating Instructions for Applicator	Crimp operation	●	—	When purchasing Applicator, it is bundled.
(3) Applicator Spare Parts Identification	Explanation for Applicator installation	●	—	
(4) Crimp Conditions	Standard values of : Crimp height ; Tensile strength	●	—	
(5) Crimp Quality Standards	Various standards for crimping conditions	●	—	When purchasing Hand Tool, it is bundled.
(6) Operating Instructions for Hand Tool	Inspection items of : Crimp height ; Crimp operation Tensile strength	—	●	
(7) Cable Assembly Procedure	Cable Assembly Procedure	●	●	Ask our sales personal to provide them.

■ Tools

When crimping work is applied to our contacts, the tool designated by Hirose should be used.

*Crimping work by using tools other than as designated must not be done because it may result in contact failure, disconnection of cable, etc.

*The operating instructions manual is available for the crimping machine and the applicator.

Be sure to carefully read the operating instructions manual before implementing the work.

■ Applicable electric wires

Check that the electric wire to be used is in the range of application.

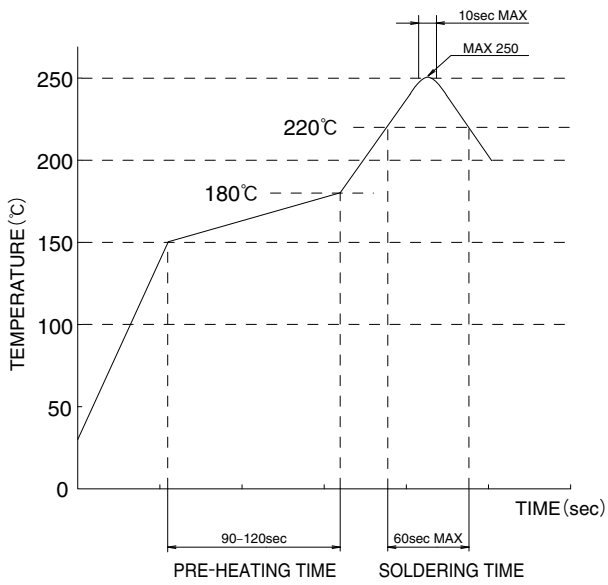
If you intend to use an electric wire other than the recommended one, ask our sales personnel.

[Precautions]

- Electric wires that are applicable for crimping connectors shall, principally, be the tin-plated stranded soft-copper wire.
- Crimping of electric wires wherein single wires, polyester yarns, etc., exist and crimping of tin-coated wires should be avoided.
- Avoid crimping two electric wires together.
- The setting values of crimp height (Note 1) may vary between tin-plated and gold-plated terminals even if the same electric wires are used.
- The setting values of crimp height (Note 1) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

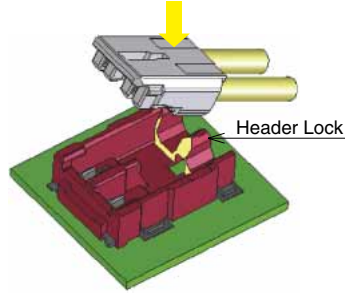
Note 1 : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

◆ Operating Precautions

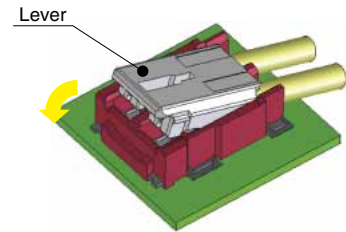
1. Recommended Temperature Profile (Lead-free soldering possible)	 [Applicable Conditions] 1. Peak Temperature: MAX 250°C 2. Heated Area: 220°C or above, within 60 sec. 3. Pre-heating Area: 150-180°C, 90-120 sec. 4. Number of Operation: Twice or less * The contact lead area was measured. The conditions may change depending on the types and manufacturers of cream solder, PCB size, and conditions of other materials used for soldering. Please fully check the soldering condition before use. [Remarks 1] This temperature profile is our recommended value.
2. Recommended Hand Solder Conditions	Soldering iron temperature : $350 \pm 10^{\circ}\text{C}$, soldering time : within 3 seconds
3. Recommended Screen Thickness, Aperture Opening Rate (Pattern Area Ratio)	Thickness 0.1mm, aperture opening rate : 100%
4. PCB Warpage	Max 0.02mm at the center of connector with the both edges of the connector as the baseline
5. Cleaning Condition	Cleaning with IPA is possible. (Cleaning is not recommended as it may change the feel of insertion/extraction, etc. Please consult with us when using other types of cleaning agents.)
6. Precautions	■ In order to maintain the performance reliability, do not insert the crimp contact into the crimp socket at a slant angle. ■ Insertion/extraction of the connector while not mounted to the PCB may cause breakage or deformation to the contact. ■ Extracting the connector by holding the cable could result in a breakage. ■ Do not apply flux at the time of hand soldering, as it may result in flux rise. ■ This product may have slightly different hue on molded items, however, they do not affect the product performance. Black spots may appear on the mold resin but this does not affect the product quality.
7. Handling Notes	Please refer to the following documents. ■ Crimp Quality Standard (ETAD-H0520-00) ■ Cable Assembly Procedure (ETAD-H0721-00) ■ User Guide for Wire-to-Board Connector

8. Mating/Un-mating Mating Operation

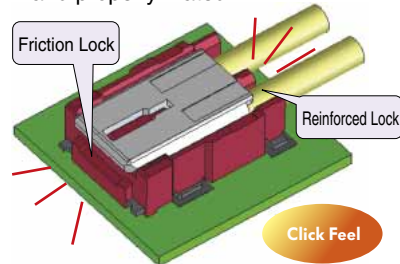
- (1) Start by placing the connector against the header lock at an angle. If the plug is not started at an angle, it will cause damage to the connector.



- (2) Then, in a slight, rotating movement, push the front section of the plug down.

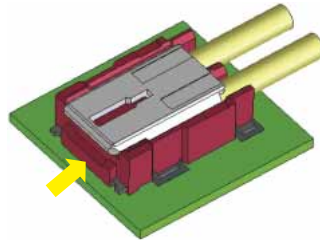


- (3) Keep pressing down until a "click" feeling is sensed. The connector is now fully and properly mated.

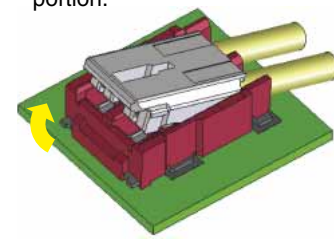


Un-mating Operation

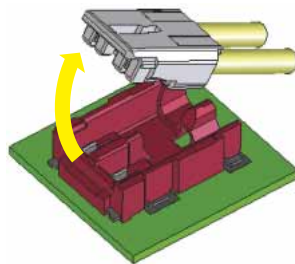
- (1) Begin by lifting up on the front section of the plug.

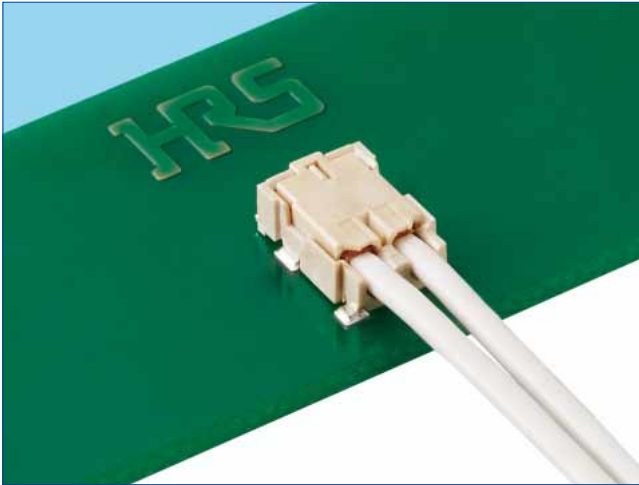


- (2) Continue to rotate it upwards and release the friction lock portion.



- (3) Once the rear, or reinforced lock, is released the plug will come free from the header and complete the un-mating sequence.





■ Features

1. Proprietary ViSe Lock design

The lock on the cable side has been strengthened with our proprietary ViSe Lock mechanism*, preventing cables from being easily disconnected due to tough routing or an excessive load. (*ViSe lock : Vertical-insertion Swing-extraction) (Fig.1)
※ Patent pending

2. Improved operation through vertical mating

Eliminates wasted board space : Vertical insertion eliminates the board space required for horizontal mating and enhances assembly (Enhanced PCB design freedom) (Fig.2)

3. Small-sized and low profile, with high withstanding voltage and current (H=2mm, 24AWG : 4A Max)

In spite of the small size on a 2.2mm contact pitch, high voltage of 350V is achieved by ensuring creepage distance. Using high conductivity material for the socket contact and lowering contact resistance through optimized contact force, high-current capability is realized.

4. High heat-resistance

Operating temperature limit of 105°C.

5. Halogen-free

Use of chlorine or bromine are within standards values.

*As defined by IEC61249-2-21
Br 900ppm max, Cl 900ppm max,
Br+Cl 1,500ppm max

Diagram to explain the ViSe Locking Design

Insertion operation is similar to vertical mating. However, the contact is actually inserted at an angle, and ensures high retention force in upper direction. (Cable tensile strength : A minimum of 10N)

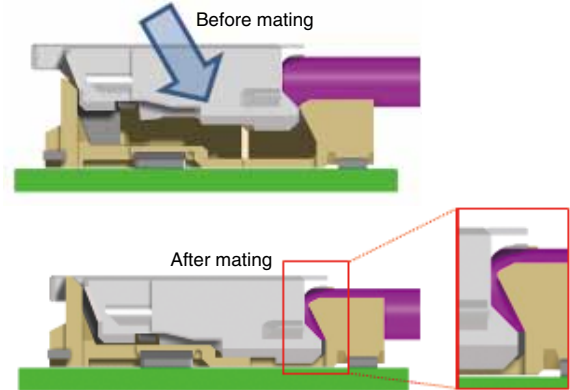


Fig.1

Improved operation through vertical mating and reduced wasted space

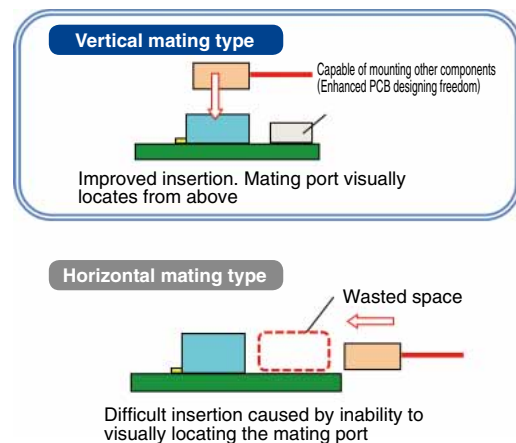
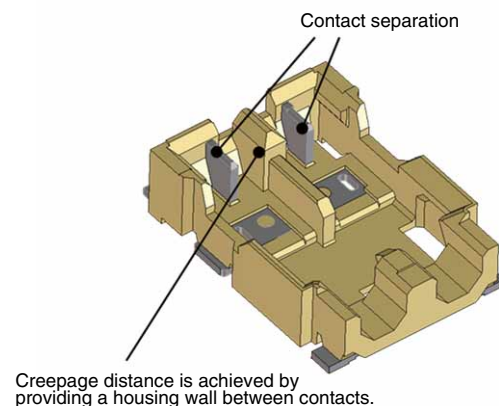


Fig.2

Long creepage distance



Creepage distance is achieved by providing a housing wall between contacts.

Fig.3

Product Specifications

Ratings	Current Rating	3.0A (28 AWG) 3.2A (26 AWG) 4.0A (24 AWG)	Operating Temperature Range Operating Humidity Range	-40 to +105°C (Note 1) 20 to 80%
	Voltage Rating	AC/DC 350V	Storage Temperature Range Storage Humidity Range	-10 to +60°C (Note 2) 40 to 70% (Note 2)

Item	Specifications	Conditions
1. Insulation resistance	1000MΩ min.	Measured at DC 500V
2. Withstand voltage	No flashover or breakdown	AC 1,200V is applied for 1 minute.
3. Contact resistance	10mΩ max.	Measured at 1mA and no higher than 20mV
4. Vibration Resistance	No electrical discontinuity for 1μs or longer	10 cycles in each of three directions at frequency 10-55 Hz, half amplitude 0.75mm
5. Shock Resistance	No electrical discontinuity for 1μs or longer	Accelerated velocity : 490m/s ² , for 11ms, half-sine in 3 directions, 3 times for each of the three directions
6. Moisture-resistance	Contact resistance : 20mΩ max. Insulation resistance : 500MΩ min.	Temperature : 40±2°C ; humidity : 90 to 95%, left as it is for 96 hours
7. Temperature cycles	Contact resistance : 20mΩ max. Insulation resistance : 500MΩ min.	-55°C : 30 minutes → 5 - 35°C : 2 - 3 minutes → 105°C : 30 minutes → 5 - 35°C : 2 - 3 minutes) 5 cycles
8. Durability	Contact resistance : 20mΩ max.	30 mating cycles
9. Resistance to solder heat	The resin components will not become deformed or lose performance due to deformities	Reflow : according to the recommended temperature profile Hand soldering : temperature of soldering iron at 350°C±10°C for 3 seconds

Note 1 : Includes the temperature rise caused by current flow.

Note 2 : The storage condition refers to long-term storage of the product on the shelf before assembly. Please use the operating temperature for temporary storage such as pre-assembly and during shipping.

Materials / Finish

Product	Part	Materials	Finish	UL specification
Header	Insulator	LCP	Natural	UL94V-0
	Contact	Brass	Tin Plated	—
Crimp socket	Insulator	LCP	Natural	UL94V-0
Crimp contact	Contact	Copper Alloy	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.

Header connector

DF 61Y - * P - 2.2 V

① ② ③ ④ ⑤ ⑥

① Series Name : DF	⑤ Pitch : 2.2mm
② Series No. : 61Y	⑥ Mounting style
③ Number of contacts : 2	V : SMT Vertical Type
④ Connector type P : Header	

Socket connector

DF 61Y - * S - 2.2 C

① ② ③ ④ ⑤ ⑥

① Series Name : DF	⑤ Pitch : 2.2mm
② Series No. : 61Y	⑥ Termination form
③ Number of contacts : 2	C : crimp socket
④ Connector type S : socket	

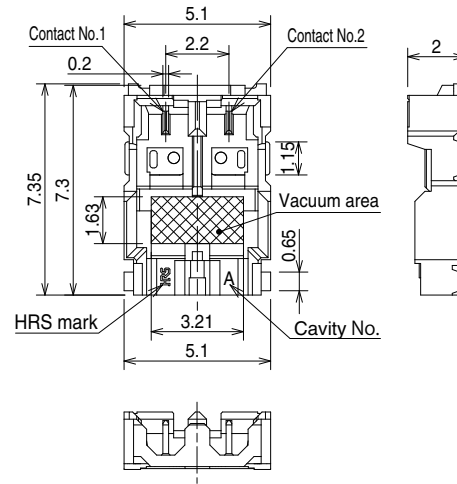
Crimp contact

DF 65 - 2428 SCF

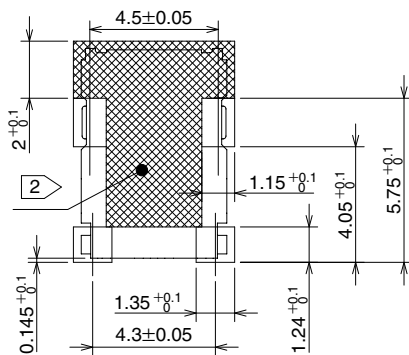
① ②

① Applicable wire size 2428 : 24 to 28 AWG	② Packaging style SCF : Socket contact•Reel

■ Straight pin header (SMT)



● Recommended PCB layout (t=1mm)

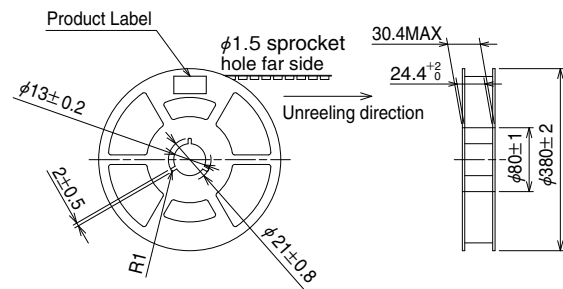
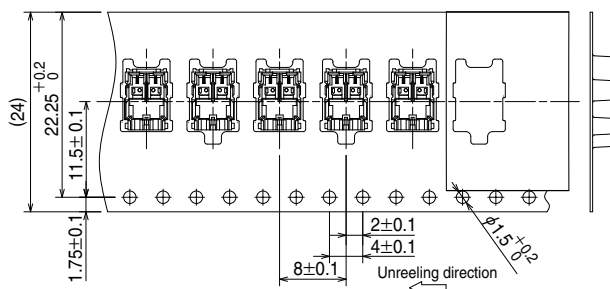


Part No.	HRS No.	No. of Contacts	Color	[Specification Number]**
DF61Y-2P-2.2V (23)	666-5100-3 23	2	Natural	(23) : Tin plated, embossed packaging

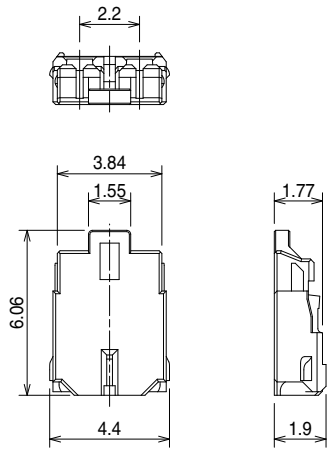
Note 1 : This product is sold per reel with 3,000 connectors pcs/reel. Please order by reel quantities.

② If the area  contains a pattern and used at the rated voltage of 350V, the creepage distance could be insufficient.

● Tape and Reel Dimensions



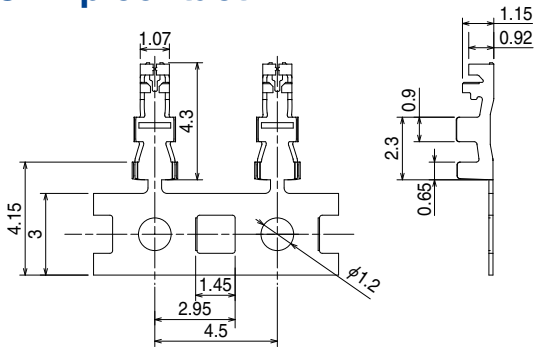
■Crimp socket



Part No.	HRS No.	No. of Contacts	Color	[Specification Number]**
DF61Y-2S-2.2C (13)	666-5101-6 13	2	Natural	(13) : 1,000 pcs/pack

Note : Each package contains 1,000 pcs/pack. Please order in full package quantities.

■Crimp contact



Part No.	HRS No.	Packaging	Quantity	Finish
DF65-2428SCF	666-6003-2 00	Reel (Note 1)	18,000	Tin plated

Note 1 : This product is delivered in 18,000 pieces per reels. Please place orders in multiples of 18,000 pieces.

●Applicable wire (Tin plated annealed copper wire)

Wire size (Stranded wire conductor)	Jacket outer diameter	Recommended cable	Strip length
24AWG (11/φ0.16mm)	φ1.11mm	UL10368	1.4 to 1.8mm
26AWG (7/φ0.16mm)	φ0.98mm		
28AWG (7/φ0.127mm)	φ0.88mm		

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

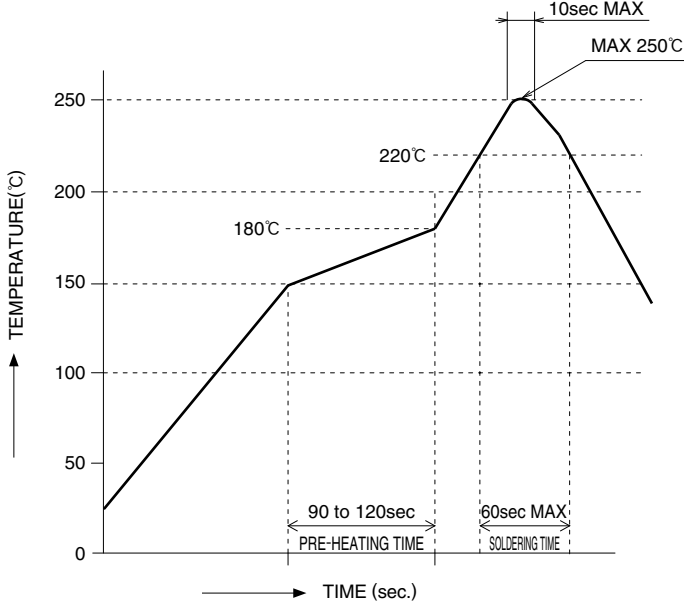
Note 2 : The strip length is a reference value. Please make adjustments so finished crimps will meet the specified values.
Refer to the crimping quality standards (ATAD-H0733-00) for details.

■Tools

Type	Part No.	HRS No.	Applicable contact
Applicator	AP105-DF65-2428S	901-4630-0 00	DF65-2428SCF
Press	CM-105C	901-0001-0 00	
Hand crimping tool	HT305/DF65-2428S	550-0306-8 00	
Contact extraction tool	DF-C-PO(B)	550-0179-2 00	

Note : If any trouble has occurred due to tools other than the designated tool, Hirose bears no responsibility for any trouble.

◆ Operating Precautions

1. Recommended Temperature Profile (Lead-free soldering possible)	 [Applicable Conditions] 1. Peak Temperature : MAX 250°C 2. Heated Area : 220°C or above, within 60 sec. 3. Pre-heating Area : 150 to 180°C, 90 to 120 sec. 4. Number of Operation : Twice or less * The contact lead area was measured. The conditions may change depending on the types and manufacturers of cream solder, PCB size, and conditions of other materials used for soldering. Please fully check the soldering condition before use. [Remarks 1] This temperature profile is our recommended value.
2. Recommended Hand Solder Conditions	Soldering iron temperature : $350 \pm 10^{\circ}\text{C}$, soldering time : within 3 seconds
3. Recommended Screen Thickness, Aperture Opening Rate (Pattern Area Ratio)	Thickness 0.1mm, aperture opening rate : 100%
4. PCB Warpage	0.02mm Max at the center of connector with the both edges of the connector as the baseline
5. Cleaning Condition	Cleaning with IPA is possible. (Cleaning is not recommended as it may change the feel of insertion/extraction, etc. Please consult with us when using other types of cleaning agents.)
6. Precautions	■ Insertion/extraction of the connector while not mounted to the PCB may cause breakage or deformation to the contact. ■ Do not apply flux at the time of hand soldering, as it may result in flux rise. ■ This product may have slightly different hue on molded items, however, they do not affect the product performance. Black spots may appear on the mold resin but this does not affect the product quality. ■ See the separate "DF61Y Insertion/Extraction Procedure Manual" for handling precautions at the time of insertion and extraction.

◆ Usage Recommendations

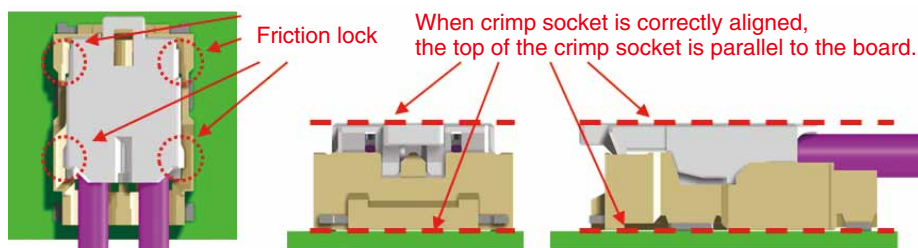
7. Insertion and removal operation

Insertion operation

Insertion operation shall be carried out in steps (1) placing the crimp socket, (2) insertion, and (3) check the mated state.

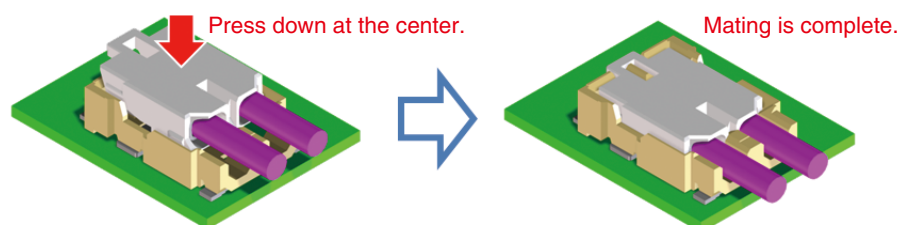
(1) Placing the crimp socket

Place the crimp socket so that the friction locks in 4 places in front and behind the crimp socket come into contact with the header.



(2) Insertion

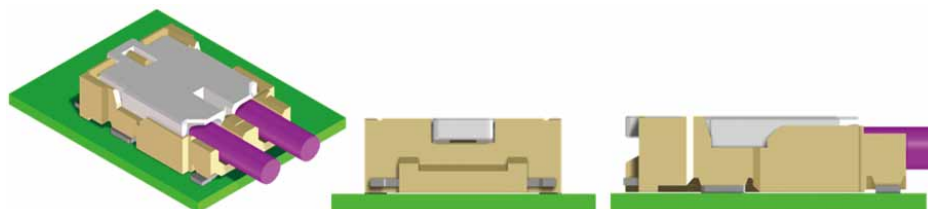
Press down on the center of the crimp socket, and mating is complete.



(3) Checking the mated state

Check if the crimp socket is securely mated.

If one end floats or is mated at an angle, unmate, and mate it again.



When the crimp socket is inserted, it is possible that only the friction lock on the cable side is inserted, as shown in the Figure below.

In this case, push the non-cable side of the crimp socket to correctly mate.



If the connector is inserted when the crimp socket isn't placed correctly, it is possible that only the friction lock on the non-cable side is inserted, as shown in the Figure below.

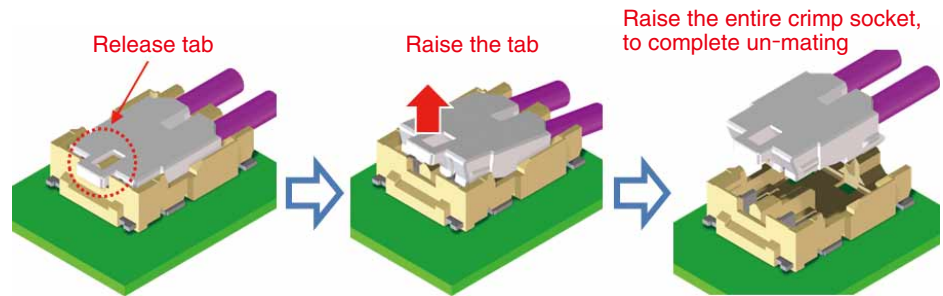
In this case, unmate, and mate again.

Forcible mating will lower the retention force.



7. Insertion and removal operation

If the connector is inserted when the crimp socket isn't placed correctly, it is possible that only the friction lock on the non-cable side is inserted, as shown in the Figure below. In this case, unmate , and mate again. Forcible mating will lower the retention force.



Use the tab to help release .

If the connector is forcibly removed by pulling the cable, cable disconnection and connector breakage will occur.



DF62 Series

Slim In-Line/THT Connectors



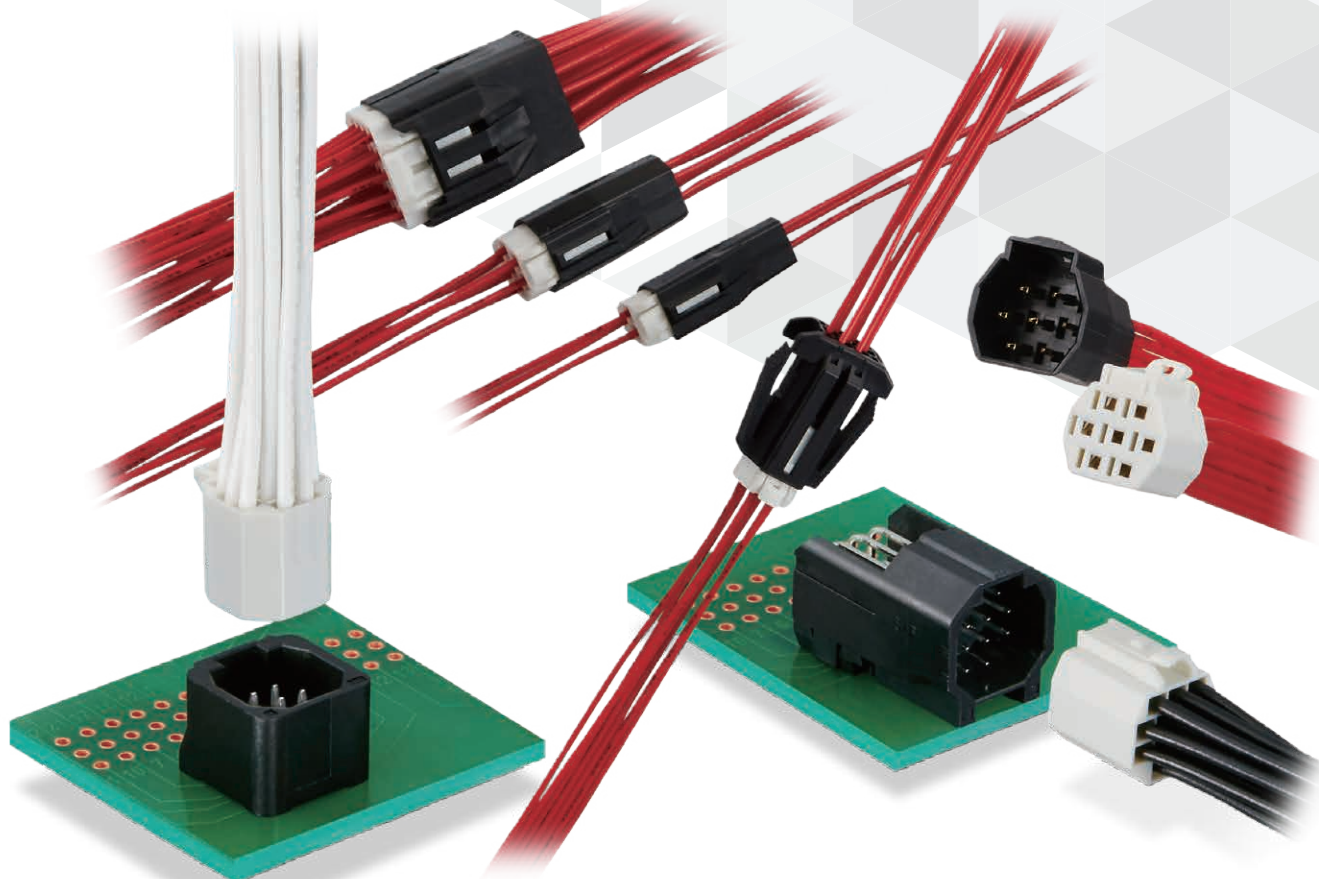
Positive-Lock



Wide Variation



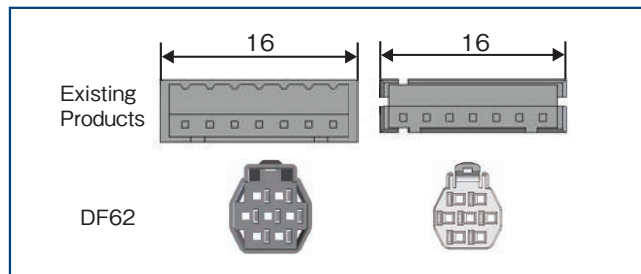
Slim In-Line



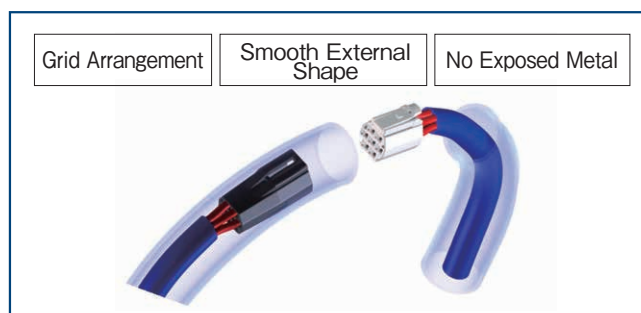
Features

1. The slim, sleek design and smooth contour combine to complete connections in tight spaces.

These connectors were designed to take full advantage of small/ narrow spaces. The contacts are arranged in a grid pattern which shortens the diagonal distances and the body was slimmed down by creating smooth outer surfaces. This design helps to save precious space and makes these connectors virtually tangle free. There is no visible or exposed metal which eliminates the possibility of electrical arcing between the connector and the inside of a metal conduit.

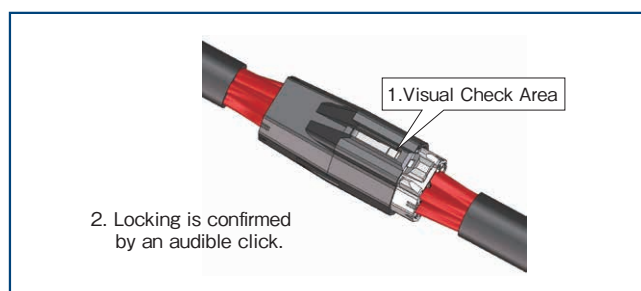


Compact shape due to 2 × 2. 2 grid layout of pins
(Both are 7 contacts with 3A current rating)



2. Secure Lock Mechanism

The friction lock emits a clear tactile click upon lock completion. The design prevents incomplete mating and connector disconnection. The socket lock can be visually checked through the plug window after mating. These indicators function together to prevent incomplete mating.

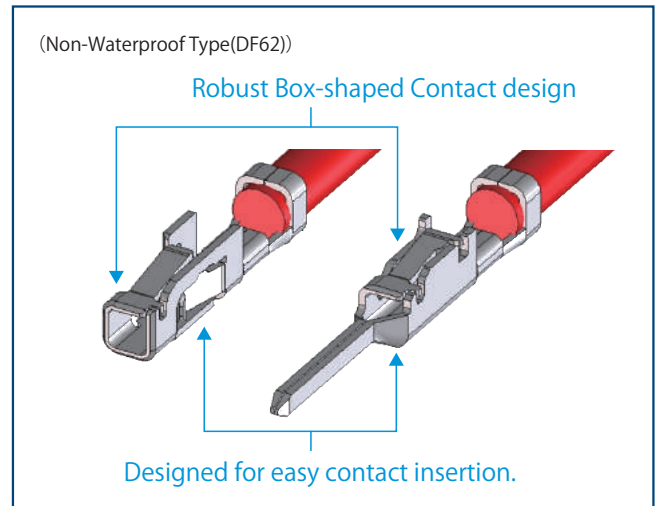


3. Reliable Contact Design

Two-point contact design that maintains contact reliability.

4. Robust Contact Design

The unique design provides protection to the contacts and lance areas and it prevents any bending or deformity that might occur during mating, assembly or transportation.



5. Multiple Variations Available

There are several different wire counts available, giving the designer a wide variety to choose from for the application.

Protected lock type, panel mount type and pin header type are also available.

6. Applicator Sharing

The applicators for the DF11 and DF59 Series (existing products) can be adapted to accommodate the DF62 Series applicators.

Note 1 : The DF11 Series applicators require part replacement in order to handle the difference in contact length.

However once replaced the applicator can be used with DF11, DF59 and DF62.

Note 2 : The die and hand tool are used only for the in designated purposes.

Note 3 : Please contact Hirose for additional details.

Product Specifications

Rated Current (Note 1)	No of Pos.	22 AWG	24 AWG	26-30 AWG	Operating Temperature (Note 2)	-35 to +105°C
	2	4A/pin	2A/pin	1A/pin	Storage Temperature Range (Note 4)	-10 to +60°C
	3	3A/pin	2A/pin	1A/pin	Operating Humidity Range (Note 3)	20 to 80%
	4	3A/pin	2A/pin	1A/pin	Storage Humidity Range (Note 4)	40 to 70%
	5	3A/pin	2A/pin	1A/pin		
	6	3A/pin	2A/pin	1A/pin		
	7	3A/pin	2A/pin	1A/pin		
	13	3A/pin	2A/pin	1A/pin		
	24	2.5A/pin	2A/pin	1A/pin		
Rated Voltage	250V AC/DC					

UL, C-UL	Rated Voltage	29.9V AC/DC	Operating Temperature (Note 2)	-35 to +75°C

UL, C-UL File Name
 UL : E52653
 C-UL : E52653

Items	Specifications	Conditions
Insulation Resistance	1000M Ω Min.	500V DC
Withstanding Voltage	No flashover or insulation breakdown	650V AC for 1 min.
Contact Resistance	30m Ω Max.	20mV Max., 1mA (DC or 1000Hz)
Vibration Resistance	No electrical discontinuity of 1 μ s.	10 cycles in each of three directions at frequency 10 to 55Hz, half amplitude 0.75mm
Shock Resistance	No electrical discontinuity of 1 μ s.	Accelerated velocity : 490 m/s ² for 11ms, half-sine wave in 3 directions, 3 times for each direction
Humidity Resistance	Contact Resistance : 30m Ω Max. Insulation Resistance : 1000M Ω Min.	96 hours at temperature of +40 $\pm$ 2°C and humidity of 90 to 95%
Temperature Cycles	Contact Resistance : 30m Ω Max. Insulation Resistance : 1000M Ω Min.	-55°C : 30 minutes $\rightarrow$ 5 to 35°C : 2 to 3 minutes $\rightarrow$ 85°C : 30 minutes $\rightarrow$ 5 to 35°C : 2 to 3 minutes, 5 cycles
Mating Durability	Contact Resistance : 30m Ω Max.	30 times
Solder Heat Resistance	No deformation in appearance or significant damage to contacts.	Flow : 260°C , 10sec. Hand soldering : temperature of soldering iron at 300°C for 3sec.

Note 1 : This is the maximum current rating while all pins are powered or used as all power lines.
 When isolating power lines into multiple circuits, current ratings may go above the stated current ratings. Please consult Hirose for details before doing this.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The connector should be completely dry (no condensation present)

Note 4 : Applicable to unused items in packed condition.

Note 5 : 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

Item	Component	Material	Finish	UL Flame Retardant Grade	RoHS2
Socket Crimping Contact	Contact	Phosphorous Bronze	Gold Plating or Tin Plating	-	Yes
Plug Crimping Contact				-	
Crimping Socket	Insulator	PBT	White or Black	UL94V-0	
Crimping Plug				UL94V-0	
Header	Insulator	Straight : Polyamide	Black	UL94V-0	
		Right Angle : PBT		UL94V-0	
	Contact	Copper Alloy	Gold Plating or Tin Plating	-	
	Retention Tab	Brass	Tin Plating	-	

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.

Note : The waterproof type (DF62W Series) and non-waterproof type (DF62 Series) are not intermateable.

Connector

DF62B - # S - 2.2 C (##)

1 2 3 4 5 6

1 Series Name	DF62B (Regular Type) DF62C (Protected Lock Type) DF62P (Panel Mount Type)	4 Contact Pitch	2.2mm
2 No. of Pos.	2, 3, 4, 5, 6, 7, 13, 24	5 Connection Part	C : Crimping Housing
3 Connector Type	S : Socket EP : In-line Plug	6 Color	Socket (None : White, 11 : Black) In-line Plug (None : Black, 10 : White)

Contact

DF62 - EP 2428 PCF A

1 2 3 4 5

1 Series Name	DF62	4 Contact Type / Packaging Type	SCF : Socket crimping contact, reel SC : Socket crimping contact, pieces PCF : Plug crimping contact, reel PC : Plug crimping contact, pieces
2 Terminal Type	EP : In-line Plug		
3 Applicable Wire Size	22 : 22 AWG 2428 : 24 to 28 AWG 30 : 30 AWG	5 Plating Type	A : Gold plating None : Tin plating

Connector

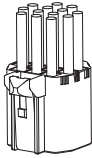
DF62 - # P - 2.2 DSA (##)

1 2 3 4 5 6

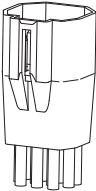
1 Series Name	DF62	4 Contact Pitch	2.2mm
2 No. of Pos.	13, 24	5 Connection Part Shape	DSA : Straight Pin Header DS : Right Angle Pin Header
3 Connector Type	P : Pin Header	6 Plating Type	None : Tin Plating 01 : Gold Plating

Diagram of Connector Mating Combinations

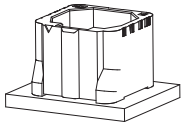
Crimping Socket (Note)	Socket Crimping Contact
DF62B-#S-2.2C	DF62-22SC(F)(A)
	DF62-2428SC(F)(A)
DF62C-#S-2.2C	DF62-30SC(F)(A)



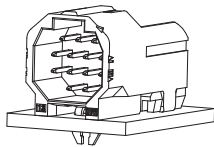
Crimping Plug (Note)	Plug Crimping Contact
DF62B-#EP-2.2C	DF62-EP22PC(F)(A)
	DF62-EP2428PC(F)(A)
DF62P-#EP-2.2C	DF62-EP30PC(F)(A)



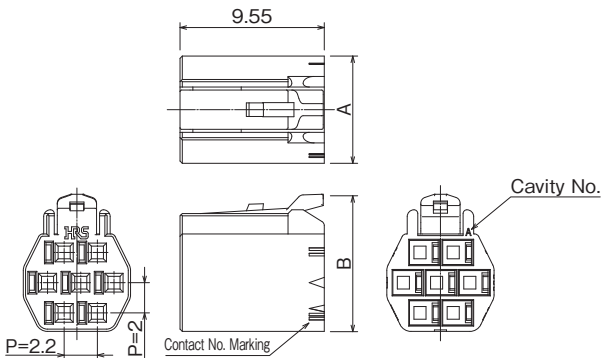
Straight Pin Header
DF62-#P-2.2DSA



Right Angle Pin Header
DF62-#P-2.2DS



Socket (Standard Type)



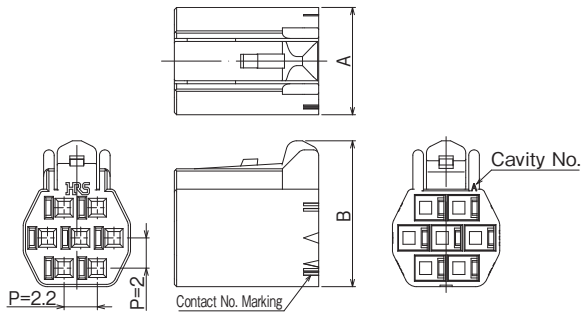
7pos. shown as an example.

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit	
DF62B-2S-2.2C(##)	CL0544-0551-0-##	2	4.9	5.08	100pcs per bag	
DF62B-3S-2.2C(##)	CL0544-0552-2-##	3		7.1		7.08
DF62B-4S-2.2C(##)	CL0544-0553-5-##	4				
DF62B-5S-2.2C(##)	CL0544-0554-8-##	5	9.08			
DF62B-6S-2.2C(##)	CL0544-0555-0-##	6				
DF62B-7S-2.2C(##)	CL0544-0556-3-##	7	9.3	11.08		
DF62B-13S-2.2C(##)	CL0544-0557-6-##	13	12.3	13.08		
DF62B-24S-2.2C(##)	CL0544-0539-4-##	24				

[Specification No.] -##.(##)
None : White

Socket (Protected Lock Type)



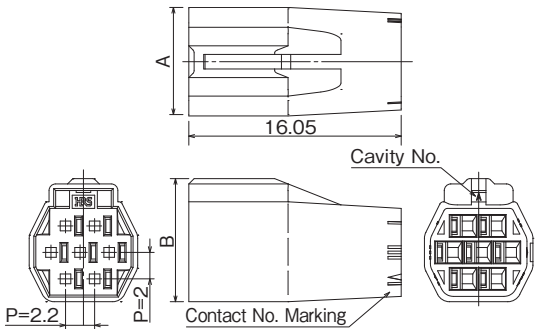
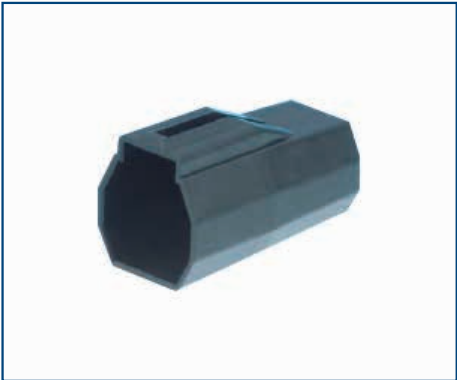
7pos. shown as an example.

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit	
DF62C-2S-2.2C(##)	CL0544-0565-4-##	2	4.9	5.65	100pcs per bag	
DF62C-3S-2.2C(##)	CL0544-0566-7-##	3		7.1		7.65
DF62C-4S-2.2C(##)	CL0544-0567-0-##	4				
DF62C-5S-2.2C(##)	CL0544-0568-2-##	5	9.65			
DF62C-6S-2.2C(##)	CL0544-0569-5-##	6				
DF62C-7S-2.2C(##)	CL0544-0570-4-##	7	11.65			
DF62C-13S-2.2C(##)	CL0544-0571-7-##	13	9.3	13.65		
DF62C-24S-2.2C(##)	CL0544-0541-6-##	24	12.3			

[Specification No.] -##,(##)
None : White
(11) : Black

Plug (Standard Type)



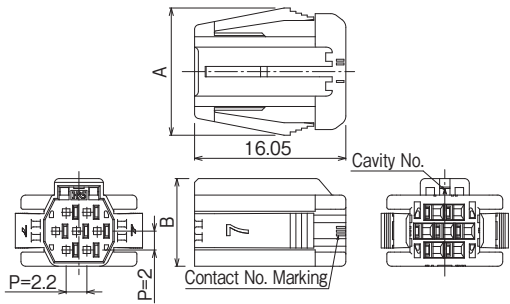
7pos. shown as an example.

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit	
DF62B-2EP-2.2C(##)	CL0544-0558-9-##	2	6.0	5.3	100pcs per bag	
DF62B-3EP-2.2C(##)	CL0544-0559-1-##	3		8.2		7.3
DF62B-4EP-2.2C(##)	CL0544-0560-0-##	4				
DF62B-5EP-2.2C(##)	CL0544-0561-3-##	5				
DF62B-6EP-2.2C(##)	CL0544-0562-6-##	6	9.3			
DF62B-7EP-2.2C(##)	CL0544-0563-9-##	7				
DF62B-13EP-2.2C(##)	CL0544-0564-1-##	13	10.4	11.3		
DF62B-24EP-2.2C(##)	CL0544-0540-3-##	24	13.4	13.3		

[Specification No.] -##,(##)
None : Black
(10) : White

Plug (Panel Mount Type)

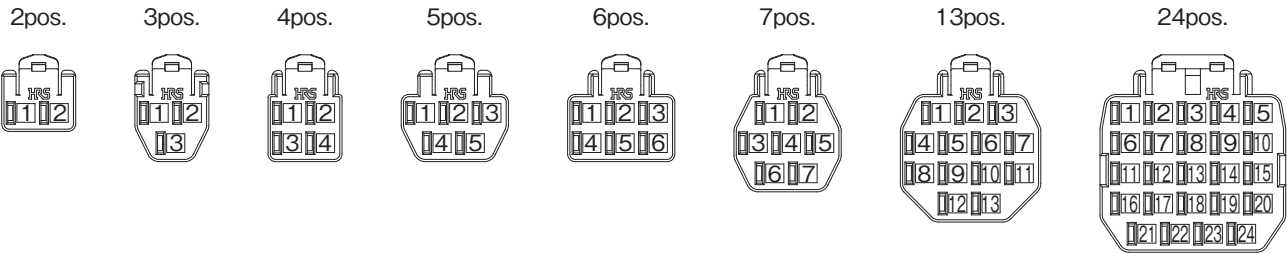


Unit : mm

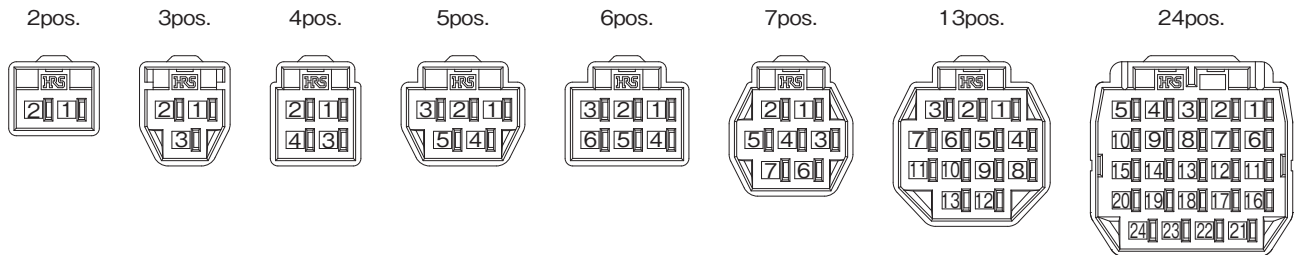
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit	
DF62P-2EP-2.2C(##)	CL0544-0543-1-##	2	11.3	5.3	100pcs per bag	
DF62P-3EP-2.2C(##)	CL0544-0544-4-##	3		13.5		7.3
DF62P-4EP-2.2C(##)	CL0544-0545-7-##	4				
DF62P-5EP-2.2C(##)	CL0544-0546-0-##	5				
DF62P-6EP-2.2C(##)	CL0544-0547-2-##	6	9.3			
DF62P-7EP-2.2C(##)	CL0544-0548-5-##	7				
DF62P-13EP-2.2C(##)	CL0544-0549-8-##	13	15.7	11.3		
DF62P-24EP-2.2C(##)	CL0544-0550-7-##	24	18.7	13.3		

[Specification No.] -##,(##)
None : Black

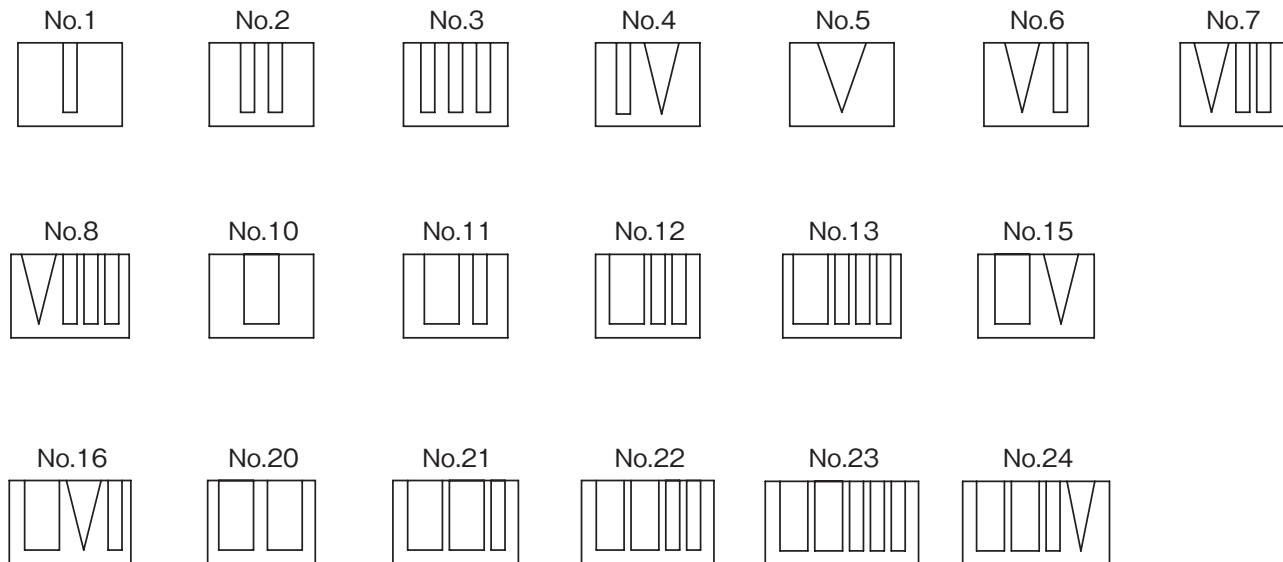
■ Socket Position Number Pin Configuration (Shown from the Mating Side)



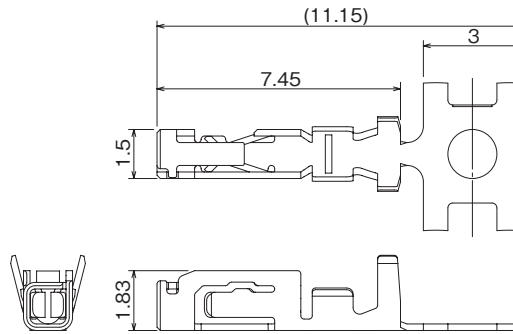
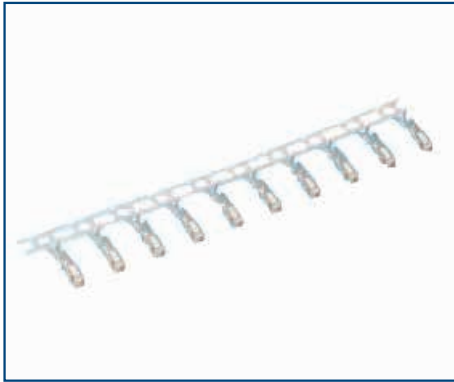
■ Plug Position Number Pin Configuration (Shown from the Mating Side)



■ Position No. Diagram



Socket Crimping Contact



● Reel Contact, Applicable Tool : Applicator

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealed Copper) (Note)					Purchase Unit
			UL	AWG	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF62-22SCF DF62-22SCFA	CL0544-0520-6-00 CL0544-0506-5-00	Tin Plated Gold Plated	1061	22	17/0.16mm	0.342mm ²	φ 1.2 to φ 1.45mm	15,000pcs per reel
DF62-2428SCF DF62-2428SCFA	CL0544-0521-9-00 CL0544-0500-9-00	Tin Plated Gold Plated	1007	24 26 28	11/0.16mm 7/0.16mm 7/0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	φ 0.9 to φ 1.45mm	
DF62-30SCF DF62-30SCFA	CL0544-0522-1-00 CL0544-0508-0-00	Tin Plated Gold Plated	1007	30	7/0.1mm	0.055mm ²	φ 0.75 to φ 1.2mm	

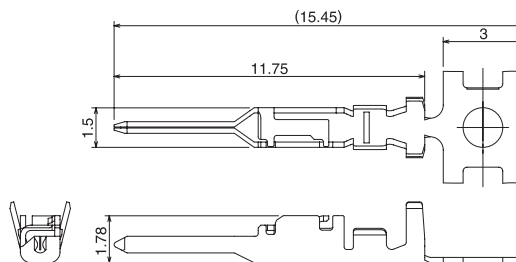
Note: When using cables not specified by Hirose, please contact a Hirose sales representative.

● Loose Piece, Applicable Tool : Hand Crimping Tool

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealed Copper) (Note)					Purchase Unit
			UL	AWG	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF62-22SC DF62-22SCA	CL0544-0572-0-00 CL0544-0526-2-00	Tin Plated Gold Plated	1061	22	17/0.16mm	0.342mm ²	φ 1.26mm	100pcs per bag
DF62-2428SC DF62-2428SCA	CL0544-0573-2-00 CL0544-0527-5-00	Tin Plated Gold Plated	1007	24 26 28	11/0.16mm 7/0.16mm 7/0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	φ 1.42mm φ 1.28mm φ 1.18mm	
DF62-30SC DF62-30SCA	CL0544-0574-5-00 CL0544-0528-8-00	Tin Plated Gold Plated	1007	30	7/0.1mm	0.055mm ²	φ 0.82mm	

Note: The applicable cables include only those listed above.

Plug Crimping Contact



● Reel Contact, Applicable Tool : Applicator

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealed Copper) (Note)					Purchase Unit
			UL	AWG	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF62-EP22PCF DF62-EP22PCFA	CL0544-0523-4-00 CL0544-0507-8-00	Tin Plated Gold Plated	1061	22	17/0.16mm	0.342mm ²	φ 1.2 to φ 1.45mm	15,000pcs per reel
DF62-EP2428PCF DF62-EP2428PCFA	CL0544-0524-7-00 CL0544-0501-1-00	Tin Plated Gold Plated	1007	24 26 28	11/0.16mm 7/0.16mm 7/0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	φ 0.9 to φ 1.45mm	
DF62-EP30PCF DF62-EP30PCFA	CL0544-0525-0-00 CL0544-0509-3-00	Tin Plated Gold Plated	1007	30	7/0.1mm	0.055mm ²	φ 0.75 to φ 1.2mm	

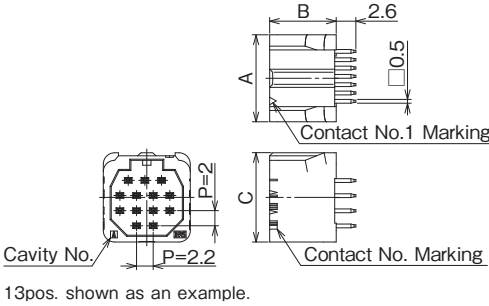
Note: When using cables not specified by Hirose, please contact a Hirose sales representative.

● Loose Piece, Applicable Tool : Hand Crimping Tool

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealed Copper) (Note)					Purchase Unit
			UL	AWG	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF62-EP22PC DF62-EP22PCA	CL0544-0575-8-00 CL0544-0529-0-00	Tin Plated Gold Plated	1061	22	17/0.16mm	0.342mm ²	φ 1.26mm	100pcs per bag
DF62-EP2428PC DF62-EP2428PCA	CL0544-0576-0-00 CL0544-0530-0-00	Tin Plated Gold Plated	1007	24 26 28	11/0.16mm 7/0.16mm 7/0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	φ 1.42mm φ 1.28mm φ 1.18mm	
DF62-EP30PC DF62-EP30PCA	CL0544-0577-3-00 CL0544-0529-0-00	Tin Plated Gold Plated	1007	30	7/0.1mm	0.055mm ²	φ 0.82mm	

Note : The applicable cables include only those listed above.

Straight Pin Header



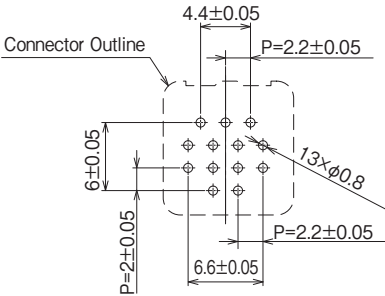
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Tin Plating	Gold Plating	Purchase Unit
DF62-13P-2.2DSA(##)	CL0544-0582-0-##	13	11.5	8.8	11.8	Yes	—	100pcs per tray
DF62-24P-2.2DSA(##)	CL0544-0584-0-##	24	14.5	10.8	13.8	Yes	Yes	80pcs per tray

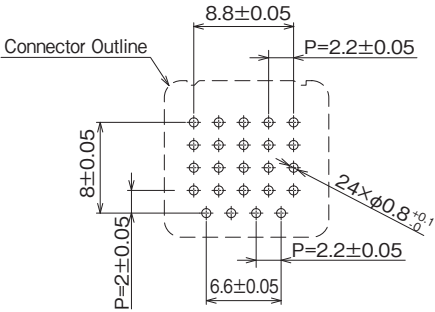
[Specification No.] -##,(##)
None : Tin Plating
(01) : Gold Plating

Note : Please contact a Hirose representative for requests on gold plating pin count variations that have not been released.

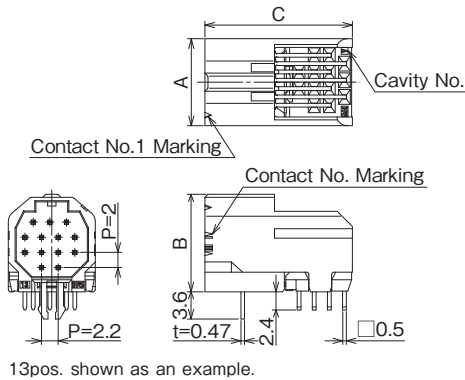
■ Recommended thickness of PCB: $t=1.6\pm0.1\text{mm}$
[13pos.]



[24pos.]



Right Angle Pin Header



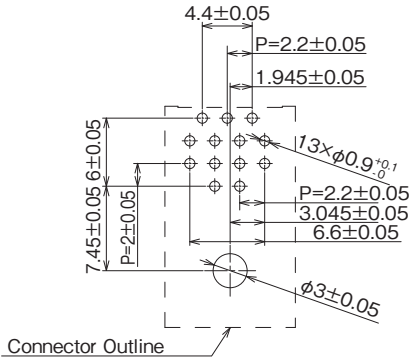
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Tin Plating	Gold Plating	Purchase Unit
DF62-13P-2.2DS(##)	CL0544-0581-0-##	13	11.5	12.9	19.5	Yes	—	100pcs per tray
DF62-24P-2.2DS(##)	CL0544-0583-0-##	24	15.4	14.9	23.5	Yes	Yes	

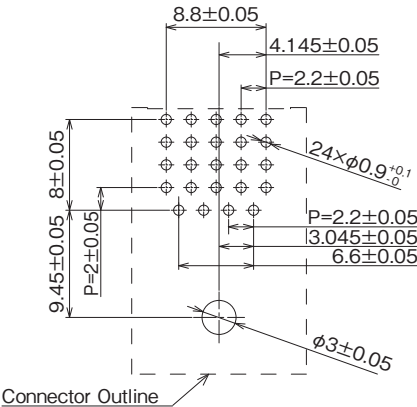
[Specification No.] -##,(##)
None : Tin Plating
(01) : Gold Plating

Note : Please contact a Hirose representative for requests on gold plating pin count variations that have not been released.

■ Recommended thickness of PCB: $t=1.6\pm0.1$ mm
[13pos.]

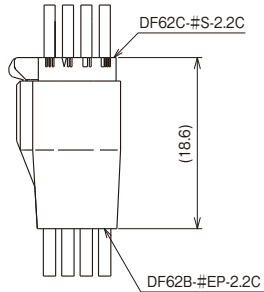


[24pos.]

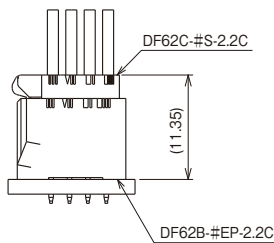


Mated Dimensions

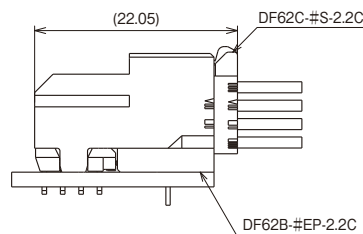
● Wire-to-Wire Connection



● Wire-to-Board Connection (Straight Pin Header)



● Wire-to-Board Connection (Right Angle Pin Header)



Applicable Crimping Tool

Tool	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF62-22	CL0901-4626-3-00	DF62-22SCFA/SCF DF62-EP22PCFA/PCF
	AP105-DF62-2428	CL0901-4625-0-00	DF62-2428SCFA/SCF DF62-EP2428PCFA/PCF
	AP105-DF62-30	CL0901-4627-6-00	DF62-30SCFA/SCF DF62-EP30PCFA/PCF
Press Body	CM-105C	CL0901-0001-0-00	-
Hand Tool	HT801/DF62-22(10) (Note 3)	CL0550-0401-9-10	DF62-22SCA/SC DF62-EP22PCA/PC
	HT801/DF62-2428(10) (Note 4)	CL0550-0400-6-10	DF62-2428SCA/SC DF62-EP2428PCA/PC
	HT801/DF62-30(10) (Note5)	CL0550-0402-1-10	DF62-30SCA/SC DF62-EP30PCA/PC
Extraction Tool	DF62/RE-MD	CL0902-4645-4-00	DF62-##SCFA/SCF/SCA/SC DF62-EP##PCFA/PCF/PCA/PC

Note 1 : Issues with non-Hirose specified tools are outside the scope of warranty.

Note 2 : Please conduct crimping work according to the "Crimping Quality Standard" (ETAD-H0642,ETAD-H0643)" and "Crimping Condition Table".

Note 3 : The compatible wire is limited to UL1061 (22 AWG).

Note 4 : The compatible wire is limited to UL1007 (24 to 28 AWG).

Note 5 : The compatible wire is limited to UL1061 (30 AWG).

Note 6 : If you do not use tools specified by our company,

please contact your our company sales representative if you would like to request dies drawing.

Crimping

■ Items Required Prior to Starting

The work-related documents listed below are required before starting harness assembly.

(The ● mark indicates a required document.)

When the documents shown below are not available, ask a Hirose sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
(1) Main unit of crimping machine instruction manual	Explanation of main press machine unit	●	-	Bundled with the purchase of the main press machine unit.
(2) Applicator Spare Parts Identification	Explanation for Applicator installation	●	-	Bundled with the purchase of applicator.
(3) Crimp Conditions	Standard values of : Crimp height Tensile strength	●	-	
(4) Crimp Quality Standards	Various standards for crimping conditions	●	-	
(5) Operating Instructions for Hand Tool	Inspection items of : Crimp height Tensile strength and others	-	●	Bundled with the purchase of hand tool.
(6) Harness Procedure Manual DF62 Series : ETAD-H0593	Harness procedure	●	●	Ask a HRS sales representative.

■ Tools

The tools specified by Hirose should be used for crimping work.

- Crimping work by tools other than those specified must not be done because it may result in contact failure, disconnection of cable, etc.
- The operating instructions manual is available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before implementing the work.

■ Applicable Electric Wires

When using a wire other than the applicable wires please contact a Hirose representative.

[Precautions]

- Electric wires that are suitable for crimping connectors are tin-plated stranded soft copper wire.
- Avoid crimping solid wires, wires with polyester threads or tin-coated wires.
- Avoid crimping two electric wires together.
- The crimp height setting value (Note) may vary between tin-plated and gold-plated contacts even if the same electric wires are used.
- The crimp height setting value (Note) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

DF63 Series

15A 3.96mm pitch Wire-to-Board Connectors for Internal Power Supply (UL, C-UL and TÜV Listed)



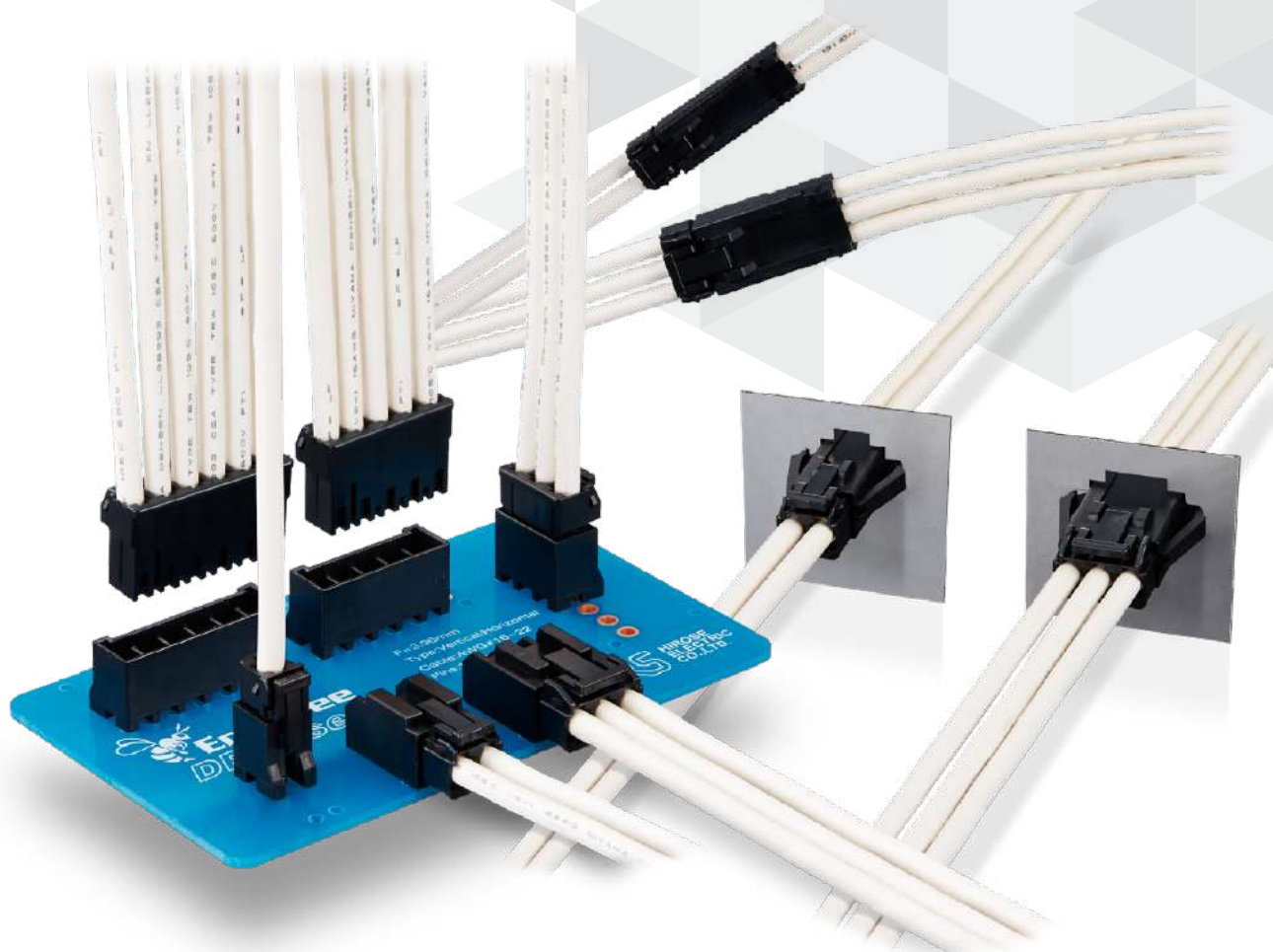
Power Supply



Positive-Lock



Compact



Features

1. Rated for up to 15A

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

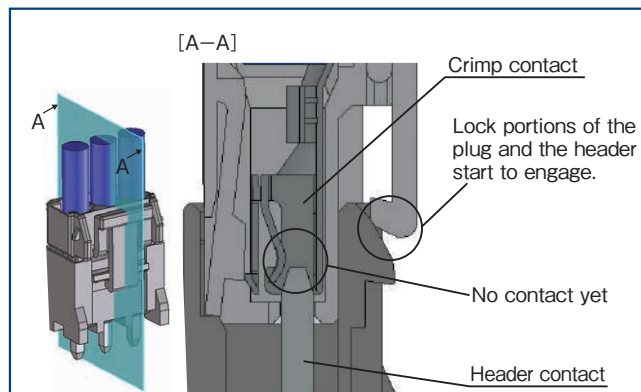
* Supports 7.92mm pitch

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

The product will be available upon request.
Please contact Hirose representative.

2. Secure mating and clear tactile click

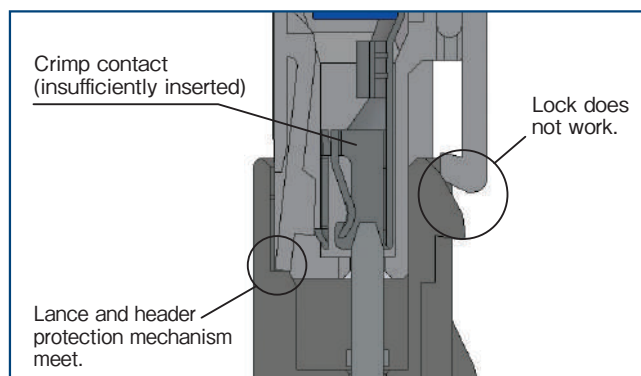
The locking mechanism delivers a clear and tactile click, which prevents incomplete mating and reduces burden on workers for improved work efficiency.



Lock structure

3. Prevents incomplete insertion of the crimp contact

A structure to prevent incomplete insertion of the crimp contacts is provided.



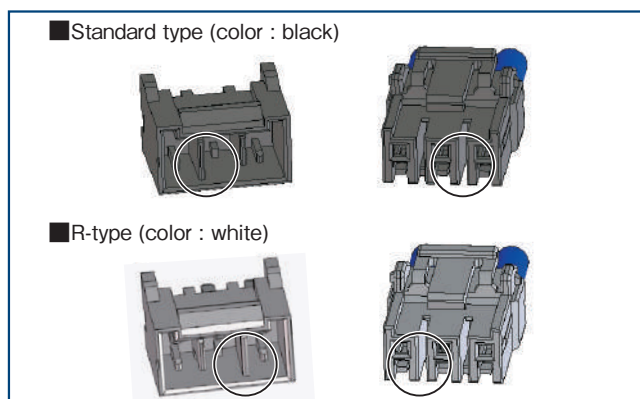
Prevention of insufficient insertion of the crimp contact

4. Prevents incorrect mating

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

*Keying options were provided to prevent incorrect connections.

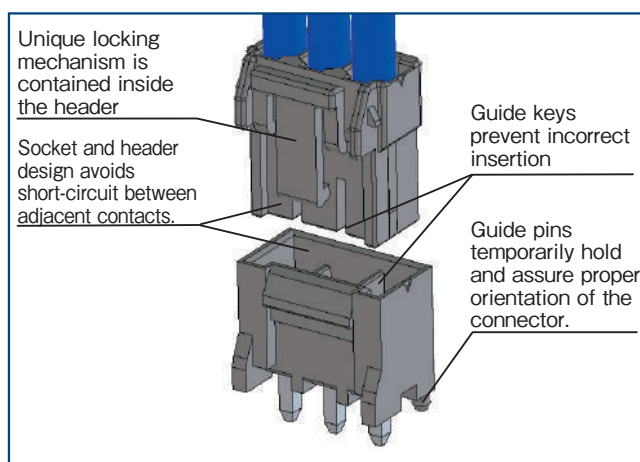
Keying options prevent incorrect connections due to the use of multiple connectors on the same board. When using identical pin counts, two versions are available with different keying options. The product will be available upon request. Please contact Hirose representative.



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

5. Reverse mounting prevention to PCB

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



6. Short-circuit prevention

The wall structure between the contacts helps to isolate the contacts and prevents short circuits between contacts.

7. Molded lance design

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

8. Suitable for potting

Capable of being potted, up to 5mm.

9. Solder crack prevention

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

Product Specifications

Rated Current	No of Pos.	16 AWG	18 AWG	20 AWG	22 AWG	Operating Temperature (Note 2)	-55 to +105°C
	1	15A	13A	11A	9A	Storage Temperature Range (Note 3)	-10 to +60°C
	2	14A	12A	10A	8A	Operating Humidity Range (Note 4)	20 to 80%
	3	12A	10A	8A	7A	Storage Humidity Range (Note 3)	40 to 70%
	4	10A	8A	7A	6A		
	5	10A	8A	7A	6A		
	6	10A	8A	7A	6A		
	2 (7.92mm Pitch)	15A	13A	11A	9A		
	3 (7.92mm Pitch)	12A	11A	9A	8A		
Rated Voltage	630V AC/DC						

Voltage Rating	UL	600V AC/DC
	C-UL	600V AC/DC
	TÜV	300V AC/DC

UL/TÜV File No. and Recognition No.

UL : E52653

C-UL : E52653

TÜV : R50318850

Item	Specifications	Conditions
Insulation Resistance	No less than 1,000M Ω	Measured at 500V DC
Withstand Voltage	No flashover or breakdown	1,500V AC is applied for 1 min.
Contact Resistance	No more than 10m Ω	Measured at 1mA and no higher than 20mV
Vibration Resistance	No electrical discontinuity of 1 μ s or greater	Frequency 10 to 55 Hz, half amplitude 0.75 mm, 10 times in each of the 3 directions
Shock Resistance	No electrical discontinuity of 1 μ s or greater	Accelerated velocity : 490 m/s ² for 11ms, half-sine wave in 3 directions, 3 times for each direction
Moisture-resistance	Contact resistance : no more than 20m Ω Insulation resistance : no less than 500M Ω	Temperature : 40 $\pm$ 2°C ; humidity : 90 to 95%, left as it is for 96 hours
Temperature Cycles	Contact resistance : no more than 20m Ω Insulation resistance : no less than 1,000M Ω	-55°C : 30 minutes $\rightarrow$ +85°C : 30 minutes 5 cycles
Mating Durability	Contact resistance : no more than 20m Ω	Tin Plated : 30 mating cycles Gold Plated : 50 mating cycles
Solder Heat Resistance	The resin parts should withstand the temperature and resist melting.	Straight Header Flow : 260°C , 5 sec Hand soldering : temperature of soldering iron at 290°C for 3 seconds Right Angle Header Flow : 260°C , 10 sec Hand soldering : temperature of soldering iron at 300°C for 3 seconds

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

Note 2 : Includes temperature rise caused by current flow.

Note 3 : Applicable to unused product packaging.

Note 4 : Use without condensation on parts.

Note 5 : 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

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

Product Number Structure

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

DF63 # - # **P** - **3.96** **DSA**

① ② ③ ④ ⑤ ⑥

Crimp contact

DF63 # - **1618** **SCF**

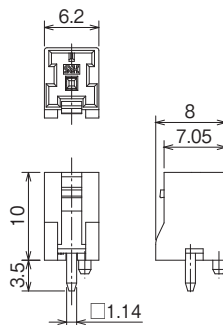
① ② ⑦ ⑧

① Series name	DF63	⑤ Contact Pitch	3.96mm 7.92mm
② Form Type	Header Blank or M : Black R : Guide post/Guide Key Type, White Sockets Blank : Black R : Guide Key Type, White In-line Plugs Blank : Panel Lock Type A : Without Panel Lock Socket contacts A : Standard In-Line plug contacts Blank : Standard	⑥ Type of housing	DSA : Straight header DS : Right angle header C : Crimp housing
③ Number of Contacts	1,2,3,4,5,6	⑦ Applicable Conductor	1618 : 16-18 AWG 2022 : 20-22 AWG
④ Connector type	P : Pin Header S : Crimp socket EP : In-line plug	⑧ Packaging	SCF : Socket contacts/Reel/Tin plated SCFA : Socket contacts/Reel/Gold plated SC : Socket contacts/Pack/Tin plated SCA : Socket contacts/Pack/Gold plated PCF : In-line plug contacts/Reel/Tin plated PCFA : In-line plug contacts/Reel/Gold plated PC : In-line plug contacts/Pack/Tin plated PCA : In-line plug contacts/Pack/Gold plated

Straight Header



[1 pos.]



[2 to 6 pos.]

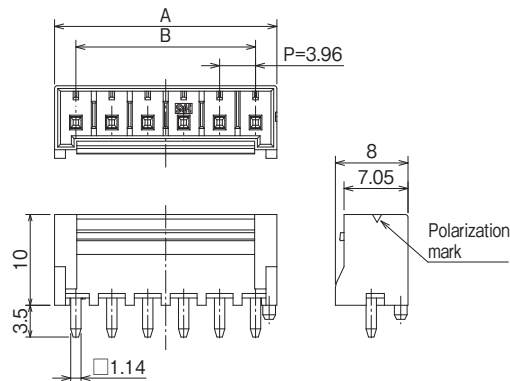
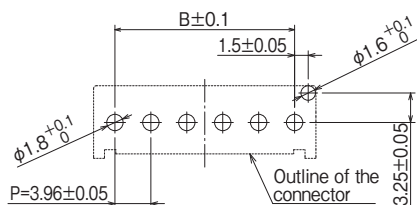


*Diagram of standard type.

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

[1 to 6 pos.]



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

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF63M-1P-3.96DSA(##)	CL0680-0566-0-##	1	6.20	-	100pcs per bag
DF63M-2P-3.96DSA(##)	CL0680-0567-0-##	2	8.66	3.96	
DF63M-3P-3.96DSA(##)	CL0680-0568-0-##	3	12.62	7.92	
DF63M-4P-3.96DSA(##)	CL0680-0569-0-##	4	16.58	11.88	
DF63-5P-3.96DSA(##)	CL0680-0506-7-##	5	20.54	15.84	
DF63-6P-3.96DSA(##)	CL0680-0507-0-##	6	24.50	19.80	

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

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF63R-5P-3.96DSA(##)	CL0680-0520-8-##	5	20.54	15.84	100pcs per bag

7.92mm pitch

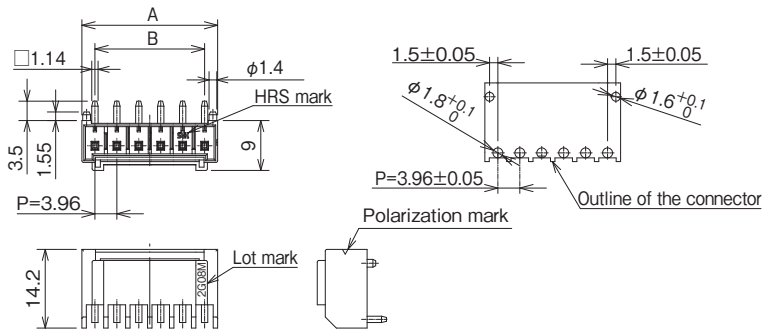
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF63M-2P-7.92DSA(##)	CL0680-0581-0-##	2	12.62	7.92	100pcs per bag
DF63-3P-7.92DSA(##)	CL0680-0537-0-##	3	20.54	15.84	

[Specification number(##), -##] None : Tin plated, (01) : Gold plated

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

Right Angle Header



Standard Type (Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF63M-1P-3.96DS(##)	CL0680-0570-0-##	1	6.20	-	100pcs per bag
DF63M-2P-3.96DS(##)	CL0680-0571-0-##	2	8.66	3.96	
DF63M-3P-3.96DS(##)	CL0680-0572-0-##	3	12.62	7.92	
DF63-4P-3.96DS(##)	CL0680-0545-0-##	4	16.58	11.88	
DF63-5P-3.96DS(##)	CL0680-0546-0-##	5	20.54	15.84	
DF63-6P-3.96DS(##)	CL0680-0547-0-##	6	24.50	19.80	

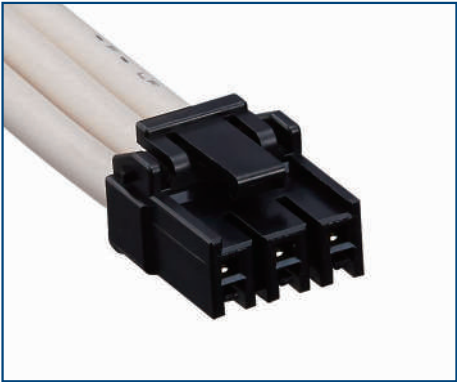
7.92mm pitch

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF63M-2P-7.92DS(##)	CL0680-0583-0-##	2	12.62	7.92	100pcs per bag
DF63-3P-7.92DS(##)	CL0680-0559-0-##	3	20.54	15.84	

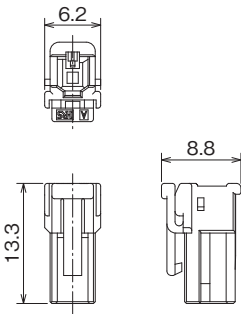
[Specification number(##), -##] None : Tin plated, (01) : Gold plated
Note : Please contact Hirose representative if you have request for (01) specification.

Crimp Socket

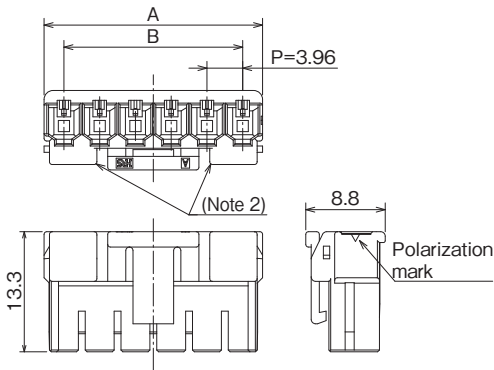


Shown with terminated and contacts installed.

[1 pos.]



[2 to 6 pos.]



Standard Type

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF63-1S-3.96C(##)	CL0680-0508-2-##	1	6.20	-	100pcs per bag
DF63-2S-3.96C(##)	CL0680-0509-5-##	2	8.36	3.96	
DF63-3S-3.96C(##)	CL0680-0502-6-##	3	12.32	7.92	
DF63-4S-3.96C(##)	CL0680-0510-4-##	4	16.28	11.88	
DF63-5S-3.96C(##)	CL0680-0511-7-##	5	20.24	15.84	
DF63-6S-3.96C(##)	CL0680-0512-0-##	6	24.20	19.80	

[Specification number(##), -##] None : Black

R Type (Guide key)

Unit : mm

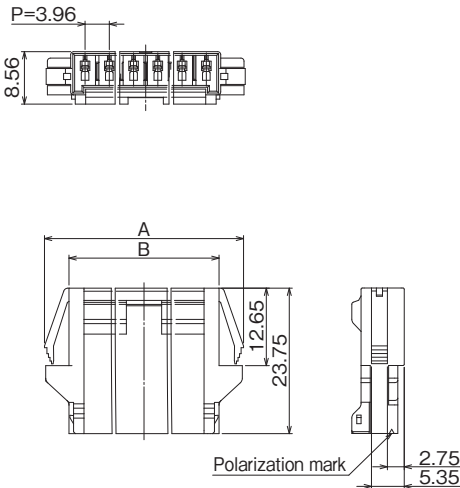
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF63R-5S-3.96C(##)	CL0680-0525-1-##	5	20.24	15.84	100pcs per bag

[Specification number(##), -##] None : White

In-line Plug (Panel Lock Type)

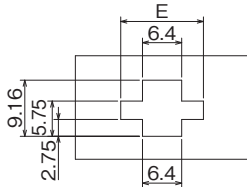


Shown with terminated and contacts installed.

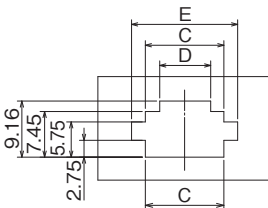


Recommended Panel Cutout

[1 pos.]



[2 to 6 pos.]



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	Purchase Unit
DF63-1EP-3.96C(##)	CL0680-0551-0-##	1	14.20	6.20	-	-	100pcs per bag
DF63-2EP-3.96C(##)	CL0680-0533-0-##	2	16.66	8.66	8.86	4.96	
DF63-3EP-3.96C(##)	CL0680-0532-7-##	3	20.62	12.62	12.82	8.32	
DF63-4EP-3.96C(##)	CL0680-0552-0-##	4	24.58	16.58	16.78	12.28	
DF63-5EP-3.96C(##)	CL0680-0553-0-##	5	28.54	20.54	20.74	16.24	
DF63-6EP-3.96C(##)	CL0680-0554-0-##	6	32.50	24.50	24.70	20.20	

Unit : mm

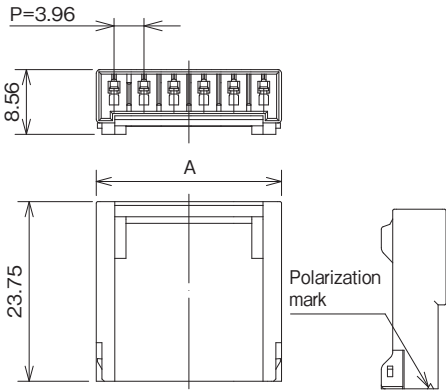
E	Panel thickness	No. of Pos.					
		1	2	3	4	5	6
	0.5 to 0.6	10.30	12.76	16.72	20.68	24.64	28.60
	0.7 to 1.1	10.80	13.26	17.22	21.18	25.14	29.10
	1.2 to 1.7	11.30	13.76	17.72	21.68	25.64	29.60
	2.0 to 2.3	11.80	14.26	18.22	22.18	26.14	30.10

[Specification number(##), -##] None : Black

In-line Plug



Shown with terminated and contacts installed.

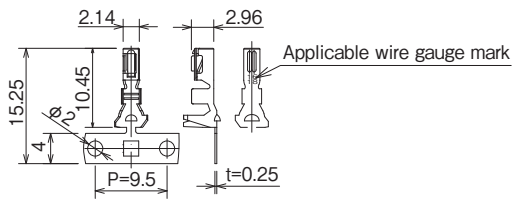


Unit : mm

Part No.	HRS No.	No. of Pos.	A	Purchase Unit
DF63A-1EP-3.96C(##)	CL0680-0555-0-##	1	6.20	100pcs per bag
DF63A-2EP-3.96C(##)	CL0680-0535-5-##	2	8.66	
DF63A-3EP-3.96C(##)	CL0680-0534-2-##	3	12.62	
DF63A-4EP-3.96C(##)	CL0680-0556-0-##	4	16.58	
DF63A-5EP-3.96C(##)	CL0680-0557-0-##	5	20.54	
DF63A-6EP-3.96C(##)	CL0680-0558-0-##	6	24.50	

[Specification number(##), -##] None : Black

Crimp Contact for Socket



Reel Contact (4,000pcs per reel) *Applicable tool : Applicator

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealed Copper) (Note 1)					RoHS
			UL	Wire Size	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF63A-1618SCF	CL0680-0573-0-00	Tin Plated	1007 1015	16 AWG	26/0.254mm	1.317m ²	φ 2.1 to 3.2mm	○
				18 AWG	34/0.18mm	0.865m ²		
DF63A-1618SCFA	CL0680-0646-0-00	Gold Plated	1007 1015	16 AWG	26/0.254mm	1.317m ²	φ 2.1 to 3.2mm	
				18 AWG	34/0.18mm	0.865m ²		
DF63A-2022SCF	CL0680-0097-0-00	Tin Plated	1007	20 AWG	21/0.18mm	0.534m ²	φ 1.7 to 1.8mm	
				22 AWG	17/0.16mm	0.342m ²		
DF63A-2022SCFA	CL0680-0647-0-00	Gold Plated	1007	20 AWG	21/0.18mm	0.534m ²	φ 1.7 to 1.8mm	
				22 AWG	17/0.16mm	0.342m ²		

Note 1 : When using a wire other than the applicable wires please contact a Hirose representative.

Loose piece (100pcs per bag) *Applicable tool : Hand crimping tool

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealed Copper) (Note 1)					RoHS
			UL	Wire Size	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF63A-1618SC	CL0680-0648-0-00	Tin Plated	1007	16 AWG	26/0.254mm	1.317m ²	2.5mm	○
				18 AWG	34/0.18mm	0.865m ²	2.1mm	
			1015	16 AWG	26/0.254mm	1.317m ²	3.2mm	
				18 AWG	34/0.18mm	0.865m ²	2.9mm	
DF63A-1618SCA	CL0680-0650-0-00	Gold Plated	1007	16 AWG	26/0.254mm	1.317m ²	2.5mm	
				18 AWG	34/0.18mm	0.865m ²	2.1mm	
			1015	16 AWG	26/0.254mm	1.317m ²	3.2mm	
				18 AWG	34/0.18mm	0.865m ²	2.9mm	
DF63A-2022SC	CL0680-0649-0-00	Tin Plated	1007	20 AWG	21/0.18mm	0.534m ²	1.8mm	
				22 AWG	17/0.16mm	0.342m ²	1.7mm	
DF63A-2022SCA	CL0680-0651-0-00	Gold Plated	1007	20 AWG	21/0.18mm	0.534m ²	1.8mm	
				22 AWG	17/0.16mm	0.342m ²	1.7mm	

Note 1 : When crimping using a hand crimping tool only the above wires are applicable.

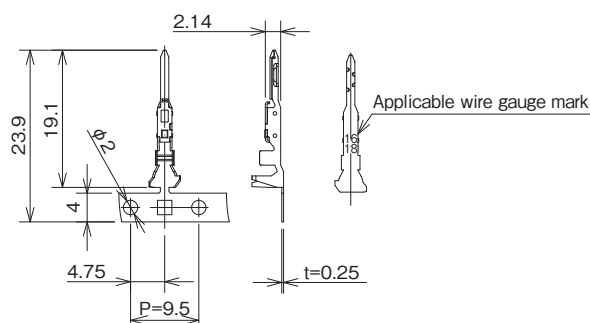
● Crimp Contact extraction tool

DF-C-PO(B), Flat-bladed screwdriver, 1.2mm blade width

● Strip length

2.9 to 3.6mm

Crimp Contact for In-line Plug



Reel Contact (4,000pcs per reel) *Applicable tool : Applicator

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealed Copper) (Note 1)					RoHS
			UL	Wire Size	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF63-1618PCF	CL0680-0529-2-00	Tin Plated	1007 1015	16 AWG	26/0.254mm	1.317m ²	φ 2.1 to 3.2mm	○
				18 AWG	34/0.18mm	0.865m ²		
DF63-1618PCFA	CL0680-0636-0-00	Gold Plated	1007 1015	16 AWG	26/0.254mm	1.317m ²	φ 2.1 to 3.2mm	
				18 AWG	34/0.18mm	0.865m ²		
DF63-2022PCF	CL0680-0538-3-00	Tin Plated	1007	20 AWG	21/0.18mm	0.534m ²	φ 1.7 to 1.8mm	
				22 AWG	17/0.16mm	0.342m ²		
DF63-2022PCFA	CL0680-0638-0-00	Gold Plated	1007	20 AWG	21/0.18mm	0.534m ²	φ 1.7 to 1.8mm	
				22 AWG	17/0.16mm	0.342m ²		

Note 1 : When using a wire other than the applicable wires please contact a Hirose representative.

Loose piece (100pcs per bag) *Applicable tool : Hand crimping tool

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealed Copper) (Note 1)					RoHS
			UL	Wire Size	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF63-1618PC	CL0680-0536-8-00	Tin Plated	1007	16 AWG	26/0.254mm	1.317m ²	2.5mm	○
				18 AWG	34/0.18mm	0.865m ²	2.1mm	
			1015	16 AWG	26/0.254mm	1.317m ²	3.2mm	
				18 AWG	34/0.18mm	0.865m ²	2.9mm	
DF63-1618PCA	CL0680-0637-0-00	Gold Plated	1007	16 AWG	26/0.254mm	1.317m ²	2.5mm	
				18 AWG	34/0.18mm	0.865m ²	2.1mm	
			1015	16 AWG	26/0.254mm	1.317m ²	3.2mm	
				18 AWG	34/0.18mm	0.865m ²	2.9mm	
DF63-2022PC	CL0680-0539-6-00	Tin Plated	1007	20 AWG	21/0.18mm	0.534m ²	1.8mm	
				22 AWG	17/0.16mm	0.342m ²	1.7mm	
DF63-2022PCA	CL0680-0639-0-00	Gold Plated	1007	20 AWG	21/0.18mm	0.534m ²	1.8mm	
				22 AWG	17/0.16mm	0.342m ²	1.7mm	

Note 1 : When crimping using a hand crimping tool only the above wires are applicable.

● Crimp Contact extraction tool

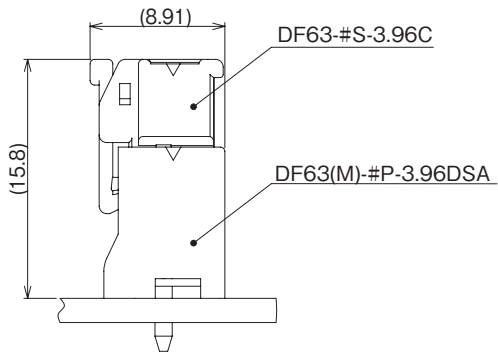
DF-C-PO(B), Flat-bladed screwdriver, 1.2mm blade width

● Strip length

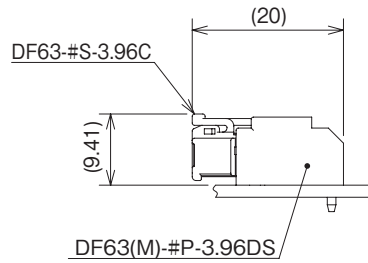
2.9 to 3.6mm

Mated Dimensions

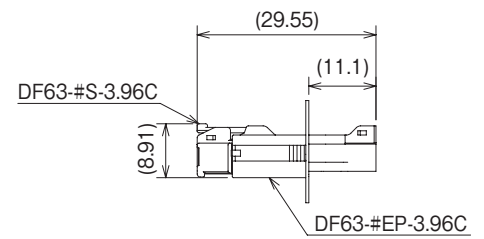
- Board-to-Wire Connection using the straight pin header



- Socket to Right Angle Header Connection



- Socket to In-line Plug Connection



Applicable Crimping Tool

Type	Part No.	HRS No.	Wire Type	Applicable Contacts
Applicator	AP105-DF63-1618S-1	CL0901-4634-1-00	UL1007 (Note 3)	DF63A-1618SCF DF63A-1618SCFA
	AP105-DF63-1618S-2	CL0901-4635-4-00	UL1015 (Note 3)	
	CHS893400H-UP (Note 8)	—	UL1015	
	AP105-DF63-1618-3	CL0901-4642-0-00	UL1007 (Note 3)	DF63-1618PCF DF63-1618PCFA DF63W-1618SCF
	AP105-DF63-1618-4	CL0901-4643-2-00	UL1015 (Note 3)	
	CHS893500H-UP (Note 8)	—	UL1015	
	AP105-DF63-2022-1	CL0901-4617-0-00	UL1007	DF63A-2022SCF DF63A-2022SCFA
	AP105-DF63-2022-3	CL0901-4646-0-00	UL1007	DF63-2022PCF DF63-2022PCFA DF63W-2022SCF
Hand tool	HT802/DF63-1618S-1	CL0550-0411-2-00	UL1007 (Note 4, 5)	DF63A-1618SC DF63A-1618SCA
	HT802/DF63-1618S-2	CL0550-0413-8-00	UL1015 (Note 4, 6)	
	HT802/DF63-1618P-1	CL0550-0423-1-00	UL1007 (Note 4, 5)	DF63-1618PC DF63-1618PCA
	HT802/DF63-1618P-2	CL0550-0424-4-00	UL1015 (Note 4, 6)	
	HT802/DF63-2022S-1	CL0550-0432-0-00	UL1007 (Note 4, 7)	DF63A-2022SC DF63A-2022SCA
	HT802/DF63-2022P-1	CL0550-0433-0-00		DF63-2022PC DF63-2022PCA

Note 1 : Please conduct crimping work according to the "Crimping quality control statement of standards (ETAD-H0730-00, ETAD-H0810-00)" and "Crimping condition table".

Note 2 : Any problems that occur from using tools other than those specified by Hirose, are not covered by warranty.

Note 3 : Applicator dies can be switched to crimp the other wire size and type. The additional dies are sold separately.

Note 4 : Hand tool dies cannot be switched.

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

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

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

Note 8 : Applicator manufactured by JAPAN AUTOMATIC MACHINE (J.A.M.). Please access to HP of J.A.M., if you make inquiries about the applicator or crimp

Contact Extraction

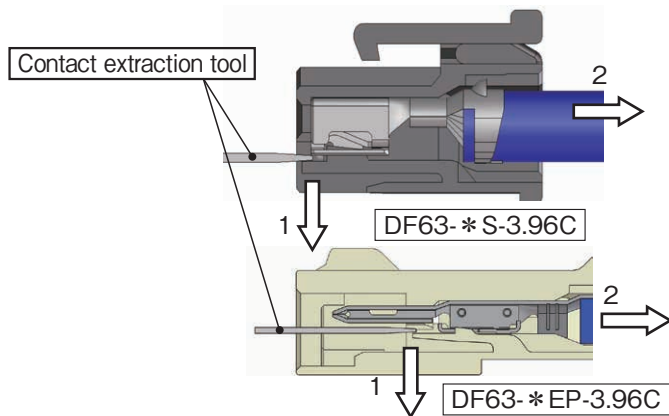
Contact extraction tool : Flat-bladed screwdriver. 1.2mm blade width or DF-C-PO(B)

Intended crimp Contacts : DF63A-1618SC(F)(A), DF63A-2022SC(F)(A), DF63-1618PC(F)(A), DF63-2022PC(F)(A)

● Work Method

1. Refer to the drawing No.1. Insert correct size contact extraction tool in the insulator against the molded-in lance. Deflect the lance as shown.
2. Assure that the lance is deflected to release the contact and pull-out wire with the terminated contact.

Housing Cross Sectional Diagram



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

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

DF63SF Series

12A Max. 3.96mm Pitch, Wire-to-Board Connectors



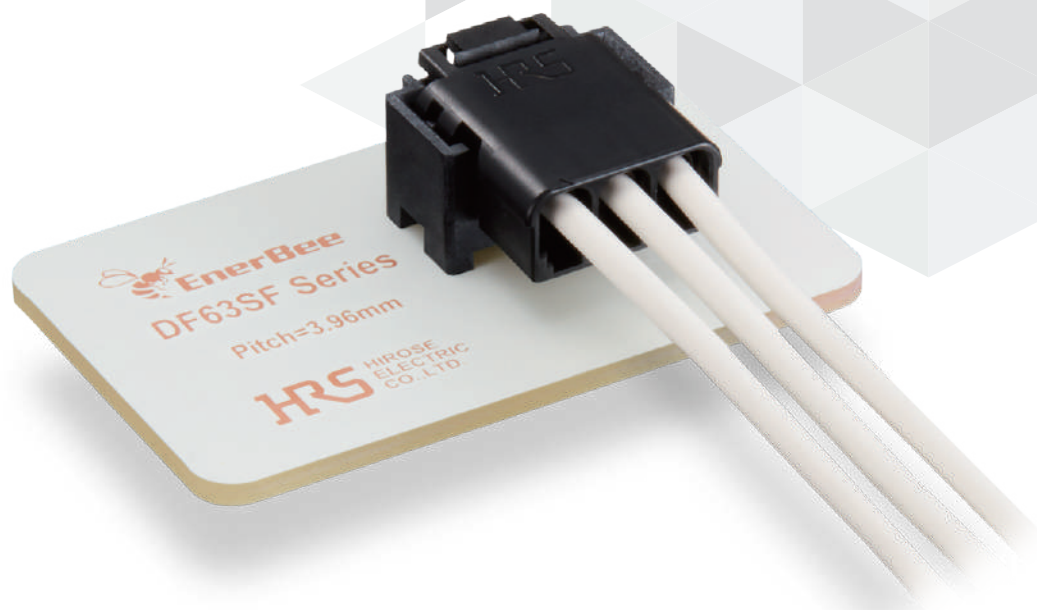
Power Supply



Compact



Vertical/Side Cable



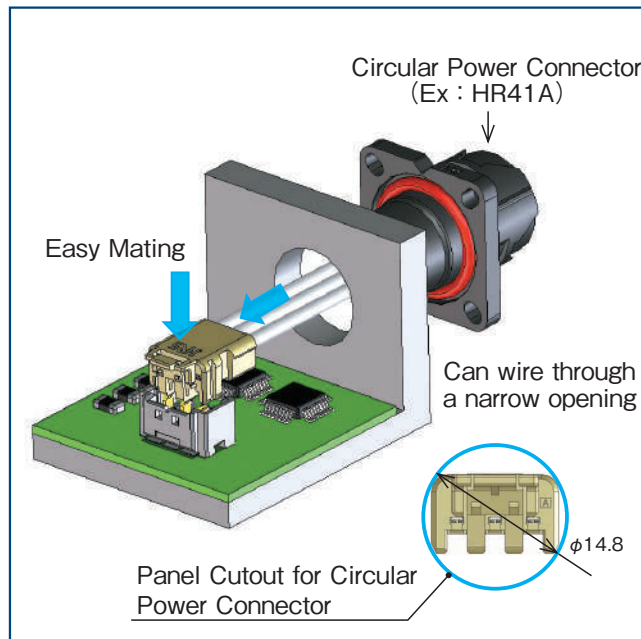
Features

1. Rated for up to 12A

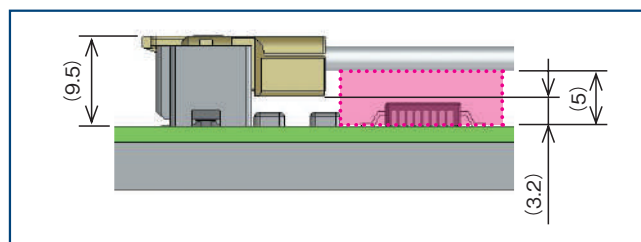
DF63SF has the capacity to handle a Max. of 12A when using 16 AWG wire.
(Please refer to the specification chart of the rated current when using other cables.)

2. The small vertical-mating design allows for easy assembly

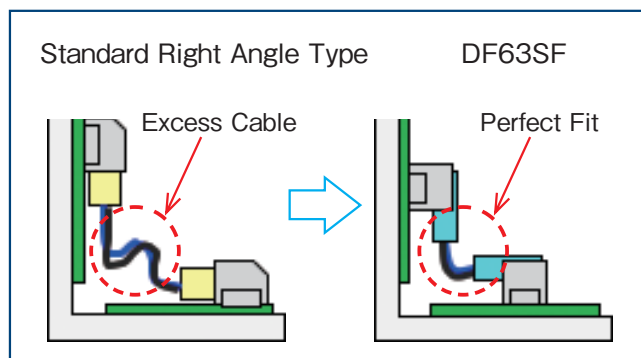
Vertical mating and horizontal wiring (Side Feed) enable high flexibility in component arrangement and reduces work space.



Small Size and Vertical Mating

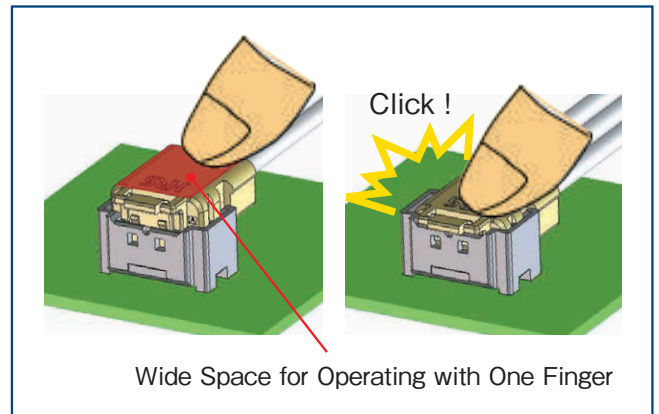


Minimized keep-out space
Other components can be mounted under the cables



3. Secure Mating with a Clear Tactile Click

The design secures a large enough space to press down the socket at the center. Mating is confirmed by the clear tactile click.



Secure Mating

4. Molded Lance Design

The molded lance design prevents deformation due to contact entanglement.

5. THR Mounting

Compatible with automatic mounting machine and contributes to improving productivity.

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

7. Supports 7.92mm pitch

Also supports 7.92mm pitch with 2pos. by skipped pin. (removing middle pin of 3pos. product)

Product Specifications

Rated Current (Note 1)	No. of Pos.	16 AWG	18 AWG	Operating Temperature (Note 2)	-55 to +105°C
	3	12A	10A	Storage Temperature Range (Note 3)	-10 to +60°C
	2 (7.92mm Pitch)	15A	13A	Operating Humidity Range (Note 4)	20 to 80%
Rated Voltage	630V AC/DC			Storage Humidity Range (Note 3)	40 to 70%

Rated Voltage	UL	600V AC/DC
	C-UL	
	TÜV	300V AC/DC

UL/TÜV File No. and Recognition No.

UL : E52653

C-UL : E52653

TÜV : R50372836

Item	Specifications	Conditions
Insulation Resistance	No less than 1,000M Ω	Measured at 500V DC
Withstand Voltage	No flashover or breakdown	2,200V AC is applied for 1 min.
Contact Resistance	No more than 10m Ω	Measured at 1mA (DC or 1000Hz) and no higher than 20mV
Vibration Resistance	No electrical discontinuity of 1 μ s or greater	Frequency 10-55Hz, half amplitude 0.75mm, 10 times in each of the three directions
Shock Resistance	No electrical discontinuity of 1 μ s or greater	Accelerated velocity : 490 m/s ² for 11ms, half-sine wave in 3 directions, 3 times for each direction
Moisture-resistance	Contact resistance : no more than 20m Ω Insulation resistance : no less than 500M Ω	Temperature : 40 $\pm$ 2°C ; humidity : 90 to 95%, left as it is for 96 hours
Temperature Cycles	Contact resistance : no more than 20m Ω Insulation resistance : no less than 1,000M Ω	-55°C : 30 minutes $\rightarrow$ 85°C : 30 minutes 5 cycles
Mating Durability	Contact resistance : no more than 20m Ω	50 mating cycles
Solder Heat Resistance	The resin parts should withstand the temperature and resist melting.	Reflow : according to the Recommended Temperature Profile Hand soldering : temperature of soldering iron at 350°C $\pm$ 10°C for 5 seconds

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

Note 2 : Includes temperature rise due to current flow.

Note 3 : The storage condition refers to long-term storage of the product on the shelf before assembly.

Please use the operating temperature for temporary storage such as pre-assembly and during shipping.

Note 4 : Use without condensation on parts.

Materials / Finish

Component	Part	Material	Finish	UL Specification
Header	Insulator	LCP	Black	UL94V-0
	Contact	Copper Alloy	Gold Plated	-
Crimp Socket	Insulator	PBT (glass-reinforced)	Black	UL94V-0
Crimp Contact	Contact	Copper Alloy	Gold 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.

Header

DF63SF

-

#

P

-

3.96

TV

1

2

3

4

5

1 Series Name	DF63SF	4 Contact Pitch	3.96mm 7.92mm
2 No. of Pos.	2,3		
3 Connector Type	P : Header	5 Termination Style	TV : THR vertical type

Crimp Socket

DF63SF

-

#

S

-

3.96

C

1

2

3

4

5

1 Series Name	DF63SF	3 Connector Type	S : Crimp socket
2 No. of Pos.	3	4 Contact Pitch	3.96mm
		5 Termination Style	C : Crimp housing

Crimp Contact

DF63SF

-

1618

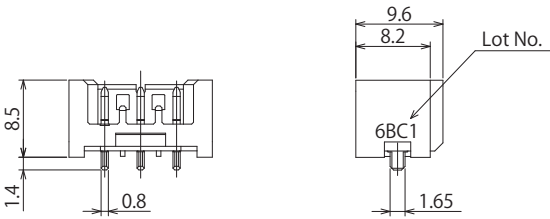
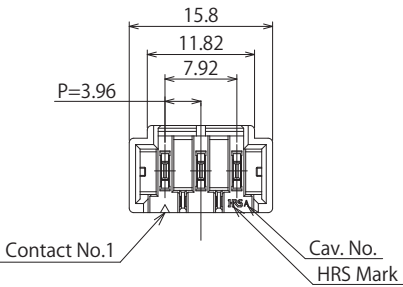
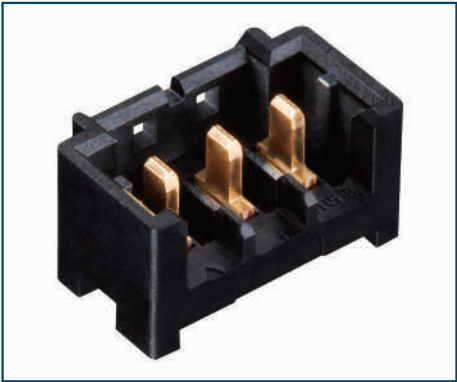
SCFA

1

2

1 Applicable Conductor	1618 : 16 to 18 AWG	2 Packaging	SCFA : Socket Contacts/Reel/Gold Plated

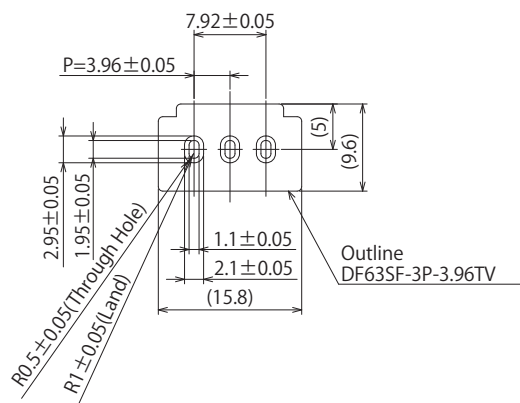
Straight Header (THR)



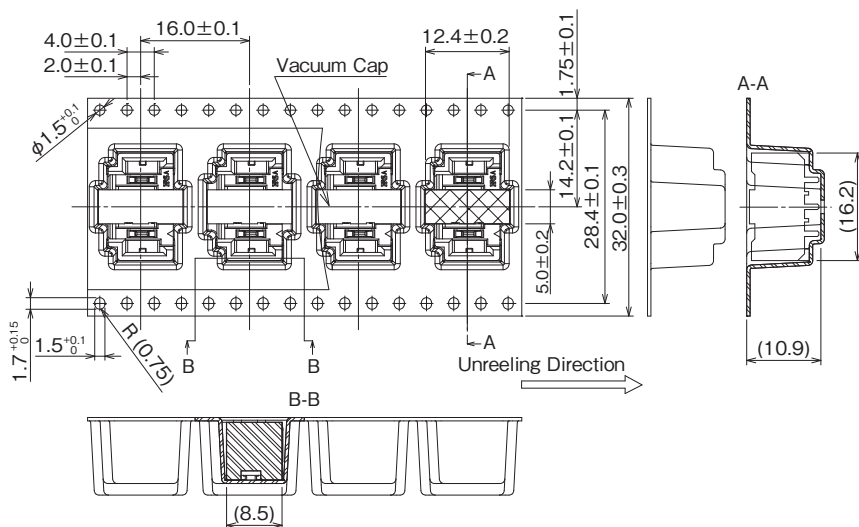
Part No.	HRS No.	No. of Pos.	Specification No.		Purchase Unit
			(51)	(52)	
DF63SF-3P-3.96TV((##)	CL0680-0701-0-##	3	○	○	450pcs per reel
DF63SF-2P-7.92TV(##)	CL0680-0704-0-##	2	○	○	

[Specification number] (##)
(51) : Gold plated(0.2 μ m), embossed packaging
(52) : Gold plated(0.76 μ m), embossed packaging

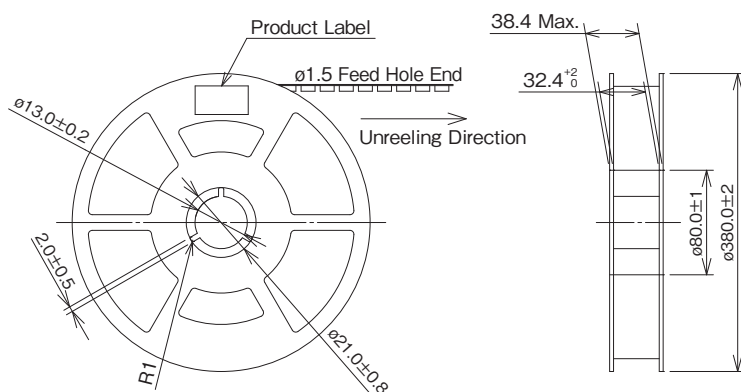
● Recommended PCB Layout (t=1.6mm)



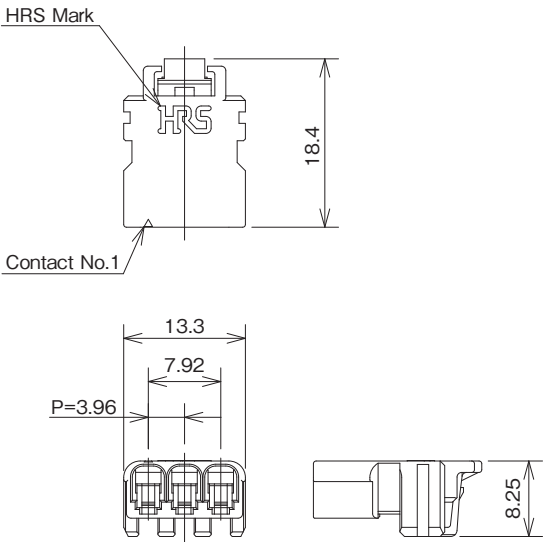
● Packaging Specification



● Style of Reel

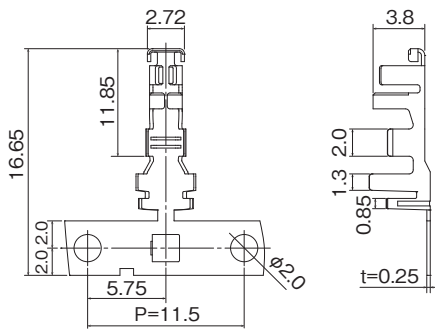


Crimp Socket



Part No.	HRS No.	No. of Pos.	Purchase Unit
DF63SF-3S-3.96C	CL0680-0702-0-00	3	100pcs per bag

Crimp Contact



Part No.	HRS No.	Type	Purchase Unit	Finish
DF63SF-1618SCFA	CL0680-0703-0-00	Reel Contact	3,000pcs per reel	Gold Plated 0.2 μ m
DF63SF-1618SCA	CL0680-0706-0-00	Loose Contact	100pcs per bag	
DF63SF-1618SCFA(05)	CL0680-0703-0-05	Reel Contact	3,000pcs per reel	Gold Plated 0.76 μ m
DF63SF-1618SCA(05)	CL0680-0706-0-05	Loose Contact	100pcs per bag	

[Specification number] (##)
None : Gold Plated(0.2 μ m)
(05) : Gold Plated(0.76 μ m)

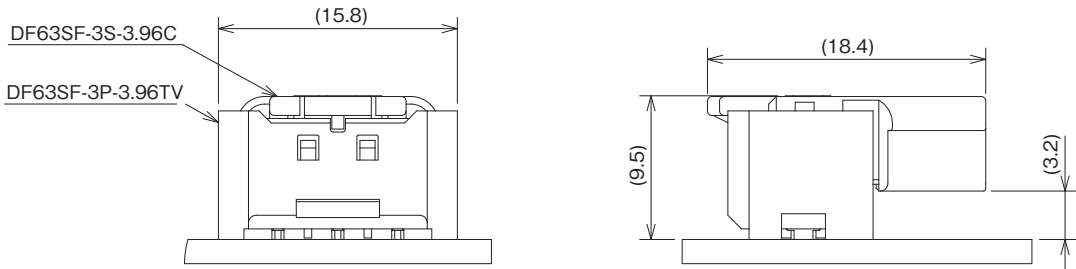
● Applicable Wire (Tinned Annealed Copper Wire)

Conductor Size (Core Structure)	Jacket Outer Diameter	Recommended Wire (Note 1)	Strip Length (Note 2)
16 AWG 26 pieces/0.254mm in diameter	φ 2.40mm	UL1007	3.1 to 3.8mm
16 AWG 54 pieces/0.180mm in diameter	φ 2.53mm	UL1430	
18 AWG 34 pieces/0.180mm in diameter	φ 2.10mm	UL1007	

Note 1 : Please contact a Hirose sales representative when using wires other than applicable wires.
Note 2 : The strip length is a reference value. Please adjust the strip length accordingly for specifications and requirements.
Refer to the Crimp Quality Standard (ATAD-H0891-00) for details.

Mated Dimensions

● Wire-to-Board Connection Using the Straight Pin Header



Applicable Crimping Tool

Type	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF63SF-1618S	CL0901-4651-0-00	DF63SF-1618SCFA(##)
	CHX022400H-UP (Note 3)	-	
Press Body	CM-105C	CL0901-0001-0-00	-
Hand Tool	HT802/DF63SF-1618SA (Note 2)	CL0550-0440-0-00	DF63SF-1618SCA(##)
Contact Extraction Tool	DF-C-PO(B)	CL0550-0179-2-00	-

Note 1 : Any problems that occur from using tools other than those specified by Hirose, are not covered by warranty.

Note 2 : Hand tool dies cannot be switched. The compatible wire is limited to UL1007 (16 to 18 AWG).

Note 3 : Applicator manufactured by JAPAN AUTOMATIC MACHINE (J.A.M.). Please visit the J.A.M. homepage, if you have inquiries about the applicator or crimp

Removing Contacts

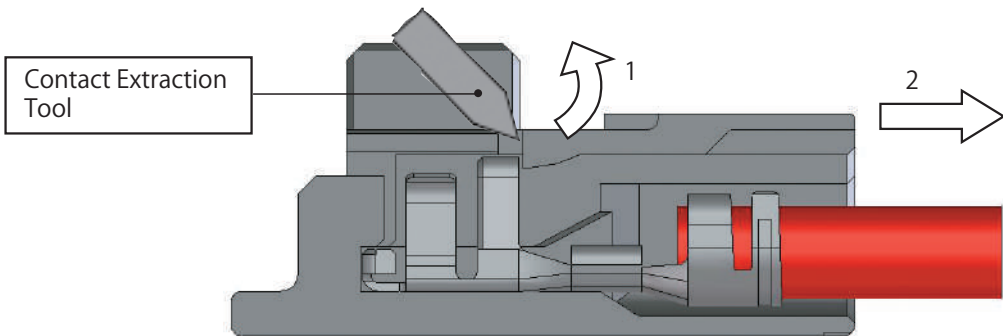
Contact extraction tool : DF-C-PO(B)

For Crimp contacts : DF63SF-1618SC(F)A(##)

● Procedure

- To remove the crimped contact once inserted, use DF-C-PO(B) or a pointed needle to pull the cable out while lifting the mold lance.
- Due to any previous repairs, the strength of the lance may be compromised.
- Hirose recommends the use of a new crimp housing to assure proper performance.

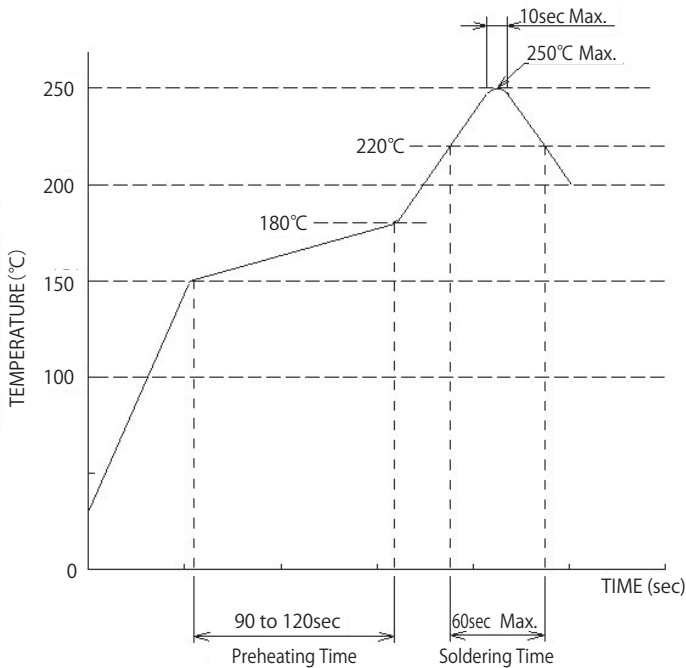
Cross-Section Diagram of Housing



⚠ Caution Please be careful when removing the contact so that you don't become injured by the protruding part of the crimp contact.

Precautions

1. Recommended Temperature Profile
(Compatible With Lead-free Soldering)



[Applicable Conditions]

- 1. Peak temperature : 250°C Max.
- 2. Heating area : 220°C Min. for less than 60 seconds
- 3. Preheating area : 150°C to 180°C for 90 to 120 seconds
- 4. Number of times : no more than 2 times

* Measurement is conducted at the contact lead part. Soldering results may change depending on conditions such as solder paste type, manufacturer, PCB size, and other soldering materials. Please determine all mounting conditions before use.

Note 1 : This temperature profile is a recommended value.
Note 2 : Prohibited backside-surface mounting.

2. Recommended Manual Soldering Conditions

Temperature of soldering iron : 350 ± 10°C , soldering time : within 5 seconds

3. Recommended screen thickness and board thickness

Screen thickness : 0.15mm
Board thickness : 1.6mm

4. Board Warpage

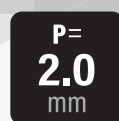
A maximum of 0.02mm at the center of connector, as measured from either end of the connector

5. Cleaning Conditions

IPA cleaning is allowed. (Cleaning is not recommended due to potential changes in mating action and other variables. Please contact us if you use other cleaning agents.)

DF11 Series

2.0mm Pitch, Double-Row Connector (UL/CSA Compliant)



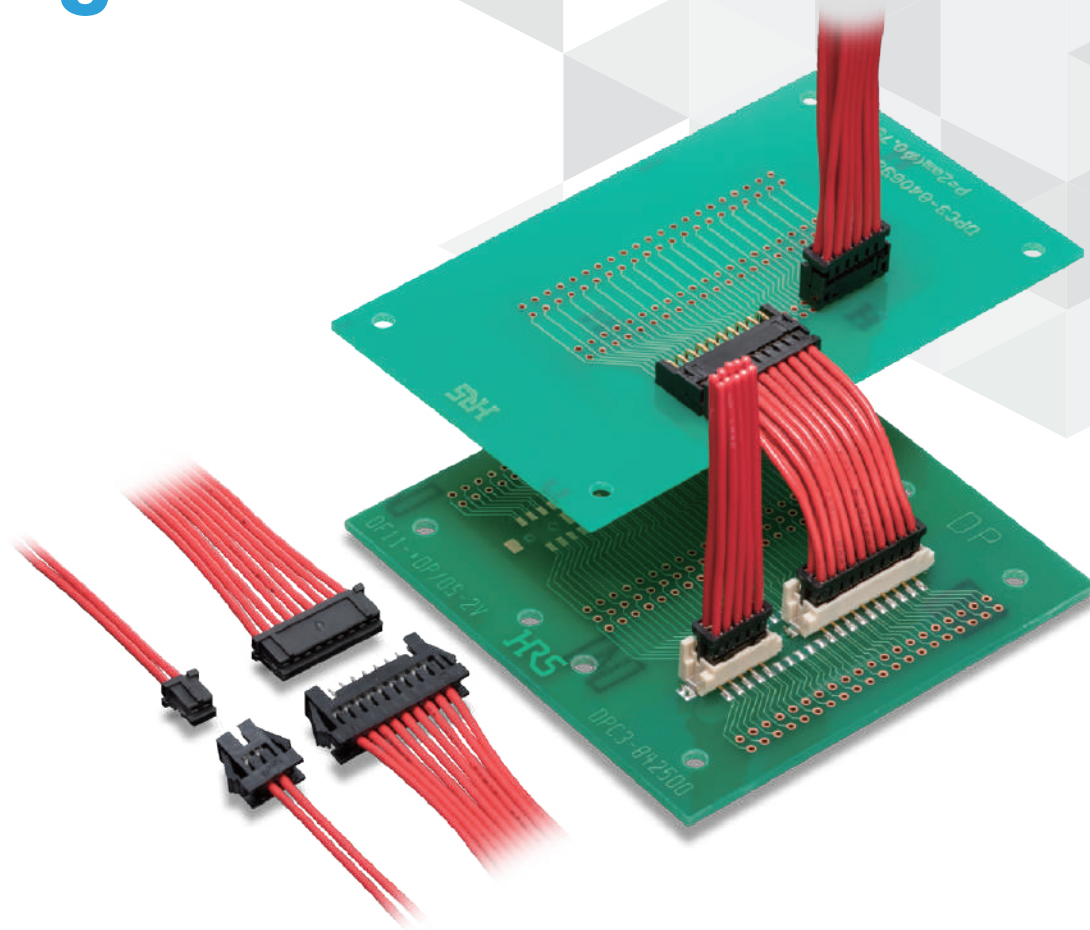
P=2.0 mm



Wide Variation



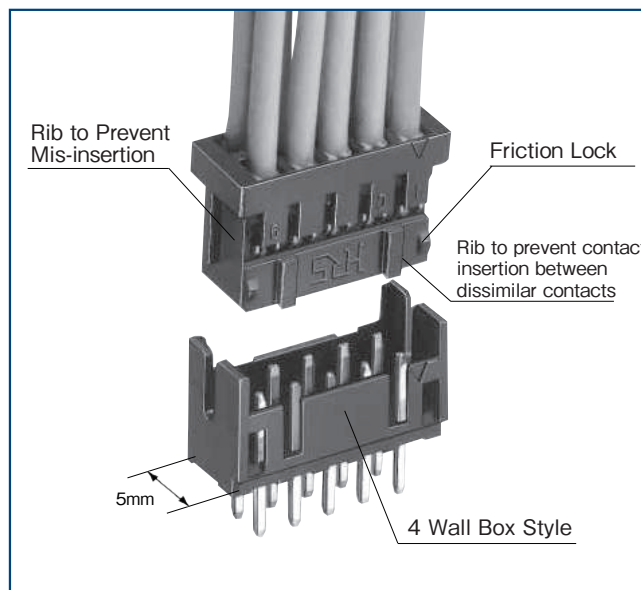
Friction-Lock



Features

1. Space-saving on Board

Double row contact arrangement with 2mm pitch has been condensed within a 5mm width. Double the number of signals can be secured in the same space as a conventional 2mm single-row connector.



2. Wide Varieties

The connection method is crimping. Variations are available in cable-to-board, in-line, and board-to-board to expand PCB design freedom. Additionally, both gold and tin plating can be selected based on the application and SMT compatible products are also available.

3. Wide Applicable Wire Range

The double 2mm pitch rows are compact while enabling an applicable wire range of 22 to 30 AWG.

Applications

Business equipment such as copy machines, printers and so on.

Product Specifications

Ratings	Crimping		
Rated Current (Note 1)	22 to 26 AWG	28 AWG	30 AWG
	2A/pin	1A/pin	0.5A/pin
Rated Voltage	250V AC/DC		
Operating Temperature Range	-30 to +85°C (Note 2)		
Operating Humidity Range	40 to 80% (Note 3)		
Storage Temperature Range	-10 to +60°C (Note 4)		
Storage Humidity Range	40 to 70% (Note 4)		

UL, CSA Safety Standard Approved Specification			
Wire Size	22 AWG	24 to 28 AWG	30 AWG
Rated Current	2A/pin	1A/pin	0.5A/pin
Rated Voltage	30V AC/DC		

■ UL, CSA Safety Standard File No.

UL : E52653

CSA : LR95109

Item	Specification	Condition		
Insulation Resistance	1000M Ω Min.	500V DC		
Withstanding Voltage	No flashover or insulation breakdown.	650V AC for 1 min.		
Contact Resistance	30m Ω Max.	100mA		
Single Insertion/Extraction Force	0.3N (30gf) Min. 4.4N (450gf) Max.	Measured by the square steel pin at 0.5 ± 0.002 mm		
Vibration	No electrical discontinuity of 1 μ s or more	Frequency : 10 to 55Hz, single amplitude of 0.75mm, 2 hours in each of the 3 directions.		
Humidity (Steady State)	Contact Resistance : 30m Ω Max. Insulation Resistance : 500M Ω Min.	96 hours at temperature of $40 \pm 2^\circ\text{C}$ and humidity of 90 to 95%		
Temperature Cycle	Contact Resistance : 30m Ω Max. Insulation Resistance : 1000M Ω Min.	(-55°C : 30 minutes $\rightarrow$ 5 to 35°C : 10 minutes $\rightarrow$ 85°C : 30 minutes $\rightarrow$ 5 to 35°C : 10 minutes) 5 cycles		
Mating Durability	Contact Resistance : 30m Ω Max.	Tin Plated : 30 cycles, Gold Plated : 50 cycles		
Resistance to Soldering Heat	No deformation of components affecting performance.	Through Hole	Flow : 260°C for 10 seconds	Manual soldering : 300°C for 2 seconds
		SMT	Reflow : At the recommended temperature profile	Manual soldering : 300°C for 3 seconds

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

When isolating power lines into multiple circuits, current ratings may go above the stated current ratings.

Please consult Hirose for details before doing this. Current rating of header is 2A.

Note 2 : Includes the temperature rise due to current flow.

Note 3 : The connector should be completely dry. (no condensation)

Note 4 : The term "storage" refers to the long-term storage condition of unused products before PCB mounting.

The operating temperature and humidity ranges apply while the connector is in a non-energized state, while in transport or after PCB mounting.

Note 5 : Information contained in this catalog represents general requirements for this Series.

Contact us for the drawings and specifications for a specific part number shown.

Material / Finish

Product Type	Part	Material	Finish	Remarks
Crimping Socket	Insulator	Polyamide	Black	UL94V-0
Crimping Contact for Socket	Contact	Phosphor Copper	Tin Plated or Gold Plated	-
Receptacle	Insulator	Polyamide	Black	UL94V-0
	Contact	Phosphor Copper	Tin Plated or Gold Plated	-
Pin Header	Insulator	Polyamide	Black	UL94V-0
	Contact	Brass	Tin Plated or Gold Plated	-
SMT Header	Insulator	Polyamide	Beige	UL94V-0
	Contact	Brass	Tin Plated or Gold Plated	-
	Retention Tab	Brass	Tin Plated	-
In-line Plug	Insulator	Polyamide	Black	UL94V-0
In-line Plug Crimping Contact	Contact	Phosphor Copper	Tin Plated or Gold 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

DF11 - # DS - 2 C

① ② ③ ④ ⑤

① Series Name	DF11	⑤ Connection Form/ Contact Style	C : Crimping Socket DSA : Straight Through Hole DS : Right Angle Through Hole V : Straight SMT
② No. of Pos.	4 to 32		
③ Connector Type	DS : Double Row Socket DP : Double Row Pin Header DEP : Double Row In-line Plug		
④ Contact Pitch	2mm		

● Contact

DF11 - EP 2428 PCF A

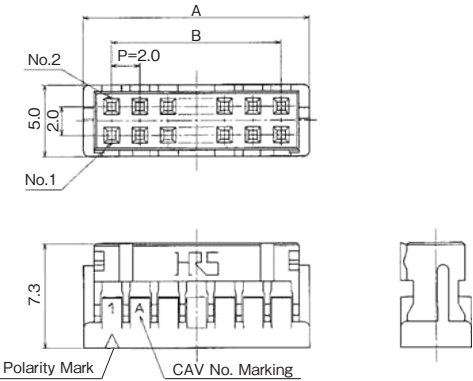
① ② ③ ④

① Contact Type	EP : For In-line Plug	④ Plating Type	Blank : Tin Plated A : Gold Plated
② Applicable Wire Size	22 : 22 AWG 2428 : 24 to 28 AWG 30 : 30 AWG		
③ Contact Type/ Packaging Type	SCF : Socket Contact, Embossed Tape SC : Socket Contact, Bag PCF : Plug Contact, Embossed Tape PC : Plug Contact, Bag		

Crimping Socket



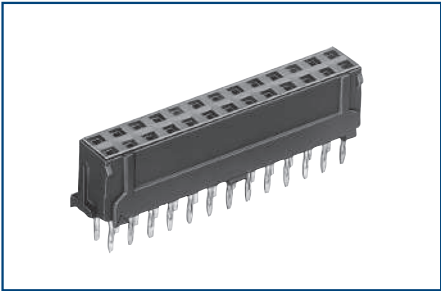
Shown Assembled with Cable



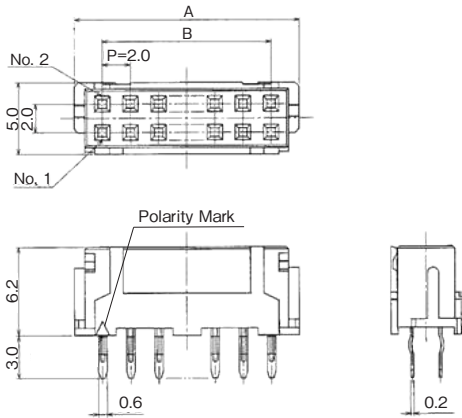
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF11-4DS-2C	CL0543-0568-6-00	4	6.0	2.0	100pcs per bag
DF11-6DS-2C	CL0543-0502-8-00	6	8.0	4.0	
DF11-8DS-2C	CL0543-0503-0-00	8	10.0	6.0	
DF11-10DS-2C	CL0543-0504-3-00	10	12.0	8.0	
DF11-12DS-2C	CL0543-0505-6-00	12	14.0	10.0	
DF11-14DS-2C	CL0543-0506-9-00	14	16.0	12.0	
DF11-16DS-2C	CL0543-0507-1-00	16	18.0	14.0	
DF11-18DS-2C	CL0543-0508-4-00	18	20.0	16.0	
DF11-20DS-2C	CL0543-0509-7-00	20	22.0	18.0	
DF11-22DS-2C	CL0543-0510-6-00	22	24.0	20.0	
DF11-24DS-2C	CL0543-0511-9-00	24	26.0	22.0	
DF11-26DS-2C	CL0543-0512-1-00	26	28.0	24.0	
DF11-28DS-2C	CL0543-0513-4-00	28	30.0	26.0	
DF11-30DS-2C	CL0543-0514-7-00	30	32.0	28.0	
DF11-32DS-2C	CL0543-0515-0-00	32	34.0	30.0	

Receptacle (Through Hole)



- Board Through-hole Diameter : $\phi 0.8^{+0.1}_0$
- Diameter of Board Hole for Kink Pin Securing : $\phi 0.8^{+0.05}_0$

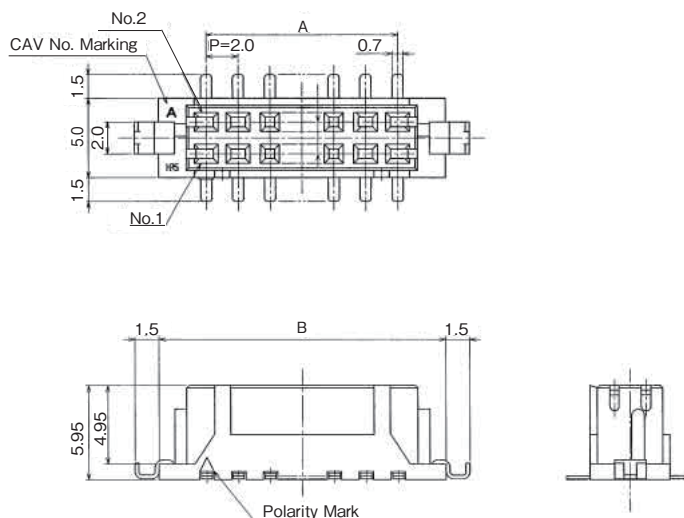
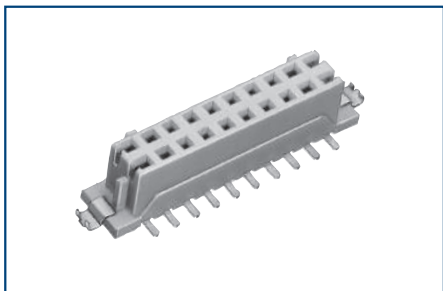


Unit : mm

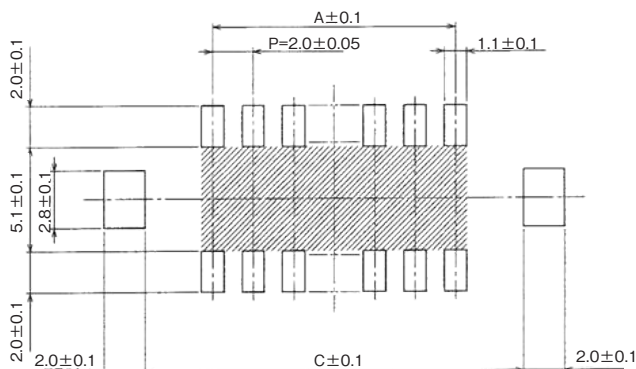
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF11-6DS-2DSA(##)	CL0543-0553-9-##	6	8.0	4.0	100pcs per bag
DF11-8DS-2DSA(##)	CL0543-0554-1-##	8	10.0	6.0	
DF11-10DS-2DSA(##)	CL0543-0555-4-##	10	12.0	8.0	
DF11-12DS-2DSA(##)	CL0543-0556-7-##	12	14.0	10.0	
DF11-14DS-2DSA(##)	CL0543-0557-0-##	14	16.0	12.0	
DF11-16DS-2DSA(##)	CL0543-0558-2-##	16	18.0	14.0	
DF11-18DS-2DSA(##)	CL0543-0559-5-##	18	20.0	16.0	
DF11-20DS-2DSA(##)	CL0543-0560-4-##	20	22.0	18.0	
DF11-22DS-2DSA(##)	CL0543-0561-7-##	22	24.0	20.0	
DF11-24DS-2DSA(##)	CL0543-0562-0-##	24	26.0	22.0	
DF11-26DS-2DSA(##)	CL0543-0563-2-##	26	28.0	24.0	
DF11-28DS-2DSA(##)	CL0543-0564-5-##	28	30.0	26.0	
DF11-30DS-2DSA(##)	CL0543-0565-8-##	30	32.0	28.0	
DF11-32DS-2DSA(##)	CL0543-0566-0-##	32	34.0	30.0	

[Specific No.] -##,(##)
(05) : Tin Plated
(06) : Gold Plated

Receptacle (SMT)



PCB Mounting Pattern



Note : If the shaded area has a pattern and is not treated with resist it may touch the connector contact.

Unit : mm

Tin Plated		Gold Plated		No. of Pos.	A	B	C	Purchase Unit
Part No.	HRS No.	Part No.	HRS No.					
DF11CZ-4DS-2V(22)	CL0543-2063-0-22	-	-	4	2.0	8.5	8.7	500pcs per reel
DF11CZ-6DS-2V(22)	CL0543-2064-3-22	DF11CZ-6DS-2V(52)	CL0543-2064-3-52	6	4.0	10.5	10.7	
DF11CZ-8DS-2V(22)	CL0543-2065-6-22	DF11CZ-8DS-2V(52)	CL0543-2065-6-52	8	6.0	12.5	12.7	
DF11CZ-10DS-2V(22)	CL0543-2066-9-22	DF11CZ-10DS-2V(52)	CL0543-2066-9-52	10	8.0	14.5	14.7	
DF11CZ-12DS-2V(22)	CL0543-2067-1-22	DF11CZ-12DS-2V(52)	CL0543-2067-1-52	12	10.0	16.5	16.7	
DF11CZ-14DS-2V(22)	CL0543-2068-4-22	DF11CZ-14DS-2V(52)	CL0543-2068-4-52	14	12.0	18.5	18.7	
DF11CZ-16DS-2V(22)	CL0543-2069-7-22	-	-	16	14.0	20.5	20.7	
DF11CZ-18DS-2V(22)	CL0543-2070-6-22	DF11CZ-18DS-2V(52)	CL0543-2070-6-52	18	16.0	22.5	22.7	
DF11CZ-20DS-2V(22)	CL0543-2071-9-22	DF11CZ-20DS-2V(52)	CL0543-2071-9-52	20	18.0	24.5	24.7	
DF11CZ-22DS-2V(22)	CL0543-2072-1-22	-	-	22	20.0	26.5	26.7	
DF11CZ-24DS-2V(22)	CL0543-2073-4-22	-	-	24	22.0	28.5	28.7	
DF11CZ-26DS-2V(22)	CL0543-2074-7-22	-	-	26	24.0	30.5	30.7	
DF11CZ-30DS-2V(22)	CL0543-2076-2-22	DF11CZ-30DS-2V(52)	CL0543-2076-2-52	30	28.0	34.5	34.7	

[Specific No.] -##, (##)

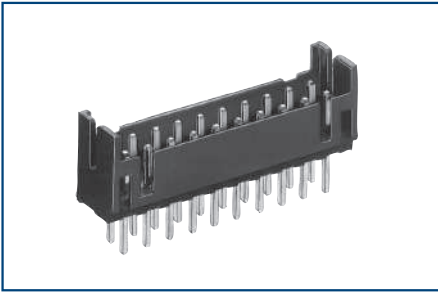
(22) : Tin Plated Embossed Tape Packaging (with Vacuum Pick-up Cap)

(52) : Gold Plated Embossed Tape Packaging (with Vacuum Pick-up Cap)

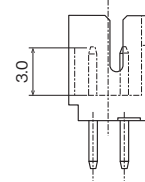
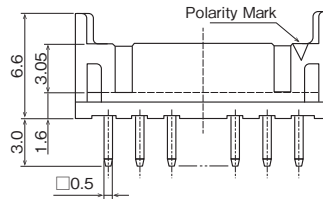
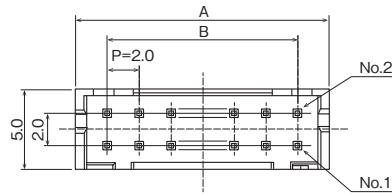
Note 1 : The 40pos. connector can only be combined with SMT products.

Note 2 : Embossed packaging products have the reel wrapped in polyethylene and include a desiccant.

Straight Pin Header



● Board Through-hole Diameter : $\phi 0.8^{+0.1}_0$



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit (##) : (01)	Purchase Unit (##) : (08)	Purchase Unit (##) : (24)
DF11-4DP-2DSA(##)	CL0543-0517-5-##	4	6.0	2.0	100pcs per bag	100pcs per bag	81pcs per tube
DF11-6DP-2DSA(##)	CL0543-0518-8-##	6	8.0	4.0			61pcs per tube
DF11-8DP-2DSA(##)	CL0543-0519-0-##	8	10.0	6.0			49pcs per tube
DF11-10DP-2DSA(##)	CL0543-0520-0-##	10	12.0	8.0			40pcs per tube
DF11-12DP-2DSA(##)	CL0543-0521-2-##	12	14.0	10.0			34pcs per tube
DF11-14DP-2DSA(##)	CL0543-0522-5-##	14	16.0	12.0			30pc per tube
DF11-16DP-2DSA(##)	CL0543-0523-8-##	16	18.0	14.0			27pcs per tube
DF11-18DP-2DSA(##)	CL0543-0524-0-##	18	20.0	16.0			24pcs per tube
DF11-20DP-2DSA(##)	CL0543-0525-3-##	20	22.0	18.0			22pcs per tube
DF11-22DP-2DSA(##)	CL0543-0526-6-##	22	24.0	20.0			20pcs per tube
DF11-24DP-2DSA(##)	CL0543-0527-9-##	24	26.0	22.0			18pcs per tube
DF11-26DP-2DSA(##)	CL0543-0528-1-##	26	28.0	24.0			17pcs per tube
DF11-28DP-2DSA(##)	CL0543-0529-4-##	28	30.0	26.0			16pcs per tube
DF11-30DP-2DSA(##)	CL0543-0530-3-##	30	32.0	28.0			15pcs per tube
DF11-32DP-2DSA(##)	CL0543-0531-6-##	32	34.0	30.0			14pcs per tube

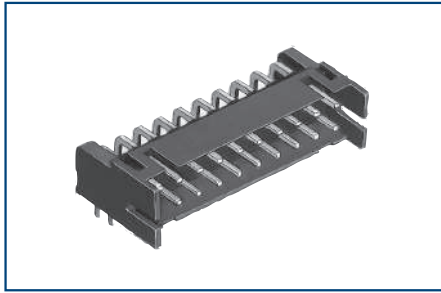
[Specific No.] -##,(##)

(01) : Gold Plated

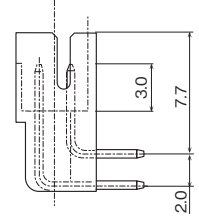
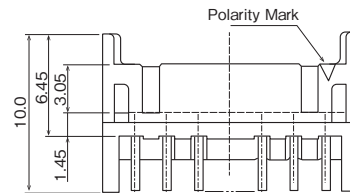
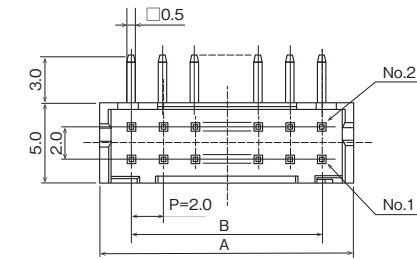
(08) : Tin Plated

(24) : Tin Plated

Right Angle Pin Header



● Board Through-hole Diameter : $\phi 0.8^{+0.1}_0$



Unit : mm

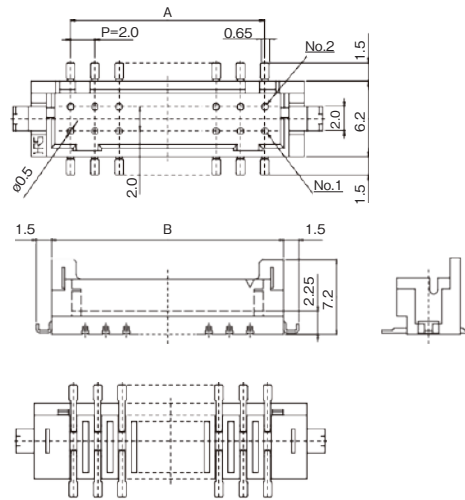
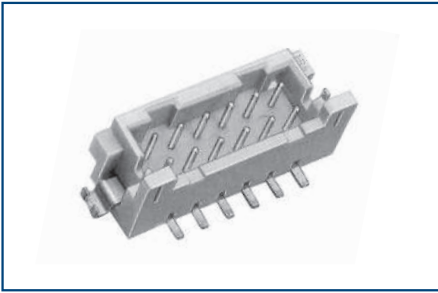
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF11-4DP-2DS(##)	CL0543-0533-1-##	4	6.0	2.0	81pcs per tube
DF11-6DP-2DS(##)	CL0543-0534-4-##	6	8.0	4.0	61pcs per tube
DF11-8DP-2DS(##)	CL0543-0535-7-##	8	10.0	6.0	48pcs per tube
DF11-10DP-2DS(##)	CL0543-0536-0-##	10	12.0	8.0	40pcs per tube
DF11-12DP-2DS(##)	CL0543-0537-2-##	12	14.0	10.0	34pcs per tube
DF11-14DP-2DS(##)	CL0543-0538-5-##	14	16.0	12.0	30pcs per tube
DF11-16DP-2DS(##)	CL0543-0539-8-##	16	18.0	14.0	27pcs per tube
DF11-18DP-2DS(##)	CL0543-0540-7-##	18	20.0	16.0	24pcs per tube
DF11-20DP-2DS(##)	CL0543-0541-0-##	20	22.0	18.0	22pcs per tube
DF11-22DP-2DS(##)	CL0543-0542-2-##	22	24.0	20.0	20pcs per tube
DF11-24DP-2DS(##)	CL0543-0543-5-##	24	26.0	22.0	18pcs per tube
DF11-26DP-2DS(##)	CL0543-0544-8-##	26	28.0	24.0	17pcs per tube
DF11-28DP-2DS(##)	CL0543-0545-0-##	28	30.0	26.0	16pcs per tube
DF11-30DP-2DS(##)	CL0543-0546-3-##	30	32.0	28.0	15pcs per tube
DF11-32DP-2DS(##)	CL0543-0547-6-##	32	34.0	30.0	14pcs per tube

[Specific No.] -##,(##)

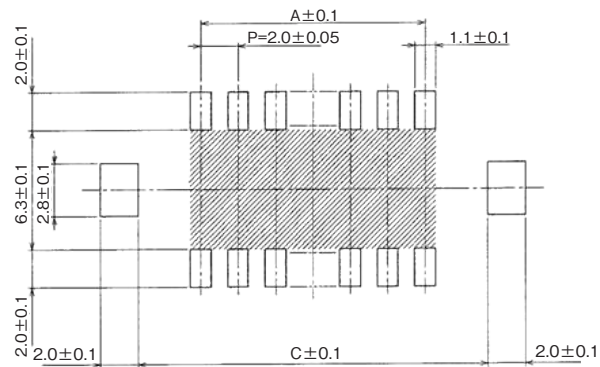
(24) : Tin Plated

(52) : Gold Plated

Straight Pin Header (SMT)



PCB Mounting Pattern



Note : If the shaded area has a pattern and is not treated with resist it may touch the connector contact.

Unit : mm

Tin Plated		Gold Plated		No. of Pos.	A	B	C	Purchase Unit
Part No.	HRS No.	Part No.	HRS No.					
DF11CZ-4DP-2V(27)	CL0543-2047-4-27	DF11C-4DP-2V(57)	CL0543-0682-1-57	4	2.0	8.5	8.7	500pcs per reel
DF11CZ-6DP-2V(27)	CL0543-2048-7-27	DF11C-6DP-2V(57)	CL0543-0683-4-57	6	4.0	10.5	10.7	
DF11CZ-8DP-2V(27)	CL0543-2049-0-27	DF11C-8DP-2V(57)	CL0543-0684-7-57	8	6.0	12.5	12.7	
DF11CZ-10DP-2V(27)	CL0543-2050-9-27	DF11C-10DP-2V(57)	CL0543-0685-0-57	10	8.0	14.5	14.7	
DF11CZ-12DP-2V(27)	CL0543-2051-1-27	DF11C-12DP-2V(57)	CL0543-0686-2-57	12	10.0	16.5	16.7	
DF11CZ-14DP-2V(27)	CL0543-2052-4-27	DF11C-14DP-2V(57)	CL0543-0687-5-57	14	12.0	18.5	18.7	
DF11CZ-16DP-2V(27)	CL0543-2053-7-27	DF11C-16DP-2V(57)	CL0543-0688-8-57	16	14.0	20.5	20.7	
DF11CZ-18DP-2V(27)	CL0543-2054-0-27	DF11C-18DP-2V(57)	CL0543-0689-0-57	18	16.0	22.5	22.7	
DF11CZ-20DP-2V(27)	CL0543-2055-2-27	DF11C-20DP-2V(57)	CL0543-0690-0-57	20	18.0	24.5	24.7	
DF11CZ-22DP-2V(27)	CL0543-2056-5-27	DF11C-22DP-2V(57)	CL0543-0691-2-57	22	20.0	26.5	26.7	
DF11CZ-24DP-2V(27)	CL0543-2057-8-27	DF11C-24DP-2V(57)	CL0543-0692-5-57	24	22.0	28.5	28.7	
DF11CZ-26DP-2V(27)	CL0543-2058-0-27	DF11C-26DP-2V(57)	CL0543-0693-8-57	26	24.0	30.5	30.7	
DF11CZ-28DP-2V(27)	CL0543-2059-3-27	DF11C-28DP-2V(57)	CL0543-0694-0-57	28	26.0	32.5	32.7	
DF11CZ-30DP-2V(27)	CL0543-2060-2-27	DF11C-30DP-2V(57)	CL0543-0695-3-57	30	28.0	34.5	34.7	
DF11CZ-32DP-2V(27)	CL0543-2061-5-27	DF11C-32DP-2V(57)	CL0543-0696-6-57	32	30.0	36.5	36.7	

[Specific No.] - ##.(##)

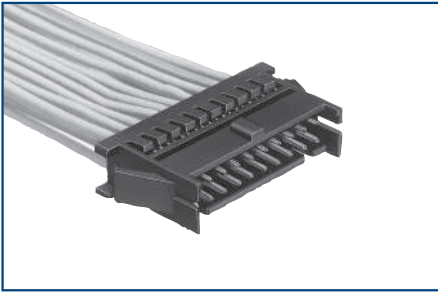
(27) : Tin Plated Embossed Tape Packaging (with Vacuum Pick-up Cap)

(57) : Gold Plated Embossed Tape Packaging (with Vacuum Pick-up Cap)

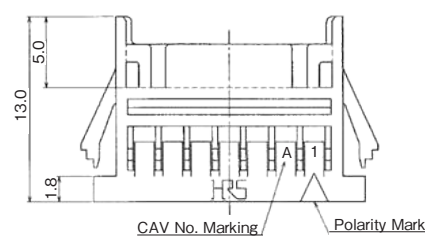
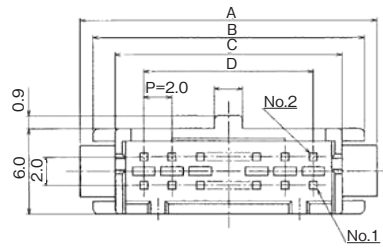
Note 1 : Embossed packaging products have the reel wrapped in polyethylene and include a desiccant.

Note 2 : There may be blisters on the mold surfaces excluding the mating face during mounting. However this does not affect the product performance.

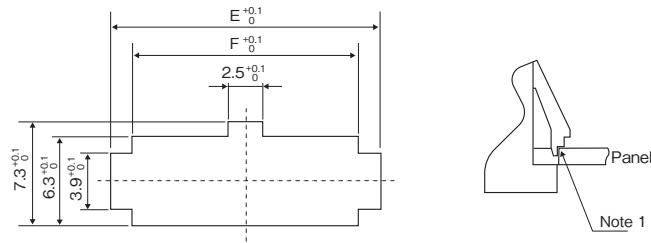
In-line Plug



Shown Assembled with Cable



In-line Plug Panel Cutouts



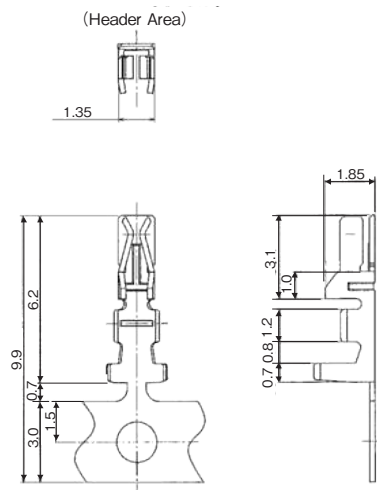
Note 1 : Please use the non-radius side for the panel hooking area.

Note 2 : Applicable panel thickness is 1.6 to 1.0mm

(Slight misalignment may occur for the panel thicknesses excluding 1.6 and 1.2mm.)

Unit : mm									Purchase Unit
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	F	
DF11-4DEP-2C	CL0543-0619-5-00	4	11.0	9.2	6.0	2.0	9.4	6.3	100pcs per bag
DF11-6DEP-2C	CL0543-0620-4-00	6	13.0	11.2	8.0	4.0	11.4	8.3	
DF11-8DEP-2C	CL0543-0621-7-00	8	15.0	13.2	10.0	6.0	13.4	10.3	
DF11-10DEP-2C	CL0543-0622-0-00	10	17.0	15.2	12.0	8.0	15.4	12.3	
DF11-12DEP-2C	CL0543-0623-2-00	12	19.0	17.2	14.0	10.0	17.4	14.3	
DF11-14DEP-2C	CL0543-0624-5-00	14	21.0	19.2	16.0	12.0	19.4	16.3	
DF11-16DEP-2C	CL0543-0625-8-00	16	23.0	21.2	18.0	14.0	21.4	18.3	
DF11-18DEP-2C	CL0543-0626-0-00	18	25.0	23.2	20.0	16.0	23.4	20.3	
DF11-20DEP-2C	CL0543-0627-3-00	20	27.0	25.2	22.0	18.0	25.4	22.3	
DF11-22DEP-2C	CL0543-0628-6-00	22	29.0	27.2	24.0	20.0	27.4	24.3	
DF11-24DEP-2C	CL0543-0629-9-00	24	31.0	29.2	26.0	22.0	29.4	26.3	
DF11-26DEP-2C	CL0543-0630-8-00	26	33.0	31.2	28.0	24.0	31.4	28.3	
DF11-28DEP-2C	CL0543-0631-0-00	28	35.0	33.2	30.0	26.0	33.4	30.3	
DF11-30DEP-2C	CL0543-0632-3-00	30	37.0	35.2	32.0	28.0	35.4	32.3	
DF11-32DEP-2C	CL0543-0633-6-00	32	39.0	37.2	34.0	30.0	37.4	34.3	

Crimping Contact for Socket



◆ Reel Contact (Applicable Tool : Applicator)

Part No.	HRS No.	Finish	Purchase Unit	Applicable Wire (Tin Plated Annealed Copper Wire) (Note 2)				
				UL	Wire Size	Standed Wire Conductor	Calculated Cross-section	Jacket Outer Dia.
DF11-22SCF	CL0543-0601-0-00	Tin Plated	10,000pcs per reel	1061	22 AWG	17 / 0.16mm	0.342mm ²	1.2 to 1.45mm
DF11-22SCFA(04)	CL0543-0603-5-04	Gold Plated		1061	22 AWG	17 / 0.16mm	0.342mm ²	1.2 to 1.45mm
DF11-2428SCF	CL0543-0500-2-00	Tin Plated		1061, 1007	24 AWG 26 AWG 28 AWG	11 / 0.16mm 7 / 0.16mm 7 / 0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	0.9 to 1.45mm
DF11A-2428SCF (Note 1)	CL0543-0634-9-00	Tin Plated		1061, 1007	24 AWG 26 AWG 28 AWG	11 / 0.16mm 7 / 0.16mm 7 / 0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	0.9 to 1.45mm
DF11-2428SCFA(04)	CL0543-0550-0-04	Gold Plated		1061, 1007	24 AWG 26 AWG 28 AWG	11 / 0.16mm 7 / 0.16mm 7 / 0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	0.9 to 1.45mm
DF11-30SCF	CL0543-0605-0-00	Tin Plated		1061, 1007	30 AWG	7 / 0.1mm	0.055mm ²	0.75 to 1.2mm
DF11-30SCFA(04)	CL0543-0607-6-04	Gold Plated		1061, 1007	30 AWG	7 / 0.1mm	0.055mm ²	0.75 to 1.2mm

● Strip Length : 1.7 to 2.3mm

Note 1 : DF11A-2428SCF is the low insertion/extraction tin plated type.

Note 2 : Contact your Hirose representative if considering use of non-specified cables.

Note 3 : The strip length is a reference value. Adjust so that each dimension after crimping meets the specified value.

Refer to the Crimp Quality Standard (ETAD-H0773-00) for details.

◆ Loose Contact (Applicable Tool : Hand Crimping Tool)

Part No.	HRS No.	Finish	Purchase Unit	Applicable Wire (Tin Plated Annealed Copper Wire) (Note 2)				
				UL	Wire Size	Standed Wire Conductor	Calculated Cross-section	Jacket Outer Dia.
DF11-22SC	CL0543-0602-2-00	Tin Plated	100pcs per bag	1061	22 AWG	17 / 0.16mm	0.342mm ²	1.3mm
DF11-22SCA	CL0543-0604-8-00	Gold Plated		1061	22 AWG	17 / 0.16mm	0.342mm ²	1.3mm
DF11-2428SC	CL0543-0501-5-00	Tin Plated		1061	24 AWG	11 / 0.16mm	0.221mm ²	1.1mm
					26 AWG	7 / 0.16mm	0.141mm ²	1.0mm
					28 AWG	7 / 0.127mm	0.089mm ²	0.9mm
				1007	24 AWG	11 / 0.16mm	0.221mm ²	1.45mm
					26 AWG	7 / 0.16mm	0.141mm ²	1.3mm
					28 AWG	7 / 0.127mm	0.089mm ²	1.2mm
DF11A-2428SC (Note 1)	CL0543-0635-1-00	Tin Plated		1061	24 AWG	11 / 0.16mm	0.221mm ²	1.1mm
					26 AWG	7 / 0.16mm	0.141mm ²	1.0mm
				28 AWG	7 / 0.127mm	0.089mm ²	0.9mm	
			1007	24 AWG	11 / 0.16mm	0.221mm ²	1.45mm	
				26 AWG	7 / 0.16mm	0.141mm ²	1.3mm	
				28 AWG	7 / 0.127mm	0.089mm ²	1.2mm	
DF11-2428SCA	CL0543-0551-3-00	Gold Plated	1061	24 AWG	11 / 0.16mm	0.221mm ²	1.1mm	
				26 AWG	7 / 0.16mm	0.141mm ²	1.0mm	
				28 AWG	7 / 0.127mm	0.089mm ²	0.9mm	
			1007	24 AWG	11 / 0.16mm	0.221mm ²	1.45mm	
				26 AWG	7 / 0.16mm	0.141mm ²	1.3mm	
				28 AWG	7 / 0.127mm	0.089mm ²	1.2mm	
DF11-30SC	CL0543-0606-3-00	Tin Plated		1061	30 AWG	7 / 0.1mm	0.055mm ²	0.8mm
DF11-30SCA	CL0543-0608-9-00	Gold Plated		1061	30 AWG	7 / 0.1mm	0.055mm ²	0.8mm

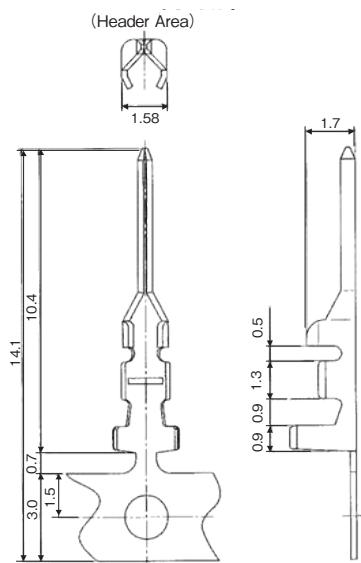
Note 1 : DF11A-2428SC is the low insertion/extraction tin plated type.

Note 2 : When crimping using a hand crimping tool, only the above wires are applicable.

Note 3 : The strip length is a reference value. Adjust so that each dimension after crimping meets the specified value.

Refer to the Crimp Quality Standard (ETAD-H0773-00) for details.

Crimping Contact for In-line Plug



◆ Reel Contact (Applicable Tool : Applicator)

Part No.	HRS No.	Finish	Purchase Unit	Applicable Wire (Tin Plated Annealed Copper Wire) (Note 1)				
				UL	Wire Size	Standed Wire Conductor	Calculated Cross-section	Jacket Outer Dia.
DF11-EP2428PCF	CL0543-0615-4-00	Tin Plated	10,000pcs per reel	1061, 1007	24 AWG 26 AWG 28 AWG	11 / 0.16mm 7 / 0.16mm 7 / 0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	0.9 to 1.45mm
DF11-EP2428PCFA	CL0543-0617-0-00	Gold Plated		1061, 1007	24 AWG 26 AWG 28 AWG	11 / 0.16mm 7 / 0.16mm 7 / 0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	0.9 to 1.45mm

● Strip Length : 1.9 to 2.3mm

Note 1 : Contact your Hirose representative if considering use of non-specified cables.

Note 2 : The strip length is a reference value. Adjust so that each dimension after crimping meets the specified value.

Refer to the Crimp Quality Standard (ETAD-H0935-00) for details.

◆ Loose Contact (Applicable Tool : Hand Crimping Tool)

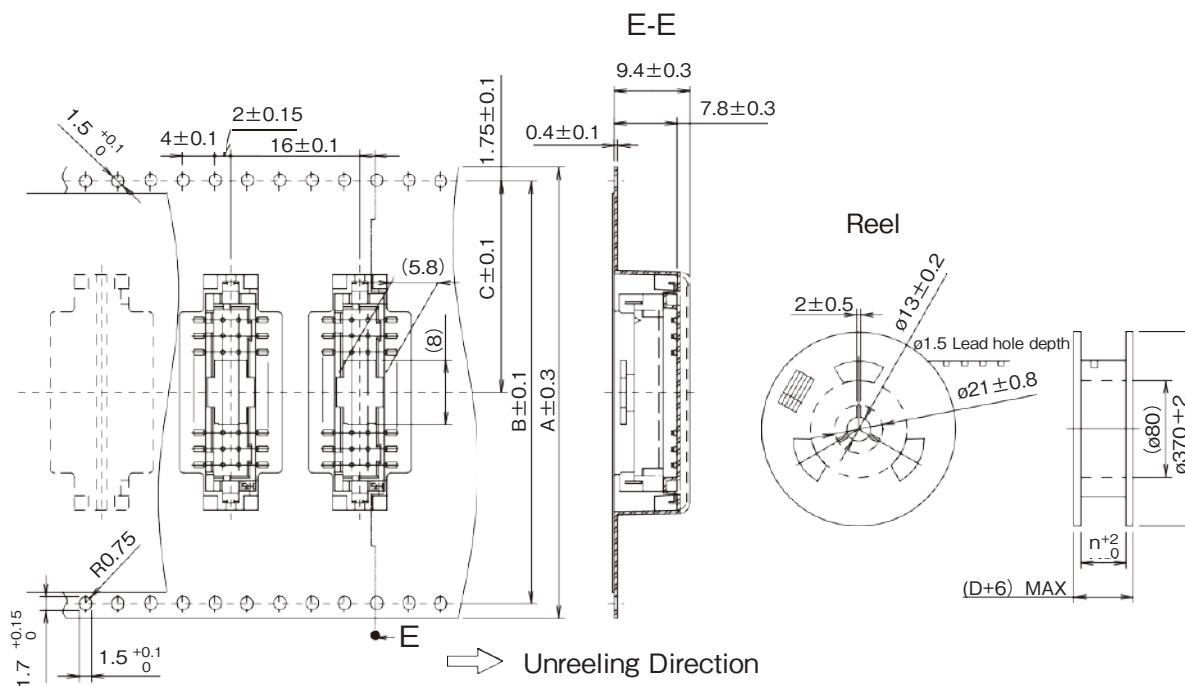
Part No.	HRS No.	Finish	Purchase Unit	Applicable Wire (Tin Plated Annealed Copper Wire) (Note 1)				
				UL	Wire Size	Standed Wire Conductor	Calculated Cross-section	Jacket Outer Dia.
DF11-EP2428PC	CL0543-0616-7-00	Tin Plated	100pcs per bag	1007	24 AWG 26 AWG 28 AWG	11 / 0.16mm 7 / 0.16mm 7 / 0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	1.45mm 1.3mm 1.2mm
DF11-EP2428PCA	CL0543-0618-2-00	Gold Plated		1007	24 AWG 26 AWG 28 AWG	11 / 0.16mm 7 / 0.16mm 7 / 0.127mm	0.221mm ² 0.141mm ² 0.089mm ²	1.45mm 1.3mm 1.2mm

Note 1 : When crimping using a hand crimping tool, only the above wires are applicable.

Note 2 : The strip length is a reference value. Adjust so that each dimension after crimping meets the specified value.

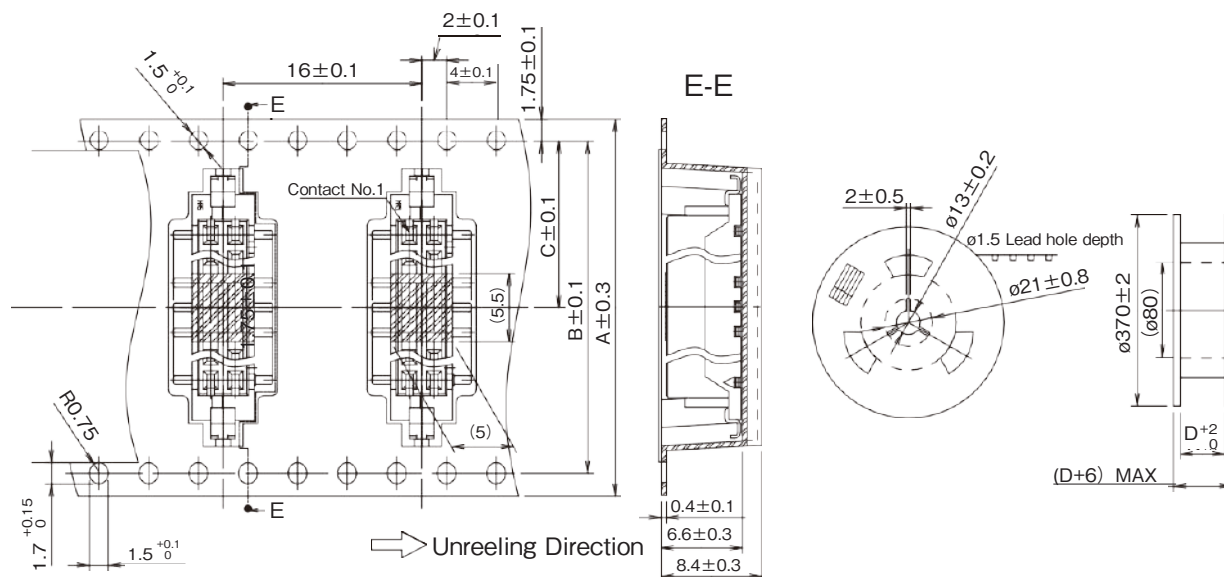
Refer to the Crimp Quality Standard (ETAD-H0935-00) for details.

- Straight Pin Header (SMT)



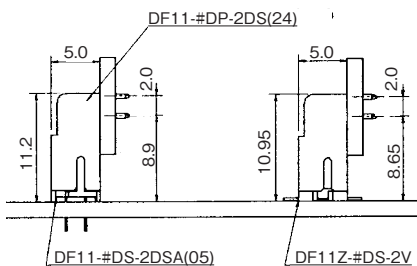
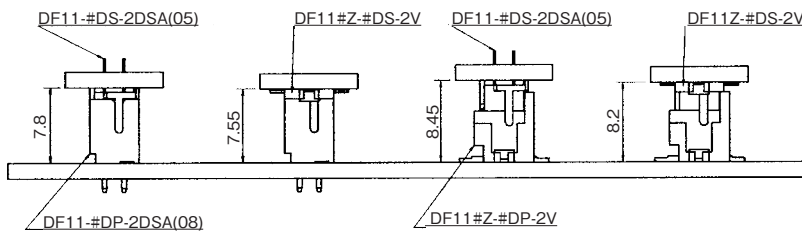
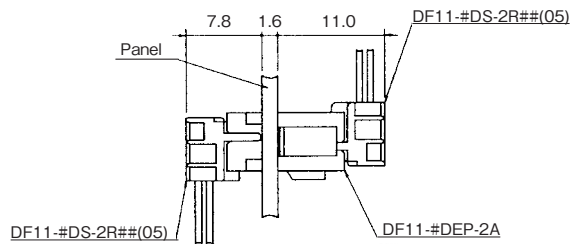
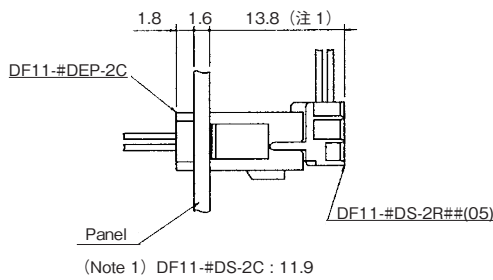
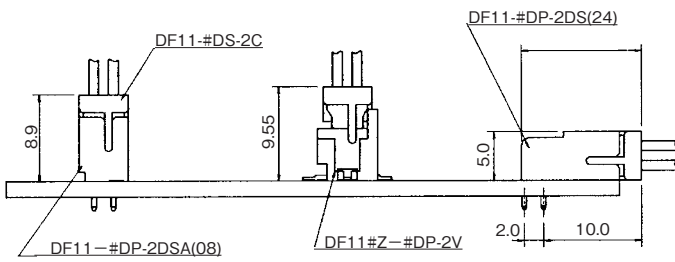
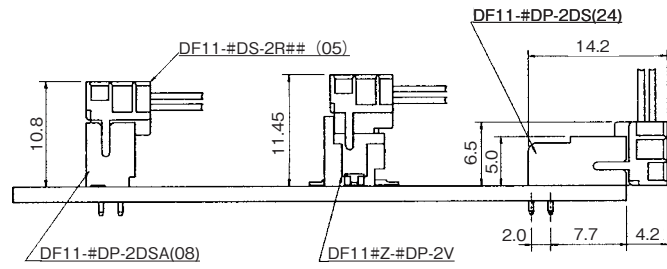
Product Type	No. of Pos.	A	B	C	D
DF11CZ-##DP-2V(27) DF11C-##DP-2V(57)	4 to 8	24.0	-	11.5	24.4
	10 to 12	32.0	28.4	14.2	32.4
	14 to 22	44.0	40.4	20.2	44.4
	24 to 32	56.0	52.4	26.2	56.4
	40	72.0	68.4	34.2	72.4

Oct.1.2023 Copyright 2023 HIROSE ELECTRIC CO., LTD. All Rights Reserved.



					Unit : mm
Product Type	No. of Pos.	A	B	C	D
DF11CZ-##DS-2V	4 to 8	24.0	-	11.5	24.4
	10 to 12	32.0	28.4	14.2	32.4
	14 to 18	44.0	40.4	20.2	44.4
	20	56.0	52.4	26.2	56.4
	22	44.0	40.4	20.2	44.4
	24 to 32	56.0	52.4	26.2	56.4
	40	72.0	68.4	34.2	72.4

Application Pattern



Applicable Crimping Tool

Type	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF11-22S	CL0901-4529-7-00	DF11-22SCF DF11-22SCFA(04)
	AP105-DF11-2428S	CL0901-4511-1-00	DF11-2428SCF DF11A-2428SCF DF11-2428SCFA(04)
	AP105-DF11-30S	CL0901-4532-1-00	DF11-30SCF DF11-30SCFA(04)
	AP105-DF11-EP2428P	CL0901-4528-4-00	DF11-EP2428PCF DF11-EP2428PCFA
Press	CM-105C	CL0901-0001-0-00	—
Hand Crimping Tool	HT801/DF11-22S(A)	CL0550-0407-5-00	DF11-22SC DF11-22SCA
	HT801/DF11-2428S(A)	CL0550-0403-4-00	DF11-2428SC DF11A-2428SC DF11-2428SCA
	HT801/DF11-30S(A)	CL0550-0408-8-00	DF11-30SC DF11-30SCA
	HT801/DF11-EP2428P(A)	CL0550-0409-0-00	DF11-EP2428PC DF11-EP2428PCA
Contact Extraction Tool	DF-C-PO(B)	CL0550-0179-2-00	DF11(A)-####SC(F)(A)(##) DF11-EP2428PC(F)(A)

Note 1 : Please do the crimping operations according to the table in the Crimp Quality Standard (ETAD-H0773-00, ETAD-H0935-00).

Note 2 : Problems with tools other than those specified by Hirose are outside the scope of warranty.

Crimping

■ Items required prior to starting crimping

The work-related documents shown below are required before starting harness assembly.

(The ● mark represents required documents.)

Please contact your Hirose sales representative if you do not have these documents.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
Crimping Machine Main Unit Instruction Manual	Explanation of Main Press Machine Unit	●	-	Bundled with purchase of main press machine unit
Applicator Spare Parts Identification	Explanation for Applicator Installation	●	-	Bundled with purchase of applicator.
Crimp Conditions	Standard Crimp Height and Tensile Strength Values	●	-	
Crimp Quality Standards	Various Standards for Crimping Conditions	●	-	
Operating Instructions for Hand Tool	Crimp Height, Tensile Strength, and Other Inspection Items	-	●	Bundled with purchase of hand tool.
Harness Procedure Manual ETAD-H0965-00	Harness Procedure	●	●	Ask a Hirose sales personnel to provide them.

■ Tools

Use tools specified by Hirose for crimping.

*Crimping performed with tools other than those designated should be avoided as it may result in contact failure, disconnection of cable, etc.

*Operating instructions are available for the crimping machine and the applicator.

Be sure to carefully read the operating instructions manual before beginning work.

■ Applicable Cables

Check that the cables to be used are within the applicable range.

If you intend to use a cable other than those recommended, contact a sales representative.

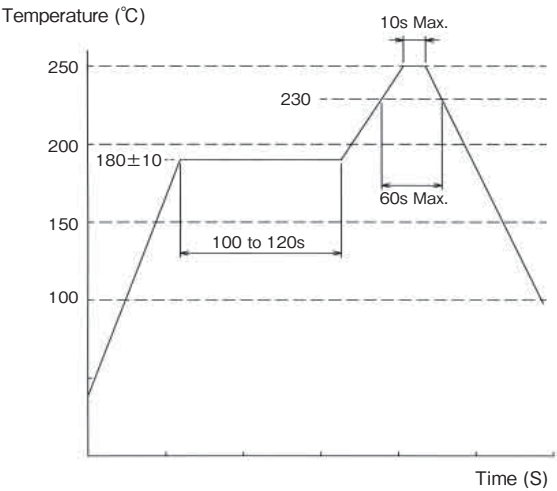
[Precautions]

- Cables applicable to crimping connectors are tin-plated stranded soft-copper wire.
- Avoid crimping solid wire, wires with polyester threads or tin coated wires.
- Avoid crimping two cables together.
- The crimp height setting values (Note 1) may vary between tin-plated and gold-plated terminals even if the same electric wires are used.
- The crimp height setting values (Note 1) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

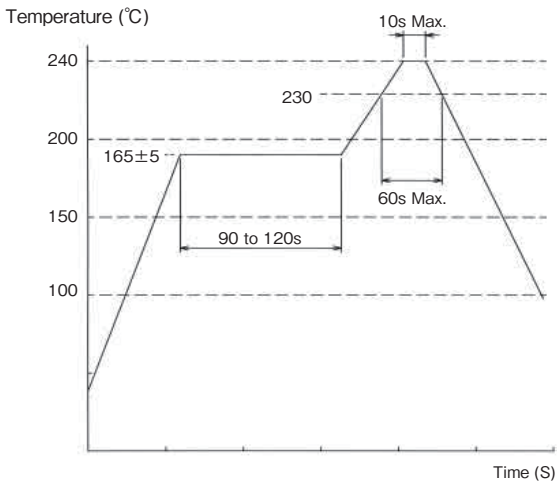
Note 1 : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

Precautions

1. Recommended Temperature Profile (SMT)



- 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.
- Note 2 : The temperature profile indicates the board surface temperature of the contact leads.
- Note 3 : This reflow profile is for the connectors packaged in embossed tape (reel), with desiccant in the package. (Within 168 hours of opening)

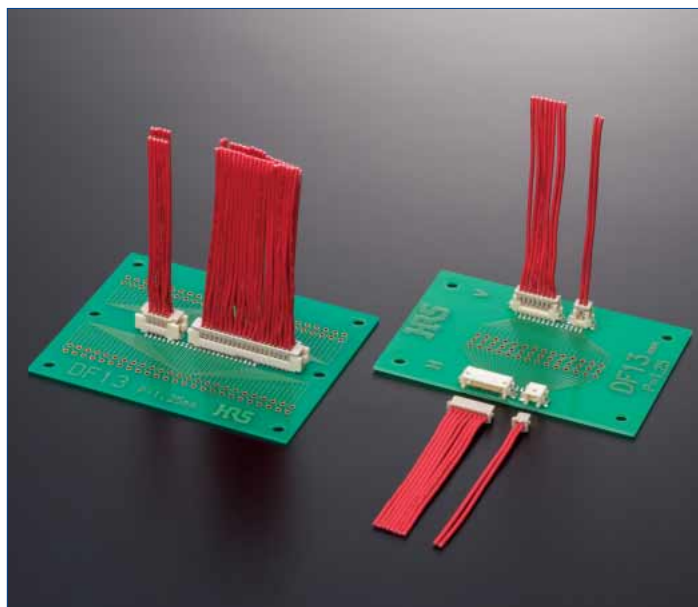


- Note 4 : Reflow temperature conditions for embossed packaged products without desiccant and for embossed packaged products with desiccant that have been opened 168 hours ago or longer.

2. Recommended Manual Soldering Condition (SMT)	Soldering iron temperature: $290 \pm 10^{\circ}\text{C}$, Soldering time: Within 2 seconds
3. Recommended Screen Thickness (SMT)	0.15 to 0.2mm
4. Board Warpage (SMT)	Based on the both connector edges, 0.03mm Max. is allowed in the connector center area.
5. Recommended Soldering Condition (Through-hole)	Flow : $250 \pm 5^{\circ}\text{C}$ for 10 seconds Manual soldering : Soldering iron temperature $290 \pm 10^{\circ}\text{C}$ for 2 seconds
6. Cleaning Condition	Refer to the "Board-to-Wire Connector Guidelines".
7. Connection Condition	Refer to the "Board-to-Wire Connector Guidelines".
8. Precautions	■ When inserting the crimp terminal into the IDC socket, do not insert diagonally in order to maintain performance reliability. ■ Refer to the DF11 Series Cable Assembly Procedure (ETAD-H0965-00), DF11#-##SC##(##) Crimp Quality Standard (ETAD-H0773-00), DF11#-EP####PC##(##) (ETAD-H0935-00) and Crimp Condition for the cable assembly procedures. ■ Please refrain from insertion and removal when not mounted to the board as it may result in damage or deformation of the contacts. ■ Do not remove the product by holding the cable as it may result in damage. ■ When soldering by hand do not apply flux that may result in flux rising. ■ There may be slight variation in the mold coloration based on production lot but this does not affect the product performance. ■ Black spots may appear on the mold resin but this does not affect the product quality.
9. Handling Instructions	Refer to the following documents when handling this product. ■ Crimp Quality Standard (ETAD-H0773-00, ETAD-H0935-00) ■ Cable Assembly Procedure (ETAD-H0965-00) ■ Board-to-Wire Connector Guidelines : ETAD-H1023-00

1.25mm Pitch Miniature Crimping Connector (UL Listed)

DF13 Series



	Type	Mounting Type	Mounting Height(h)
Straight Type	DIP		5.3mm
	SMT		5.8mm
Right Angle Type	DIP		3.6mm
	SMT		

■Features

1. Miniature Size

Designed in the low profile at mounting height 5.8mm.
(SMT mounting straight type)
(For DIP type, the mounting height is to 5.3mm to the straight and 3.6mm at the right angle)

2. Multi-contact

The double row type achieves the multi-contact up to 40 contacts, and secures 30% higher density in the mounting area, compared with the single row type.

3. Correspond to Automatic Mounting

The header provides the grade with the vacuum absorption area, and secures automatic mounting by the embossed tape packaging.

In addition, the tube packaging can be selected. (Fig.1)

4. Integral Basic Function Despite Miniature Size

The header is designed in a scoop-proof box structure, and completely prevents mis-insertion.

In addition, the surface mounting (SMT) header is equipped with the metal fitting to prevent solder peeling. (Fig.1)

5. UL Certified

■Applications

Note PC, mobile terminal, miniature type business equipment, and other various consumer equipment, including video camera

Correspond to Automatic Mounting
Secure the automatic plain area for the absorption type automatic mounting machine.

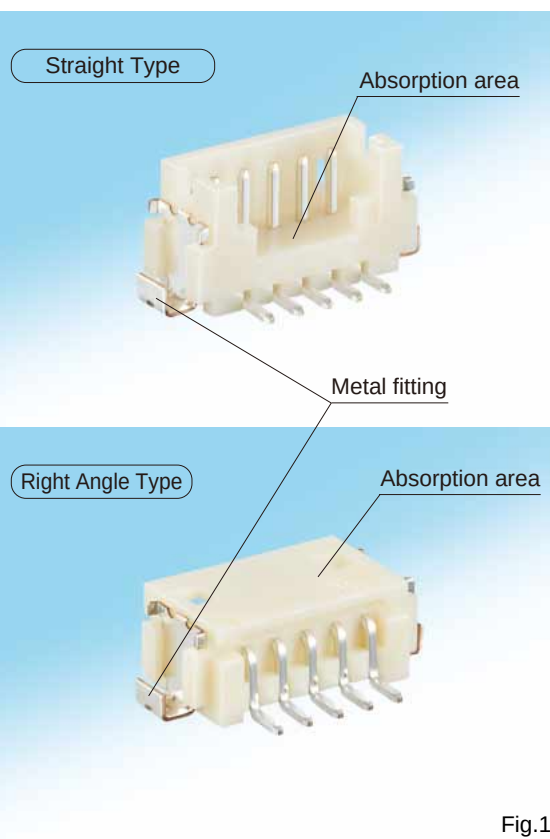


Fig.1

Product Specifications

Rating	Rated Current	Specification	2pos. 26 AWG : 2.5A/pin 28 AWG : 2.0A/pin 30 AWG : 1.0A/pin 32 AWG : 1.0A/pin Other pos. 1A/pin	Operating Temperature	-35 to +85°C (Note 1)	Storage Temperature	-10 to +60°C (Note 2)
		UL	1A/pin				
	Rated Voltage	Specification	150V AC/DC	Operating Humidity Range	20 to 80% (Note 3)	Storage Humidity Range	40 to 70% (Note 2)
		UL	29.9V AC/DC				

Item	Specification	Condition
1. Insulation Resistance	500MΩ min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown.	500V AC/1 minute
3. Contact Resistance	30mΩ max.	100mA
4. Vibration	No electrical discontinuity of 1μs or more	Frequency : 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 directions.
5. Humidity (Steady state)	Contact resistance : 30mΩ max. Insulation resistance : 500MΩ min.	96 hours at temperature of 40°C and humidity of 90% to 95%
6. Temperature Cycle	Contact resistance : 30mΩ max. Insulation resistance : 500MΩ min.	(-55°C : 30 minutes → 5 to 35°C : 10 minutes → 85°C : 30 minutes → 5 to 35°C : 10 minutes) 5 cycles
7. Durability (Mating/un-mating)	Contact resistance : 30mΩ max.	Tin plating : 30 cycles Gold plating : 50 cycles
8. Resistance to Soldering heat	No deformation of components affecting performance.	Flow : 250°C for 10 seconds
		Manual soldering : 300°C for 3 seconds
		Reflow : At the recommended temperature profile
		Manual soldering : 300°C for 3 seconds

Note 1 : Includes temperature rise caused by current flow.

Note 2 : The term "storage" refers to products 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.

Note 3 : Use without condensation on parts.

Note 4 : Information contained in this catalog represents general requirements for this Series.
Contact us for the drawings and specifications for a specific part number shown.

●UL File No. and Recognition
No. UL : E52653

Materials/Finish

Product	Part	Material	Finish	Remarks	RoHS2
Crimping Socket	Insulator	Polyamide	Beige	UL94V-0	Yes
Crimping Contact for Socket	Contact	Phosphor copper	Tin plated or gold plated	————	
Pin Header (Through hole)	Insulator	Polyamide	Beige	UL94V-0	
	Contact	Brass	Tin plated	————	
Pin Header (SMT Single row)	Insulator	Polyamide	Beige	UL94V-0	
	Contact	Brass	Tin plated or gold plated	————	
	Metal Fitting	Phosphor copper	Tin plated	————	
Pin Header (SMT Double row)	Insulator	Polyamide	Beige	UL94V-0	
	Contact	Brass	Tin plated or gold plated	————	
	Metal Fitting	Phosphor copper	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

DF13 - ***** **S** - **1.25** **C**

① ② ③ ④ ⑤

① Series Name : DF13	③ Connector Type S : Single row socket P : Single row pin header DS : Double row socket DP : Double row pin header	⑤ Connection Form / Contact Style. C : Crimping socket DSA : Straight through hole DS : Right angle through hole V : Straight SMT H : Right angle SMT
② Number of Contacts Single row : 2 to 12, 14, 15 Double row : 10, 20, 30, 40	④ Contact Pitch : 1.25mm	

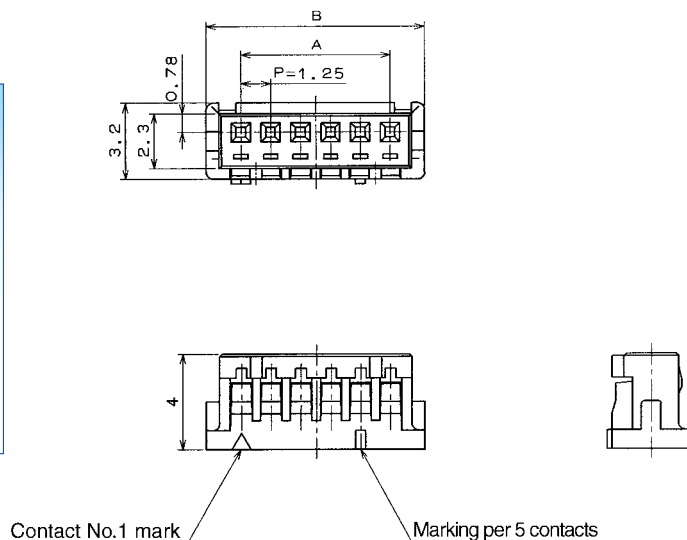
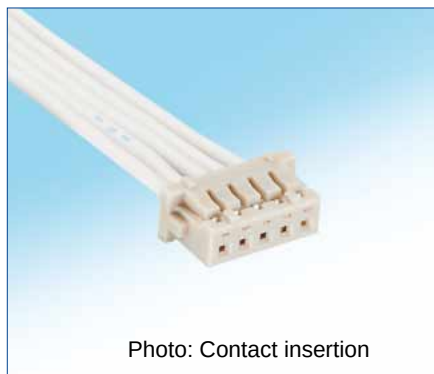
Contact

DF13 **#** - **2630** **SCF** **A**

① ② ③ ④

① Style Symbol Blank : Standard G : Low insertion / extraction	③ Packaging Type SCF : Socket Contact/Reel
② Applicable Cable Size 2630 : 26 to 30 AWG 3032 : 30 to 32 AWG	④ Plating Type Blank : Tin plated A : Gold plated

Single Row Socket



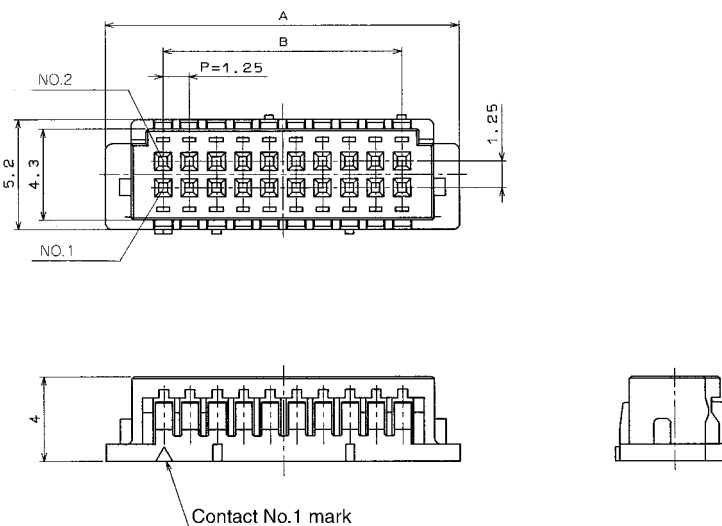
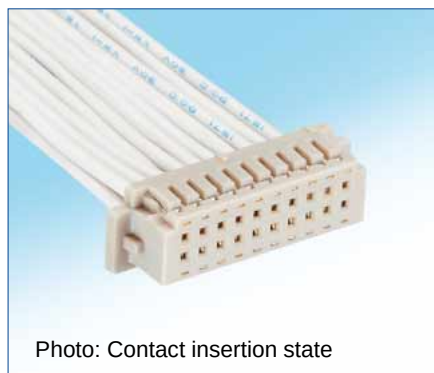
Unit : mm

Part No.	HRS No.	No. of Contacts	A	B
DF13-2S-1.25C	536-0001-4	2	1.25	4.15
DF13-3S-1.25C	536-0002-7	3	2.50	5.40
DF13-4S-1.25C	536-0003-0	4	3.75	6.65
DF13-5S-1.25C	536-0004-2	5	5.00	7.90
DF13-6S-1.25C	536-0005-5	6	6.25	9.15
DF13-7S-1.25C	536-0006-8	7	7.50	10.40
DF13-8S-1.25C	536-0007-0	8	8.75	11.65

Part No.	HRS No.	No. of Contacts	A	B
DF13- 9S-1.25C	536-0008-3	9	10.00	12.90
DF13-10S-1.25C	536-0009-6	10	11.25	14.15
DF13-11S-1.25C	536-0010-5	11	12.50	15.40
DF13-12S-1.25C	536-0011-8	12	13.75	16.65
DF13-13S-1.25C	536-0012-0	13	15.00	17.90
DF13-14S-1.25C	536-0013-3	14	16.25	19.15
DF13-15S-1.25C	536-0014-6	15	17.50	20.40

Note 1 : The quantity is delivered per bag (100pcs.). If needed, please select and order the products per bag.

Double Row Socket

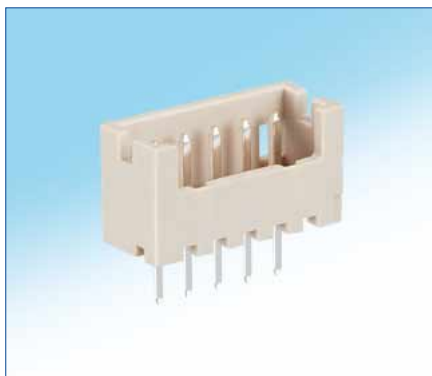


Unit : mm

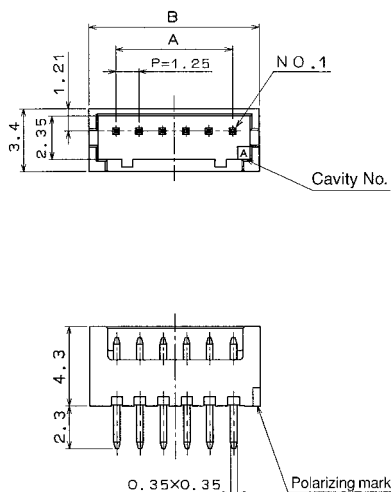
Part No.	HRS No.	No. of Contacts	A	B
DF13-10DS-1.25C	536-0550-2	10	10.40	5.00
DF13-20DS-1.25C	536-0555-6	20	16.65	11.25
DF13-30DS-1.25C(10)	536-0560-6 10	30	22.90	17.50
DF13-40DS-1.25C(10)	536-0565-0 10	40	29.15	23.75

Note : The quantity is delivered per bag (100pcs). If needed, please select and order the products per bag.

Single Row Straight Pin Header (Through hole)

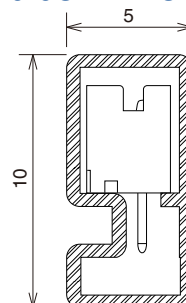


●Board Through-hole Diameter : $\phi 0.6 \pm 0.03$



[Specific No.]
(05) : Tin plated
(25) : Tin plated, tube packaging

Tube Dimensions



Unit: mm

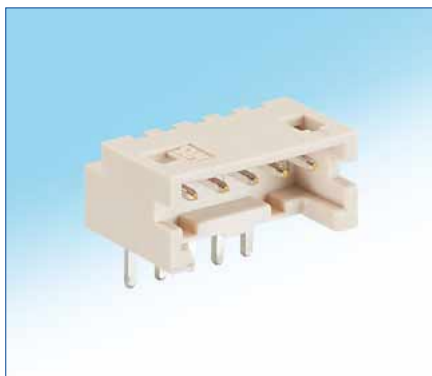
Part No.	HRS No.	No. of Contacts	A	B	Tube Packaging Quantity
DF13-2P-1.25DSA(**)	536-0101-9 **	2	1.25	4.15	115
DF13-3P-1.25DSA(**)	536-0102-1 **	3	2.50	5.40	89
DF13-4P-1.25DSA(**)	536-0103-4 **	4	3.75	6.65	72
DF13-5P-1.25DSA(**)	536-0104-7 **	5	5.00	7.90	61
DF13-6P-1.25DSA(**)	536-0105-0 **	6	6.25	9.15	52
DF13-7P-1.25DSA(**)	536-0106-2 **	7	7.50	10.40	46
DF13-8P-1.25DSA(**)	536-0107-5 **	8	8.75	11.65	41

Part No.	HRS No.	No. of Contacts	A	B	Tube Packaging Quantity
DF13- 9P-1.25DSA(**)	536-0108-8 **	9	10.00	12.90	37
DF13-10P-1.25DSA(**)	536-0109-0 **	10	11.25	14.15	34
DF13-11P-1.25DSA(**)	536-0110-0 **	11	12.50	15.40	31
DF13-12P-1.25DSA(**)	536-0111-2 **	12	13.75	16.65	29
DF13-13P-1.25DSA(**)	536-0112-5 **	13	15.00	17.90	27
DF13-14P-1.25DSA(**)	536-0113-8 **	14	16.25	19.15	25
DF13-15P-1.25DSA(**)	536-0114-0 **	15	17.50	20.40	23

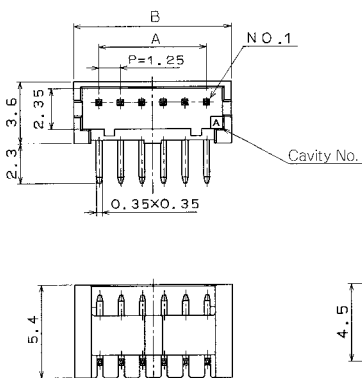
Note 1 : The quantity at the specific No."05" is delivered per bag (100pcs.). If needed, please select and order the products per bag.

Note 2 : Order the tube packaging product, multiplying the tube packaging quantity.

Single Row Right Angle Pin Header (Through hole)

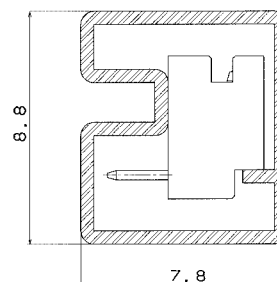


●Board Through-hole Diameter : $\phi 0.6 \pm 0.03$



[Specific No.] (**), **
(25) : Tin plated tube packaging

Tube Dimensions



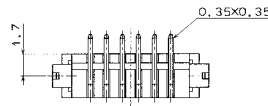
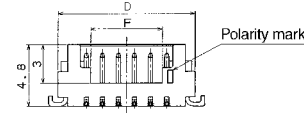
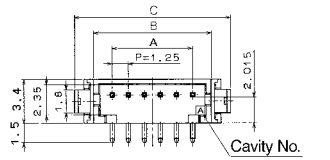
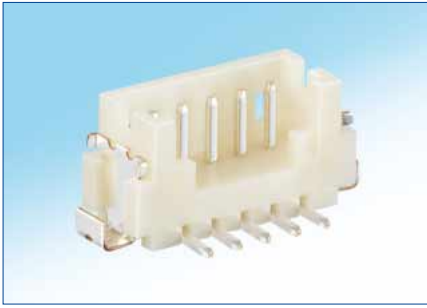
Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	Tube Packaging Quantity
DF13-2P-1.25DS(25)	536-0151-7 25	2	1.25	4.15	115
DF13-3P-1.25DS(25)	536-0152-0 25	3	2.50	5.40	89
DF13-4P-1.25DS(25)	536-0153-2 25	4	3.75	6.65	72
DF13-5P-1.25DS(25)	536-0154-5 25	5	5.00	7.90	61
DF13-6P-1.25DS(25)	536-0155-8 25	6	6.25	9.15	52
DF13-7P-1.25DS(25)	536-0156-0 25	7	7.50	10.40	46
DF13-8P-1.25DS(25)	536-0157-3 25	8	8.75	11.65	41

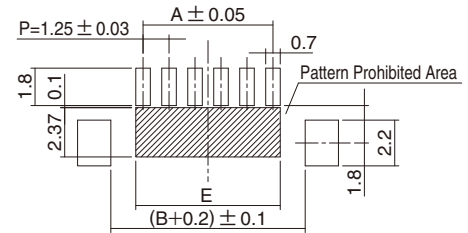
Part No.	HRS No.	No. of Contacts	A	B	Tube Packaging Quantity
DF13- 9P-1.25DS(25)	536-0158-6 25	9	10.00	12.90	37
DF13-10P-1.25DS(25)	536-0159-9 25	10	11.25	14.15	34
DF13-11P-1.25DS(25)	536-0160-8 25	11	12.50	15.40	31
DF13-12P-1.25DS(25)	536-0161-0 25	12	13.75	16.65	29
DF13-14P-1.25DS(25)	536-0163-6 25	14	16.25	19.15	25
DF13-15P-1.25DS(25)	536-0164-9 25	15	17.50	20.40	23

Note 1 : Order the tube packaging product, multiplying the tube packaging quantity.

Single Row Straight Pin Header (SMT) (Three-Wall/Correspond to Vacuum Absorption)



PCB mounting pattern



Note 1. Shaded area must be free of any electrically conductive traces to avoid contact with soldered pin header terminations.

This pin header is a three-wall type, header has sufficiently large flat areas to allow pick-up with vacuum nozzles of automatic placement equipment.

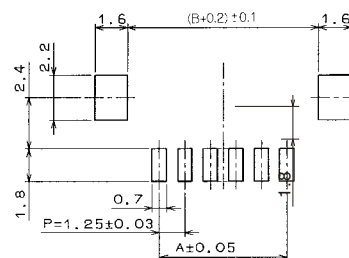
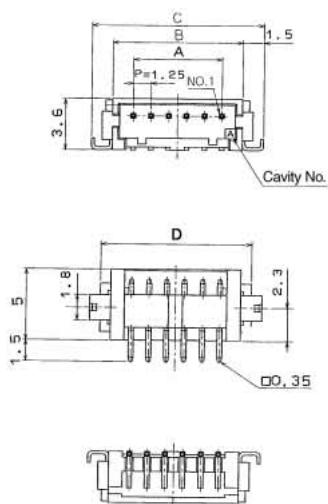
[Specific No.] (**), **
(21) : Tin plated embossed tape packaging
(51) : Gold plated embossed tape packaging

Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	D	E	F	Emboss Width
DF13C- 2P-1.25V(**)	536-0401-2 **	2	1.25	4.15	7.15	5.65	1.95	2.20	16
DF13C- 3P-1.25V(**)	536-0402-5 **	3	2.50	5.40	8.40	6.90	3.20	3.45	16
DF13C- 4P-1.25V(**)	536-0403-8 **	4	3.75	6.65	9.65	8.15	4.45	3.10	24
DF13C- 5P-1.25V(**)	536-0404-0 **	5	5.00	7.90	10.90	9.40	5.70	4.35	24
DF13C- 6P-1.25V(**)	536-0405-3 **	6	6.25	9.15	12.15	10.65	6.95	5.60	24
DF13C- 7P-1.25V(**)	536-0406-6 **	7	7.50	10.40	13.40	11.90	8.20	6.85	24
DF13C- 8P-1.25V(**)	536-0407-9 **	8	8.75	11.65	14.65	13.15	9.45	8.10	24
DF13C- 9P-1.25V(**)	536-0408-1 **	9	10.00	12.90	15.90	14.40	10.70	9.35	24
DF13C-10P-1.25V(**)	536-0409-4 **	10	11.25	14.15	17.15	15.65	11.95	10.60	24
DF13C-11P-1.25V(**)	536-0410-3 **	11	12.50	15.40	18.40	16.90	13.20	11.85	32
DF13C-12P-1.25V(**)	536-0411-6 **	12	13.75	16.65	19.65	18.15	14.45	13.10	32
DF13C-14P-1.25V(**)	536-0413-1 **	14	16.25	19.15	22.15	20.65	16.95	15.60	32
DF13C-15P-1.25V(**)	536-0414-4 **	15	17.50	20.40	23.40	21.90	18.20	16.85	44

Note 1 : Please order the embossed tape packaging product according to reel number. (1000pcs/reel)

PCB mounting pattern

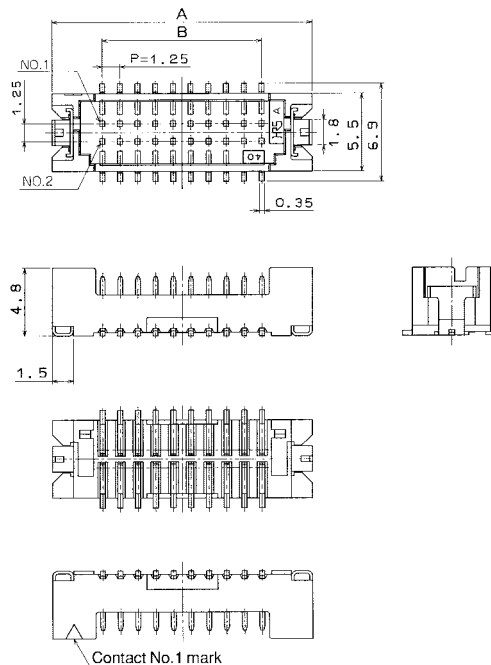
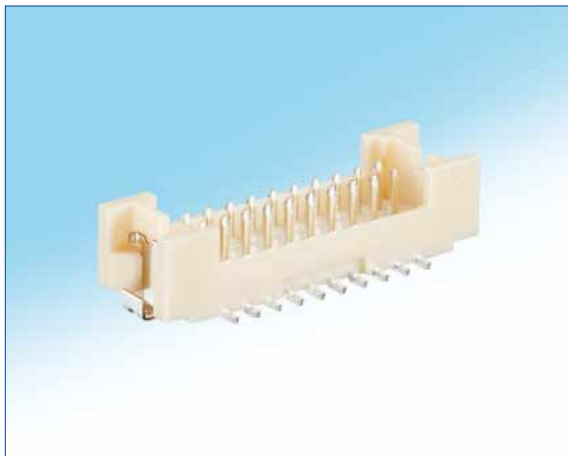


Unit : mm

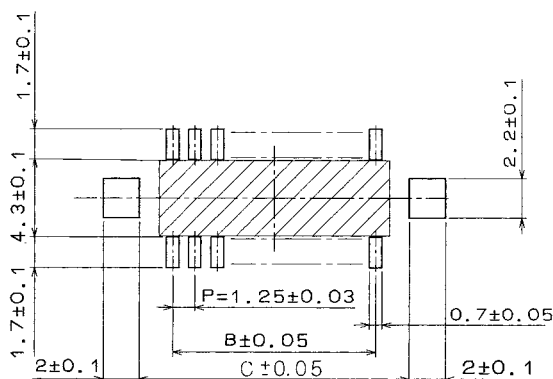
Part No.	HRS No.	No. of Contacts	A	B	C	D	Emboss Width
DF13A- 2P-1.25H(**)	536-0301-8 **	2	1.25	4.15	7.15	5.65	16
DF13A- 3P-1.25H(**)	536-0302-0 **	3	2.50	5.40	8.40	6.90	16
DF13A- 4P-1.25H(**)	536-0303-3 **	4	3.75	6.65	9.65	8.15	24
DF13A- 5P-1.25H(**)	536-0304-6 **	5	5.00	7.90	10.90	9.40	24
DF13A- 6P-1.25H(**)	536-0305-9 **	6	6.25	9.15	12.15	10.65	24
DF13A- 7P-1.25H(**)	536-0306-1 **	7	7.50	10.40	13.40	11.90	24
DF13A- 8P-1.25H(**)	536-0307-4 **	8	8.75	11.65	14.65	13.15	24
DF13A- 9P-1.25H(**)	536-0308-7 **	9	10.00	12.90	15.90	14.40	24
DF13A-10P-1.25H(**)	536-0309-0 **	10	11.25	14.15	17.15	15.65	24
DF13A-11P-1.25H(**)	536-0310-9 **	11	12.50	15.40	18.40	16.90	32
DF13A-12P-1.25H(**)	536-0311-1 **	12	13.75	16.65	19.65	18.15	32
DF13A-14P-1.25H(**)	536-0313-7 **	14	16.25	19.15	22.15	20.65	32
DF13A-15P-1.25H(**)	536-0314-0 **	15	17.50	20.40	23.40	21.90	44

Note 1 : Please order the embossed tape packaging product according to reel number. (1000pcs/reel)

Double Row Straight Pin Header (SMT) (Four-Wall/Correspond to Vacuum Absorption)



PCB mounting pattern



Note 1. Shaded area must be free of any electrically conductive traces to avoid contact with soldered pin header terminations.

[Specific No.] (**), **
(22) : Tin plated embossed tape packaging
(52) : Gold plated embossed tape packaging

Unit : mm

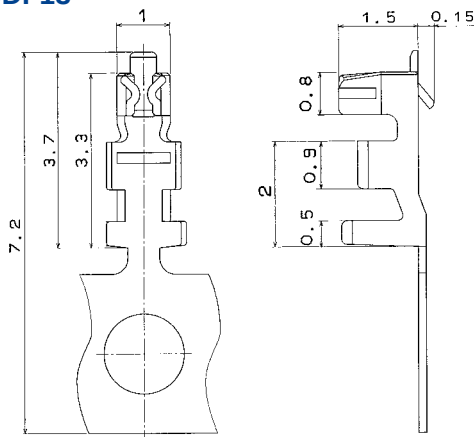
Part No.	HRS No.	No. of Contacts	A	B	C	Spec No. (22)	Spec No. (52)	Emboss Width
DF13EA-10DP-1.25V(**)	536-0570-0	10	12.10	5.00	8.70	✓	✓	24
DF13EA-20DP-1.25V(**)	536-0571-0	20	18.35	11.25	14.95	✓	✓	32
DF13EA-30DP-1.25V(**)	536-0572-0	30	24.60	17.50	21.20	✓	✓	44
DF13EA-40DP-1.25V(**)	536-0573-0	40	30.85	23.75	27.45	—	✓	44

Note 1 : Please order the embossed tape packaging product according to reel number. (1000pcs/reel)

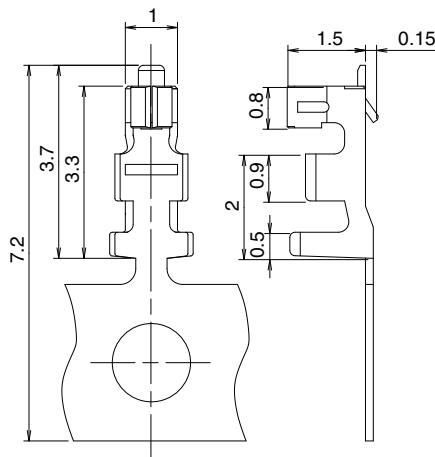
Note 2 : The absorption cap is attached to the embossed tape packaging product.

■Crimping Contact

●DF13



●DF13G



Reel Contact (1Reel, 10,000reel contacts)

Part No.	HRS No.	Finish	Applicable Cable (Tin Plated Annealing Copper Wire) (Note 1)				
			UL	Wire size	Stranded wire conductor	Calculated coss-section	Jacket Diameter
DF13-2630SCF	536-0300-5	Tin plated	1061	26 AWG	7Pieces / $\phi 0.16\text{mm}$	0.141mm ²	0.56 to 1.0mm
			1571	28 AWG	7Pieces / $\phi 0.127\text{mm}$	0.089mm ²	
				30 AWG	7Pieces / $\phi 0.1\text{mm}$	0.055mm ²	
DF13-3032SCF	536-0299-8	Au plated	1061	30 AWG	7Pieces / $\phi 0.1\text{mm}$	0.055mm ²	0.52 to 0.8mm
			1571	32 AWG	7Pieces / $\phi 0.08\text{mm}$	0.035mm ²	
				26 AWG	7Pieces / $\phi 0.16\text{mm}$	0.141mm ²	
DF13-2630SCFA(04)	536-0298-5 04	Au plated	1061	28 AWG	7Pieces / $\phi 0.127\text{mm}$	0.089mm ²	0.56 to 1.0mm
			1571	30 AWG	7Pieces / $\phi 0.1\text{mm}$	0.055mm ²	
				32 AWG	7Pieces / $\phi 0.08\text{mm}$	0.035mm ²	
DF13-3032SCFA	536-0641-6	Au plated	1061	30 AWG	7Pieces / $\phi 0.1\text{mm}$	0.055mm ²	0.52 to 0.8mm
			1571	32 AWG	7Pieces / $\phi 0.08\text{mm}$	0.035mm ²	
				26 AWG	7Pieces / $\phi 0.16\text{mm}$	0.141mm ²	
DF13G-2630SCF (Low insertion/extraction)	536-0643-1	Tin plated	1061	28 AWG	7Pieces / $\phi 0.127\text{mm}$	0.089mm ²	0.56 to 1.0mm
			1571	30 AWG	7Pieces / $\phi 0.1\text{mm}$	0.055mm ²	
				32 AWG	7Pieces / $\phi 0.08\text{mm}$	0.035mm ²	
DF13G-2630SCFA (Low insertion/extraction)	536-0642-9	Au plated	1061	26 AWG	7Pieces / $\phi 0.16\text{mm}$	0.141mm ²	0.56 to 1.0mm
			1571	28 AWG	7Pieces / $\phi 0.127\text{mm}$	0.089mm ²	
				30 AWG	7Pieces / $\phi 0.1\text{mm}$	0.055mm ²	

Note 1 : Please contact your local Hirose sales REP if you plan on using wires other than those listed above.

◆Applicable Crimping Tool

Type	Part No.	HRS No.	Applicable Cable (Note 5)	Applicable Contact
Applicator for Hirose Crimping Tool	AP105-DF13-2630S	901-4531-9	UL1571 UL1061	DF13-2630SCF/SCFA (04)
	AP105-DF13-2630S-S	901-4555-7	(Note 4)	DF13G-2630SCF/SCFA
	AP105-DF13-3032S	901-4552-9	UL1571	DF13-3032SCF/SCFA
Applicators Compatible with Other Companies' Crimping Tools (Note 3)	AP109A-DF13-2630S	901-4562-2	UL1571 UL1061	DF13-2630SCF/SCFA (04)
	AP109A-DF13-2630SS	901-4557-2	(Note 4)	DF13G-2630SCF/SCFA
Hirose Crimping Tool	CM-105C	901-0001-0	—	—
Manual Crimping Tool	DF13-TB2630HC	550-0256-1	UL1571	DF13-2630SCF (Note 6)
Extraction Tool	DF-C-PO (B)	550-0179-2	—	DF13-2630SCF/SCFA (04)
				DF13G-2630SCF/SCFA
				DF13-3032SCF/SCFA

Note 1 : Please conduct crimping based on the "Crimping Quality Standards (ATAD-H0895-00, ATAD-H0953-00)" and "Crimping Conditions Table".

Note 2 : Problems with tools not specified by Hirose are outside the scope of warranty.

Note 3 : Applicators compatible with other companies' crimping tools (AP109A type applicator) cannot be used with Hirose crimping tool CM-105C. A separate attachment for mounting is needed when using the applicator. Contact the crimping tool maker for inquiries on the attachment.

Note 4 : Thin cable applicator type

Note 5 : Applicable cables are limited to those listed in the table. Contact a Hirose representative for inquiries regarding cables other than those listed.

Note 6 : Cut the reel terminal sequentially with the carrier attached for use with the manual crimping tool. The applicable contacts are limited to those listed in the table.

◆ Crimping

■ Items required prior to start crimping

The work-related documents shown below are required before starting the harness connections.

(The ● mark shows the document required.)

When the documents shown below are not available, ask our sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
(1) Main unit of crimping machine instruction manual	Explanation of main press machine unit	●	—	When purchasing main press machine unit, it is bundled.
(2) Operating Instructions for Hand Tool	Crimp operation	●	—	When purchasing Applicator, it is bundled.
(3) Applicator Spare Parts Identification	Explanation for Applicator installation	●	—	
(4) Crimp Conditions	Standard values of : Crimp height ; Tensile strength	●	—	
(5) Crimp Quality Standards	Various standards for crimping conditions	●	—	
(6) Operating Instructions for Hand Tool	Inspection items of : Crimp height ; Crimp operation Tensile strength	—	●	When purchasing Hand Tool, it is bundled.

■ Tools

When crimping work is applied to our contacts, the tool designated by Hirose should be used.

Crimping work by using tools other than as designated must not be done because it may result in contact failure, disconnection of cable, etc.

*The operating instructions manual is available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before implementing the work.

■ Applicable electric wires

Check that the electric wire to be used is in the range of application.

If you intend to use an electric wire other than the recommended one, ask our sales personnel.

[Precautions]

- Electric wires that are applicable for crimping connectors shall, principally, be the tin-plated stranded soft-copper wire.
- Crimping of electric wires wherein single wires, polyester yarns, etc., exist and crimping of tin-coated wires should be avoided.
- Avoid crimping two electric wires together.
- The setting values of crimp height (Note 1) may vary between tin-plated and gold-plated terminals even if the same electric wires are used.
- The setting values of crimp height (Note 1) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

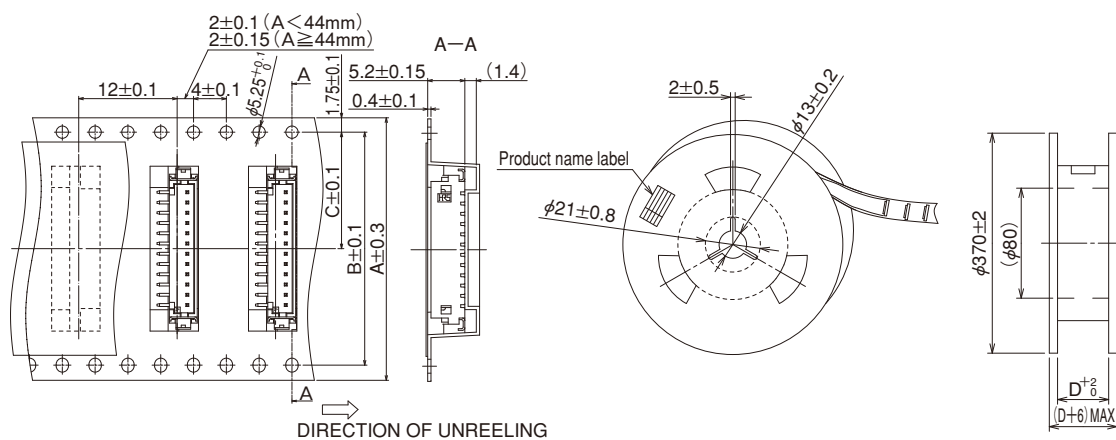
Note 1 : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

◆ Application Pattern

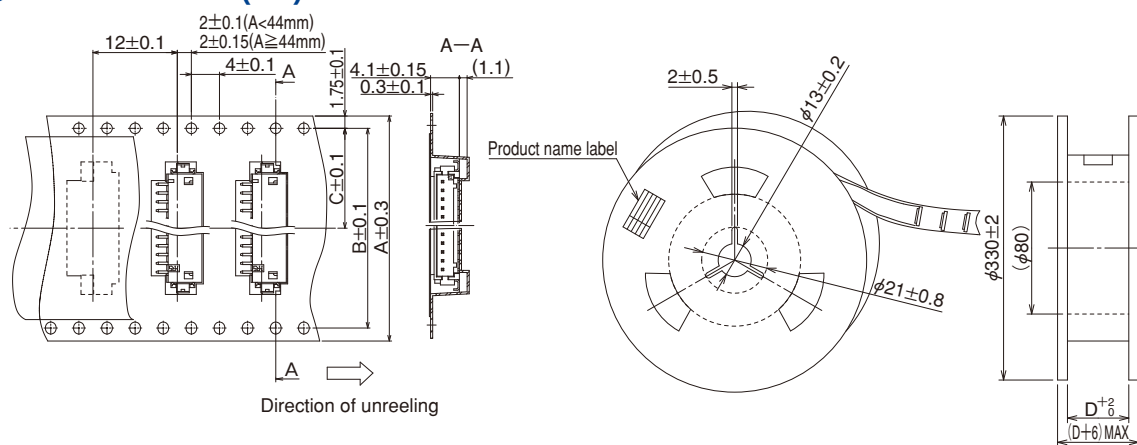
	SMT (Single Row Product)	Through hole (Single Row Product)	SMT (Double Row Product)
Right Angle			
Straight			

◆ Embossed Carrier Tape Dimensions

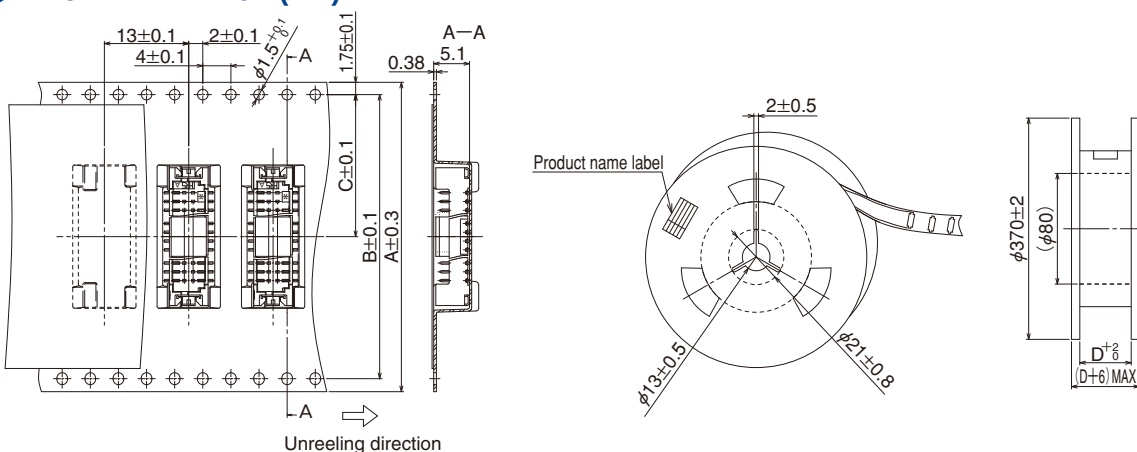
● DF13C-*P-1.25V (**)



● DF13A-*P-1.25H (**)



● DF13EA-*DP-1.25V (**)



Unit : mm

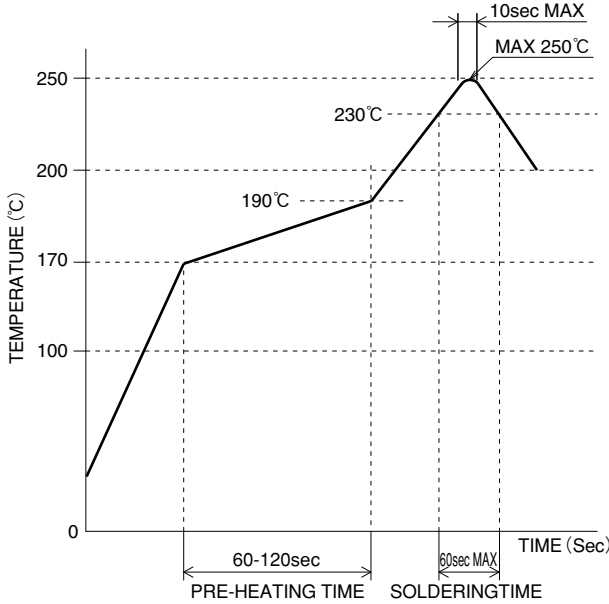
Product Type	Size	No. of Contacts	A	B	C	D
DF13C-*P-1.25V (**) DF13A-*P-1.25H (**)		2, 3	16	—	7.5	16.4
		4 to 10	24	—	11.5	24.4
		11 to 14	32	28.4	14.2	32.4
		15	44	40.4	20.2	44.4

Note : The 13 contacts is not serialized.

Unit : mm

Product Type	Size	No. of Contacts	A	B	C	D
DF13EA-*DP-1.25V (**)		10	24	—	11.5	24.4
		20	32	28.4	14.2	32.4
		30 to 40	44	40.4	20.2	44.4

◆Precautions

1. Recommended Temperature Profile (SMT)	 [Applicable Conditions] 1. Peak temperature : 250°C max. 2. Heating area : 230°C min. for less than 60 seconds 3. Preheating area : 170°C to 190°C for 60 to 120 seconds 4. Number of times : no more than 2 times * Measurement is conducted at the contact lead part Soldering results may change depending on conditions such as solder paste type, manufacturer, PCB size, and other soldering materials. Please determine all mounting conditions before use. Note 1 : This temperature profile is a recommended value. Note 2 : 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. Note 3 : The temperature profile indicates the board surface temperature at the point of contacts with the connector terminals. Note 4 : Slight variations in color of the plastic compounds do not affect form, fit or function of the connector.
2. Recommended Screen Thickness (SMT)	0.15 to 0.2mm
3. Board Warpage (SMT)	Max 0.03mm in the connector center area, based on both connector edges
4. Recommended Manual Soldering Condition	290±10°C for 2 seconds max.
5. Cleaning Condition	Refer to Wire to board connector Use Hand book. IPA cleaning is allowed. (Cleaning is not recommended because cleaning may change the mating/withdrawal feeling etc. Please contact us when you use other cleaning agents.)
6. Cautions	■Be careful for the excessive scoop insertion/extraction, which will cause damage to the product. ■The color of the plastic molding may differ slightly depending on product lot and future storage conditions but this does not affect the product performance. Black spots may appear on the mold resin but this does not affect the product quality.
7. Precautions	Please refer to following documents in handling this product. ■Crimp quality standards (ETAD-H0895-00, ETAD-H0953-00) ■Wire to board connector Use Hand book.

◆Precautions

<Precautions at Time of Insertion>

Align with the connector form and press down
continue pressing until there is a tactile click.

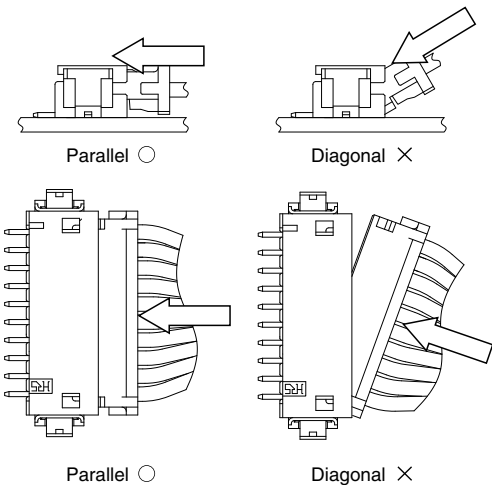
Handling

Method : Lightly grasping the base the cable, press
the connector with your finger and insert it.

Insertion Angle

Caution : Do not insert at an angle of 30° or greater.
Doing so will cause contact deformation or
case damage.

Method : Insert with the connector parallel.



<Precautions at Time of Disconnection>

Align with the connector form and press down
continue pressing until there is a tactile click.

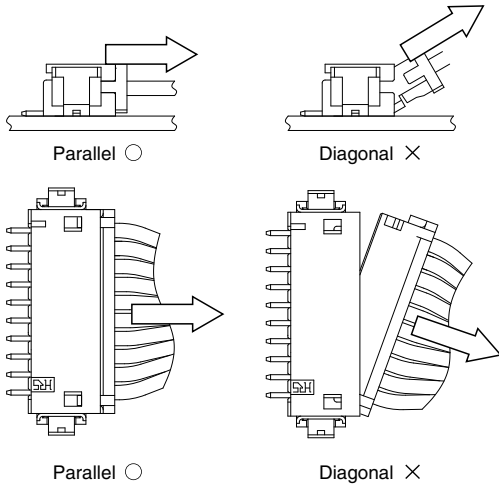
Handling

Method : Grasp the cable so that the entire cable is
pulled evenly and it out.

Angle of Removal

Caution : Do not remove at an angle of 30° or greater.
Doing so will cause contact deformation or
case damage.

Method : Remove with the connector parallel.



DF14 Series

1.25mm Pitch, Low Profile Crimp Connector



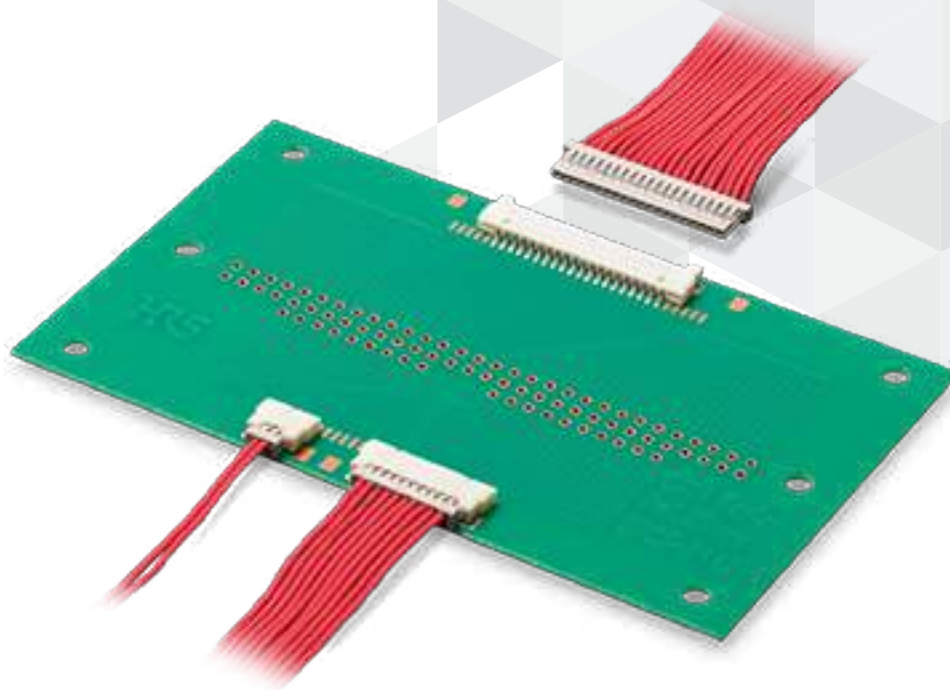
Low Profile



Right Angle



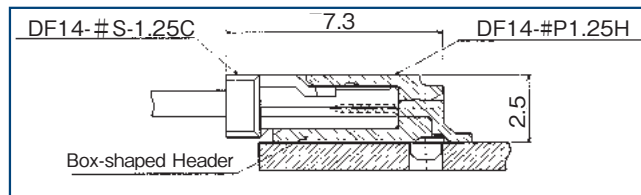
Wide Variation



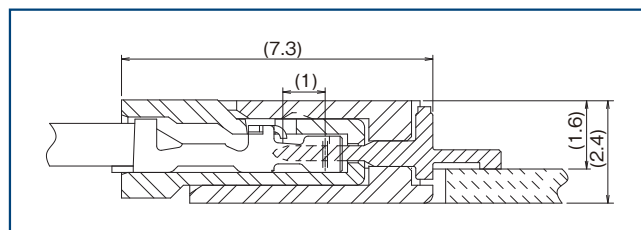
Features

1.Low Profile

DF14 is a right angle connector that enables a low profile on the board. Signals can be routed in places where there is no space between boards using DF14. The on-board type, DF14(A), has a board mounted height of 2.5mm. The offset type, DF14H, has an even lower profile with a board mounted height of 1.6mm.



DF14(A) On Board Type Board Mounted Diagram



DF14H Offset Type Board Mounted Diagram

2.Pick & Place Mounting

The header has a vacuum suction surface and embossed tape packaging for pick & place mounting. Additionally, tube packaging is available for the on-board type.

3.Four-wall Design

The box-shaped header prevents prying and mis-insertion. The walls on the header prevent issues resulting from friction to the board caused by the socket. Retention tabs are added to prevent solder peeling.

Applications

LCD (crystal panel), Note PCs, PDAs, Small Office Equipment, Video Devices and other Consumer Products.

Product Specifications

Rated Current	1A/pin	Operating Temperature (Note 1)	-35 to +85°C
		Operating Humidity Range (Note 2)	40 to 80%
Rated Voltage	150V AC/DC	Storage Temperature Range (Note 3)	-10 to +60°C
		Storage Humidity Range (Note 3)	40 to 70%

Note 1 : Includes temperature rise due to current flow.

Note 2 : Please use without condensation.

Note 3 : Applicable to unused items in packaged state.

Item	Specification	Condition
Insulation Resistance	500M Ω Min.	100V DC
Withstanding Voltage	No flashover or insulation breakdown.	500V AC per min.
Contact Resistance	30m Ω Max.	Measured at 20mV or less, 1mA (DC or 1000Hz)
Insertion/Extraction Force	0.15N Min. (15gf), 3N Max. (300gfl)	Measured with 0.3 ^{+0.005} ₀ mm square pin
Vibration Resistance	No electrical discontinuity of 1 μ s or more	Frequency : 10 to 55Hz, single amplitude of 0.75mm, 2 hours in each of the 3 directions.
Humidity (Steady State)	Contact resistance : 30m Ω Max. Insulation resistance : 500M Ω Min.	96 hours at temperature of 40 $\pm$ 2°C and humidity of 90% to 95%
Temperature Cycle	Contact resistance : 30m Ω Max. Insulation resistance : 500M Ω Min.	(-55°C : 30 minutes $\rightarrow$ 5 to 35°C : 2-3 minutes $\rightarrow$ 85°C : 30 minutes $\rightarrow$ 5 to 35°C : 2-3 minutes) 5 cycles
Mating Durability	Contact resistance : 30m Ω Max.	Tin Plating : 30 cycles Gold Plating : 50 cycles
Soldering Heat Resistance	No deformation of components affecting performance.	SMT Type Reflow : At the recommended temperature profile Manual soldering : 350°C for 3 seconds

Material / Finish

Product	Part	Material	Finish	Remarks	RoHS2
Crimp Socket	Insulator	Polyamide	Beige	UL94V-0	○
Socket Crimp Contact	Contact	Phosphor Copper	Tin or Gold Plated	-	
Pin Header	Insulator	Polyamide	Beige	UL94V-0	
	Contact	Brass	Tin or Gold Plated	-	
	Retention Tab	Phosphor Copper	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

DF14

#

-

#

S

-

1.25

C

1

2

3

4

5

6

1 Series Name	DF14	4 Connector Type	S : Single Row Socket P : Single Row Pin Header
2 Configuration	Blank : Standard On-board, with Boss A : On-board, without Boss H : Offset	5 Contact Pitch	1.25mm
3 No. of Pos.	2 to 10, 15, 20, 25, 30	6 Contact Type	C : Crimping Socket H : Right Angle SMT

Contact

DF14

-

2628

SCF

A

1

2

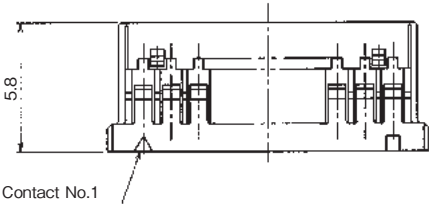
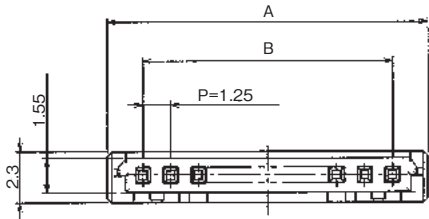
3

1 Applicable Cable Size	2628 : 26 to 28 AWG 3032 : 30 to 32 AWG	2 Packaging Type	SCF : Socket contact/reel
		3 Plating Type	Blank : Tin Plated A : Gold Plated

Crimp Socket



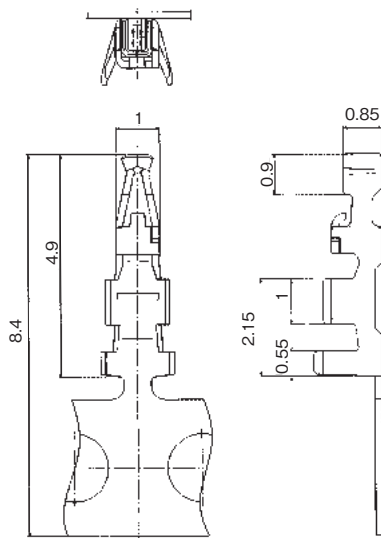
Shown with crimp contacts assembled.



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF14-2S-1.25C(10)	CL0538-0005-8-10	2	4.45	1.25	100pcs per bag
DF14-3S-1.25C(10)	CL0538-0006-0-10	3	5.70	2.50	
DF14-4S-1.25C(10)	CL0538-0007-3-10	4	6.95	3.75	
DF14-5S-1.25C(10)	CL0538-0008-6-10	5	8.20	5.00	
DF14-6S-1.25C(10)	CL0538-0009-9-10	6	9.45	6.25	
DF14-7S-1.25C(10)	CL0538-0010-8-10	7	10.70	7.50	
DF14-8S-1.25C(10)	CL0538-0011-0-10	8	11.95	8.75	
DF14-9S-1.25C(10)	CL0538-0013-6-10	9	13.20	10.00	
DF14-10S-1.25C(10)	CL0538-0014-9-10	10	14.45	11.25	
DF14-15S-1.25C(10)	CL0538-0054-3-10	15	20.70	17.50	
DF14-20S-1.25C(10)	CL0538-0059-7-10	20	26.95	23.75	
DF14-25S-1.25C(10)	CL0538-0064-7-10	25	33.20	30.00	
DF14-30S-1.25C(10)	CL0538-0012-3-10	30	39.45	36.25	

Socket Crimp Contact



●Applicable Cable (Tin Plating Annealed Copper Wire)

Strip Length : 1.2 to 1.9mm (Note 3)

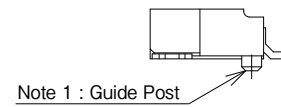
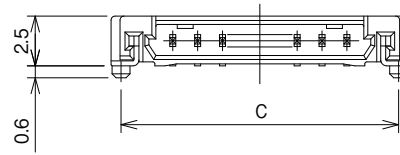
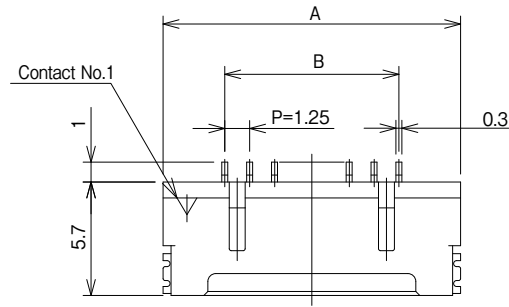
Part No.	HRS No.	Finish	Purchase Unit	Applicable Cable (Tin Plated Annealed Conductor) (Note 1)				
				UL	AWG	Wire Construction	Sectional area	Jacket diameter (Note 2)
DF14-2628SCF	CL0538-0001-7-00	Tin Plated	10,000pcs per reel	1571	26 AWG	7/0.16mm	0.141mm ²	0.54 to 1mm(0.98mm)
					28 AWG	7/0.127mm	0.089mm ²	0.54 to 1mm(0.88mm)
DF14-2628SCFA	CL0538-0002-0-00	Gold Plated		1571	26 AWG	7/0.16mm	0.141mm ²	0.54 to 1mm(0.98mm)
					28 AWG	7/0.127mm	0.089mm ²	0.54 to 1mm(0.88mm)
DF14-3032SCF	CL0538-0003-2-00	Tin Plated		1571	30 AWG	7/0.1mm	0.055mm ²	0.54 to 1mm(0.7mm)
					32 AWG	7/0.08mm	0.035mm ²	0.54 to 1mm(0.54mm)
DF14-3032SCFA	CL0538-0004-5-00	Gold Plated		1571	30 AWG	7/0.1mm	0.055mm ²	0.54 to 1mm(0.7mm)
					32 AWG	7/0.08mm	0.035mm ²	0.54 to 1mm(0.54mm)

Note 1 : Please contact a Hirose sales representative when using cables other than those specified.

Note 2 : When crimping with a manual crimping tool, only the wires with the outer diameter of the coating shown in parentheses are applicable.

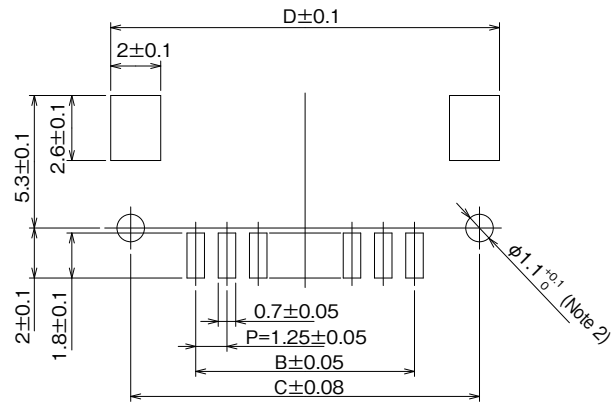
Note 3 : The strip length is a reference value. Adjust each dimension after crimping so that it satisfies the standard value.

Right Angle Pin Header (On-board SMT)



Note 1 : "Without boss" indicates the style with no boss.

PCB Mounting Pattern



Note 2 : "Without boss" indicates that no hole is needed.

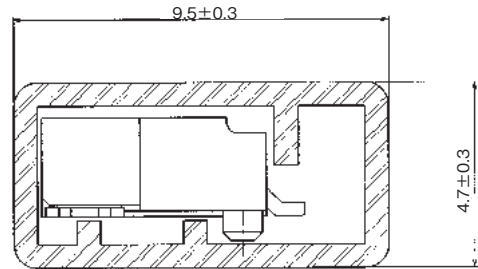
Unit : mm

With Boss		Without Boss		No. of Pos.	A	B	C	D	Purchase Unit
Part No.	HRS No.	Part No.	HRS No.						
DF14-2P-1.25H(##)	CL0538-0021-4-##	DF14A-2P-1.25H(##)	CL0538-0033-3-##	2	7.45	1.25	6.45	8.05	66pcs per tube
DF14-3P-1.25H(##)	CL0538-0022-7-##	DF14A-3P-1.25H(##)	CL0538-0034-6-##	3	8.70	2.50	7.70	9.30	56pcs per tube
DF14-4P-1.25H(##)	CL0538-0023-0-##	DF14A-4P-1.25H(##)	CL0538-0035-9-##	4	9.95	3.75	8.95	10.55	49pcs per tube
DF14-5P-1.25H(##)	CL0538-0024-2-##	DF14A-5P-1.25H(##)	CL0538-0036-1-##	5	11.20	5.00	10.20	11.80	44pcs per tube
DF14-6P-1.25H(##)	CL0538-0025-5-##	DF14A-6P-1.25H(##)	CL0538-0037-4-##	6	12.45	6.25	11.45	13.05	39pcs per tube
DF14-7P-1.25H(##)	CL0538-0026-8-##	DF14A-7P-1.25H(##)	CL0538-0038-7-##	7	13.70	7.50	12.70	14.30	36pcs per tube
DF14-8P-1.25H(##)	CL0538-0027-0-##	DF14A-8P-1.25H(##)	CL0538-0039-0-##	8	14.95	8.75	13.95	15.55	32pcs per tube
DF14-9P-1.25H(##)	CL0538-0028-3-##	DF14A-9P-1.25H(##)	CL0538-0040-9-##	9	16.20	10.00	15.20	16.80	30pcs per tube
DF14-10P-1.25H(##)	CL0538-0029-6-##	DF14A-10P-1.25H(##)	CL0538-0041-1-##	10	17.45	11.25	16.45	18.05	28pcs per tube
DF14-15P-1.25H(##)	CL0538-0084-4-##	DF14A-15P-1.25H(##)	CL0538-0114-3-##	15	23.70	17.50	22.70	24.30	20pcs per tube
DF14-20P-1.25H(##)	CL0538-0089-8-##	DF14A-20P-1.25H(##)	CL0538-0119-7-##	20	29.95	23.75	28.95	30.55	16pcs per tube
DF14-25P-1.25H(##)	CL0538-0094-8-##	DF14A-25P-1.25H(##)	CL0538-0124-7-##	25	36.20	30.00	35.20	36.80	13pcs per tube
DF14-30P-1.25H(##)	CL0538-0020-1-##	DF14A-30P-1.25H(##)	CL0538-0045-2-##	30	42.45	36.25	41.45	43.05	11pcs per tube

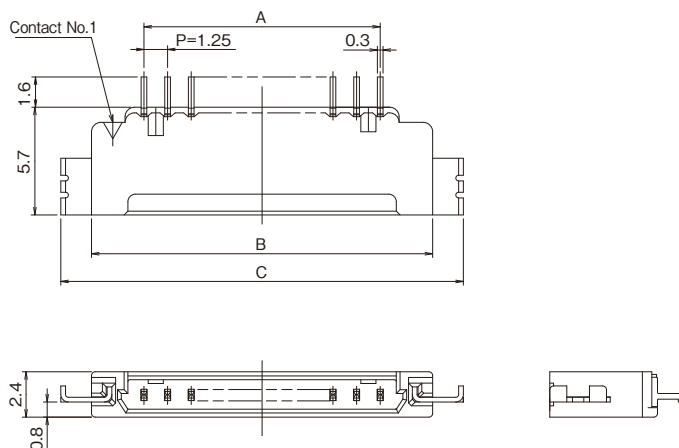
[Specifications] -##, (##)
 (22) : Tin Plated, Embossed Tape Packaging
 (35) : Tin Plated, Tube Packaging
 (52) : Gold Plated, Embossed Tape Packaging
 (65) : Gold Plated, Tube Packaging

Note 1 : Please order the tube packaging product, multiplying the packaging quantity (pcs.).
 Note 2 : Please order the embossed tape packaging product according to reel number. (1000pcs./reel)

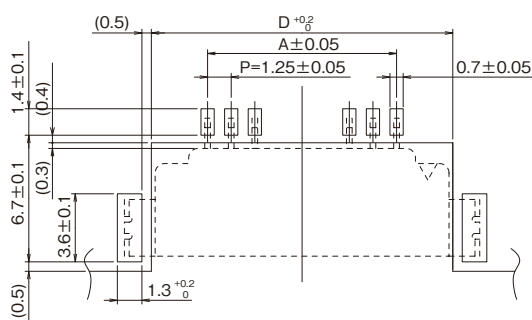
Tube Packaging Dimensions



Right Angle Pin Header (Offset SMT)



PCB Mounting Pattern



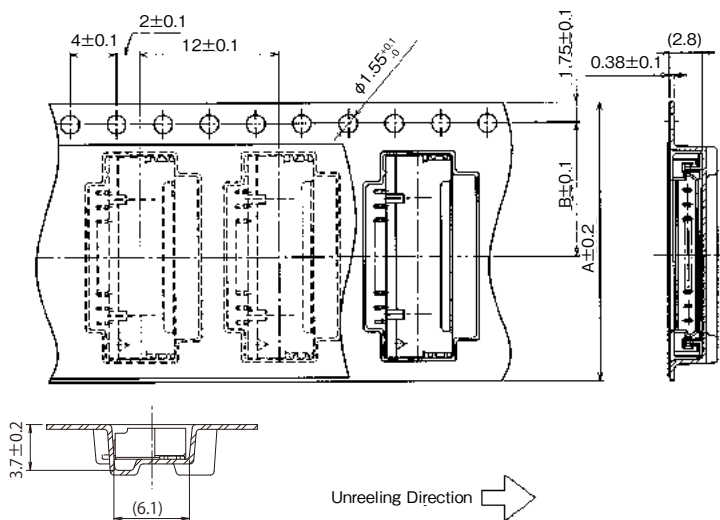
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	Purchase Unit
DF14H-20P-1.25H(##)	CL0538-0167-0-##	20	23.75	29.3	32.6	29.7	1000pcs per reel
DF14H-30P-1.25H(##)	CL0538-0188-0-##	30	36.25	41.8	45.1	42.2	

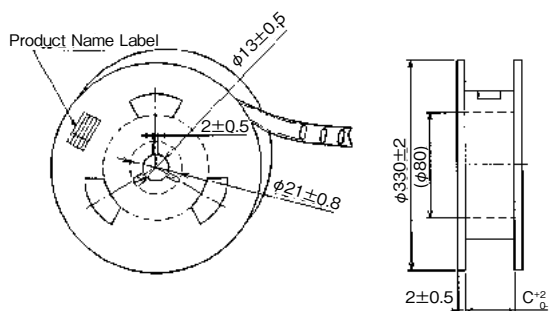
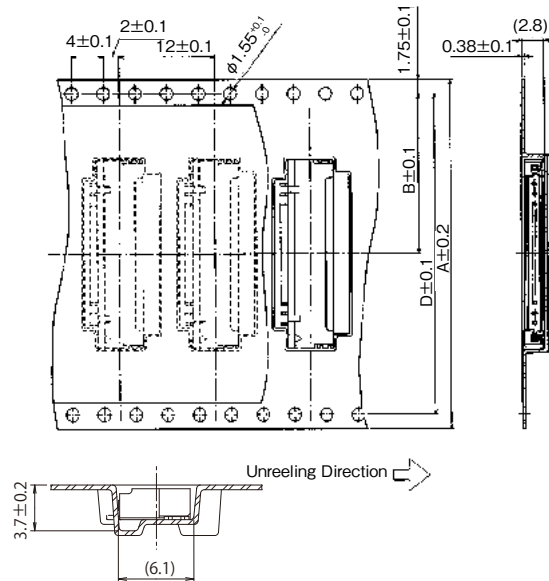
[Specific No.] -##, (##)
 (52) : Gold Plated, Embossed Tape Packaging

Embossed Carrier Tape Dimensions (JIS-C-0806)

■ 2 to 10 pos.



■ 15, 20, 25, 30 pos.

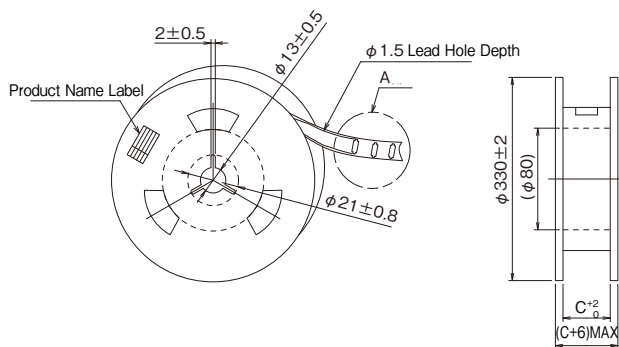
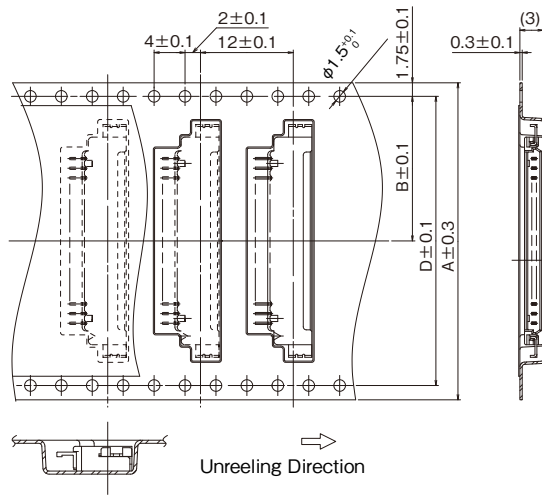


Unit : mm

Part No.	No. of Pos.	A	B	C	D
DF14/14A- 2P-1.25H	2	16.0	7.5	16.4	—
DF14/14A- 3P-1.25H	3				
DF14/14A- 4P-1.25H	4	24.0	11.5	24.4	—
DF14/14A- 5P-1.25H	5				
DF14/14A- 6P-1.25H	6				
DF14/14A- 7P-1.25H	7				
DF14/14A- 8P-1.25H	8				
DF14/14A- 9P-1.25H	9				
DF14/14A-10P-1.25H	10	44.0	20.2	44.4	40.4
DF14/14A-15P-1.25H	15				
DF14/14A-20P-1.25H	20				
DF14/14A-25P-1.25H	25	56.0	26.2	56.4	52.4
DF14/14A-30P-1.25H	30				

Embossed Carrier Tape Dimensions (JIS-C-0806)

DF14H-#P-1.25H



Unit : mm

Part No.	No. of Pos.	A	B	C	D
DF14H-20P-1.25H	20	44.0	20.2	44.4	40.4
DF14H-30P-1.25H	30	56.0	26.2	56.4	52.4

Applicable Crimping Tool

Type	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF14-2628S	CL0901-4548-1-00	DF14-2628SCF/DF14-2628SCFA
	AP105-DF14-3032S	CL0901-4544-0-00	DF14-3032SCF/DF14-3032SCFA
Manual Crimping Tool	DF14-2628/CR-HT	CL0901-0001-0-00	DF14-2628SCF/DF14-2628SCFA
	DF14-3032/CR-HT	CL0550-0261-1-00	DF14-3032SCF/DF14-3032SCFA
Press Unit	CM-105C	CL0901-0001-0-00	-
Extraction tool	DF-C-PO(B)	CL0550-0179-2-00	DF14-2628SCF/DF14-2628SCFA
			DF14-3032SCF/DF14-3032SCFA

Note 1 : Please perform crimping work based on the crimping quality standard (ETAD-H0819-00) and crimping condition table.

Note 2 : The warranty does not cover problems caused by tools other than those specified by us.

Note 3 : For manual crimping tools, the reel terminals are cut continuously.

Crimping Precautions

■ Items Required Prior to Crimping

The work- related documents shown below are required before starting harness assembly.

(The ● mark represents required documents.)

Please contact your Hirose sales representative if you do not have these documents.

Document Title	Description	Automatic Crimping	Hand Crimping	Remarks
Crimping Machine Main Unit Instruction Manual	Explanation of main press unit	●	—	Bundled with purchase of main press machine unit.
Applicator Instruction Manual	Crimp Method	●	—	Bundled with purchase of applicator.
Applicator Spare Parts List	Applicator Installation Instruction	●	—	
Crimp Conditions	Crimp height, tensile strength standard value	●	—	
Crimp Quality Standards	Various standards for crimping conditions	●	—	
Hand Tool Operating Instructions	Crimp method, crimp height and tensile height standard value	—	●	Bundled with purchase of hand tool.
Cable Assembly	Cable assembly	●	●	Contact a Hirose sales representative.

■ Tools

- Use tools designated by Hirose when crimping.
- Crimping performed using tools other than those specified is outside the scope of warranty.
- The operating instructions are available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before beginning work.

■ Applicable Cables

Check that the cables to be used are within the applicable range.

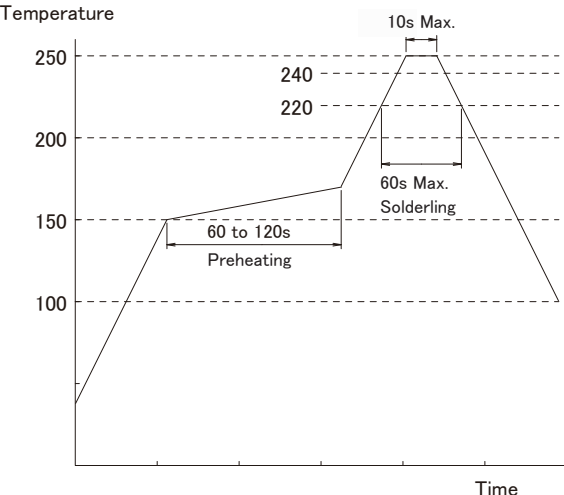
If you intend to use a cable other than those recommended, contact a sales representative.

[Precautions]

- Cables applicable to crimping connectors are tin- plated stranded soft- copper wire.
- Avoid crimping solid wire, wires with polyester threads or tin coated wires.
- Avoid crimping two cables together.
- The crimp height setting values (Note 1) may vary between tin- plated and gold- plated terminals even if the same electric wires are used.
- The crimp height setting values (Note 1) may vary depending on the difference in the core wire configuration even if the computed cross- sectional area is the same.

Note 1 : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

Precautions

1. Recommended Temperature Profile (SMT)	 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. Note 2 : The temperature profile indicates the temperature of the surface of the connector lead.
2. Recommended Manual Soldering Conditions (SMT)	Manual soldering : 350°C for 3 seconds
3. Recommended Screen Thickness (SMT)	0.15 to 0.2mm
4. Board Warpage (SMT)	Max 0.03mm at the connector in reference in the both edges of the connector.
5. Cleaning Conditions	Refer to "Wire-to-Board Connector Use Handbook."
6. Termination Conditions	Refer to "Wire-to-Board Connector Use Handbook." ■ Crimp contacts are small, so please make sure to perform crimping based on the instructions in the "Crimping Conditions" and "Crimping Quality Standards".
7. Cautions	■ Excessive prying during mating and unmating may result in damage. For details, refer to the "Instruction Manual". ■ Black spots may appear on the mold resin but this does not affect the product quality.
8. Handling	Please refer to the following documents when handling the product. ■ Crimp Quality Standard (ETAD-H0819-00) ■ Wire-to-Board Connector Use Handbook

■Precautions During Insertion

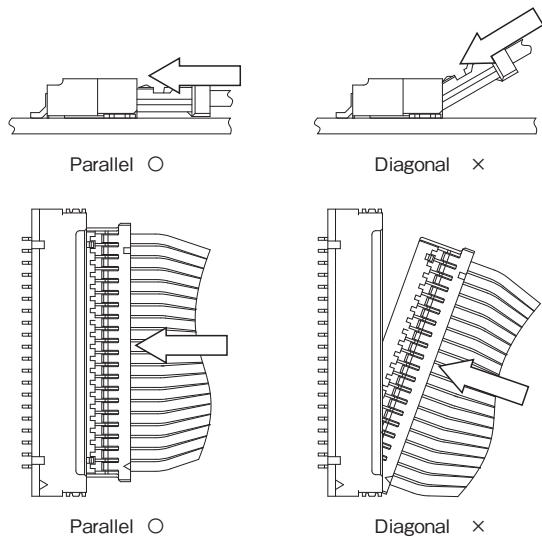
●Handling

Method : Lightly grasping the base of the cable, press the connector with your finger and insert it.

●Insertion Angle

[Caution] Do not insert at an angle of 30° or greater. Doing so will cause contact deformation or case damage.

Method : Insert with the connector parallel to the board.



■Precautions During Disconnection

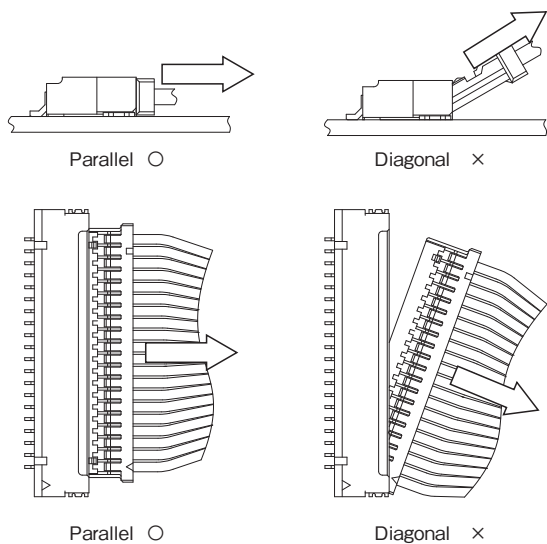
●Handling

Method : Grasp the cable so that it held evenly and pull out.

●Removal Angle

[Caution] Do not remove at an angle of 30° or greater. Doing so will cause contact deformation or case damage.

Method : Remove with the connector parallel to the board.



DF19 Series

1.0mm Pitch, Low Profile Wire-to-Board, FPC-to-Board, Micro-coaxial Cable-to-Board Connectors



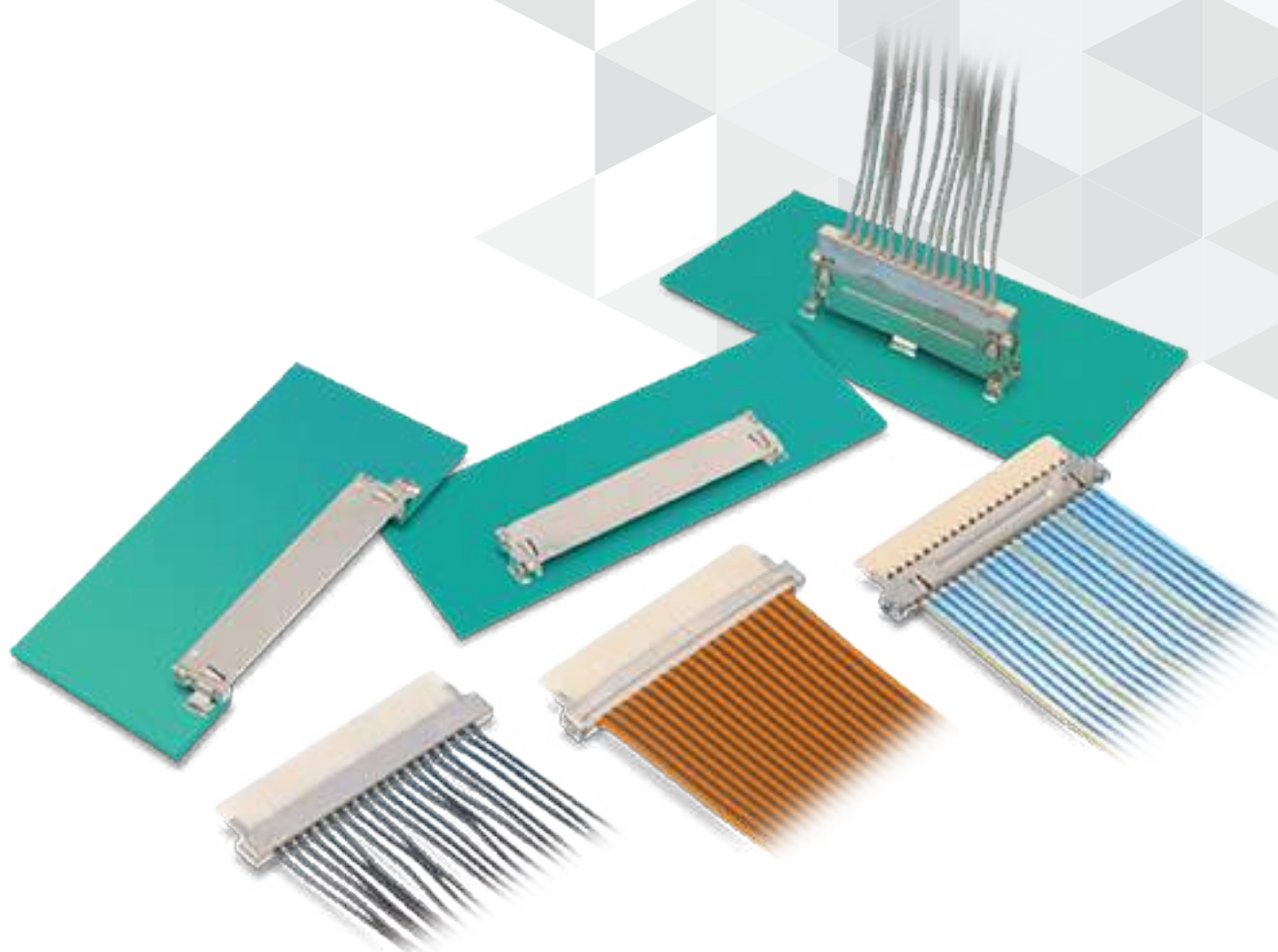
Low Profile



Thin coaxial



FPC



Features

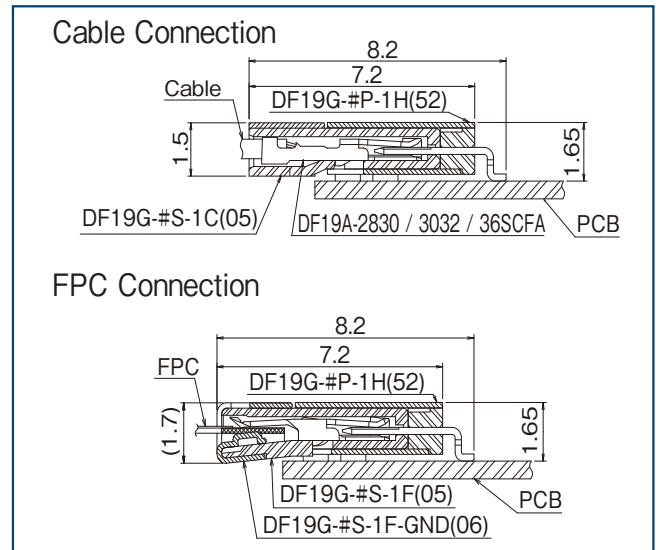
1. De Facto Standard for LCD Panel Connection

DF19 has been accepted as the market standard for LCD panels (12in. or less) due to its high performance for LVD high speed differential signals.

2. Low Profile Design

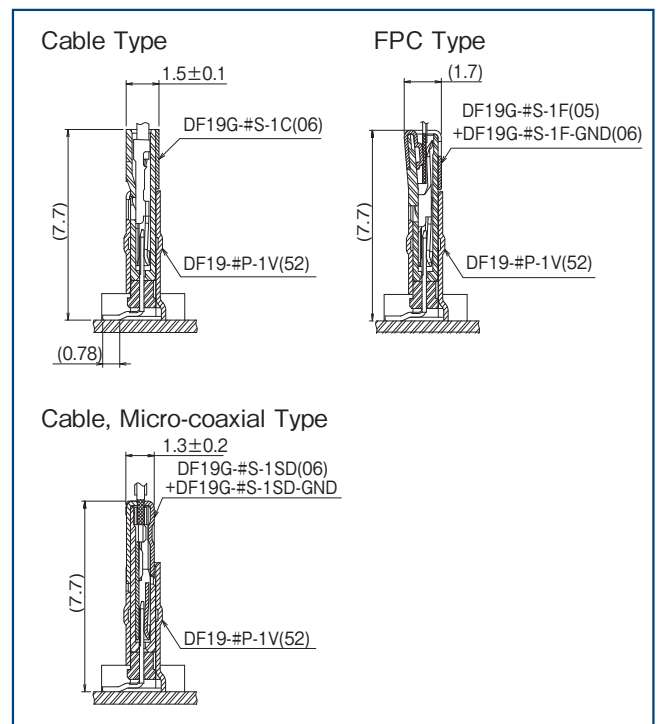
Cable, micro-coaxial type : 1.5mm thickness
(1.6mm Max.)

FPC Type : 1.7mm Max.



3. Common Header

Header is compatible with the 3 socket types (discrete wire, FPC and micro-coaxial types), for a wide selection of mating combinations.

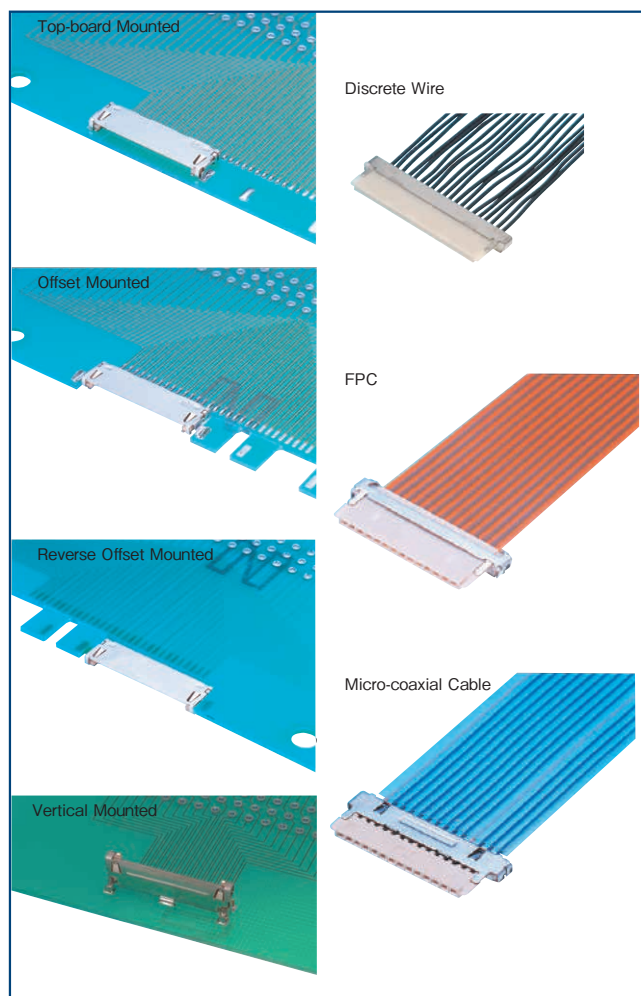


4. Uniform External Dimensions

External dimensions of each socket type are the same and can be used in a wide array of applications.

5. Wide Varieties

Header is available in top-board, offset, reverse mount offset and vertical mounted styles to meet a wide array of application needs.



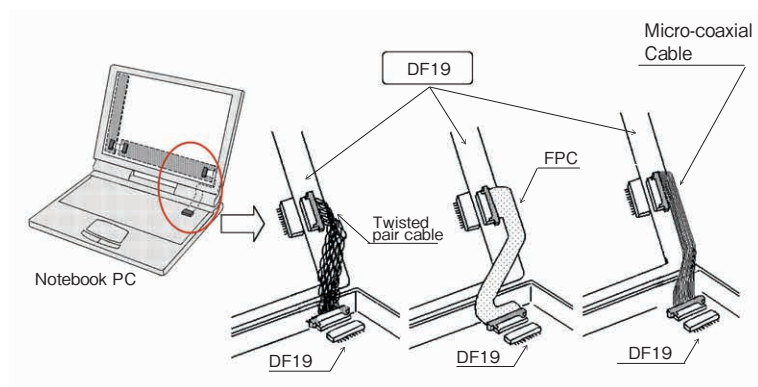
6. Ground Connection with Outer Shell

Metal shell enables ground connection.

7. Glow Wire Compatible (IEC60695-2-11 Standard)

Applications

Mobile phones, LCD connections, DVC, DSC, PDA, camera modules, and other small equipment



Product Specifications

Rated Current	28 AWG	30 AWG	32 AWG	36 AWG	FPC	Micro-coaxial Cable 40 AWG	Operating Temperature (Note 1)	-35 to +85℃
	1A/pin	0.9A/pin	0.8A/pin	0.5A/pin	0.5A/pin	0.3A/pin	Operating Humidity Range (Note 2)	40 to 80%
Rated Voltage	100V AC/DC						Storage Temperature Range (Note 3)	-10 to +60℃
							Storage Humidity Range (Note 3)	40 to 70%

Note 1 : Includes temperature rise due to current flow.
Note 2 : Please use without condensation.
Note 3 : Applicable to unused items in packaged state.
Note 4 : Information contained in this catalog represents general requirements for this Series. Contact us for the drawings and specifications for a specific part number shown.

Item	Specification	Conditions
Insulation Resistance	500M Ω Min.	100V DC
Withstanding Voltage	No flashover or insulation breakdown.	300V AC for 1 min.
Contact Resistance	30m Ω Max. (50m Ω Max. for FPC)	1mA
Vibration	No electrical discontinuity of 1 μ s or more.	Frequency : 10 to 55 Hz, single amplitude of 0.75mm, in 3 direction for 10 cycles
Humidity (Steady State)	Contact Resistance : 30m Ω Max. (50m Ω Max. for FPC) Insulation Resistance : 500M Ω Min.	96 hours at temperature of 40 ± 2℃ and humidity of 90 to 95%
Temperature Cycle	Contact Resistance : 30m Ω Max. (50m Ω Max. for FPC) Insulation Resistance : 500M Ω Min.	Temperature : -55℃ → +5 to +35℃ → +85℃ → +5 to +35℃ Time (Minutes) : 30 → 10 → 30 → 10 for 5 cycles
Mating Durability	Contact Resistance : 30m Ω Max. (50m Ω Max. for FPC)	30 cycles
Soldering Heat Resistance	No deformation of the insulator parts affecting performance.	Re-flow soldering : At the recommended temperature profile Manual soldering : Soldering iron temperature 350℃ , 5 seconds

Materials / Finish

Product	Component	Material	Finish / Color	Remarks	RoHS2
Pin Header	Insulator	Polyamide	Black or Beige	UL94V-0	○
	Contacts	Phosphor Bronze	Partially Gold Plated	-	
	Exterior Shell	Phosphor Bronze	Partially Tin Plated	-	
Crimp Case	Insulator	Polyamide	Beige	UL94V-0	
	Exterior Shell	Stainless Steel	Tin Plated	-	
Socket Crimp Contact	Contact	Phosphor Bronze	Gold Plated	-	
FPC Socket	Insulator	Polyamide	Beige	UL94V-0	
	Contact	Phosphor Bronze	Gold Plated	-	
FPC Grounding Plate	Exterior Shell	Stainless Steel	Tin Plated	-	
Micro-coaxial Socket	Insulator	LCP	Beige	UL94V-0	
	Contact	Phosphor Bronze	Partially Gold Plated	-	
	Exterior Shell	Phosphor Bronze	Tin Plated	-	
Grounding Plate for Micro-Coaxial	Exterior Shell	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 (52)
① ② ③ ④ ⑤ ⑥ ⑧

DF19 # - # S - 1 F - GND
① ② ③ ④ ⑤ ⑥ ⑦

① Series Name	DF19	③ No. of Pos.	8, 14, 20, 30 (Note 1)
② Configuration	Pin Header G : Top-board Mouted (1.65mm Height) K : Offset Mounted (1.0mm Height) L : Offset Mounted (1.1mm Height) KR : Reverse Offset Mounted Version of DF19K (1.0mm Height) Crimp Socket Blank : No Exterior Shell G : With Exterior Shell (EMI Prevention Specification) FPC Socket G : With Grounding Plate Grounding Plate for FPC G : With Grounding Plate Micro-coaxial Socket G : With Grounding Plate Grounding Plate for Micro-coaxial Cable G : With Grounding Plate	④ Connector Type	S : Single Row Socket P : Single Row Pin Header
		⑤ Contact Pitch	1.0mm
		⑥ Mounting Type/ Termination Type	H : Right Angle SMT V : Straight SMT C : Crimp Case F : FPC, Socket SD : Micro-coaxial Socket
		⑦ Attachable Parts	GND : Ground plate (Note 2)
		⑧ Specification	(52) : Gold plated, tape & reel packaging

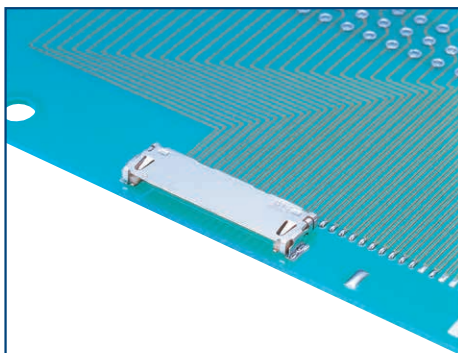
Note 1 : The pin count availabilities vary based on connection style.
Note 2 : Grounding plates are required when terminating with the FPC and Micro-coaxial cable.

Crimp Contact

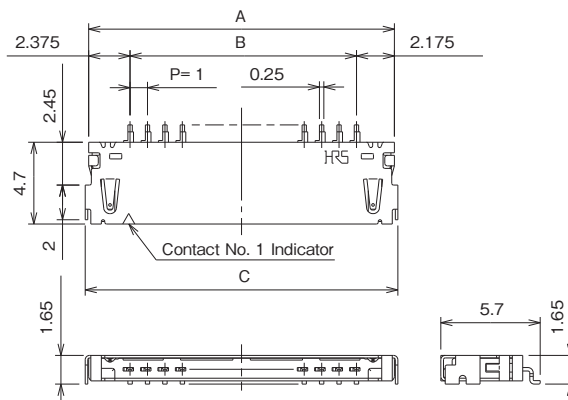
DF19A - 2830 SCF A (##)
① ② ③ ④

① Conductor Size	2830 : 28-30 AWG 3032 : 30-32 AWG 36 : 36 AWG	③ Plating	A : Gold Plated
② Contact Type/ Packaging	SCF : Socket Contact, Reel	④ Packaging	Blank : 10,000pcs per reel (41) : 20,000pcs per reel

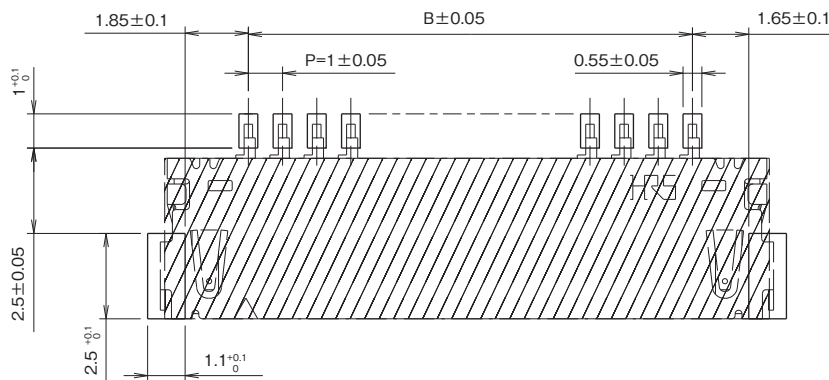
Right Angle Pin Header (SMT) (Top-Board Mounted Type)



Pictured mounted on board.



Recommended PCB Mounting Pattern



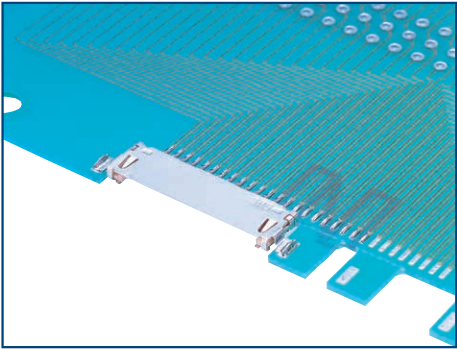
Note : If there is a pattern on the  portion and resist is not applied, it may come into contact with the ground plate.

Unit : mm

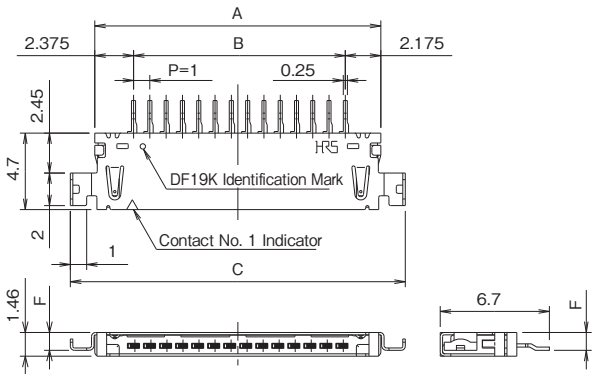
Part No.	HRS No.	No. of Pos.	A	B	C	Remarks	Purchase Unit
DF19G-8P-1H(52)	CL0685-0021-0-52	8	11.55	7.0	11.95	1.65mm Height Above Board	1,000pcs per reel
DF19G-14P-1H(52)	CL0685-0004-0-52	14	17.55	13.0	17.95		
DF19G-20P-1H(52)	CL0685-0006-6-52	20	23.55	19.0	23.95		
DF19G-30P-1H(52)	CL0685-0015-7-52	30	33.55	29.0	33.95		

Note : When using in combination with the single row socket (FPC Type), mount on the edge of the PCB.

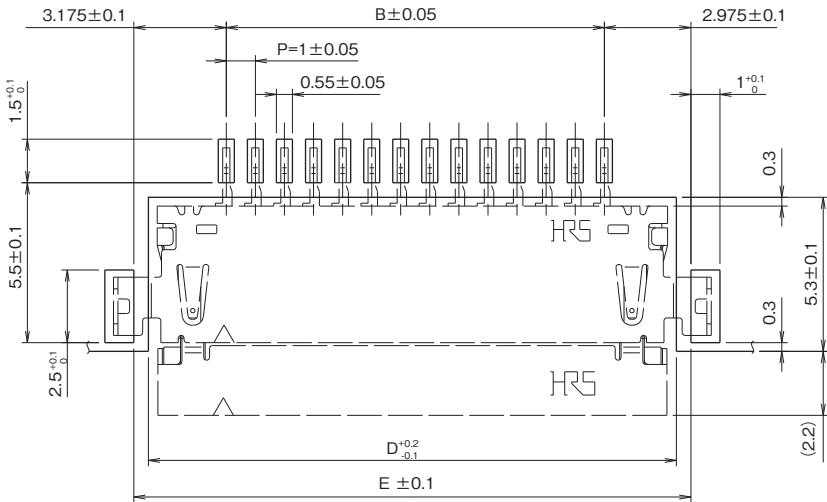
Right Angle Pin Header (SMT) (Offset Mounted Type)



Pictured mounted on board.



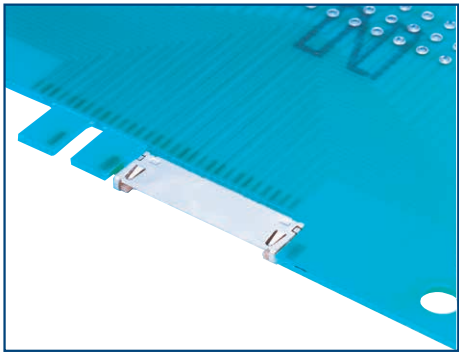
Recommended PCB Mounting Pattern



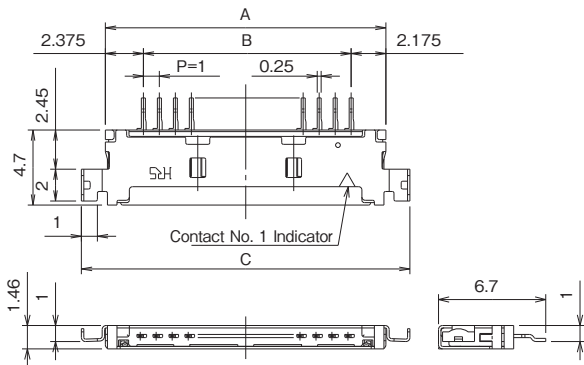
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	F	Remarks	Purchase Unit
DF19K-20P-1H(52)	CL0685-0008-1-52	20	23.55	19.0	26.55	24.15	25.15	1.0	1.0mm Height Above Board	1,000pcs per reel
DF19K-30P-1H(52)	CL0685-0032-6-52	30	33.55	29.0	36.55	34.15	35.15	1.0	1.0mm Height Above Board	
DF19L-14P-1H(52)	CL0685-0003-8-52	14	17.55	13.0	20.55	18.15	19.15	1.1	1.1mm Height Above Board	
DF19L-20P-1H(52)	CL0685-0019-8-52	20	23.55	19.0	26.55	24.15	25.15	1.1	1.1mm Height Above Board	
DF19L-30P-1H(52)	CL0685-0016-0-52	30	33.55	29.0	36.55	34.15	35.15	1.1	1.1mm Height Above Board	

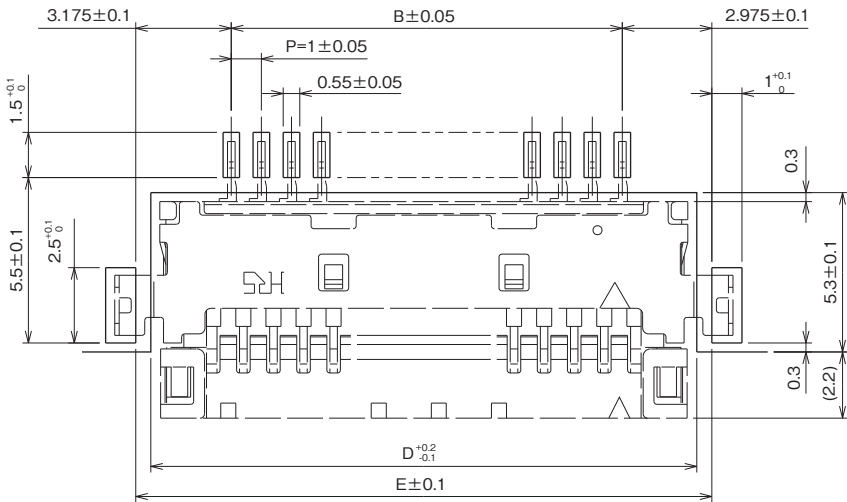
Right Angle Pin Header (SMT) (Reverse Offset Mounted Type)



Pictured mounted on board.



Recommended PCB Mounting Pattern



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Remarks	Purchase Unit
DF19KR-20P-1H(52)	CL0685-0023-5-52	20	23.55	19.0	26.55	24.15	25.15	1.0mm Height Above Board	1,000pcs per reel

Technical drawing of the 100-pin connector showing three views: top, side, and front. The top view shows a rectangular connector with dimensions 1.12, 0.95, 1.07, 1.3, 0.25, 1, 1.56, 5.22, 1.96, 3.8, and labels A, B, C, and "Contact No. 1 Indicator". The side view shows a height of 1.07. The front view shows a width of 2 and a height of 0.25.

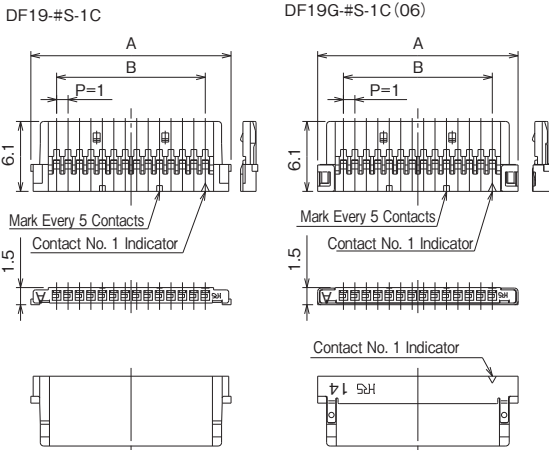
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	F	G	Purchase Unit
DF19-14P-1V(52)	CL0685-0036-7-52	14	17.9	13.0	15.25	14.95	6.675	6.325	13.0	1,000pcs per reel
DF19-20P-1V(52)	CL0685-0037-0-52	20	23.9	19.0	21.25	20.95	9.675	9.325	19.0	

Single Row Socket (Cable Type)



Shown with terminated and installed contacts

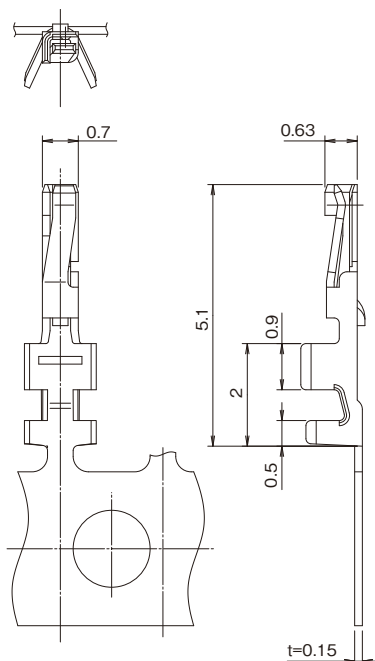
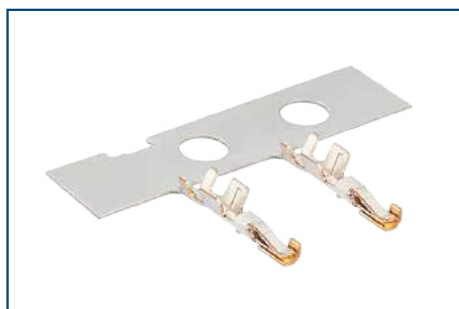


Unit : mm					
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF19-8S-1C	CL0685-0029-1-00	8	11.5	7.0	100pcs per bag
DF19-14S-1C	CL0685-0012-9-00	14	17.5	13.0	
DF19-20S-1C	CL0685-0011-6-00	20	23.5	19.0	
DF19-30S-1C	CL0685-0013-1-00	30	33.5	29.0	

With Exterior Shell (EMI Prevention Specification)

Unit : mm					
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF19G-8S-1C(06)	CL0685-0022-2-06	8	11.5	7.0	100pcs per bag
DF19G-14S-1C(06)	CL0685-0005-3-06	14	17.5	13.0	
DF19G-20S-1C(06)	CL0685-0007-9-06	20	23.5	19.0	
DF19G-30S-1C(06)	CL0685-0014-4-06	30	33.5	29.0	

Socket Crimp Contacts



Part No.	HRS No.	Purchase Unit (##) : Blank	Purchase Unit (##) : (41)
DF19A-2830SCFA(##)	CL0685-0048-6-##	10,000pcs per reel	20,000pcs per reel
DF19A-3032SCFA(##)	CL0685-0046-0-##		
DF19A-36SCFA(##)	CL0685-0047-3-##		

Applicable Wire (Tin Plated Annealing Copper Wire)

Part No.	UL	Wire Size	Stranded Wire Structure	Sectional Area	Jacket Diameter	Strip Length
DF19A-2830SCFA(##)	1571 (Thin Type)	28 AWG	7/0.127mm	0.089mm ²	φ 0.5-0.6mm	1.2-1.9mm
DF19A-3032SCFA(##)		30 AWG	7/0.1mm	0.055mm ²		
DF19A-36SCFA(##)		36 AWG	7/0.05mm	0.014mm ²	φ 0.27mm	

Note 1 : Please contact a Hirose sales representative when using cables other than those specified.

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

Applicable Tools

Type	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF19S	CL0901-4571-3-00	DF19A-2830SCFA(##) DF19A-3032SCFA(##)
Press Unit	CM-105C	CL0901-0001-0-00	-

Note 1 : Please conduct crimping work according to the "Crimping Quality Standard" (ETAD-H0945-00) and "Crimping Condition Table".

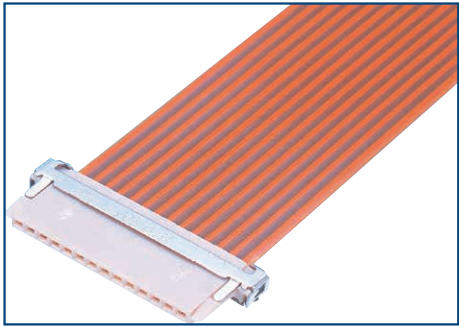
Note 2 : Issues with non-Hirose specified tools are outside the scope of warranty.

Note 3 : Contact your Hirose sales representative when using 36 AWG.

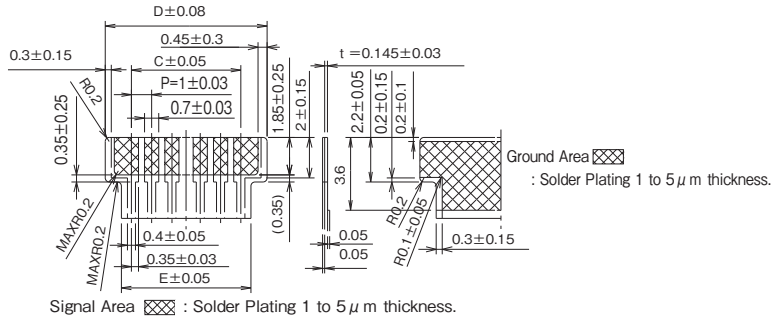
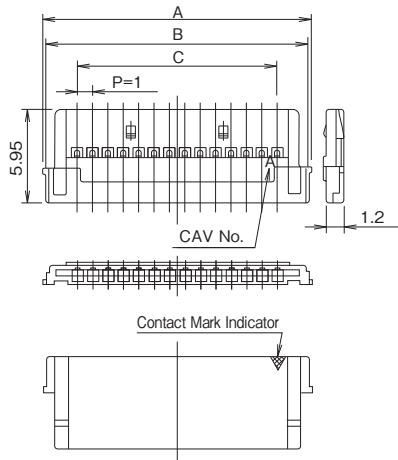
Note 4 : When non-authorized tools are used, please consult with Hirose sales representative about provision of the drawing of the crimping tool.

Single Row Socket (FPC Type)

Note : Socket and grounding plate is required.



Shown terminated with FPC.

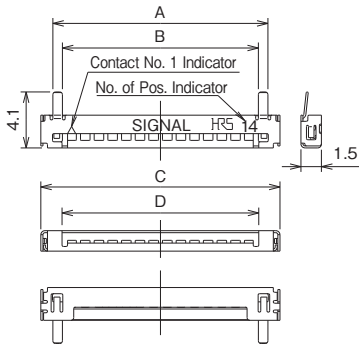


Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF19G-14S-1F(05)	CL0685-0017-2-05	14	17.5	17.1	13.0	15.6	14.0	100pcs per bag
DF19G-20S-1F(05)	CL0685-0009-4-05	20	23.5	23.1	19.0	21.6	20.0	
DF19G-30S-1F(05)	CL0685-0033-9-05	30	33.5	33.1	29.0	31.6	30.0	

Note : When using in combination with the right angle pin header (Top Board Type), mount on the edge of the PCB.

Ground Plate for FPC



Unit : mm

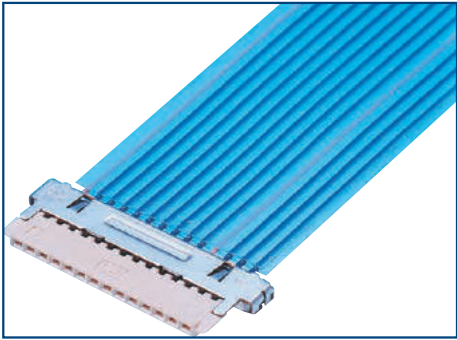
Part No.	HRS No.	No. of Pos.	A	B	C	D	Purchase Unit
DF19G-14S-1F-GND(06)	CL0685-0018-5-06	14	15.75	14.35	17.5	14.4	100pcs per bag
DF19G-20S-1F-GND(06)	CL0685-0010-3-06	20	21.75	20.35	23.5	20.4	
DF19G-30S-1F-GND(06)	CL0685-0034-1-06	30	31.75	30.35	33.5	30.4	

Applicable Assembly Tools

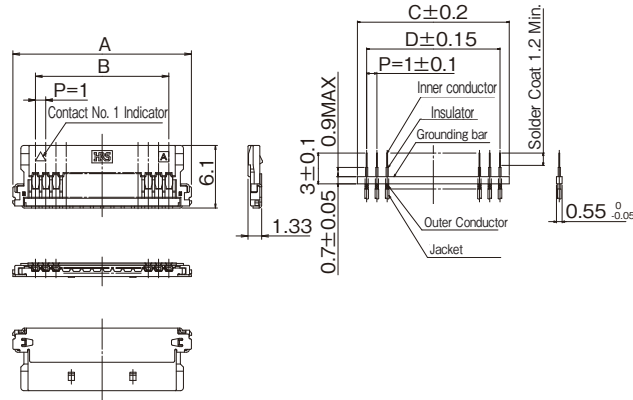
Type	Part No.	HRS No.
Desktop tool (for 14pos.)	DF19G-14S/PR-MD2	CL0902-4514-6-00
Desktop tool (for 20pos.)	DF19G-20S/PR-MD2	CL0902-4513-3-00
Desktop tool (for 30pos.)	DF19G-30S/PR-MD2	CL0902-4518-7-00

Note : Issues caused by tools other than those specified for Hirose are outside the scope of warranty.

Single Row Socket (Micro-coaxial)



Shown terminated with micro-coaxial cable.



- Note 1 : The pitch misalignment prevention tape can be connected without cutting, but please use a durable material.
- Note 2 : The inner conductor must be soldered in advance.
- Note 3 : When using a two position coaxial line, there are some pin arrangements that cannot be used due connector protrusion. Please check the official specifications.

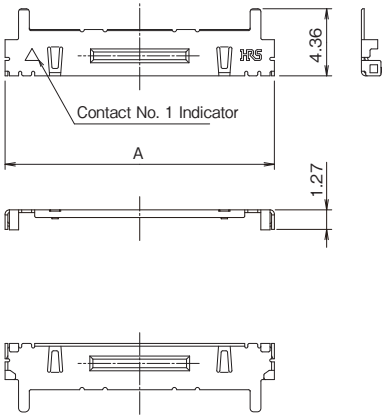
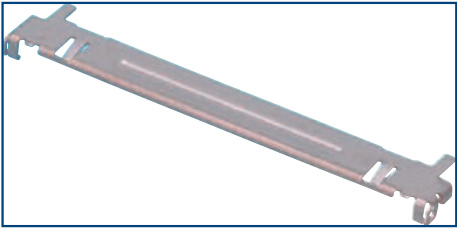
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	Purchase Unit
DF19G-14S-1SD(06)	CL0685-0026-3-06	14	17.4	13.0	14.8	13.0	100pcs per bag
DF19G-20S-1SD(06)	CL0685-0025-0-06	20	23.4	19.0	20.8	19.0	

Applicable Cable (Micro-coaxial Cable)

Wire Size (Core Wire Configuration)	Jacket Diameter
40 AWG (7 / 0.03mm)	φ 0.3-0.4mm

Grounding Plate for Micro-coaxial Cable

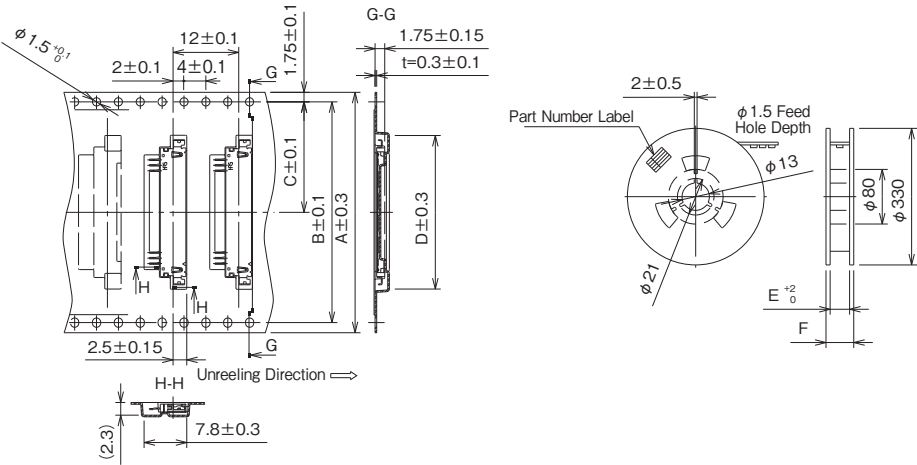


Unit : mm

Part No.	HRS No.	No. of Pos.	A	Purchase Unit
DF19G-14S-1SD-GND	CL0685-0028-9-00	14	17.5	100pcs per bag
DF19G-20S-1SD-GND	CL0685-0027-6-00	20	23.5	

Embossed Carrier Tape Dimensions (JIS-C-0806 Standard)

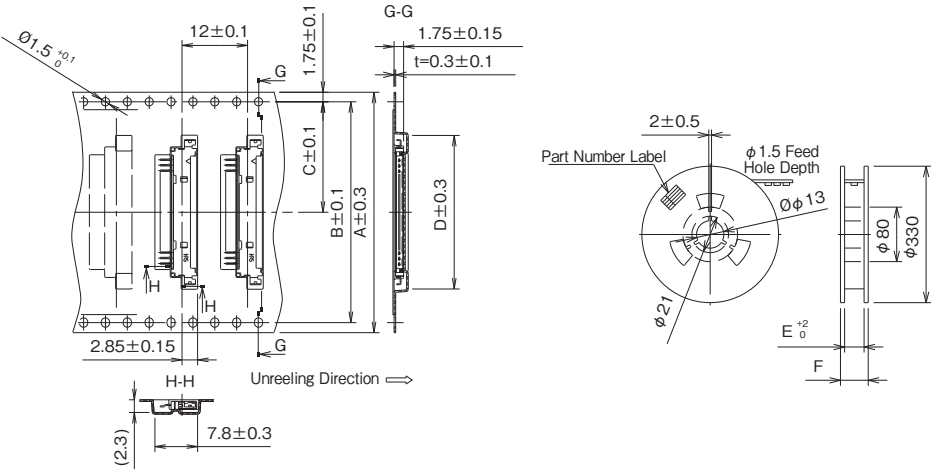
- DF19G-#P-1H(52)
- DF19K-#P-1H(52)
- DF19L-#P-1H(52)



Unit : mm

Part No.	No. of Pos.	A	B	C	D	E	F	Remarks
DF19G-8P-1H(52)	8	24.0	-	11.5	16.1	24.4	30.4	Top-board Mounted (1.65mm Height)
DF19G-14P-1H(52)	14	44.0	40.4	20.2	22.1	44.4	50.4	
DF19G-20P-1H(52)	20	44.0	40.4	20.2	28.1	44.4	50.4	
DF19G-30P-1H(52)	30	56.0	50.2	26.2	38.1	56.4	62.4	
DF19K-20P-1H(52)	20	44.0	40.4	20.2	28.1	44.4	50.4	Offset Mounted (1.0mm Height)
DF19K-30P-1H(52)	30	56.0	52.4	26.2	38.1	56.4	62.4	
DF19L-14P-1H(52)	14	44.0	40.4	20.2	22.1	44.4	50.4	Offset Mounted (1.1mm Height)
DF19L-20P-1H(52)	20	44.0	40.4	20.2	28.1	44.4	50.4	
DF19L-30P-1H(52)	30	56.0	52.4	26.2	38.1	56.4	62.4	

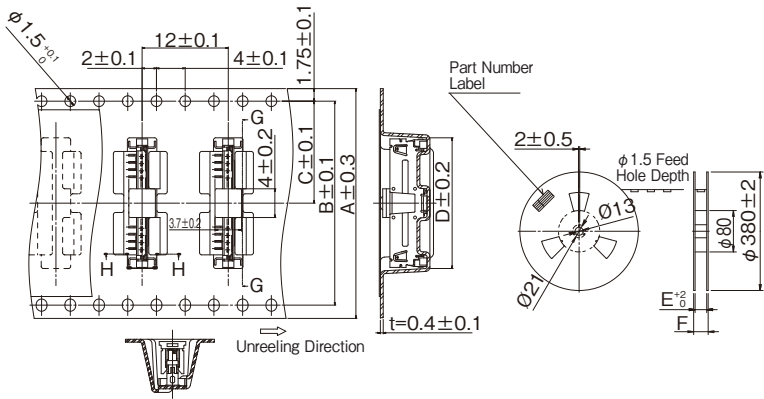
●DF19KR-20P-1H(52)



Unit : mm

Part No.	No. of Pos.	A	B	C	D	E	F	Remarks
DF19KR-20P-1H(52)	20	44.0	40.4	20.2	28.1	44.4	50.4	Reverse type of DF19K Offset Mounted (1.0mm Height)

●DF19-#P-1V(52)



Unit : mm

Part No.	No. of Pos.	A	B	C	D	E	F	Remarks
DF19-14P-1V(52)	14	32.0	28.4	14.2	18.2	32.4	38.4	Straight Type
DF19-20P-1V(52)	20	44.0	40.4	20.2	24.2	44.4	50.4	

Crimping Precautions

■ Items Required Prior to Crimping

The work-related documents shown below are required before starting harness assembly.

(The ● mark represents required documents.)

Please contact your Hirose sales representative if you do not have these documents.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
① Crimping Machine Main Unit Instruction Manual	Explanation of main press unit	●	-	Bundled with purchase of main press machine unit.
② Applicator Instruction Manual	Crimp Method	●	-	Bundled with purchase of applicator.
③ Applicator Spare Parts List	Applicator Installation Instruction	●	-	
④ Crimp Conditions	Crimp height, tensile strength standard value	●	-	
⑤ Crimp Quality Standards	Various standards for crimping conditions	●	-	
⑥ Hand Tool Operating Instructions	Crimp method, crimp height and tensile height standard value	-	●	Bundled with purchase of hand tool.
⑦ Cable Assembly	Cable assembly	●	●	Contact a Hirose sales representative.

■ Tools

- Use tools designated by Hirose when crimping.
- Crimping performed using tools other than those specified is outside the scope of warranty.
- The operating instructions are available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before beginning work.

■ Applicable Cables

Check that the cables to be used are within the applicable range.

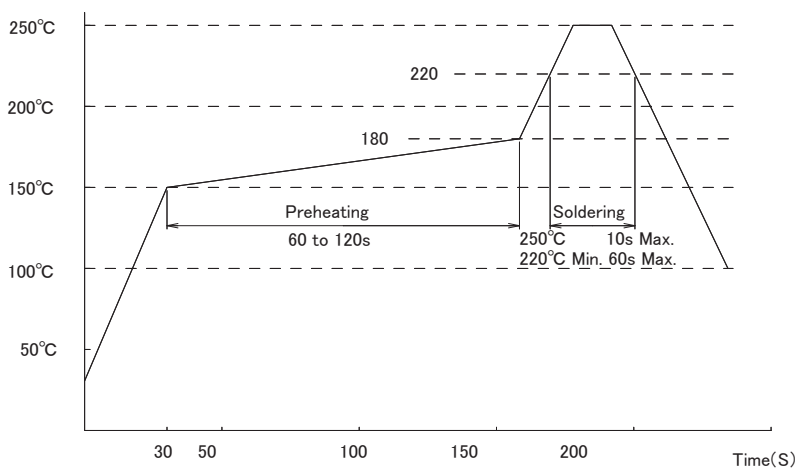
If you intend to use a cable other than those recommended, contact a sales representative.

[Precautions]

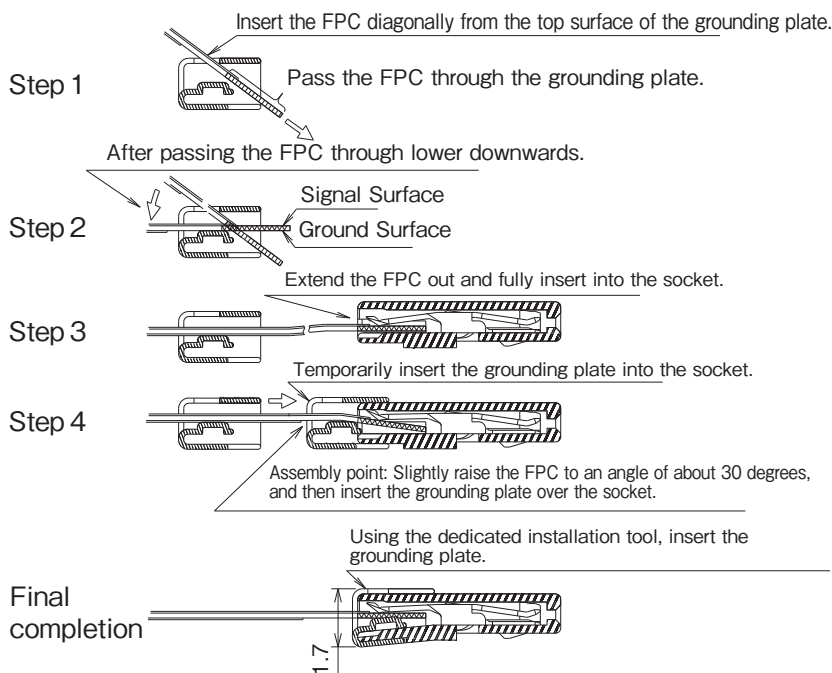
- Cables applicable to crimping connectors are tin-plated stranded soft-copper wire.
- Avoid crimping solid wire, wires with polyester threads or tin coated wires.
- Avoid crimping two cables together.
- The crimp height setting values (Note) may vary between tin-plated and gold-plated terminals even if the same electric wires are used.
- The crimp height setting values (Note) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

Precautions

1. Recommended Temperature Profile	Temperature (°C)  Time(S) 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. Note 2 : The temperature profile indicates the temperature of the surface of the connector lead. Note 3 : The color of the grounding plate may change color, although this does not affect the product performance.
2. Recommended Manual Soldering Conditions	Manual soldering : 350±10°C for 5 seconds
3. Recommended Metal Mask 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	■ Excessive prying during mating and unmating may result in damage. ■ Black spots may appear on the mold resin but this does not affect the product quality.
8. Handling	Please refer to the following documents when handling the product. ■ Crimp Quality Standard (ETAD-H9045-00) ■ Wire-to-Board Connector Use Handbook ■ Cable Assembly Procedure (ETAD-H0963-00)

Single Row Socket (FPC Type) Assembly Method



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

Note 2 : Dedicated assembly tools are required for assembly.

Note 3 : When temporarily inserting the ground plate, the FPC can be easily inserted by lightly lifting the FPC up to 30° and designing a self-alignment guide.

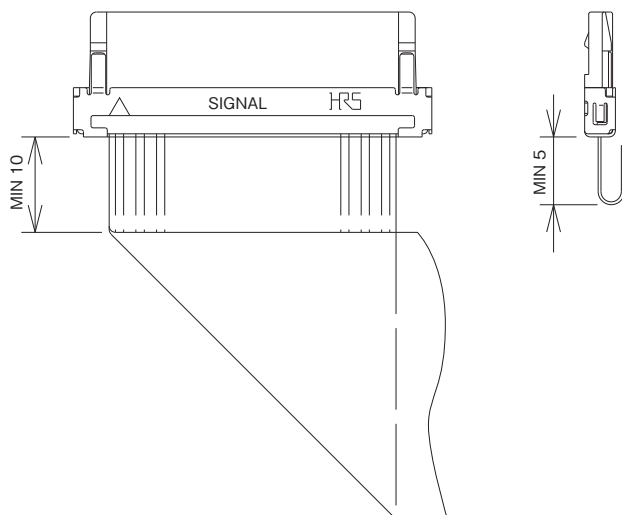
However, if excessive force (bending, twisting, etc.) is applied to the FPC, the FPC (edge of the cover film) copper foil may crack.

Note 4 : If the ground plate cannot be inserted, make sure it is aligned parallel to the socket and do not force it in.

Note 5 : To protect the FPC, insert and remove the connector parallel to the mating surface.

Note 6 : To protect the FPC, do not apply excessive tension.

Note 7 : Refer to the FPC manufacture recommended bending radius and other specifications. Distance should be allowed for bending as shown below.

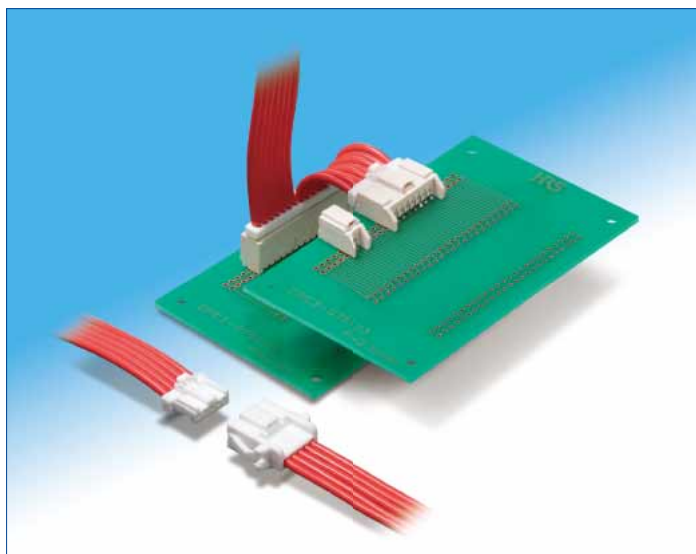


Note 8 : When terminating the FPC there is a risk of misuse of the tools, or injury from the ridge on the metal part of the connector, etc. Follow the terminal tools instruction manual to ensure proper termination.

2.5mm Pitch Connectors for Full Lock and Discrete Wire Connection

DF1E Series

UL, C-UL Listed



Full lock function added

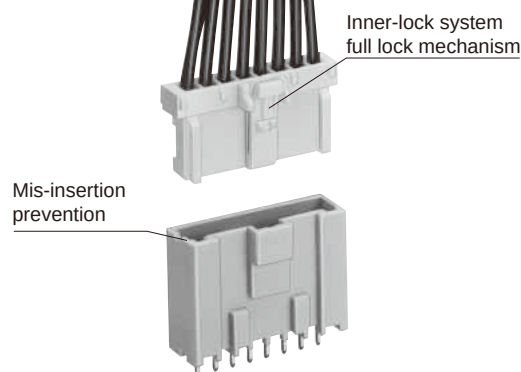


Fig.1

■ Features

1. Full Lock Function Added

The inner lock system adopts a full lock mechanism. This mechanism prevents disengagement to occur due to an unexpected external shock. (Fig.1)

2. Increase in Crimping Contact Fixation Force and Semi-insertion Prevention

The double lock is activated for the use method to give a stress to the cable, to increase crimping contact fixation force, and to prevent the semi-insertion of the crimping contact. (Fig.2)

3. Mold Lance Adopted

Since the contact lance may be deformed involving in the contact after the crimping process, the mold lance has been adopted.

4. Mis-insertion Prevention

Equipped with the mechanism to completely prevent reverse insertion and insertion between dissimilar contacts. (Fig.1)

5. Means to Prevent Solder Crack

The glass enforcement resin is adopted for the pin header to prevent a solder crack to occur due to heat compression.

6. Production Facility Cost Reduction

The female crimping contact uses the DF1B series crimping contact, which has been conventionally marketed. Investment for new facilities isn't needed. However, if the retainer is installed in the cable with 22 AWG or more wire, use the DF1E crimping contact. The female crimping contact for in-line is used together with the DF1B applicator. Therefore, no investment is needed for new facilities.

Double lock engaged

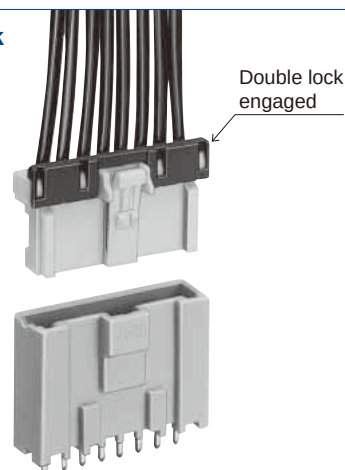


Fig.2

7. Various Applications

With the same series, various applications can be used for the board solder dip type and in-line.

8. Listed by UL, C-UL

Products Specifications

Rating	Current rating (Note 1) 20 to 24 AWG : 3A/pin 26 AWG : 2A/pin 28 AWG : 1A/pin 30 AWG : 0.5A/pin	Operating Temperature : -35 to +85°C (Note 2)	Storage Temperature Range : -10 to +60°C (Note 4)
	Voltage rating 250V AC/DC	Operating Moisture Range : 40 to 80% (Note 3)	Storage Moisture Range : 40 to 70% (Notes 4)

UL, C-UL Rating		
Rating	Current rating	20 to 22 AWG : 3A/pin 24 to 28 AWG : 1A/pin 30 AWG : 0.5A/pin
	Voltage rating	29.9V AC/DC

■UL/C-UL File No. and Recognition No.

UL : E52653

C-UL : E52653

Item	Specification	Condition
1. Contact Resistance	30mΩ max.	Measured at 20mV max. and 1mA
2. Insulation Resistance	1000MΩ min.	500V DC
3. Withstanding voltage	No flashover or insulation breakdown.	650V AC/1 minute
4. Durability (Mating/un-mating)	30mΩ max	Tin plated : 30 cycles, Gold plated : 50 cycles
5. Vibration	No electrical discontinuity of 1μs or more	Frequency : 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 directions.
6. Shock	No electrical discontinuity of 1μs or more	Acceleration of 490 m/s ² , 11 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis
7. Humidity (Steady state)	30mΩ max	96 hours at temperature of 40±2°C and humidity of 90% to 95%
8. Temperature Cycle	30mΩ max.	(-55°C : 30 minutes-> 5 to 35°C : 5 minutes-> 85°C : 30 minutes-> 5 to 35°C : 5 minutes) 5 cycles
9. Resistance to Soldering heat	No deformation of components affecting performance.	Flow : 260°C for 10 seconds
		Manual soldering : 300°C for 3 seconds

Note 1 : Current rating of header is 3A.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : Use without condensation on parts.

Note 4 : Applied for the product unused and packaged.

Note 5 : 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	Part	Material	Finish	Remarks	RoHS2
Socket	Insulator	Polyamide	White	UL94V-0	Yes
Header	Insulator	Polyamide	Beige	UL94V-0	
	Contact	Brass	Tin plated or Gold plated	————	
In-line Plug	Insulator	Polyamide	White	UL94V-0	
Retainer	Insulator	Polyamide	Black	UL94V-0	
Crimping contact	Contact	Phosphor copper	Tin plated or Gold 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.

Pin Header

DF1E **C** - ***** **P** - **2.5** **DSA**

① ② ③ ④ ⑤ ⑥

① Series Name : DF1E	③ Number of Contacts : 2 to 15 contacts
② Hold Types Blank : Right Angle Pin Header C : Straight Pin Header	④ Connector Type P : Pin Header
	⑤ Contact Pitch : 2.5mm
	⑥ Form type DSA : Straight Type DS : Right Angle Type

Socket

DF1E - ***** **S** - **2.5** **C**

① ② ③ ④ ⑤

① Series Name : DF1E	③ Connector type S : Socket
② Number of Contacts : 2 to 15 contacts	④ Contact Pitch : 2.5mm
	⑤ Form Type C : Crimping socket

In-line Plug

DF1E **A** - ***** **EP** - **2.5** **C**

① ② ③ ④ ⑤ ⑥

① Series Name : DF1E	③ Number of Contacts : 2 to 10 contacts
② In-line Plug type Blank : With Panel mount Lock A : Without Panel mount Lock	④ EP : In-line plug
	⑤ Contact Pitch : 2.5mm
	⑥ Form Type C : Crimping socket

Crimping Contact

DF1E - ****** **SCF**

① ② ③

① Series Name : Socket side : DF1B (Note 1) DF1E (Note 1) Plug side : DF1E	② Applicable Cable Size 2022 : 20 to 22 AWG 2428 : 24 to 28 AWG 30 : 30 AWG
	③ Packaging Type SCF : Female contact/reel/Tin plated SCFA : Female contact/reel/Gold plated SC : Female contact/pack/Tin plated SCA : Female contact/pack/Gold plated PCF : Male contact/reel/Tin plated PCFA : Male contact/reel/Gold plated PC : Male contact/pack/Tin plated PCA : Male contact/pack/Gold plated

Note 1 : When the retainer is used, use DF1E-2022SC(F)(A), DF1B-2428SC(F)(A), and DF1B-30SC(F)(A) contacts.
When no retainer is used, all DF1B-**SC(F)(A) and DF1E-2022SC(F)(A) contacts can be used.

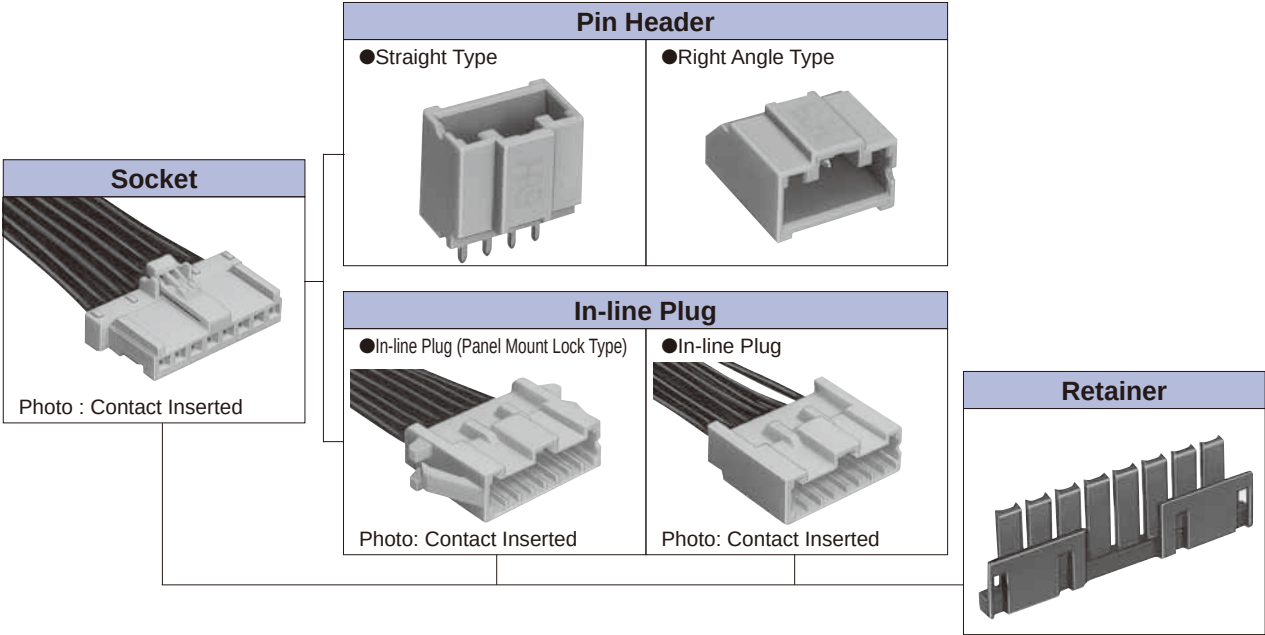
Retainer

DF1E - ***** **RS/P** - **2.5**

① ② ③ ④

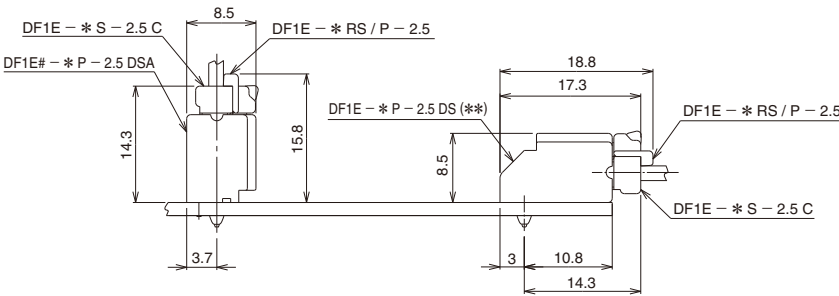
① Series Name : DF1E	③ Connector Type RS/P : Retainer Commonly used for socket and in-line plug
② Number of Contacts : 2 to 10 contacts	④ Contacts Pitch : 2.5mm

◆Application Pattern

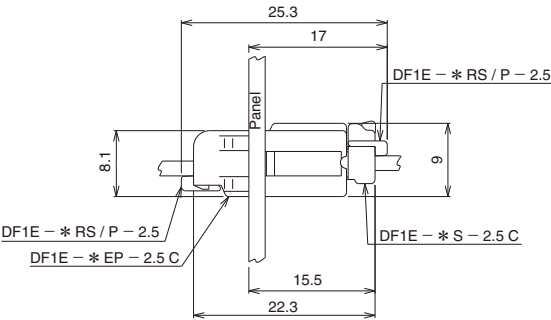


◆Mated Dimensions

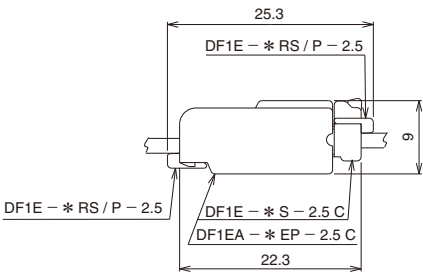
●Standard Header



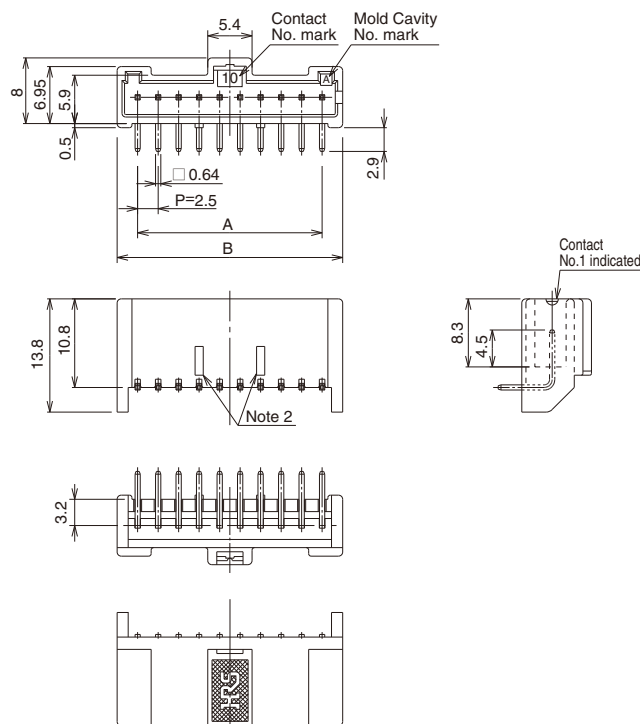
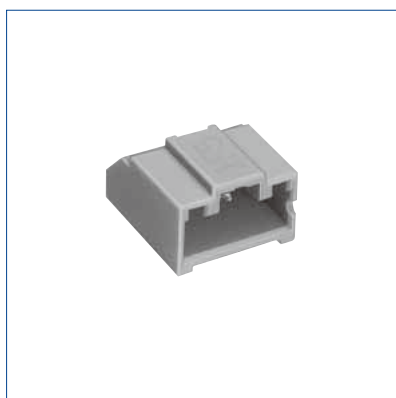
●Panel Mounting Lock In-line Plug



●In-line Plug



Right Angle Pin Header



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B
DF1E- 2P-2.5DS(**)	541-0985-0 **	2	2.5	7.5
DF1E- 3P-2.5DS(**)	541-0986-3 **	3	5.0	10.0
DF1E- 4P-2.5DS(**)	541-0987-6 **	4	7.5	12.5
DF1E- 5P-2.5DS(**)	541-0988-9 **	5	10.0	15.0
DF1E- 6P-2.5DS(**)	541-0989-1 **	6	12.5	17.5
DF1E- 7P-2.5DS(**)	541-0990-0 **	7	15.0	20.0
DF1E- 8P-2.5DS(**)	541-0991-3 **	8	17.5	22.5
DF1E- 9P-2.5DS(**)	541-0992-6 **	9	20.0	25.0
DF1E-10P-2.5DS(**)	541-0993-9 **	10	22.5	27.5
DF1E-11P-2.5DS(**)	541-0994-1 **	11	25.0	30.0
DF1E-12P-2.5DS(**)	541-0995-4 **	12	27.5	32.5
DF1E-14P-2.5DS(**)	541-0997-0 **	14	32.5	37.5
DF1E-15P-2.5DS(**)	541-0998-2 **	15	35.0	40.0

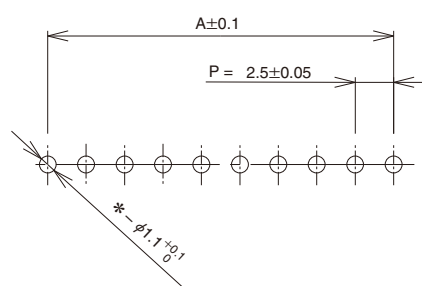
[Specific No.] -* *, (* *)
 (36) : Gold plated
 (35) : Tin plated

Note 1 : A packaging quantity is delivered by the bag unit (100 pcs.). If needed, please order the products per bag. However, the quantity for delivery will be changed according to the Specific No.

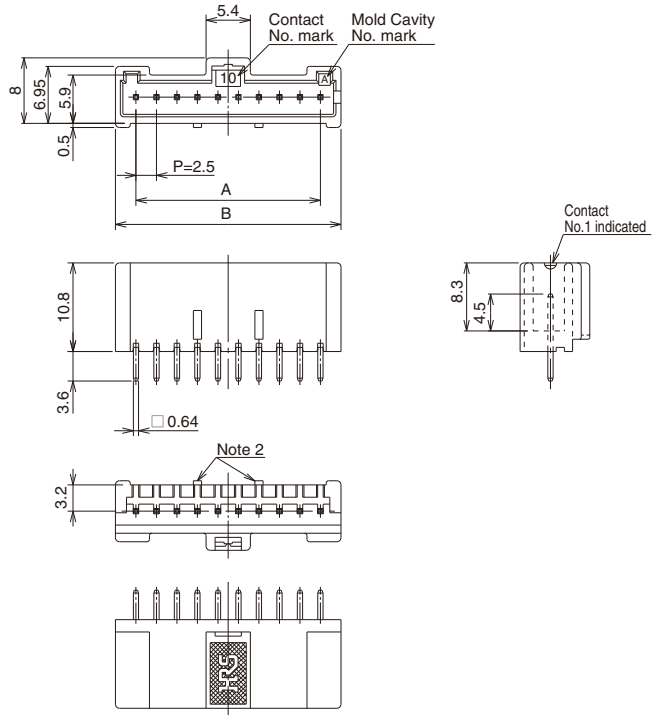
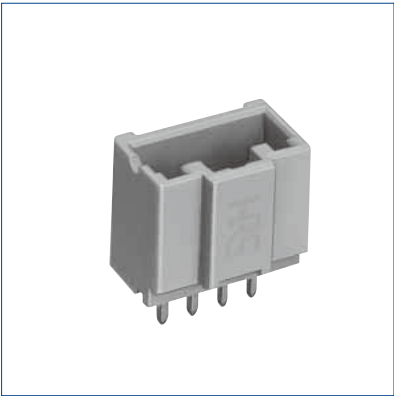
Note 2 : The 2 to 4 contacts differ in two convex portions from those in above figures. The 2 and 3 contacts are not contained, but the 4 contact connector is contained in the center at one point.

Note 3 : Styles of 2 to 4 contact connectors partially differ from those in above figures.

PCB mounting pattern (Board Thickness $t = 1.6 \pm 0.1$)



■Straight Pin Header



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B
DF1EC- 2P-2.5DSA(**)	541-0867-4 **	2	2.5	7.5
DF1EC- 3P-2.5DSA(**)	541-0868-7 **	3	5.0	10.0
DF1EC- 4P-2.5DSA(**)	541-0869-0 **	4	7.5	12.5
DF1EC- 5P-2.5DSA(**)	541-0870-9 **	5	10.0	15.0
DF1EC- 6P-2.5DSA(**)	541-0871-1 **	6	12.5	17.5
DF1EC- 7P-2.5DSA(**)	541-0872-4 **	7	15.0	20.0
DF1EC- 8P-2.5DSA(**)	541-0873-7 **	8	17.5	22.5
DF1EC- 9P-2.5DSA(**)	541-0874-0 **	9	20.0	25.0
DF1EC-10P-2.5DSA(**)	541-0875-2 **	10	22.5	27.5
DF1EC-11P-2.5DSA(**)	541-0876-5 **	11	25.0	30.0
DF1EC-12P-2.5DSA(**)	541-0877-8 **	12	27.5	32.5
DF1EC-14P-2.5DSA(**)	541-0879-3 **	14	32.5	37.5
DF1EC-15P-2.5DSA(**)	541-0880-2 **	15	35.0	40.0

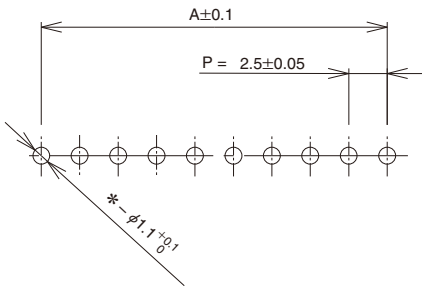
[Specific No.] -* *, (* *)
(36) : Gold plated
(35) : Tin plated

Note 1 : A packaging quantity is delivered by the bag unit (100 pcs.). If needed, please order the products per bag. However, the quantity for delivery will be changed according to the Specific No.

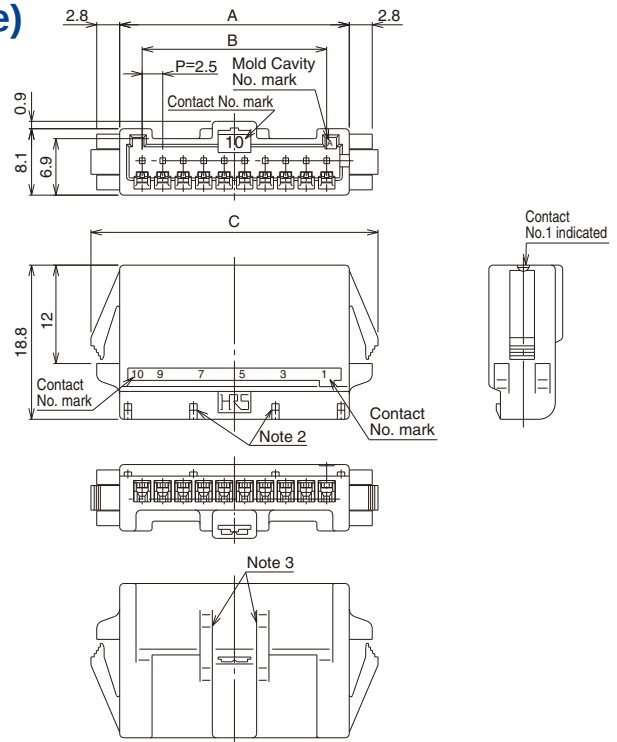
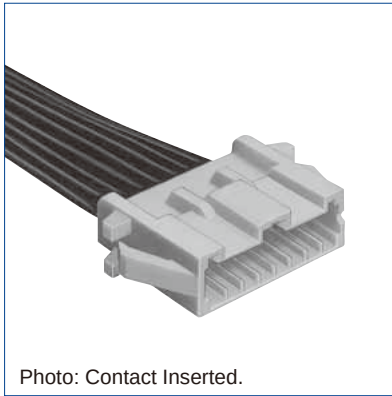
Note 2 : The 2 to 4 contacts differ in two convex portions from those in above figures. The 2 and 3 contacts are not contained, but the 2 and 3 contacts are not contained, and 4 contact is in the center at one point.

Note 3 : Styles of 2 to 4 contacts partially differ from those in above figures.

● PCB mounting pattern (Board Thickness $t = 1.6 \pm 0.1$)



■ In-line Plug (Panel Mount Lock Type)



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	D	E
DF1E- 2EP-2.5C	541-0943-0	2	8.0	2.5	15.0	8.4	11.9
DF1E- 3EP-2.5C	541-0944-3	3	10.5	5.0	17.5	10.9	14.4
DF1E- 4EP-2.5C	541-0945-6	4	13.0	7.5	20.0	13.4	16.9
DF1E- 5EP-2.5C	541-0946-9	5	15.5	10.0	22.5	15.9	19.4
DF1E- 6EP-2.5C	541-0947-1	6	18.0	12.5	25.0	18.4	21.9
DF1E- 8EP-2.5C	541-0949-7	8	23.0	17.5	30.0	23.4	26.9
DF1E-10EP-2.5C	541-0951-9	10	28.0	22.5	35.0	28.4	31.9

Note 1 : A packaging quantity is delivered by the bag unit (100 pcs.). If needed, please order the products per bag. However, the quantity for delivery will be changed according to the Specific No.

Note 2 : In regard to 2 to 5 contacts, the retainer fixed convex portions are located at both ends.

Note 3 : In regard to 2 to 7 contacts, 2 convex portions are different from those in the above figures.

Note 4 : Use the no radius side at the panel edge in the looking area.

Note 5 : Panel fixation is loosened. (May be enlarged according to the panel board thickness.)

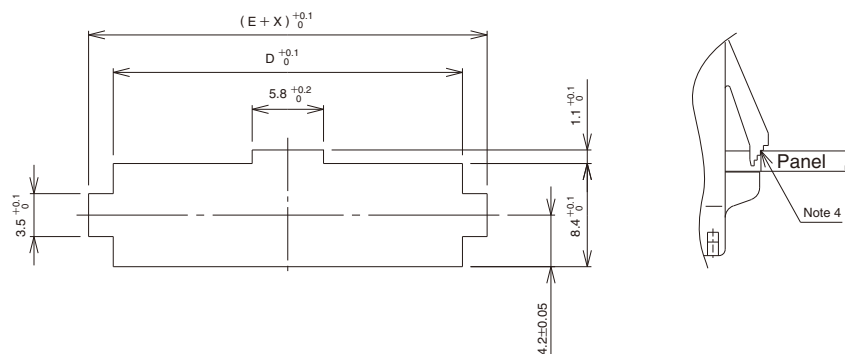
Note 6 : Styles of 2 to 4 contact partially differ from those in the above figures.

* Refer to page 11 for the retainer.

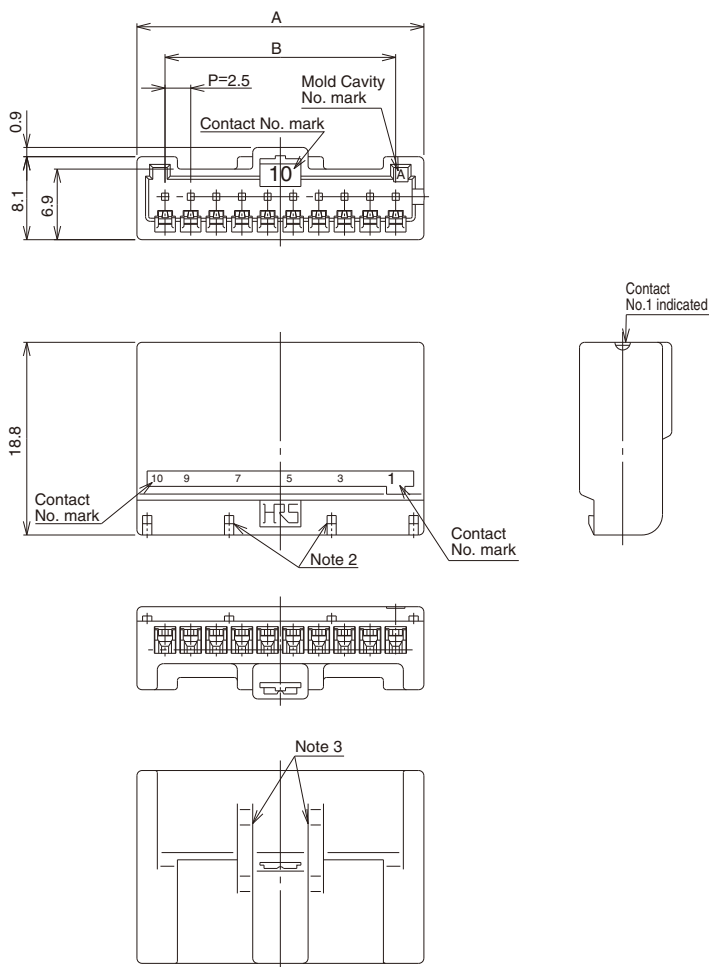
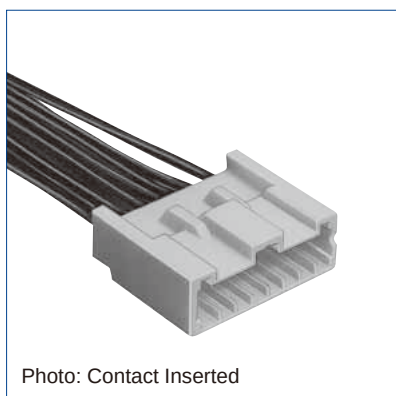
● Panel Cutout

Unit : mm

Panel Thickness	X
1.7 to 2.0	1.5
1.3 to 1.6	1.0
0.9 to 1.2	0.5
0.7 to 0.8	0.0



In-line Plug



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B
DF1EA- 2EP-2.5C	541-0957-5	2	8.0	2.5
DF1EA- 3EP-2.5C	541-0958-8	3	10.5	5.0
DF1EA- 4EP-2.5C	541-0959-0	4	13.0	7.5
DF1EA- 5EP-2.5C	541-0960-0	5	15.5	10.0
DF1EA- 6EP-2.5C	541-0961-2	6	18.0	12.5
DF1EA- 9EP-2.5C	541-0964-0	9	25.5	20.0
DF1EA-10EP-2.5C	541-0965-3	10	28.0	22.5

Note 1 : A packaging quantity is delivered by the bag unit (100 pcs.). If needed, please order the products per bag. However, the quantity for delivery will be changed according to the Specific No.

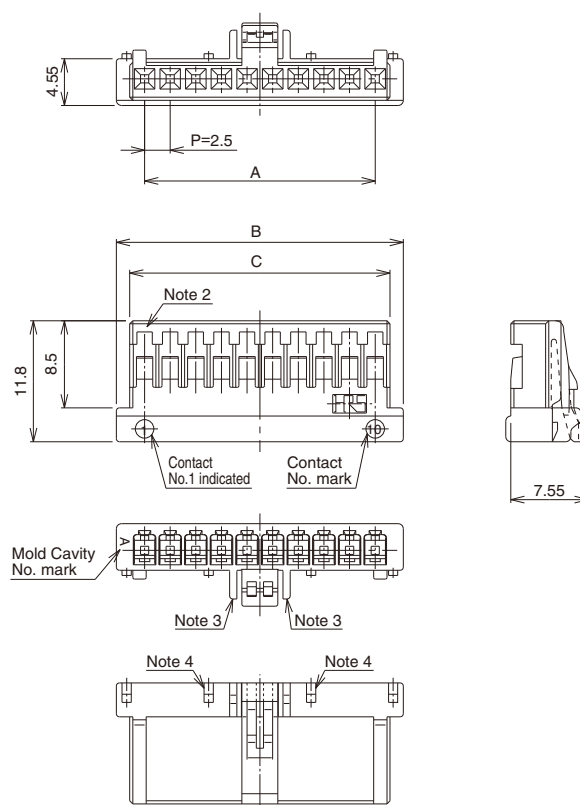
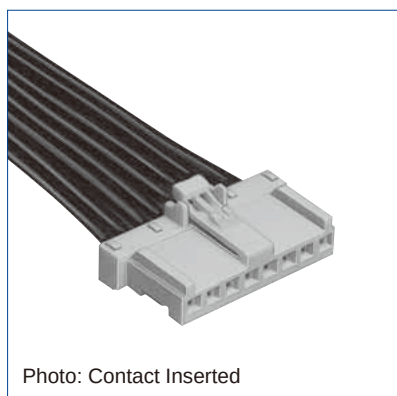
Note 2 : In regard to 2 to 5 contacts, the retainer fixed convex portions are located at both ends.

Note 3 : 2 to 7 contacts do not contain two convex portions, which is different from the above figure.

Note 4 : Styles of 2 to 4 contacts partially differ from the above figures.

* Refer to page 11 for retainer.

Socket



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C
DF1E- 2S-2.5C	541-0811-0	2	2.5	8.0	5.4
DF1E- 3S-2.5C	541-0812-2	3	5.0	10.5	7.9
DF1E- 4S-2.5C	541-0813-5	4	7.5	13.0	10.4
DF1E- 5S-2.5C	541-0814-8	5	10.0	15.5	12.9
DF1E- 6S-2.5C	541-0815-0	6	12.5	18.0	15.4
DF1E- 7S-2.5C	541-0816-3	7	15.0	20.5	17.9
DF1E- 8S-2.5C	541-0817-6	8	17.5	23.0	20.4
DF1E- 9S-2.5C	541-0818-9	9	20.0	25.5	22.9
DF1E-10S-2.5C	541-0819-1	10	22.5	28.0	25.4
DF1E-11S-2.5C	541-0820-0	11	25.0	30.5	27.9
DF1E-12S-2.5C	541-0821-3	12	27.5	33.0	30.4
DF1E-14S-2.5C	541-0823-9	14	32.5	38.0	35.4
DF1E-15S-2.5C	541-0824-1	15	35.0	40.5	37.9

Note 1 : A packaging quantity is delivered by the bag unit (100 pcs.). If needed, please order the products per bag. However, the quantity for delivery will be changed according to spec number.

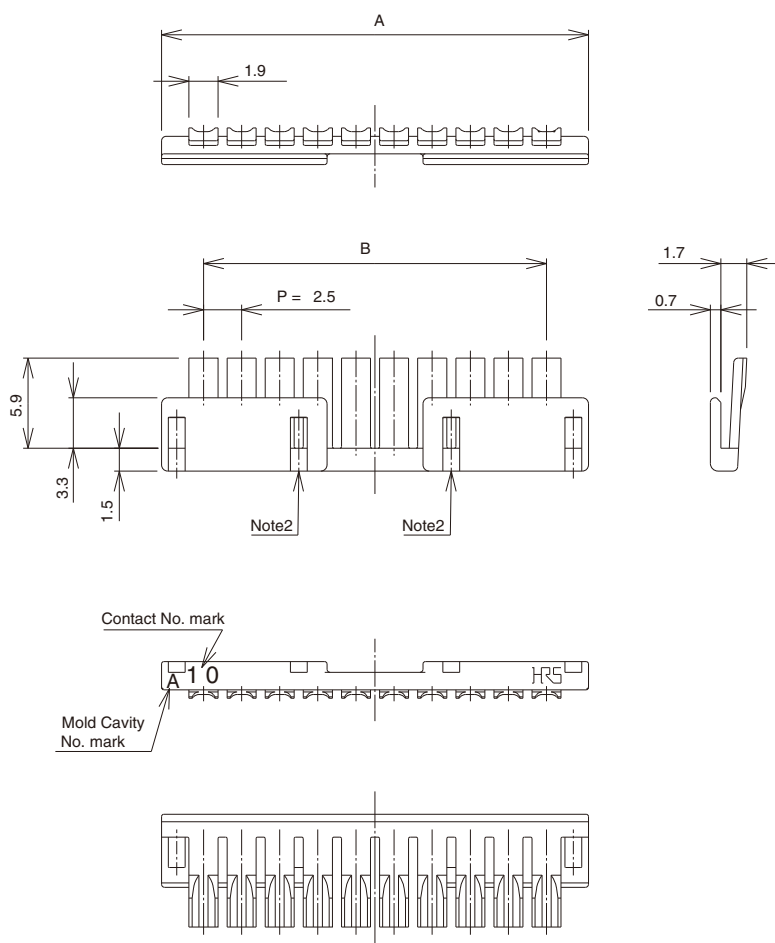
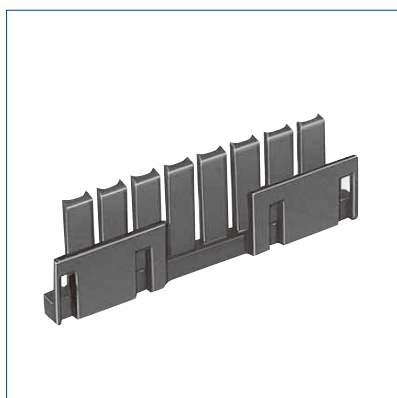
Note 2 : The 2 contact connector is equipped with the convex portion to prevent false-insertion.

Note 3 : The 2 consult Has no wall on the locking side

Note 4 : The 2 to 5 contacts contain the retainer fixed convex portions at both ends.

* Refer to page 11 for the retainer.

Retainer



Unit : mm

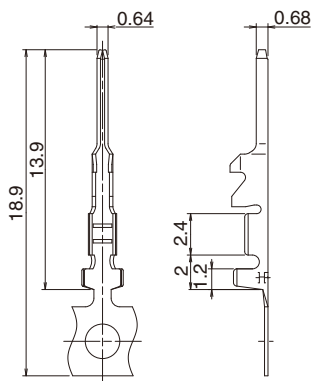
Part No.	HRS No.	No. of Contacts	A	B
DF1E- 2RS/P-2.5	541-0971-6	2	8.0	2.5
DF1E- 3RS/P-2.5	541-0972-9	3	10.5	5.0
DF1E- 4RS/P-2.5	541-0973-1	4	13.0	7.5
DF1E- 5RS/P-2.5	541-0974-4	5	15.5	10.0
DF1E- 6RS/P-2.5	541-0975-7	6	18.0	12.5
DF1E- 8RS/P-2.5	541-0977-2	8	23.0	17.5
DF1E-10RS/P-2.5	541-0979-8	10	28.0	22.5

Note 1 : A packaging quantity is delivered by the bag unit (100 pcs.). If needed, please order the products per bag. However, the quantity for delivery will be changed according to spec number.

Note 2 : The 2 to 4 contacts contain socket and plug fixed holes at both ends.

* This retainer can be used together with the socket and In-line plug.

■ Plug Crimping Contact



● Reel Contact Applicable Tool : Applicator

Part No.	HRS No.	Applicable Cable (Tin Plated Annealing Copper Wire)				Purchase Unit	Finish
		UL Style	Jacket Diameter	AWG	Wire Construction		
DF1E-2022PCF	541-0937-8	UL1007 UL1061	1.2 to 1.9mm	20 AWG	21/0.18	10000	Tin plated
DF1E-2022PCFA	541-1003-0			22 AWG	17/0.16		Gold plated
DF1E-2428PCF	541-0939-3			20 AWG	21/0.18		Tin plated
DF1E-2428PCFA	541-1005-6			22 AWG	17/0.16		Gold plated
			0.9 to 1.5mm	24 AWG	11/0.16		Tin plated
				26 AWG	7/0.16		
				28 AWG	7/0.127		
				24 AWG	11/0.16		Gold plated
				26 AWG	7/0.16		
				28 AWG	7/0.127		

Note : When using cables other than those specified, contact a Hirose sales representative.

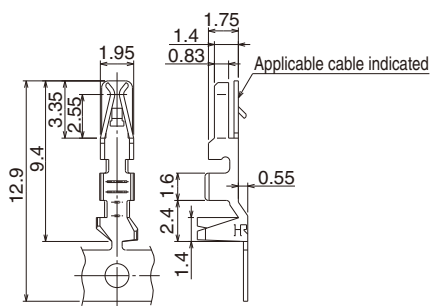
● Loose Contact Applicable Tool : Manual Crimping Tool

Part No.	HRS No.	Applicable Cable (Tin Plated Annealing Copper Wire)				Purchase Unit	Finish
		UL Style	Jacket Diameter	AWG	Wire Construction		
DF1E-2022PCA	541-1004-3	UL1007	1.8mm	20 AWG	21/0.18	100	Gold plated
			1.6mm	22 AWG	17/0.16		
DF1E-2428PC	541-0940-2		1.5mm	24 AWG	11/0.16		Tin plated
			1.3mm	26 AWG	7/0.16		
			1.2mm	28 AWG	7/0.127		

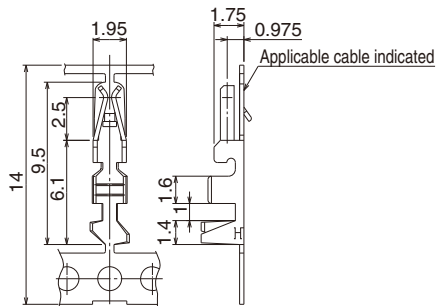
Note : Only the above cables are suitable when using the manual crimping tool.

Socket Crimping Contact

DF1E-2022SCF (A)



DF1B - * * * * SCF (A)



Reel Contact Applicable Tool : Applicator

Part No.	HRS No.	Applicable Cable (Tin Plated Annealing Copper Wire)				Purchase Unit	Finish
		UL Style	Jacket Diameter	AWG	Wire Construction		
DF1E-2022SCF	541-0999-5	UL1007 UL1061	1.2 to 1.9mm	20 AWG	21/0.18	10000	Tin plated
DF1E-2022SCFA	541-1001-5			22 AWG	17/0.16		Gold plated
DF1B-2022SCF	541-0223-1		1.2 to 1.9mm	20 AWG	21/0.18		Tin plated
DF1B-2022SCFA	541-0662-1			22 AWG	17/0.16		Gold plated
DF1B-2428SCF	541-0678-1		0.9 to 1.5mm	24 AWG	11/0.16		Tin plated
DF1B-2428SCFA	541-0680-3			26 AWG	7/0.16		
				28 AWG	7/0.127		
			24 AWG	11/0.16	Gold plated		
DF1B-2428SCFA	541-0680-3		26 AWG	7/0.16			
			28 AWG	7/0.127			
			DF1B-30SCF	541-0682-9	0.6 to 1.2mm		30 AWG
DF1B-30SCFA	541-0684-4		0.6 to 1.2mm	30 AWG	7/0.1		Gold plated

Note : When using cables other than those specified, contact a Hirose sales representative.

Loose Contact Applicable Tool : Manual Crimping Tool

Part No.	HRS No.	Applicable Cable (Tin Plated Annealing Copper Wire)				Purchase Unit	Finish
		UL Style	Jacket Diameter	AWG	Wire Construction		
DF1E-2022SC	541-1000-2	UL1007	1.8mm	20 AWG	21/0.18	100	Tin plated
DF1E-2022SCA	541-1002-8		1.6mm	22 AWG	17/0.16		Gold plated
			1.8mm	20 AWG	21/0.18		
DF1B-2022SC	541-0224-4		1.6mm	22 AWG	17/0.16		Tin plated
			1.8mm	20 AWG	21/0.18		
DF1B-2022SCA	541-0663-4		1.6mm	22 AWG	17/0.16		Gold plated
			1.8mm	20 AWG	21/0.18		
DF1B-2428SC	541-0679-4		1.6mm	22 AWG	17/0.16		Tin plated
			1.5mm	24 AWG	11/0.16		
			1.3mm	26 AWG	7/0.16		
			1.2mm	28 AWG	7/0.127		
DF1B-2428SCA	541-0681-6		1.5mm	24 AWG	11/0.16		Gold plated
			1.3mm	26 AWG	7/0.16		
			1.2mm	28 AWG	7/0.127		
			1.1mm	30 AWG	7/0.1		
DF1B-30SC	541-0683-1		1.1mm	30 AWG	7/0.1		Tin plated
DF1B-30SCA	541-0685-7		1.1mm	30 AWG	7/0.1		Gold plated

Note : Only the above cables are suitable when using the manual crimping tool.

◆ Crimping Tools

Item	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF1E-2022S	901-4561-0	DF1E-2022SCF DF1E-2022SCFA
	AP105-DF1B-2022S ◎	901-4510-9	DF1B-2022SCF DF1B-2022SCFA
	AP105-DF1B-2428S ◎	901-4518-0	DF1B-2428SCF DF1B-2428SCFA
	AP105-DF1B-30S ◎	901-4517-8	DF1B-30SCF DF1B-30SCFA
	AP105-DF1B-2022P ◎	901-4509-0	DF1E-2022PCF DF1E-2022PCFA
	AP105-DF1B-2428P ◎	901-4521-5	DF1E-2428PCF DF1E-2428PCFA
Main Press Unit	CM-105C ◎	901-0001-0	—
Manual Crimping Tool	HT102/DF1E-2022S	550-0277-1	DF1E-2022SC DF1E-2022SCA
	DF1B-TA2022SHC ◎	550-0182-7	DF1B-2022SC DF1B-2022SCA
	DF1B-TA2428SHC ◎	550-0209-1	DF1B-2428SC DF1B-2428SCA
	DF1B-TA30SHC ◎	550-0211-3	DF1B-30SC DF1B-30SCA
	HT102/DF1BE-2022P	550-0278-4	DF1E-2022PC DF1E-2022PCA
	HT102/DF1BE-2428P	550-0279-7	DF1E-2428PC DF1E-2428PCA
Contact Extraction Tool	DF-C-PO (B)	550-0179-2	DF1E-2022SC (F) (A) DF1B- * * * * SC (F) (A) DF1E- * * * * PC (F) (A)

Note 1 : Add " ◎ " to the last number of the product, in order to use DF1B series tools, which have been conventionally merchandized.

Note 2 : If any trouble has occurred due to other tools, which are not designated by Hirose, Hirose won't guarantee any products.

Note 3 : Please perform crimping work in accordance with the "Crimp Quality Standard" (ETAD-H0947-00, ETAD-H0949-00) and the "Crimp Condition Table".

Note 4 : Please contact a Hirose sales representative to request the tooth profile drawings when using other than tools specified by our company.

◆ Crimping Precautions

■ Items Required Prior to Crimping

The work-related documents shown below are required before starting the harness assembly.

(The ● mark represents required documents.)

Please contact your Hirose sales representative if you do not have these documents.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
(1) Crimping Machine Main Unit Instruction Manual	Explanation of main press unit	●	—	Bundled with purchase of main press machine unit.
(2) Applicator Instruction Manual	Crimp Method	●	—	Bundled with purchase of applicator.
(3) Applicator Spare Parts List	Applicator Installation Instruction	●	—	
(4) Crimp Conditions	Crimp height, tensile strength standard value	●	—	
(5) Crimp Quality Standards	Various standards for crimping conditions	●	—	Bundled with purchase of hand tool.
(6) Hand Tool Operating Instructions	Crimp method, crimp height and tensile height standard value	—	●	

■ Tools

- Use tools designated by Hirose when crimping.
- Crimping performed using tools other than those specified is outside the scope of warranty.
- The operating instructions are available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before beginning work.

■ Applicable Cables

Check that the cables to be used are within the applicable range.

If you intend to use a cable other than those recommended, contact a sales representative.

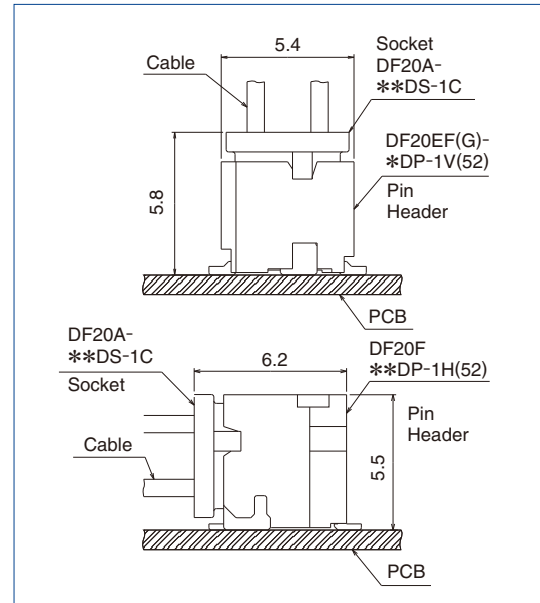
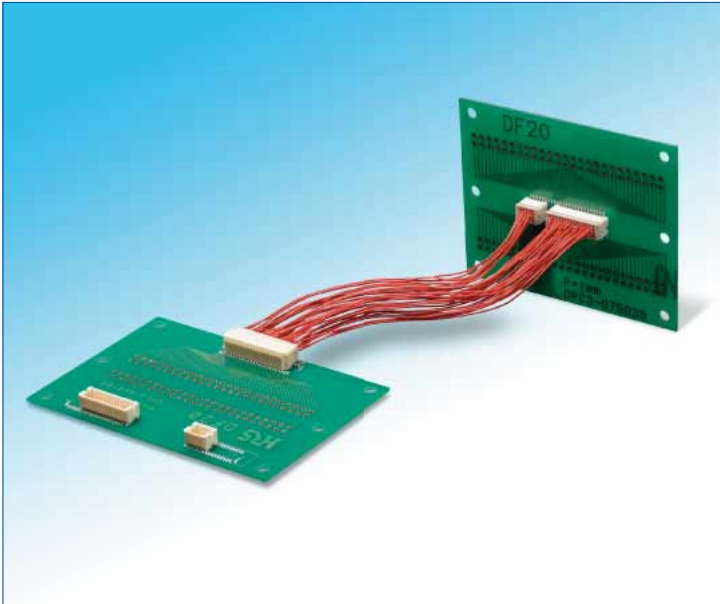
[Precautions]

- Cables applicable to crimping connectors are tin-plated stranded soft-copper wire.
- Avoid crimping solid wire, wires with polyester threads or tin coated wires.
- Avoid crimping two cables together.
- The crimp height setting values (Note 1) may vary between tin-plated and gold-plated terminals even if the same electric wires are used.
- The crimp height setting values (Note 1) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note 1 : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

1mm Pitch Double Rows Low Profile Wire-to-Board Connectors

DF20 Series



■ Features

1. Contact Pitch

1mm contact pitch allows reliable solder and cable termination.

2. Reliable electrical connection wipe

Effective electrical connection is assured with a 1mm wipe of mating contacts.

3. Narrower external width and length

Redesigned metal fittings decreased the overall length of the board- mount receptacle and permit end-to-end mounting of several connectors.

4. Automatic equipment board placement

Straight type pin headers are supplied with a 5.4mm x 4.6mm flat platform to allow vacuum pick-up and placement on the board.

5. Product variations

- (1) Available with 10, 20, 30, 40, and 50 contacts.
- (2) Pin headers are available in two types : with or without board positioning bosses.
- (3) Depending on specific application pin headers can be ordered in straight or right angle types.

Narrower external width and length



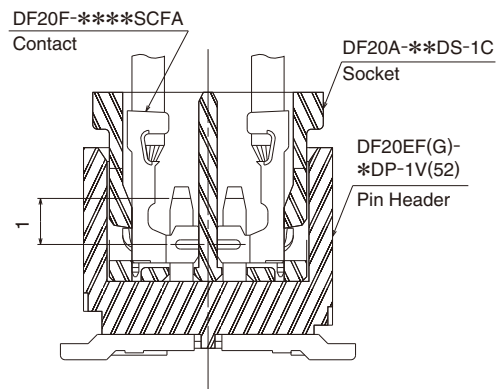
Metal fitting

■ Applications

Notebook PC, small office automation equipment, small consumer devices, portable devices.

Any application requiring low profile reliable board-to-cable connection with a 28 AWG, 30 AWG, 32 AWG conductors.

1mm Pitch, Double Rows



Product Specifications

Rating	Rated current	28 AWG : 1A/pin 30 AWG : 0.9A/pin 32 AWG : 0.7A/pin	Operating temperature range	-35°C to +85°C (Note 1)	Storage temperature range	-10°C to +60°C
	Rated voltage	100V AC/DC	Operating humidity range	40% to 80% (Note 2)	Storage humidity range	40% to 70%

Item	Specifications	Conditions
1. Insulation resistance	500MΩ min.	Measured at 100V DC
2. Withstanding voltage	No flashover or insulation breakdown	Conduction of 300V AC applied for 1 minute
3. Contact resistance	30MΩ max.	Measure at 1mA.
4. Vibration	No electrical discontinuity of 1μs min.	Frequency of 10 to 55 Hz, single amplitude of 0.75mm, in 3 directions for 10 cycles
5. Humidity	Contact resistance of 30mΩ max., insulation resistance of 100MΩ min.	Temperature of 40±2°C, humidity of 90% to 95%, left standing for 96 hours
6. Temperature cycle	Contact resistance of 30mΩ max, insulation resistance of 500MΩ min.	(-55°C : 30min / 5°C to 35°C : 2 to 3min / 85°C : 30min / 5°C to 35°C : 2 to 3min) for 5 cycles
7. Mechanical operation	Contact resistance of 30mΩ max.	50 cycles
8. Resistance to Soldering heat	No deformation of the insulator parts that will affect performance	Reflow : At the recommended temperature profile, manual solder : Soldering iron temperature of 300°C for 3 seconds

Note1 : Includes temperature rise caused by current flow.

Note2 : No condensing.

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

Item	Part	Material	Finish	Remarks	RoHS2
Socket	Insulator	Polyamide	Color : Beige	UL94V-0	YES
Crimping contact	Contact	Phosphor bronze	Gold plating	———	
Pin header	Insulator	Polyamide	Color : Beige	UL94V-0	
	Contact	Phosphor bronze	Gold plating	———	
	Metal Fitting	Brass	Tin Plating	———	

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.

Pin header

DF20 # - * DP - 1 V

① ② ③ ④ ⑤ ⑥

① Series name	DF20, DF20E	④ Connector type	DP : Double-row pin header
② Boss Type	F : Without boss G : With boss	⑤ Contact pitch	: 1mm
③ Number of contacts	: 10, 20, 30, 40, 50	⑥ Type of housing, header	V : Straight SMT header H : Right angle SMT header

Crimping contact

DF20 F - 2830 SCF A - ()**

① ② ③ ④

① Applicable wire size	2830 : 28 to 30 AWG 3032 : 30 to 32 AWG	③ Plating type	A : Gold plating
② Contact & packaging type	SCF : Socket contact reel	④ Packaging Specifications	04 : 1 reel = 10,000 pieces 44 : 1 reel = 20,000 pieces

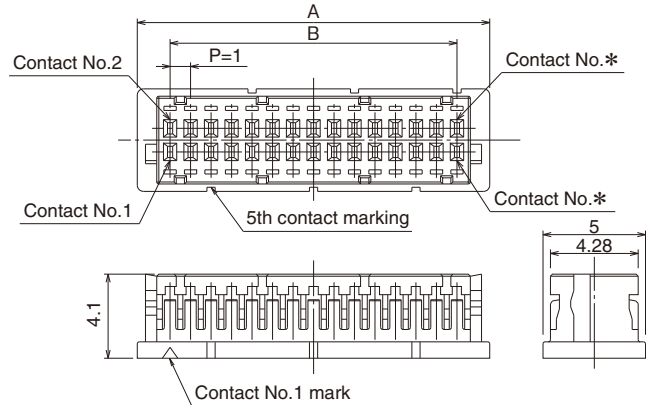
Crimp socket

DF20 A - * DS - 1 C

① ② ③ ④ ⑤

① Series name	DF20A	④ Contact pitch	: 1mm
② Number of contacts	: 10, 20, 30, 40, 50	⑤ Type of housing, header	C : Crimp housing
③ Connector type	DS : Double-row socket		

Double Row Socket



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B
DF20A-10DS-1C	686-0020-3	10	7.2	4.0
DF20A-20DS-1C	686-0021-6	20	12.2	9.0
DF20A-30DS-1C	686-0022-9	30	17.2	14.0
DF20A-40DS-1C	686-0023-1	40	22.2	19.0
DF20A-50DS-1C	686-0024-4	50	27.2	24.0

【Specifications number】-*, (**)

Blank : Bag packaging (100 pcs / pack)

Note : Sales quantities are by the package unit (containing 100 pieces). Please order by package unit.

Crimp Contacts

Part No.	HRS No.	Finish	Applicable Wire (Tin plated annealing copper wire) (Note 1)				
			UL Style	AWG	Wire Construction	Sectional Area	Jacket Diameter (Note 2)
DF20F-2830SCFA(**)	686-0042-6 **	Gold plated	1571 (Thin type)	28 AWG	7cores/0.127mm	0.089mm ²	0.54~0.6mm (0.58mm)
				30 AWG	7cores/0.1mm	0.055mm ²	0.54~0.6mm (0.56mm)
DF20F-3032SCFA(**)	686-0043-9 **	Gold plated	1571 (Thin type)	30 AWG	7cores/0.1mm	0.055mm ²	0.54~0.6mm
				32 AWG	7cores/0.08mm	0.035mm ²	0.54~0.6mm

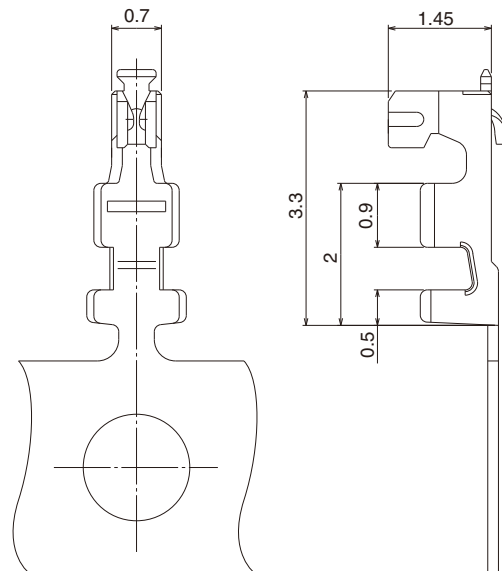
【Specifications number】(**)

(04) : 10,000 pieces/reel

(44) : 20,000 pieces/reel

Note 1 : Please consult with our Hirose sales representative when using wires other than these applicable wire.

Note 2 : The wire of jacket diameter in parenthesis is only suitable when crimping with hand tool.



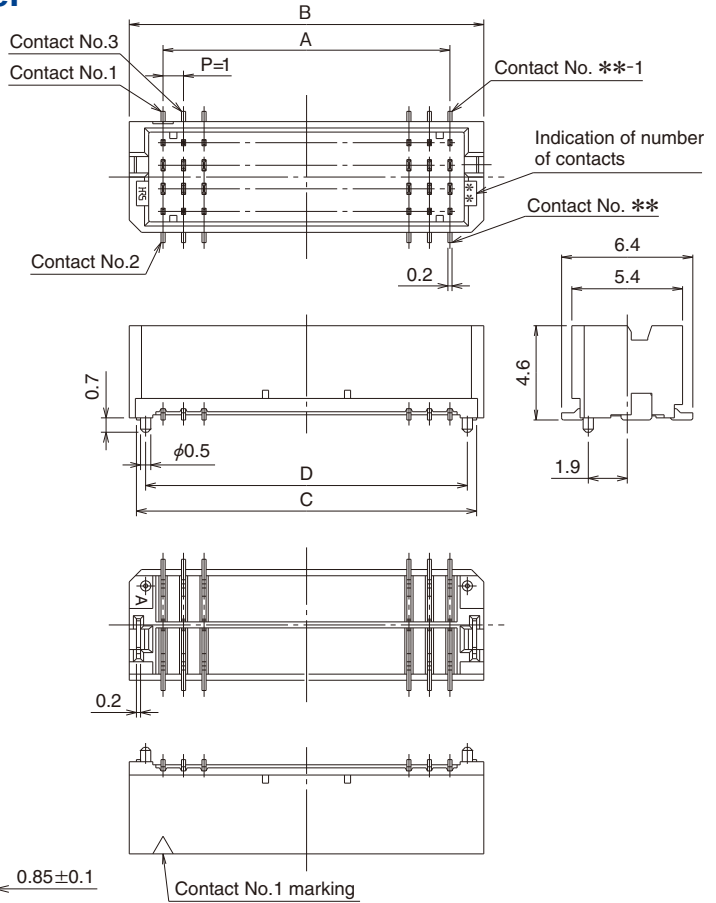
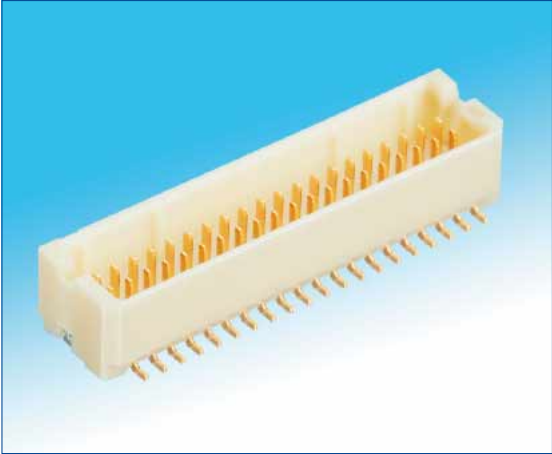
Applicable Crimping Tool

Type	Part No.	HRS No.	Applicable contact
Applicator	AP105-DF20-2830S	901-4572-6	DF20F-2830SCFA(04), DF20F-2830SCFA(44) DF20F-3032SCFA(04), DF20F-3032SCFA(44)
Manual Crimping Tool	HT302/DF20B-2830S	902-4540-6	DF20F-2830SCFA(04), DF20F-2830SCFA(44)
Press	CM-105C	901-0001-0	—

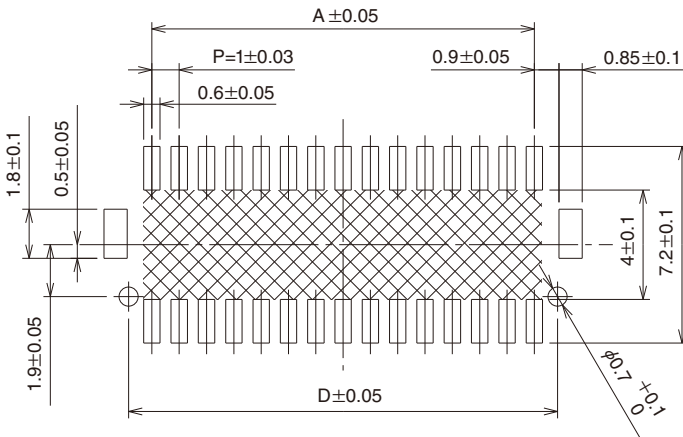
Note 1 : Hirose Electric will not be responsible for any problems caused by use of tools other than specified.

Note 2 : Please conduct crimping work according to the "Crimp Quality Standard (ETAD-H0929-00)" and "Crimp condition table".

Double Row Straight Pin header



PCB Footprints



Note 1 : Shaded area must be free of any electrically conductive traces to avoid contact with soldered pin header terminations.
Note 2 : Required only for pin headers supplied with the positioning boss.

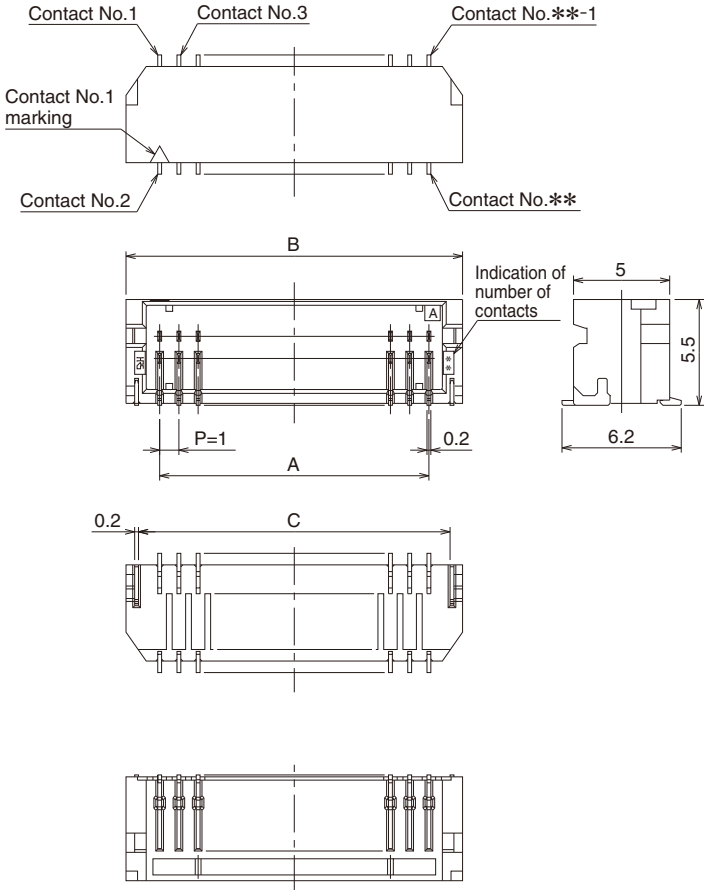
Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	Remarks
DF20EF-10DP-1V(52)	686-0055-0 52	10	4.0	7.3	6.6	—	Without boss
DF20EF-20DP-1V(52)	686-0056-0 52	20	9.0	12.3	11.6	—	
DF20EF-30DP-1V(52)	686-0057-0 52	30	14.0	17.3	16.6	—	
DF20EF-40DP-1V(52)	686-0058-0 52	40	19.0	22.3	21.6	—	
DF20EF-50DP-1V(52)	686-0053-0 52	50	24.0	27.3	26.6	—	
DF20EG-10DP-1V(52)	686-0059-0 52	10	4.0	7.3	6.6	5.7	With boss
DF20EG-20DP-1V(52)	686-0060-0 52	20	9.0	12.3	11.6	10.7	
DF20EG-30DP-1V(52)	686-0061-0 52	30	14.0	17.3	16.6	15.7	
DF20EG-40DP-1V(52)	686-0062-0 52	40	19.0	22.3	21.6	20.7	
DF20EG-50DP-1V(52)	686-0054-0 52	50	24.0	27.3	26.6	25.7	

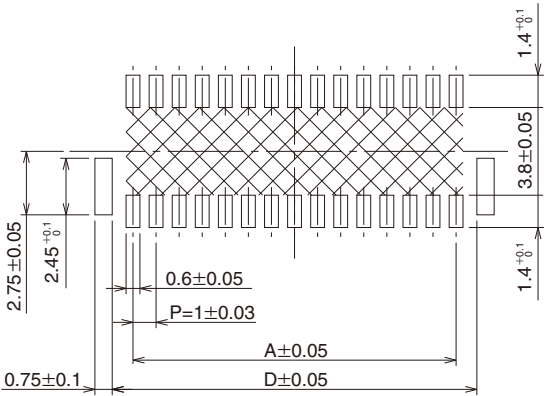
Note 1 : Order embossed tape packaging items by the reel. (1 reel contains 1,000 pieces)
Note 2 : Vacuum pick-up cap are included with embossed tape packaged connectors.

【Specifications number】-*, (**)
(52) : Gold plating,
embossed tape packaging

■Double Row Right angle Pin header



◆PCB Footprints



Note : Shaded area must be free of any electrically conductive traces to avoid contact with soldered pin header terminations.

Unit : mm

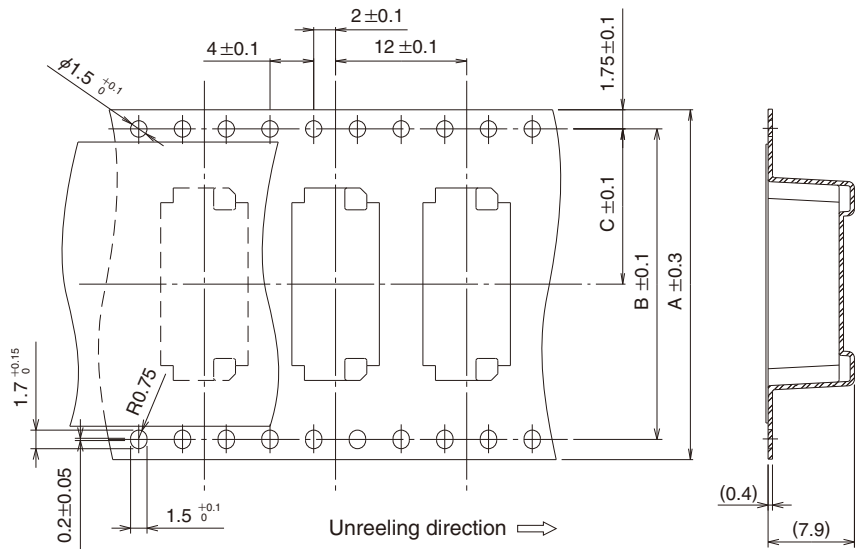
Part No.	HRS No.	No. of contacts	A	B	C	D	Remarks
DF20F-10DP-1H (52)	686-0027-2 52	10	4.0	7.5	6.2	5.8	Without boss
DF20F-20DP-1H (52)	686-0028-5 52	20	9.0	12.5	11.2	10.8	
DF20F-30DP-1H (52)	686-0029-8 52	30	14.0	17.5	16.2	15.8	
DF20F-40DP-1H (52)	686-0030-7 52	40	19.0	22.5	21.2	20.8	

Note : Order embossed tape packaging items by the reel. (1 reel contains 1,000 pieces)

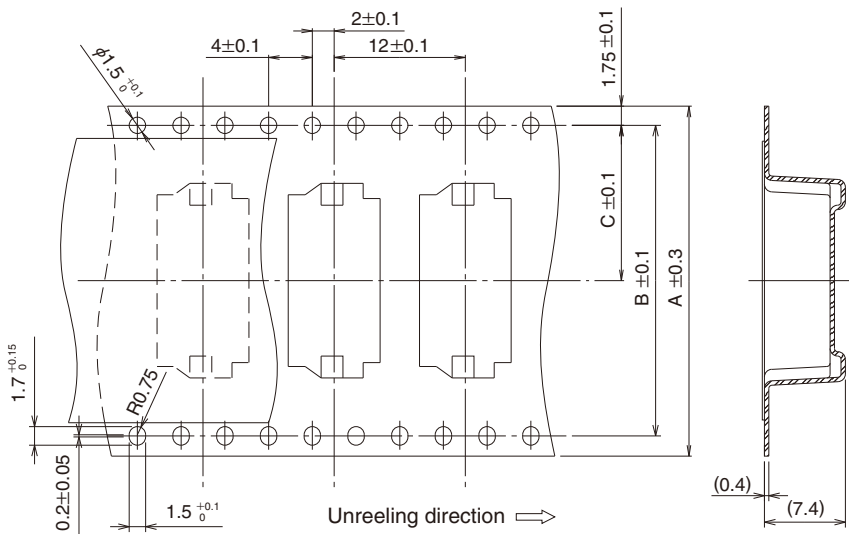
【Specifications number】-*, (**)
(52) : Gold plating,
embossed tape packaging

◆ Embossed Carrier Tape Dimensions

● Straight pin header

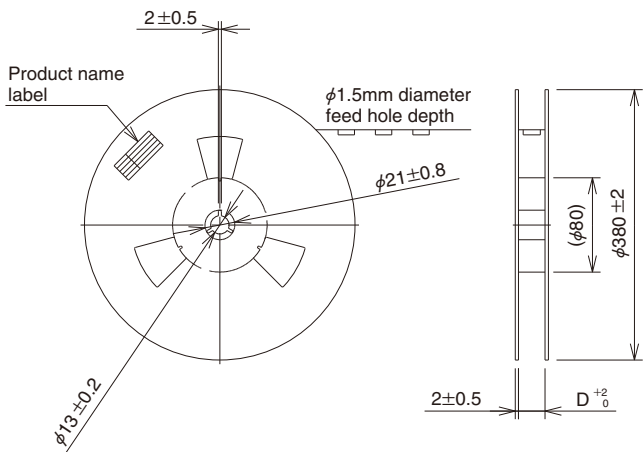


● Right angle pin header



● Reel dimensions

Part No.	No. of Contacts	A	B	C	D
DF20EF(G)-10DP-1V(52)	10	16	—	7.5	16.4
DF20EF(G)-20DP-1V(52)	20	24	—	11.5	24.4
DF20EF(G)-30DP-1V(52)	30	32	28.4	14.2	32.4
DF20EF(G)-40DP-1V(52)	40	44	40.4	20.2	44.4
DF20EF(G)-50DP-1V(52)	50	44	40.4	20.2	44.4
DF20F-10DP-1H(52)	10	16	—	7.5	16.4
DF20F-20DP-1H(52)	20	24	—	11.5	24.4
DF20F-30DP-1H(52)	30	32	28.4	14.2	32.4
DF20F-40DP-1H(52)	40	44	40.4	20.2	44.4



◆ Crimping Precautions

■ Items required prior to start crimping

The work-related documents shown below are required before starting the harness connections.
(The ● mark shows the document required.)

When the documents shown below are not available, ask our sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
(1) Main unit of crimping machine instruction manual	Explanation of main press machine unit	●	—	When purchasing main press machine unit, it is bundled.
(2) Operating Instructions for Hand Tool	Crimp operation	●	—	When purchasing Applicator, it is bundled.
(3) Applicator Spare Parts Identification	Explanation for Applicator installation	●	—	
(4) Crimp Conditions	Standard values of : Crimp height ; Tensile strength	●	—	
(5) Crimp Quality Standards	Various standards for crimping conditions	●	—	When purchasing Hand Tool, it is bundled.
(6) Operating Instructions for Hand Tool	Inspection items of : Crimp height ; Crimp operation Tensile strength	—	●	
(7) Cable Assembly Procedure	Cable Assembly Procedure	●	●	Ask our sales personal to provide them.

■ Tools

When crimping work is applied to our contacts, the tool designated by Hirose should be used.
Crimping work by using tools other than as designated must not be done because it may result in contact failure, disconnection of cable, etc.

*The operating instructions manual is available for the crimping machine and the applicator.

Be sure to carefully read the operating instructions manual before implementing the work.

■ Applicable electric wires

Check that the electric wire to be used is in the range of application.

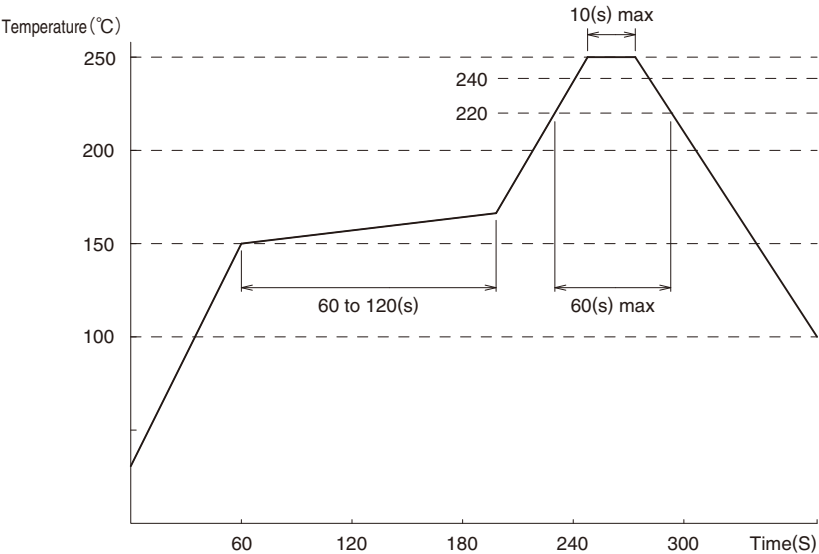
If you intend to use an electric wire other than the recommended one, ask our sales personnel.

[Precautions]

- Electric wires that are applicable for crimping connectors shall, principally, be the tin-plated stranded soft-copper wire.
- Crimping of electric wires wherein single wires, polyester yarns, etc., exist and crimping of tin-coated wires should be avoided.
- Avoid crimping two electric wires together.
- The setting values of crimp height (Note 1) may vary between tin-plated and gold-plated terminals even if the same electric wires are used.
- The setting values of crimp height (Note 1) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note 1 : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

◆Handling Points

1. Recommended Soldering Temperature Profile for IR Reflow.	 The graph shows Temperature (°C) on the y-axis (100 to 250) and Time (S) on the x-axis (0 to 300). The profile starts at ~50°C, rises to 150°C at 60s, then to 240°C at 240s. It holds at 240°C for a maximum of 10s, then cools to 100°C by 300s. A dwell of 60 to 120s is indicated between 150°C and 240°C, and a dwell of 60s max is indicated at 240°C. 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. Note 2 : The temperature indicates the board surface temperature at the points of contacts with the connector terminals.
2. Recommended Manual Soldering Conditions	Soldering temperature : 290°C ±10°C, Soldering time : within 3 sec.
3. Recommended Solder Screen Thickness	0.15mm
4. Board Warping	Maximum of 0.03mm at the connector center section, with both ends of the connector as reference points.
5. Cleaning Conditions	Refer to "Wire-to-Board Connector Use Handbook"
6. Wiring Termination Conditions	Refer to "Wire-to-Board Connector Use Handbook" Crimp contacts should be handled with care as not to cause any deformation or damage affecting the performance or termination.
7. Cautions	Excessive twisting and pulling on wires during mating/un-mating should be avoided as it may cause damage to connectors. Black spots may appear on the mold resin but this does not affect the product quality.
8. Precautions	Please refer to the following documents. ■ Crimp Quality Standard (ETAD-H0929-00) ■ Cable Assembly Procedure (ETAD-H0930-00) ■ Mating/Unmating Operation Instruction Manual (ETAD-H0997-00) ■ User Guide for Wire-to-Board Connector

DF22 Series

7.92mm Contact Pitch High Current Connectors for Internal Power Supplies (UL, C-UL and TÜV Listed)



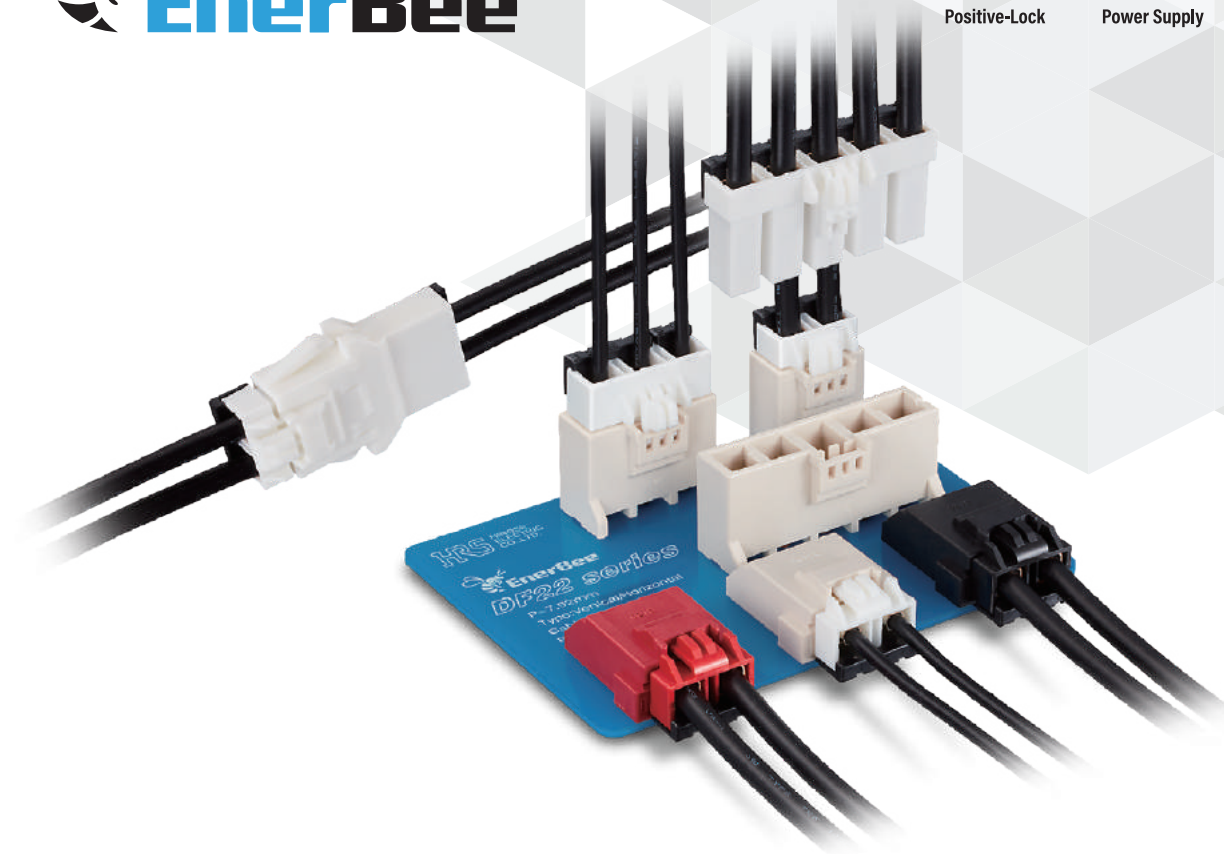
Positive-Lock



Power Supply



Wide Variation



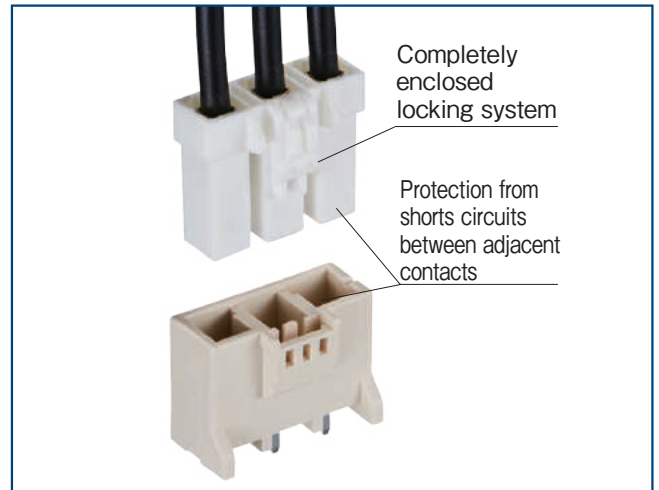
Features

1. Rated up to 30A

Single position connector can carry current of 30A with 10 AWG conductor. Please refer to Table # 1 for current ratings for multi-position connectors using other conductor sizes.

2. Positive Locking Function

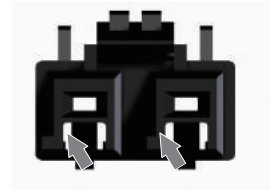
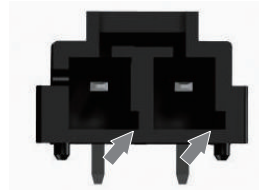
Reliable interior lock protects mated connectors from accidental disconnection.



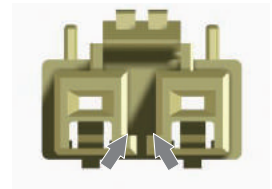
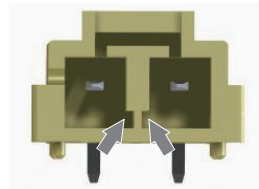
3. Prevention of Incorrect Connections

To prevent incorrect connection when using multiple connectors having the same Number of contacts, 3 product types having different mating configurations are available.

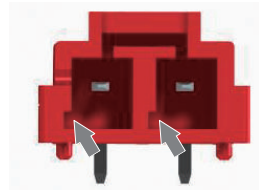
● R Type (Guide Key : Right Side, Color : Black)



● Standard Type (Guide Key : Inside, Color : Natural)



● L Type (Guide Key : Left Side, Color : Red)



- The image on the left shows the header (the board dipside), the image on the right shows the socket (cable side).
- The guide key position is indicated in position facing the mating surface of the header.

4. Molded-in contact retention tabs

Handling of terminated contacts during the crimping is easier and avoids entangling of wires, since there are no protruding metal tabs.

5. Prevention of incorrect board placement

Built-in posts assure correct connector placement and orientation on the board.

6. Supports resin sealing

Allows potting up to 10mm.

Product Specifications

Rated Current (Note 1)	No of Pos.	10 AWG	12 AWG	14 AWG	16 AWG	Operating Temperature Range (Note 2)	-55 to +85°C
	1	30A	25A	20A	15A	Storage Temperature Range (Note 3)	-10 to +60°C
	2	25A	20A	18A	15A	Operating Humidity Range	20 to 80%
	3	25A	20A	18A	15A	Storage Humidity Range (Note 3)	40 to 70%
	4	22A	18A	15A	13A		
	5	22A	18A	15A	13A		
Rated Voltage	1000V AC/DC						

	Rated Current	Rated Voltage
UL	See table above	600V AC/DC
C-UL	See table above	600V AC/DC
TÜV	See table above	600V AC/DC

UL/C-UL/TÜV File No. and Recognition No.

UL : E52653

C-UL : E52653

TÜV : R9950703

Item	Specifications	Conditions
Contact Resistance	No more than 5mΩ	Measured at 1mA and no higher than 20mV
Insulation Resistance	No less than 1,000MΩ	Measured at 1000V DC
Withstand Voltage	No flashover or breakdown	2500V AC is applied for 1 minute.
Contact Insertion and Extraction Forces	0.3N Min., 5N Max.	Measured with a steel pin of 1.6 × 0.8 ± 0.002 thickness
Durability	Contact resistance : no more than 10mΩ	30 mating cycles
Vibration Resistance	No electrical discontinuity of 1 μs or greater	Frequency 10 to 55 Hz, single amplitude 0.75 mm, at 2 h, for 3 directions.
Shock Resistance	No electrical discontinuity of 1 μs or greater	Accelerated velocity : 490 m/s ² for 11 ms, half-sine wave in 3 directions, 3 times for each direction
Moisture-Resistance	Contact resistance : no more than 10mΩ	Temperature : 40 ± 2°C ; humidity : 90 to 95% , left as it is for 96 hours
Temperature cycles	Contact resistance : no more than 10mΩ	(-55°C : 30 minutes → 5 to 35°C : 5 minutes → 85°C : 30 minutes → 5 to 35°C : 5 minutes) for 5 cycles
Solder heat Resistance	The resin parts should withstand the temperature and resist melting.	Flow : 260°C , 10 sec Hand soldering : temperature of soldering iron at 300°C for 3 seconds

Note 1 : This is the maximum current rating while all pins are powered or used as all power lines. If you split the current over multiple lines, please factor in your own safety margin.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The storage condition refers to long-term storage of the product on the shelf before assembly. Please use the operating temperature for temporary storage such as pre-assembly and during shipping.

Materials/Finish

Product	Part	Material	Finish	Remarks
Sockets	Insulator	Polyamide	Color : Natural white (Note)	UL94V-0
Crimp Contacts	Contacts	High Conductivity Copper Alloy	Gold Plated	-
Headers	Insulator	Polyamide (Glass Reinforced)	Color : Natural beige (Note)	UL94V-0
	Contacts	High Conductivity Copper Alloy	Gold Plated	-

Note : The Standard Colors, colors of the differing coupling forms are black for DF22R and red for DF22L.

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.

■ Socket, Header

DF22 **B** **L** - **2** **S** - **7.92** **C**

① ② ③ ④ ⑤ ⑥ ⑦

■ Contacts

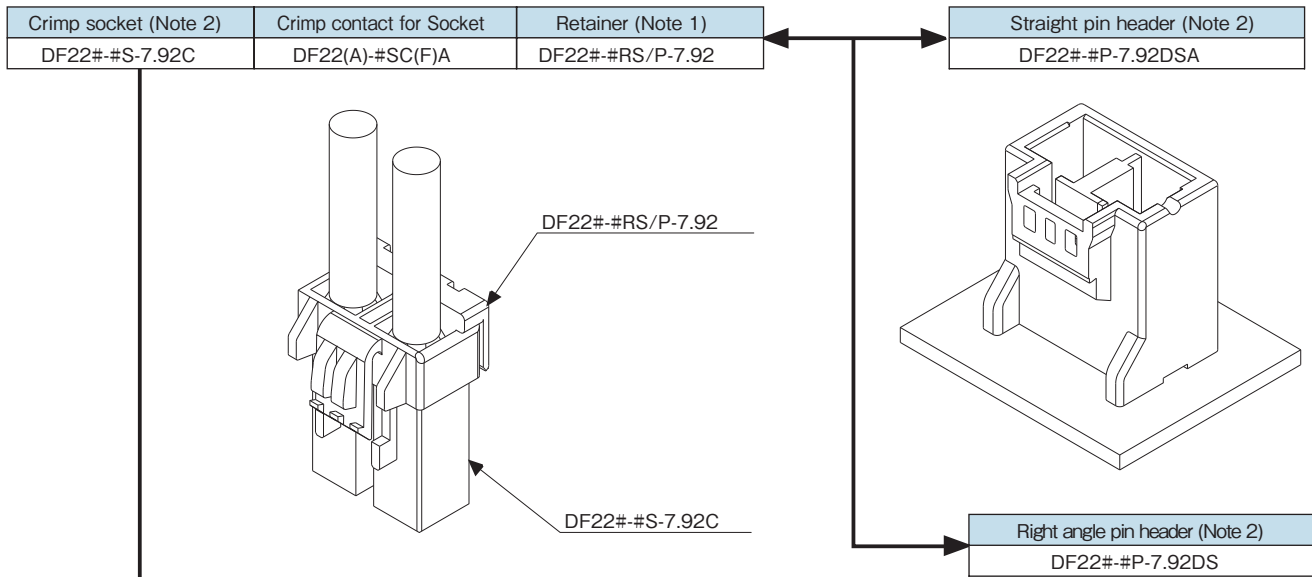
DF22 **A** - **1416** **SCF** **A**

① ⑧ ⑨ ⑩ ⑪

① Series Name	DF22	⑥ Contact Pitch	7.92mm
② Form Type	Sockets Blank : Standard height, standard lock (Type I) B : Long type, standard lock (Type III) C : Long type, ergonomic lock (Type IV) In-line Plugs Blank : With panel stop A : Without panel stop	⑦ Type of Housing	C : Crimp housing DSA : Straight header DS : Right-angle header No letter : Retainer
③ Guide Key Type	Blank : Inside (Color : Natural) R : Right side (Color : Black) L : Left side (Color : Red)	⑧ Applicable Cable	Blank : UL1430 A : UL1015
④ Number of Pos.	1 to 5	⑨ Applicable Conductor	1416 : 14 to 16 AWG 1012 : 10 to 12 AWG
⑤ Connector Type	S : Socket DS : Double-row socket P : Header EP : In-line plug DEP : Double-row in-line plug RS/P : Retainer	⑩ Packaging	SCF : Socket contacts / reel SC : Socket contacts / bag PCF : In-line plug contacts / reel PC : In-line plug contacts / bag
		⑪ Plating Specifications	A : Gold Plated

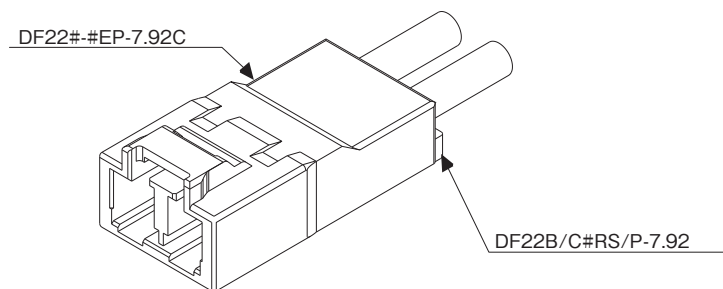
Diagram of Connector Mating Combinations

● Wire-to-Board Connection



● In-line or Wire-to-Wire Connection

In-line plug	Crimp contact for in-line plug	Retainer (Note 1)
DF22#-#EP-7.92C	DF22(A)-#PC(F)A	DF22B/C-#RS/P-7.92

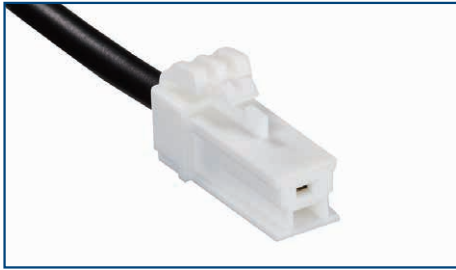


Note 1 : Since this product uses thick wires, a larger load is applied to the connector when inserting/extracting or routing the wires.
Please use a retainer to reduce the load on the connector.

Crimp socket	Applicable Retainer	In-line plug	Applicable Retainer
DF22-#S-7.92C	DF22-#RS/P-7.92	DF22-#EP-7.92C	DF22B/C-#RS/P-7.92
DF22B-#S-7.92C	DF22B/C-#RS/P-7.92	DF22A-#EP-7.92C	
DF22C-#S-7.92C			

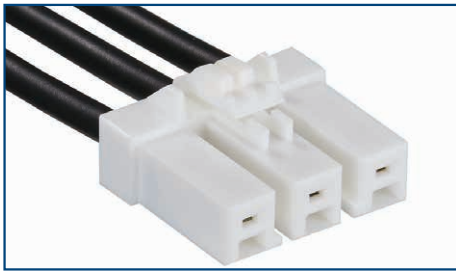
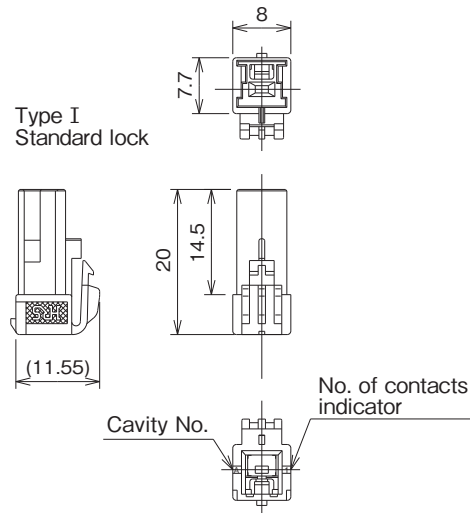
Note 2 : The key difference (L, R) product matches the mating connector of the same key (L, R).

Crimp Sockets (Standard Height Type)



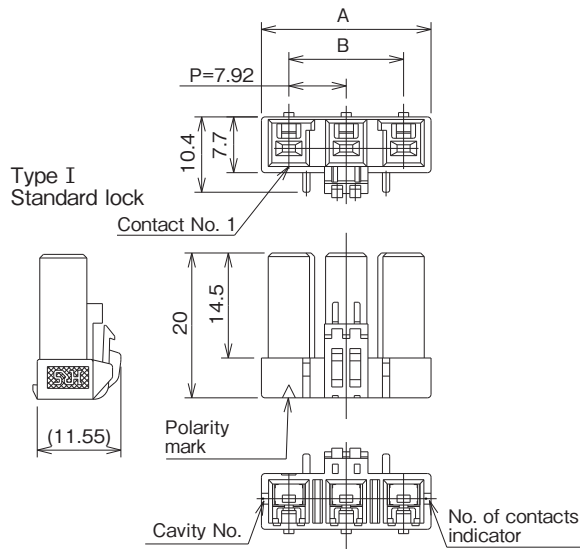
Shown with terminated and contacts installed.

[1Pos.]



Shown with terminated and contacts installed.

[2 to 5Pos.]



[Type I]

Height : Standard type, Standard lock

Note : The part number and HRS No. have changed to reflect the product form change of the 2 to 5 pos. types.

Standard Type (Guide Key : Inside, Color : White)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22-1S-7.92C(28)	CL0680-1012-2-28	1	8.00	-	100pcs per bag
DF22-2S-7.92C(28)	CL0680-1004-4-28	2	15.50	7.92	
DF22-3S-7.92C(28)	CL0680-1005-7-28	3	23.42	15.84	
DF22-4S-7.92C(28)	CL0680-1006-0-28	4	31.34	23.76	
DF22-5S-7.92C(28)	CL0680-1007-2-28	5	39.26	31.68	

R Type (Guide Key : Right Side, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22R-1S-7.92C(28)	CL0680-1026-7-28	1	8.00	-	100pcs per bag
DF22R-2S-7.92C(28)	CL0680-1027-0-28	2	15.50	7.92	
DF22R-3S-7.92C(28)	CL0680-1028-2-28	3	23.42	15.84	
DF22R-4S-7.92C(28)	CL0680-1029-5-28	4	31.34	23.76	
DF22R-5S-7.92C(28)	CL0680-1030-4-28	5	39.26	31.68	

L Type (Guide Key : Left Side, Color : Red)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22L-1S-7.92C(28)	CL0680-1031-7-28	1	8.00	-	100pcs per bag
DF22L-2S-7.92C(28)	CL0680-1032-0-28	2	15.50	7.92	
DF22L-3S-7.92C(28)	CL0680-1033-2-28	3	23.42	15.84	
DF22L-4S-7.92C(28)	CL0680-1034-5-28	4	31.34	23.76	
DF22L-5S-7.92C(28)	CL0680-1035-8-28	5	39.26	31.68	

Note : Every even number position has a different locking design.

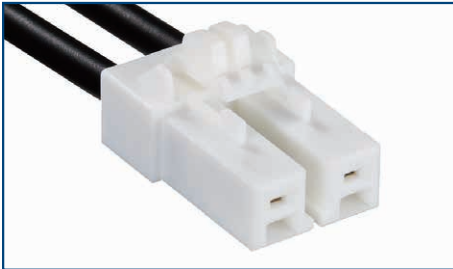
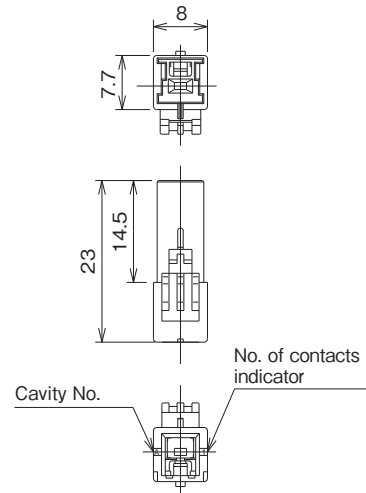
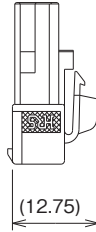
Crimp Sockets (Height, Long Type)



Shown with terminated and contacts installed.

[1Pos.]

Type IV
Height : Long type,
user-friendly operation

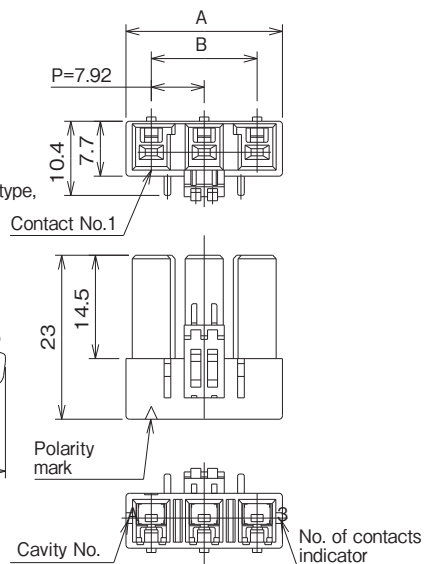
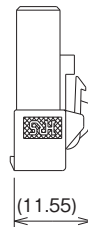
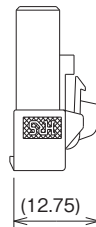


Shown with terminated and contacts installed.

[2, 3Pos.]

Type IV
Height : Long type,
Enhanced
ergonomic lock

Type III
Height : Long type,
Standard lock



[Type III]**Height : Long type, Standard lock****Standard Type (Guide Key : Inside, Color : White)**

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22B-2S-7.92C	CL0680-1097-5-00	2	15.50	7.92	100pcs per bag
DF22B-3S-7.92C	CL0680-1098-8-00	3	23.42	15.84	

Note : Every even number position has a different locking design.

[Type IV]**Height : Long type, Enhanced ergonomic lock****Standard Type (Guide Key : Inside, Color : White)**

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22C-2S-7.92C	CL0680-1102-3-00	2	15.50	7.92	100pcs per bag

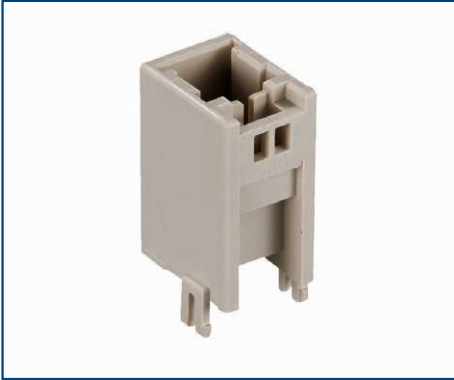
R Type (Guide Key : Right Side, Color : Black)

Unit : mm

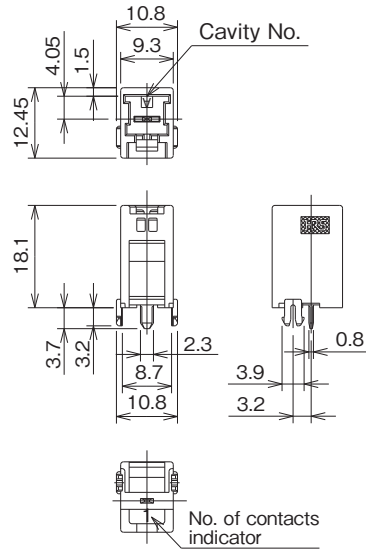
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22CR-3S-7.92C	CL0680-1130-9-00	3	23.42	15.84	100pcs per bag

Note : Every even number position has a different locking design.

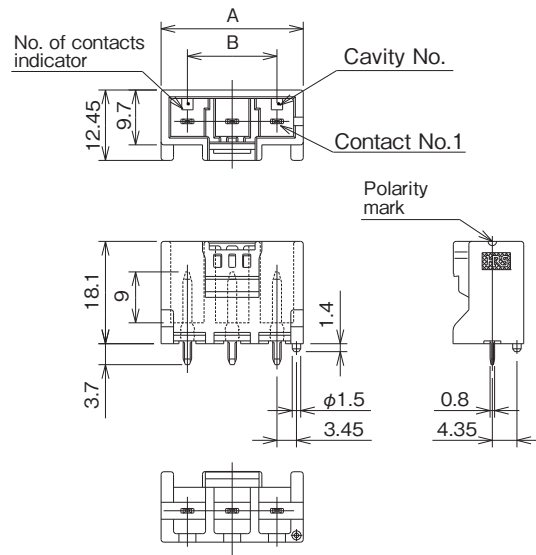
Straight Header



[1Pos.]



[2 to 5Pos.]



Standard Type (Guide Key : Inside, Color : Natural Beige)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Bag Packaging	Tray Packaging
DF22-1P-7.92DSA(##)	CL0680-1013-5-##	1	-	-	-	○
DF22-2P-7.92DSA(##)	CL0680-1014-8-##	2	17.22	7.92	○	-
DF22-3P-7.92DSA(##)	CL0680-1015-0-##	3	25.14	15.84	○	-
DF22-4P-7.92DSA(##)	CL0680-1016-3-##	4	33.06	23.76	○	-
DF22-5P-7.92DSA(##)	CL0680-1017-6-##	5	40.98	31.68	○	-

[Specification number (##)] (53) : Gold plated, bag packaging / (58) : Gold plated, tray packaging (only 1pos.)

R Type (Guide Key : Right Side, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Bag Packaging	Tray Packaging
DF22R-1P-7.92DSA(##)	CL0680-1036-0-##	1	-	-	-	○
DF22R-2P-7.92DSA(##)	CL0680-1037-3-##	2	17.22	7.92	○	-
DF22R-3P-7.92DSA(##)	CL0680-1038-6-##	3	25.14	15.84	○	-
DF22R-4P-7.92DSA(##)	CL0680-1039-9-##	4	33.06	23.76	○	-
DF22R-5P-7.92DSA(##)	CL0680-1040-8-##	5	40.98	31.68	○	-

[Specification number (##)] (53) : Gold plated, bag packaging / (57) : Gold plated, tray packaging (only 1pos.)

L Type (Guide Key : Left Side, Color : Red)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Bag Packaging	Tray Packaging
DF22L-1P-7.92DSA(##)	CL0680-1041-0-##	1	-	-	-	○
DF22L-2P-7.92DSA(##)	CL0680-1042-3-##	2	17.22	7.92	○	-
DF22L-3P-7.92DSA(##)	CL0680-1043-6-##	3	25.14	15.84	○	-
DF22L-4P-7.92DSA(##)	CL0680-1044-9-##	4	33.06	23.76	○	-
DF22L-5P-7.92DSA(##)	CL0680-1045-1-##	5	40.98	31.68	○	-

[Specification number (##)] (53) : Gold plated, bag packaging / (57) : Gold plated, tray packaging (only 1pos.)

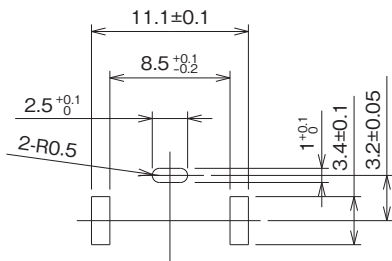
Note 1 : Bag packaging (100pcs per bag). Order by number of packs.

Note 2 : Tray packaging (150pcs per tray). Order by number of 150.

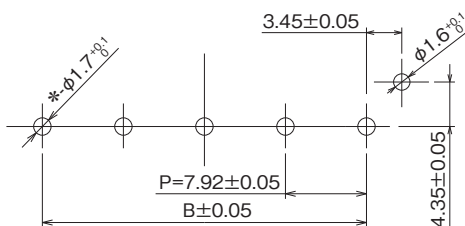
Note 3 : Every even number position has a different locking design.

■ Recommended PCB Layout (Board thickness : 1.6±0.1)

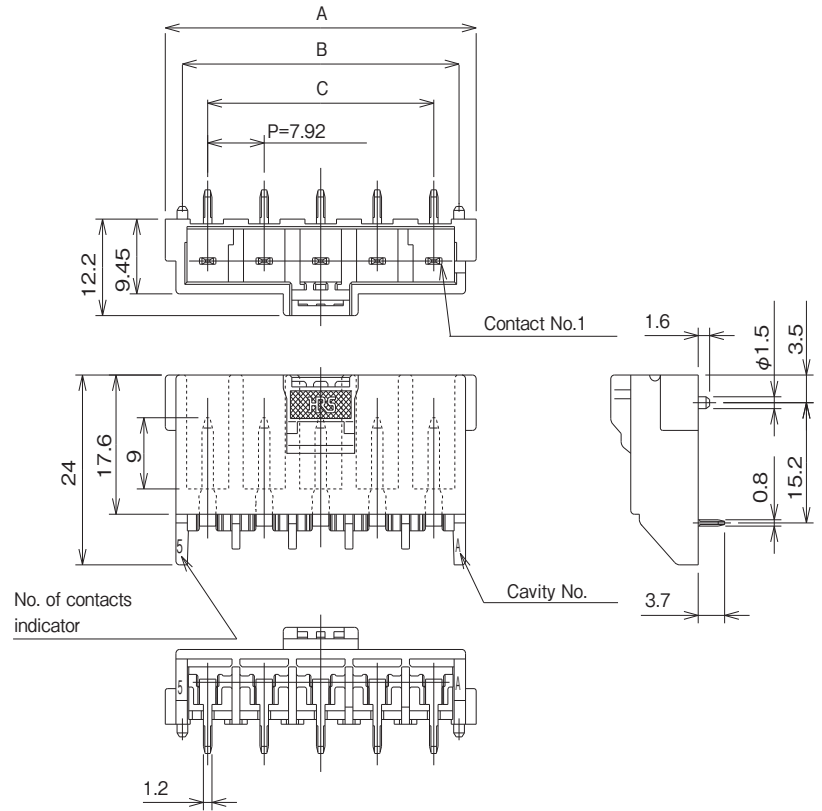
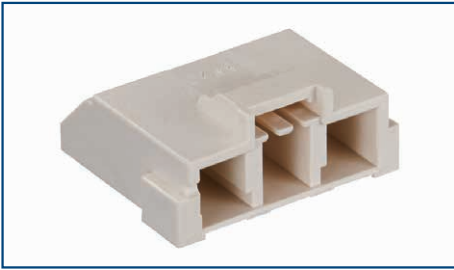
[1Pos.]



[2 to 5Pos.]



Right Angle Header



Standard Type (Guide Key : Inside, Color : Natural Beige)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF22-2P-7.92DS(##)	CL0680-1008-5-##	2	19.80	15.00	7.92	100pcs per bag
DF22-3P-7.92DS(##)	CL0680-1009-8-##	3	27.72	22.92	15.84	
DF22-4P-7.92DS(##)	CL0680-1010-7-##	4	35.64	30.84	23.76	
DF22-5P-7.92DS(##)	CL0680-1011-0-##	5	43.56	38.76	31.68	

R Type (Guide Key : Right Side, Color : Black)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF22R-2P-7.92DS(##)	CL0680-1018-9-##	2	19.80	15.00	7.92	100pcs per bag
DF22R-3P-7.92DS(##)	CL0680-1019-1-##	3	27.72	22.92	15.84	
DF22R-4P-7.92DS(##)	CL0680-1020-0-##	4	35.64	30.84	23.76	
DF22R-5P-7.92DS(##)	CL0680-1021-3-##	5	43.56	38.76	31.68	

L Type (Guide Key : Left Side, Color : Red)

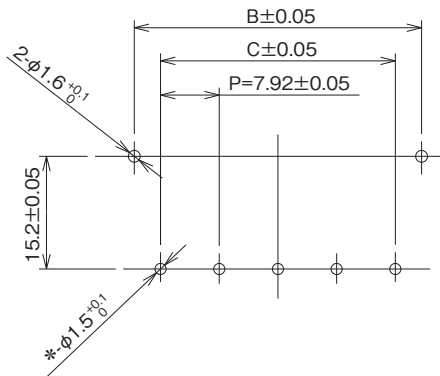
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF22L-2P-7.92DS(##)	CL0680-1022-6-##	2	19.80	15.00	7.92	100pcs per bag
DF22L-3P-7.92DS(##)	CL0680-1023-9-##	3	27.72	22.92	15.84	
DF22L-4P-7.92DS(##)	CL0680-1024-1-##	4	35.64	30.84	23.76	
DF22L-5P-7.92DS(##)	CL0680-1025-4-##	5	43.56	38.76	31.68	

[Specification number (##)] (53) : Gold Plated

Note : Every even number position has a different locking design.

■ Recommended PCB Layout (Board thickness : 1.6±0.1)

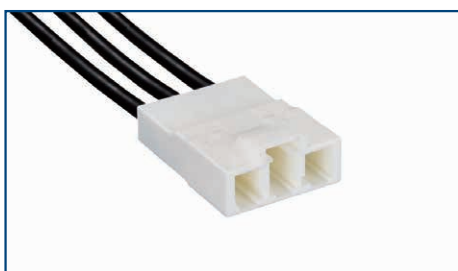
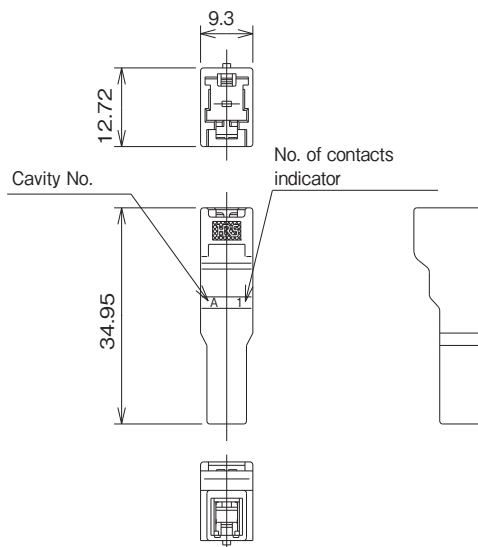


In-line Plug



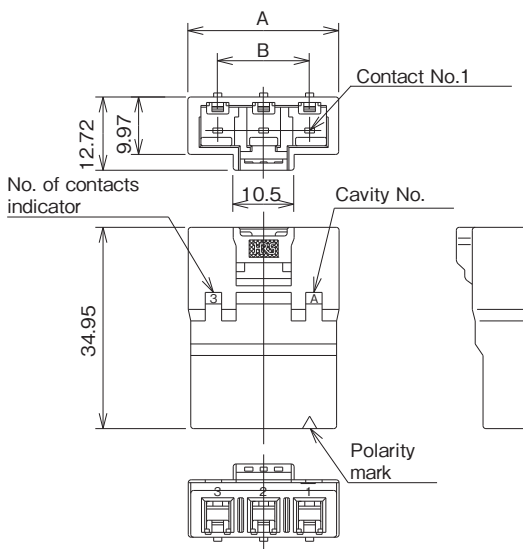
Shown with terminated and contacts installed.

[1Pos.]



Shown with terminated and contacts installed.

[2, 3Pos.]



Standard Type (Guide Key : Inside, Color : Natural Beige)

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22A-1EP-7.92C	CL0680-1053-0-00	1	9.30	-	100pcs per bag
DF22A-2EP-7.92C	CL0680-1054-2-00	2	18.00	7.92	
DF22A-3EP-7.92C	CL0680-1055-5-00	3	26.00	15.84	

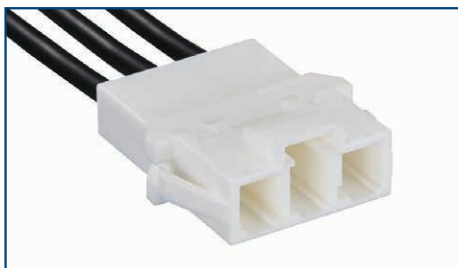
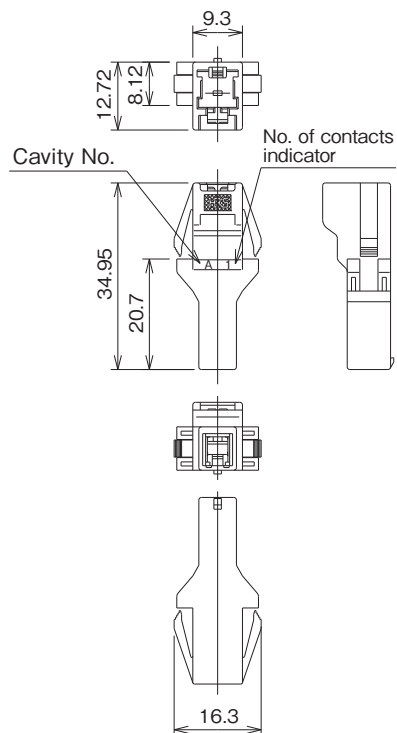
Note : Every even number position has a different locking design.

In-line Plug (Panel Lock Type)



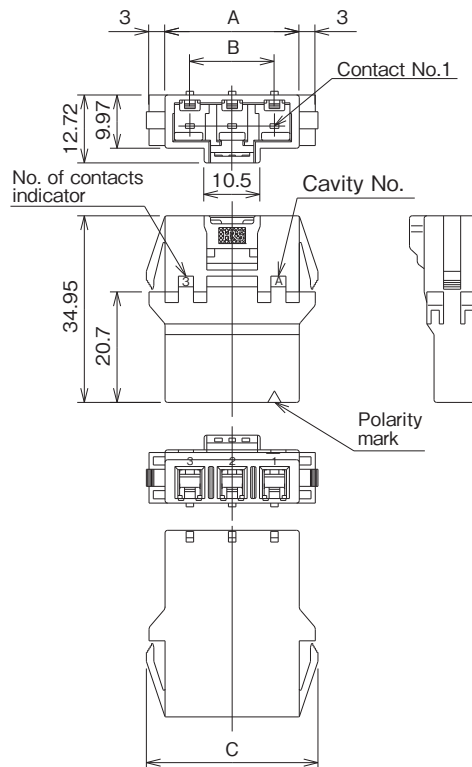
Shown with terminated and contacts installed.

[1Pos.]



Shown with terminated and contacts installed.

[2, 3Pos.]



Standard Type (Guide Key : Inside, Color : White)

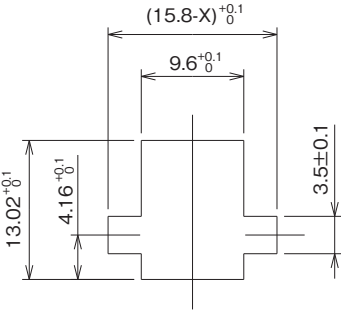
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF22-1EP-7.92C	CL0680-1048-0-00	1	9.30	-	16.30	100pcs per bag
DF22-2EP-7.92C	CL0680-1049-2-00	2	17.22	7.92	24.22	
DF22-3EP-7.92C	CL0680-1050-1-00	3	25.14	15.84	32.14	

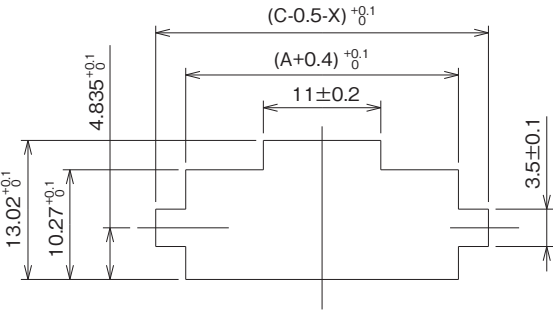
Note : Every even number position has a different locking design.

■ Panel Cutout

[1Pos.]



[2, 3Pos.]



Unit : mm

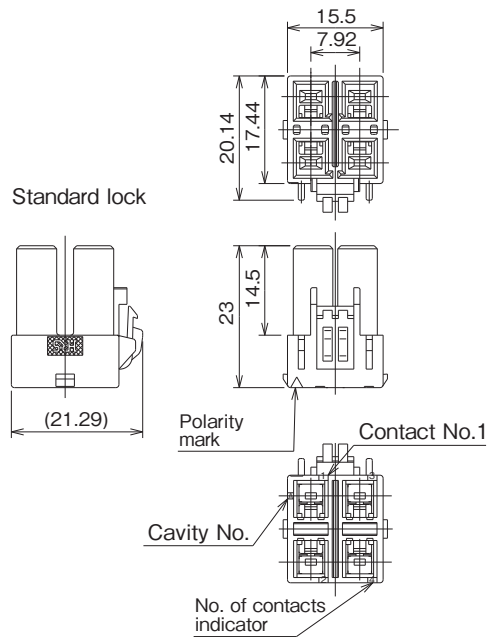
Panel thickness	X
2.0	0.48
1.6	0.96
1.2	1.44
0.8	1.92

Note : Do not use a rounded surface at the panel tab portion.

In-line Double-row Socket



Shown with terminated and contacts installed.

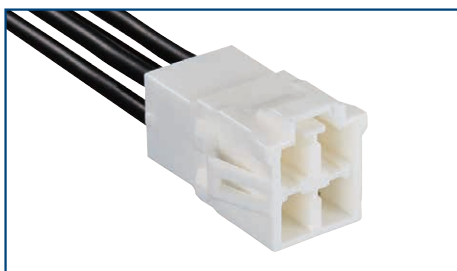


Standard Type (Guide Key : Inside, Color : White)

Unit : mm

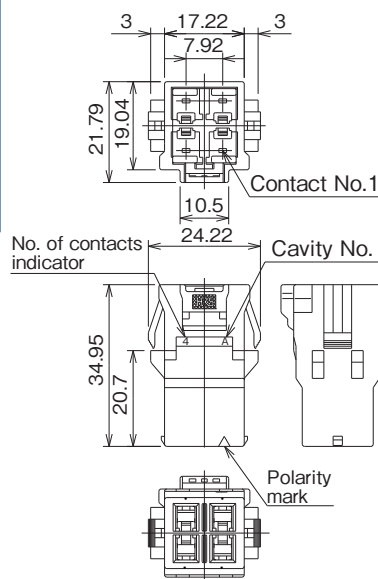
Part No.	HRS No.	No. of Pos.	Lock type	Purchase Unit
DF22B-4DS-7.92C	CL0680-1142-8-00	4	Standard lock	100pcs per bag

In-line Double-row Plug

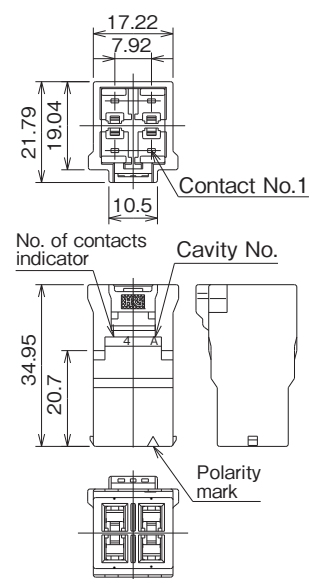


Shown with terminated and contacts installed.

Panel lock type



Without panel lock function

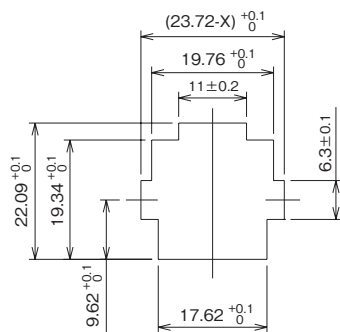


Standard Type (Guide Key : Inside, Color : White)

Unit : mm

Part No.	HRS No.	No. of Pos.	Connector type	Purchase Unit
DF22-4DEP-7.92C	CL0680-1051-4-00	4	Panel lock type	100pcs per bag
DF22A-4DEP-7.92C	CL0680-1056-8-00	4	Without panel lock function	

■ Recommended Panel Cutout (Panel mount type)



Unit : mm

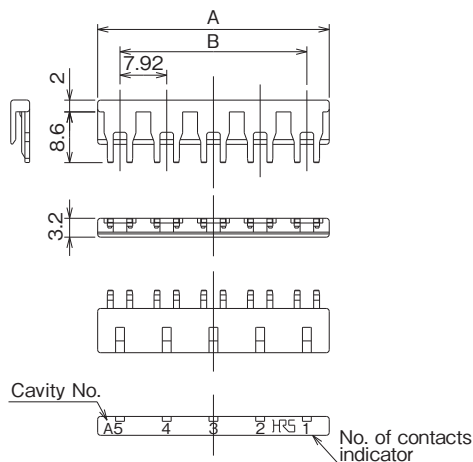
Panel thickness	X
2.0	0.48
1.6	0.96
1.2	1.44
0.8	1.92

Note : Do not use a rounded surface at the panel tab portion.

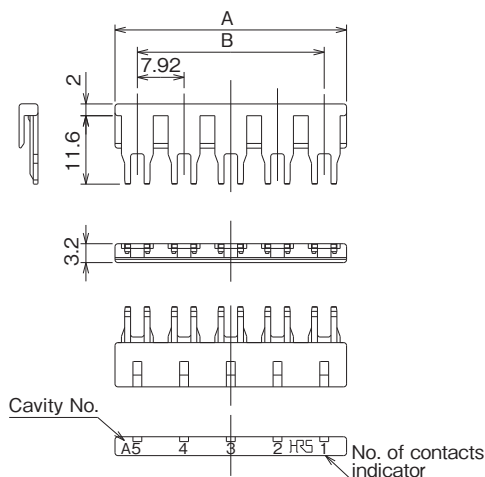
Retainer



[For Standard height, standard lock (Type I)]



[For Long type, standard lock (Type III)
Long type, enhanced ergonomic lock (Type IV)]



Unit : mm

Unit : mm					
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22-1RS/P-7.92	CL0680-1213-4-00	1	7.04	-	100pcs per bag
DF22-2RS/P-7.92	CL0680-1209-7-00	2	15.50	7.92	
DF22-3RS/P-7.92	CL0680-1210-6-00	3	23.42	15.84	
DF22-4RS/P-7.92	CL0680-1211-9-00	4	31.34	23.76	
DF22-5RS/P-7.92	CL0680-1212-1-00	5	39.26	31.68	
Applicable Socket	DF22-#S-7.92C(28) For Standard height, standard lock(Type I) #indicates number of contacts.				

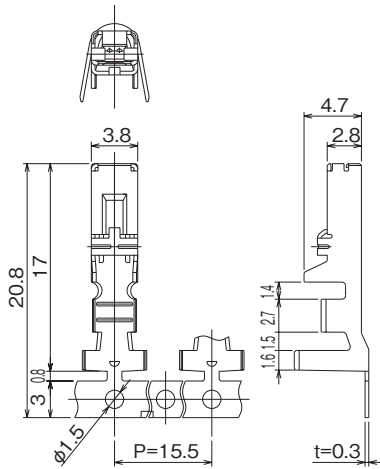
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF22B/C-1RS/P-7.92	CL0680-1214-0-00	1	7.04	-	100pcs per bag
DF22B/C-2RS/P-7.92	CL0680-1200-2-00	2	15.50	7.92	
DF22B/C-3RS/P-7.92	CL0680-1201-5-00	3	23.42	15.84	
DF22B/C-4RS/P-7.92	CL0680-1202-8-00	4	31.34	23.76	
DF22B/C-5RS/P-7.92	CL0680-1203-0-00	5	39.26	31.68	
Applicable Socket	DF22B-#S-7.92C For Long type, standard lock (Type III) DF22C-#S-7.92C Long type, enhanced ergonomic lock (Type IV) DF22-#EP-7.92C DF22A-#EP-7.92C #indicates number of contacts.				

Note : When connecting retainer into the plug housing, please note the cavity numbers will line up numerically,
but the retainer cavity numbers will be upside down compared to the plug cavity numbers.

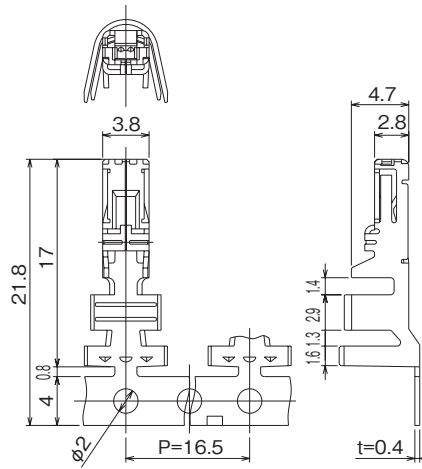
Crimp Contact for Socket

[For 14 to 16 AWG]



● Strip length : 3.5 to 4.5mm

[For 10 to 12 AWG]



● Strip length 3.5 to 4.5mm

Reel Contact, Applicable Tool : Applicator

Part No.	HRS No.	Applicable cable					Finish	Purchase Unit
		UL style	AWG	Wire Construction	Sectional area	Jacket diameter		
DF22-1416SCFA	CL0680-1085-6-00	1430	16	26/0.254mm	1.32mm ²	2.4 to 3.0mm	Gold Plated	2500pcs per reel
DF22A-1416SCFA	CL0680-1087-1-00	1015	14	41/0.26mm	2.18mm ²	3.0 to 3.8mm		2000pcs per reel
			16	26/0.254mm	1.32mm ²			
DF22A-1012SCFA	CL0680-1106-4-00	1015	10	104/0.26mm	5.52mm ²	3.6 to 4.9mm		
			12	65/0.26mm	3.45mm ²			

Note 1 : The conductor of applicable wire is tin plated annealed copper.

Note 2 : When using other than the applicable wire, contact your nearest Hirose representative.

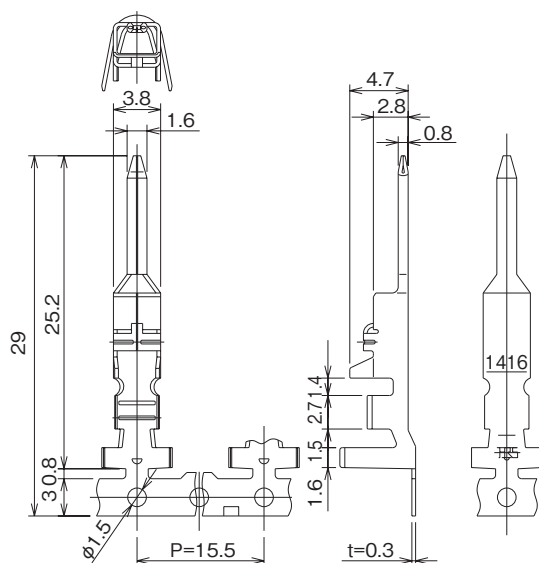
Bulk Contact, Applicable Tool : Manual Crimping Tool

Part No.	HRS No.	Applicable cable					Finish	Purchase Unit
		UL style	AWG	Wire Construction	Sectional area	Jacket diameter		
DF22-1416SCA	CL0680-1190-0-00	1430	16	26/0.254mm	1.32mm ²	2.6mm	Gold Plated	100pcs per bag
DF22A-1416SCA	CL0680-1191-0-00	1015	14	41/0.26mm	2.18mm ²	3.7mm		
			16	26/0.254mm	1.32mm ²	3.2mm		
DF22A-1012SCA	CL0680-1107-7-00	1015	10	104/0.26mm	5.52mm ²	4.69mm		
			12	65/0.26mm	3.45mm ²	4.04mm		

Note 1 : The conductor of applicable wire is tin plated annealed copper.

Note 2 : When using other than the applicable wire, contact your nearest Hirose representative.

Crimp Contact for In-line Plug



● Strip length 3.5 to 4.5mm

Reel Contact, Applicable Tool : Applicator

Part No.	HRS No.	Applicable cable					Finish	Purchase Unit
		UL style	AWG	Wire Construction	Sectional area	Jacket diameter		
DF22-1416PCFA	CL0680-2002-4-00	1430	16	26/0.254mm	1.32mm ²	2.4 to 3.0mm	Gold Plated	2500pcs per reel
DF22A-1416PCFA	CL0680-1194-0-00	1015	14	41/0.26mm	2.18mm ²	3.0 to 3.8mm		2000pcs per reel
			16	26/0.254mm	1.32mm ²			

Note 1 : The conductor of applicable wire is tin plated annealed copper.

Note 2 : When using other than the applicable wire, contact your nearest Hirose representative.

Bulk Contact, Applicable Tool : Manual Crimping Tool

Part No.	HRS No.	Applicable cable					Finish	Purchase Unit
		UL style	AWG	Wire Construction	Sectional area	Jacket diameter		
DF22-1416PCA	CL0680-1192-0-00	1430	16	26/0.254mm	1.32mm ²	2.6mm	Gold Plated	100pcs per bag
DF22A-1416PCA	CL0680-1193-0-00	1015	14	26/0.254mm	2.18mm ²	3.7mm		
			16	26/0.254mm	1.32mm ²	3.2mm		

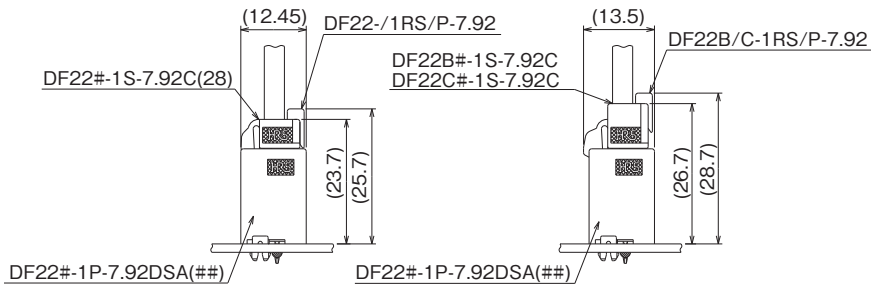
Note 1 : The conductor of applicable wire is tin plated annealed copper.

Note 2 : When using other than the applicable wire, contact your nearest Hirose representative.

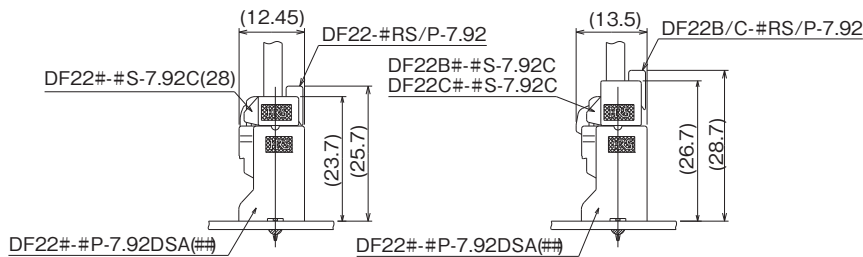
Mated Dimensions

● Socket to Straight Header Connection

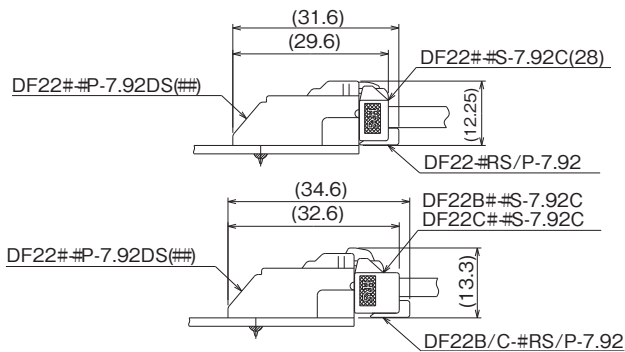
1 Pos.



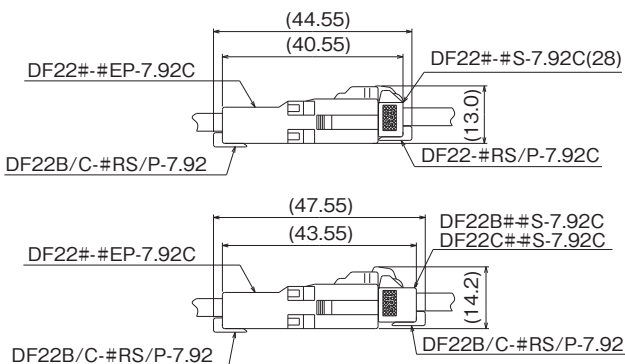
2 to 5 Pos.



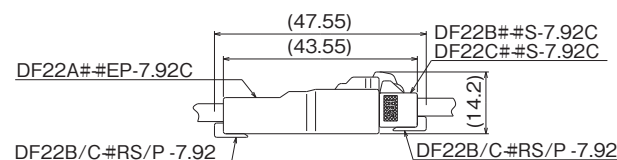
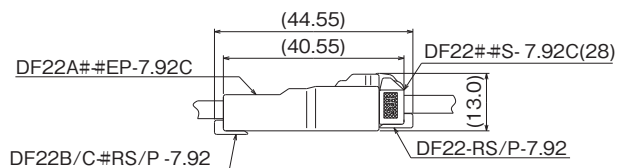
● Socket to Right Angle Header Connection



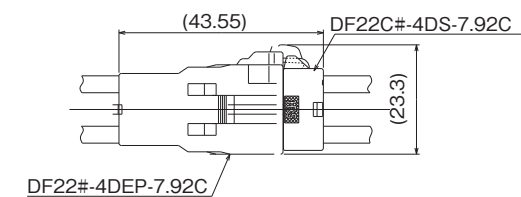
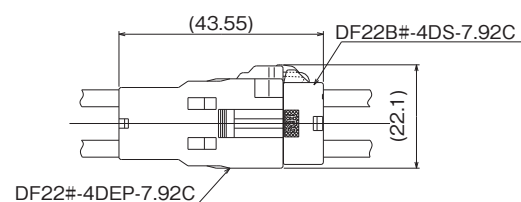
● Socket to In-line Plug (Panel lock type) Connection



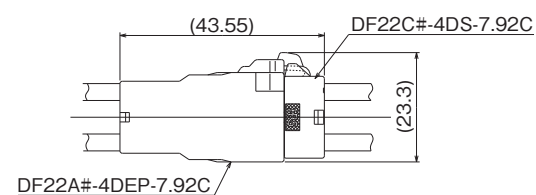
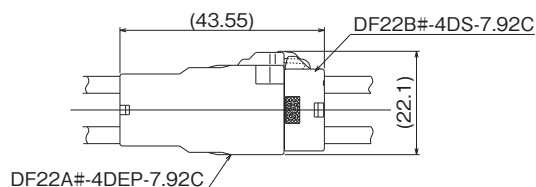
● Socket to In-line Plug Connection



● In-line Double-row socket to In-line Double-row Plug (Panel lock type) Connection



● In-line Double-row socket to In-line Double-row Plug Connection



Tools

Type	Part No.	HRS N o.	Applicable Wire (Note 7)	Applicable Contact (Note 6)
Hirose Press Unit	CM-105C	CL0901-0001-0-00	-	DF22/DF22A-1416SCFA/PCFA
Applicators Used in Hirose Press Unit	AP105-DF22-1416	CL0901-4576-7-00	UL1430	DF22-1416SCFA/PCFA
	AP105-DF22A-1416	CL0901-4578-2-00	UL1015	DF22A-1416SCFA/PCFA
Applicators Used in Press Units of Other Japanese Companies (Note 2)	AP109A-DF22-1416	CL0901-4579-5-00	UL1430	DF22-1416SCFA/PCFA
	AP109A-DF22A-1416	CL0901-4580-4-00	UL1015	DF22A-1416SCFA/PCFA
	AP109A-DF22A-1012	CL0901-4582-0-00	UL1015	DF22A-1012SCFA (Note 1)
Applicator Manufactured by Japan Automatic Machine (Note 3)	CHS893800H-UP	-	UL1430	DF22-1416SCFA/PCFA
	CHS893900H-UP	-	UL1015	DF22A-1416SCFA/PCFA
	QHS895800H-UP	-	UL1015	DF22A-1012SCFA (Note 1)
Crimping Tools	HT104/DF22-1416	CL0550-0285-0-00	16 AWG : UL1430	DF22-1416SCA/PCA
	HT104/DF22A-1416	CL0550-0286-2-00	16, 14 AWG : UL1015	DF22A-1416SCA/PCA
	HT103/DF22A-1012	CL0550-0288-8-00	10, 12 AWG : UL1015	DF22A-1012SCA

Note 1 : When crimping DF22A-1012SCFA use a press of at least 3.5 tons.

Note 2 : Applicators compatible with other Japanese companies (AP109A Applicator) cannot be used with the Hirose Press Unit CM-105C.

An attachment is required when using the applicator. Please contact the press unit manufacturer for inquiries on attachments.

Note 3 : Please contact Japan Automatic Machine (J.A.M.) via their homepage regarding inquiries on the

Conditions Table."

Note 6 : Applicable contacts are limited to those listed in the table.

Note 7 : Applicable cables are limited to those listed in the table.

Contact Extraction

● Contact extraction tool

Flat-bladed screwdriver, 1.4mm blade width

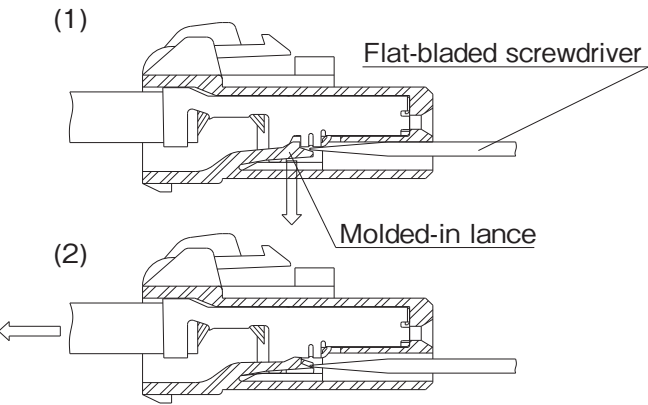
● Intended crimp Contacts

DF22-1416SC(F)A, DF22A-1416SC(F)A, DF22A-1012SC(F)A, DF22-1416PC(F)A, DF22A-1416PC(F)A

● Work Method

1. Refer to the drawing No. 1. Insert correct size screwdriver in the housing against the molded-in lance.
Push down the lance as shown.
2. Assure that the lance is deflected to release the contact and pull out wire with the crimped contact.

(Housing Cross- Sectional Diagram)



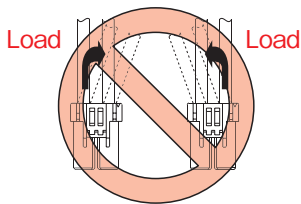
Note : Please do not reuse the repaired housing. Replace it to new one.

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

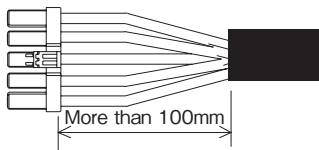
Precautions	
1.Cleaning Condition	Refer to the "Wire-to-Board Connector Use Handbook"
2.Connection Condition	Refer to the "Wire-to-Board Connector Use Handbook"
3.Cautions	The color of the plastic molding may differ slightly depending on product lot and future storage conditions but this does not affect the product performance. Black spots may appear on the mold resin but this does not affect the product quality.
4.Precaution	Please refer to the following documents. ■ Crimp Quality Standards (ETAD-H095-00, ETAD-H0952-00) ■ Harness Procedure Manual (ETAD-H0798-00) ■ Board-to-Wire Connector Guidelines (ETAD-H1023-00)

Precautions When Using High-Current Connectors

1. If this product is used outside the specifications, evaluate it in the final set to confirm that there are no problems in use.
2. No outdoor use.
3. Notification for harness assembly
 - 1) When inserting the crimping terminal to the crimping socket, please do not tilt the crimping terminal or twist the cable. Insertion at tilted angles or twisting the cable may cause deformation of the crimping terminal or crimping socket.
 - 2) After inserting the crimping terminal to the crimping socket, please make sure that the lance has been hooked with pulling the cable lightly. When checking the hook, please avoid bending the cable for preventing terminal drop-off.



- 3) Bundle cables/Cabletyre Cables
 Recommend bundle and strip position of cables are 100mm or more.
 Bundling close to the connectors may cause terminal drop-off, breaking cables and unstable connection.

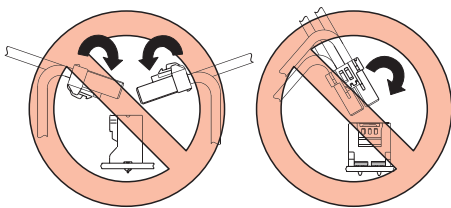


4. Notification for Insertion Extraction

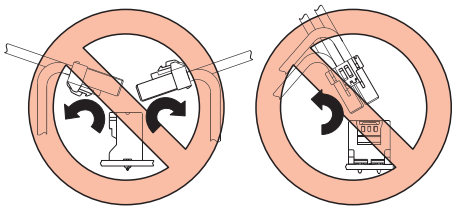
⚠ Caution

- 1) Please insert/extract the crimping socket straight to the mating connector. Insertion/extraction at tilted angles applies load concentration to the connector end and may cause deformation (at connection area, socket and header case, etc.). There is firing risk using this kind of deformed connector.

Insertion



Extraction



- 2) When it is hard to extract, please lightly insert the connector beforehand and then pull it with releasing the lock. Forced extraction has a risk of connector breakage.

DF3 Series

2mm Pitch Connector for Discrete Wire Connection (Product approved by UL CSA Standard)



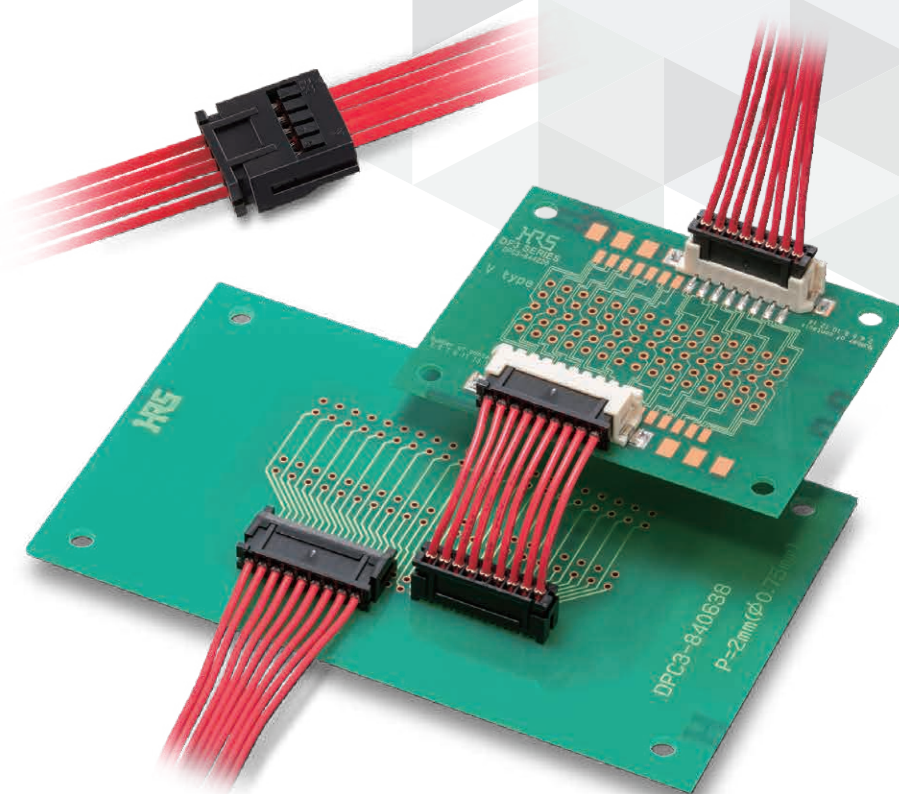
P=2.0 mm



Wide Variation



Compact



Application

General office automation equipment such as copiers and printers

Product Specifications

Rated Current (Note1)	Crimping	22 to 24AWG	26 AWG	28 AWG	Operating Temperature (Note 2)	-55 to +105°C
		3A / pin	2A / pin	1A / pin	Operating Humidity Range (Note 3)	40 to 80%
Rated Voltage		250V AC/DC			Storage Temperature Range (Note 4)	-10 to +60°C
					Storage Humidity Range (Note 4)	40 to 70%

UL-CSA	Rated Current	24 AWG	26AWG	28 AWG
		3A / pin	2A / pin (Note 5)	1A / pin
	Rated Voltage	30V AC/DC		

UL, CSA File No.
UL : E52653
CSA : LR95109

Item	Standards	Condition
Insulation Resistance	1,000M Ω Min.	Measured at 500V DC
Withstanding Voltage	No flashover or dielectric breakdown	650V AC for 1 min.
Contact Resistance	30m Ω Max.	Measured at 20mV Max., 1mA
Vibration Resistance	No electrical discontinuity of 1 μ s or more	Frequency 10 to 55 Hz, Half amplitude 0.75 mm, 2 hours in each of the 3 directions
Humidity Resistance	Contact Resistance : 30m Ω Max. Insulation Resistance: 500M Ω Min.	96 hours at temperature of +40 $\pm$ 2°C and humidity of 90 to 95%
Temperature Cycle	Contact Resistance : 30m Ω Max. Insulation Resistance: 1,000M Ω Min.	-55°C : 30 minutes $\rightarrow$ +5 to +35°C : 2 to 3 minutes $\rightarrow$ +85°C : 30 minutes $\rightarrow$ +5 to +35°C : 2 to 3 minutes, 5 cycles
Mating Durability	Contact Resistance: 30m Ω Max.	Tin Plating : 30 times Gold Plating : 50 times
Solder Heat Resistance	No dissolution of the resin part affecting performance.	Dip Type Flow : +260°C , 10sec. / Hand Soldering : Soldering iron temperature +300°C , for 2 sec. SMT Type Reflow : Recommended in Temperature Profile / Hand Soldering : Soldering iron temperature 300°C for 3sec.

Note 1: Information contained in this catalog represents general requirements for this Series.

Contact us for the drawings and specifications for a specific part number shown.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : Use without condensation.

Note 4 : Apply to unused product on packaged condition.

Note 5 : The mating side is a crimp type.

Note 6 : 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

Item	Component	Material	Finish	UL Flame Retardant Grade	RoHS
Crimp Socket	Insulator	PA	Black	UL94V-0	○
Crimp Contact for Socket	Contact	Phosphorous Bronze	Tin Plating or Gold Plating	-	
Pin Header	Insulator	PA	Black	UL94V-0	
	Contact	Brass	Tin Plating or Gold Plating	-	
SMT Pin Header	Insulator	PA	Beige	UL94V-0	
	Contact	Brass	Tin Plating or Gold Plating	-	
	Retention Tab	Brass	Tin Plating	-	
In-Line Plug	Insulator	PA	Black	UL94V-0	
In-Line Plug Crimp Contact	Contact	Phosphorous Bronze	Tin Plating or Gold Plating	-	

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

DF3 - # S - 2 C

① ② ③ ④ ⑤

① Series Name	DF3, 3A, 3AA, 3EA	④ Contact Pitch	2mm
② No. of Pos.	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	⑤ Termination Type / Contact Type	C : Crimp Housing DSA : Straight Dip DS : Right Angle Dip V : Straight SMT H : Right Angle SMT
③ Connector Type	S : Socket P : Pin Header EP : In-Line Plug		

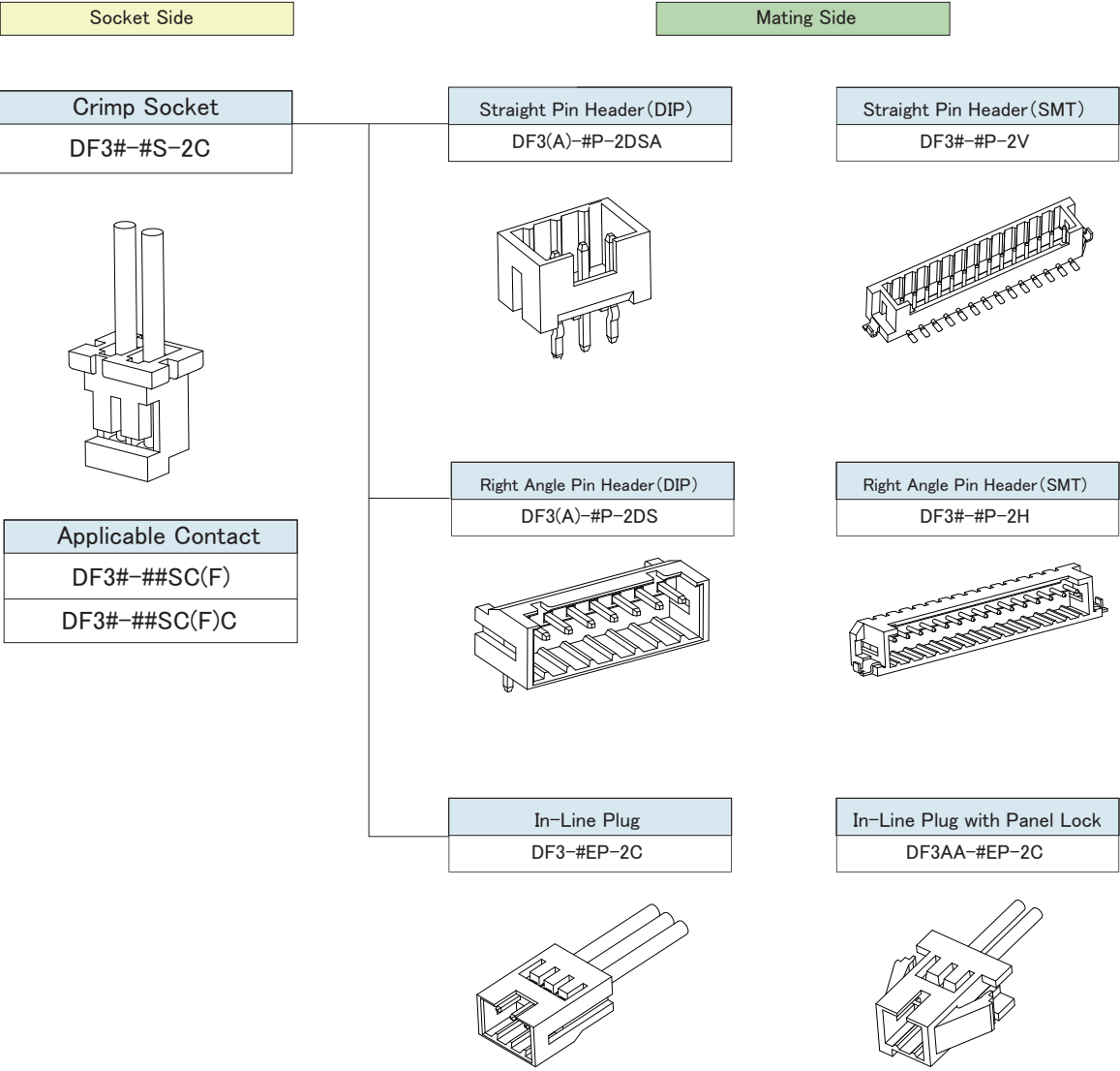
●Contact

DF3 - EP 2428 PCF A

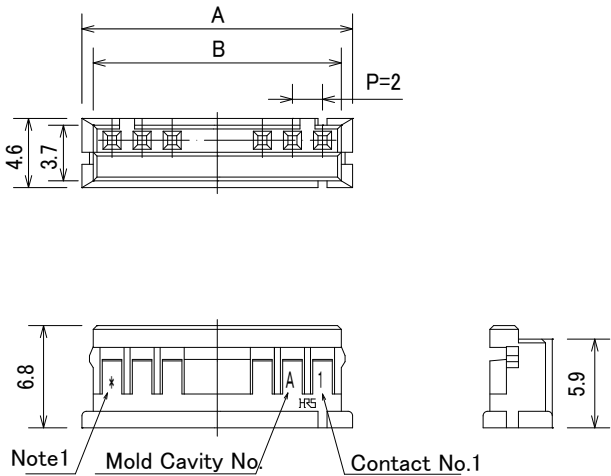
① ② ③ ④

① Terminal Type	EP : In-Line	④ Plating Type	None : Tin Plating A : Gold Plating (Plug Contact) C : Gold Plating (Socket Contact)
② Applicable Wire Size	22 : 22AWG 2428 : 24 to 28AWG		
③ Termination Type / Contact Type	SCF : Socket Contact / Reel SC : Socket Contact / Loose Piece PCF : Plug Contact / Reel PC : Plug Contact / Loose Piece		

Connector Mating Combinations Diagram



Crimp Socket

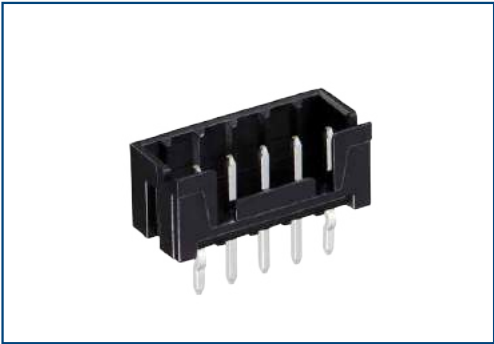


Unit : mm

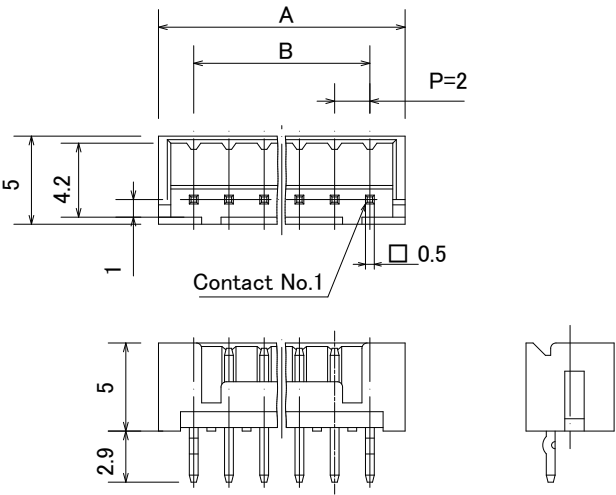
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF3-2S-2C	CL0543-0003-8-00	2	6	2	100pcs per bag
DF3-3S-2C	CL0543-0004-0-00	3	8	4	
DF3-4S-2C	CL0543-0005-3-00	4	10	6	
DF3-5S-2C	CL0543-0006-6-00	5	12	8	
DF3-6S-2C	CL0543-0007-9-00	6	14	10	
DF3-7S-2C	CL0543-0008-1-00	7	16	12	
DF3-8S-2C	CL0543-0009-4-00	8	18	14	
DF3-9S-2C	CL0543-0010-3-00	9	20	16	
DF3-10S-2C	CL0543-0011-6-00	10	22	18	
DF3-11S-2C	CL0543-0012-9-00	11	24	20	
DF3-12S-2C	CL0543-0013-1-00	12	26	22	
DF3-13S-2C	CL0543-0014-4-00	13	28	24	
DF3-14S-2C	CL0543-0015-7-00	14	30	26	
DF3-15S-2C	CL0543-0016-0-00	15	32	28	

Note 1 : Show the number of product pos..

Straight Pin Header



·Board Through-Hole Diameter : $\phi 0.8^{+0.1}_0$
·Kink Pre-Fixed Effective Diameter : $\phi 0.8^{+0.05}_0$



● Tin Plating

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF3A-2P-2DSA	CL0543-0165-0-00	2	6	2	100pcs per bag
DF3A-3P-2DSA	CL0543-0166-2-00	3	8	4	
DF3A-4P-2DSA	CL0543-0167-5-00	4	10	6	
DF3A-5P-2DSA	CL0543-0168-8-00	5	12	8	
DF3A-6P-2DSA	CL0543-0169-0-00	6	14	10	
DF3A-7P-2DSA	CL0543-0170-0-00	7	16	12	
DF3A-8P-2DSA	CL0543-0171-2-00	8	18	14	
DF3A-9P-2DSA	CL0543-0172-5-00	9	20	16	
DF3A-10P-2DSA	CL0543-0173-8-00	10	22	18	
DF3A-11P-2DSA	CL0543-0174-0-00	11	24	20	
DF3A-12P-2DSA	CL0543-0175-3-00	12	26	22	
DF3A-13P-2DSA	CL0543-0176-6-00	13	28	24	
DF3A-14P-2DSA	CL0543-0177-9-00	14	30	26	
DF3A-15P-2DSA	CL0543-0178-1-00	15	32	28	

●Gold Plating

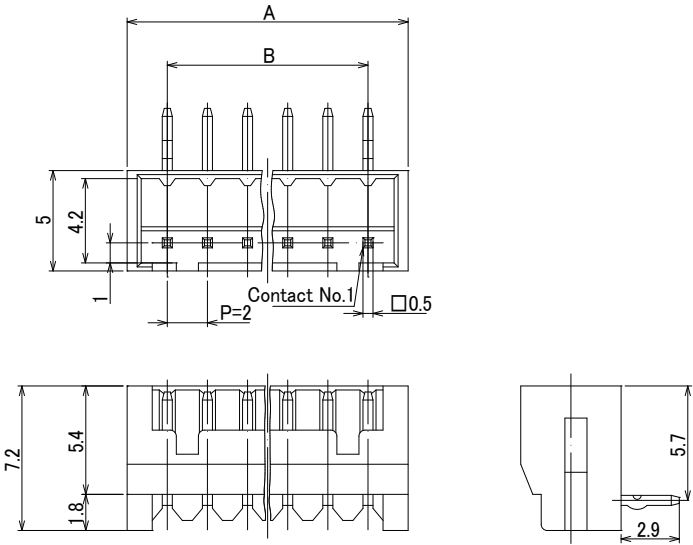
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF3-2P-2DSA(01)	CL0543-0017-2-01	2	6	2	100pcs per bag
DF3-3P-2DSA(01)	CL0543-0018-5-01	3	8	4	
DF3-4P-2DSA(01)	CL0543-0019-8-01	4	10	6	
DF3-5P-2DSA(01)	CL0543-0020-7-01	5	12	8	
DF3-6P-2DSA(01)	CL0543-0021-0-01	6	14	10	
DF3-7P-2DSA(01)	CL0543-0022-2-01	7	16	12	
DF3-8P-2DSA(01)	CL0543-0023-5-01	8	18	14	
DF3-9P-2DSA(01)	CL0543-0024-8-01	9	20	16	
DF3-10P-2DSA(01)	CL0543-0025-0-01	10	22	18	
DF3-11P-2DSA(01)	CL0543-0026-3-01	11	24	20	
DF3-12P-2DSA(01)	CL0543-0027-6-01	12	26	22	
DF3-13P-2DSA(01)	CL0543-0028-9-01	13	28	24	
DF3-14P-2DSA(01)	CL0543-0029-1-01	14	30	26	
DF3-15P-2DSA(01)	CL0543-0030-0-01	15	32	28	

Right Angle Pin Header



·Board Through-Hole Diameter : $\phi 0.8^{+0.1}_0$
·Kink Pre-Fixed Effective Diameter : $\phi 0.8^{+0.05}_0$



● Tin Plating

Unit : mm

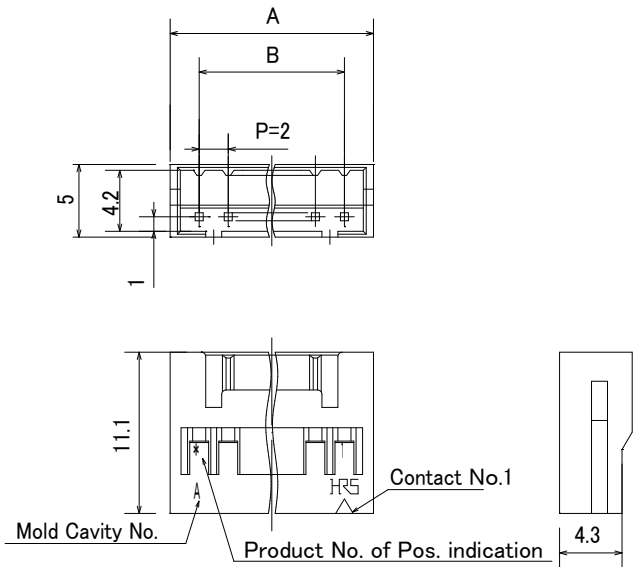
Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF3A-2P-2DS	CL0543-0179-4-00	2	6	2	100pcs per bag
DF3A-3P-2DS	CL0543-0180-3-00	3	8	4	
DF3A-4P-2DS	CL0543-0181-6-00	4	10	6	
DF3A-5P-2DS	CL0543-0182-9-00	5	12	8	
DF3A-6P-2DS	CL0543-0183-1-00	6	14	10	
DF3A-7P-2DS	CL0543-0184-4-00	7	16	12	
DF3A-8P-2DS	CL0543-0185-7-00	8	18	14	
DF3A-9P-2DS	CL0543-0186-0-00	9	20	16	
DF3A-10P-2DS	CL0543-0187-2-00	10	22	18	
DF3A-11P-2DS	CL0543-0188-5-00	11	24	20	
DF3A-12P-2DS	CL0543-0189-8-00	12	26	22	
DF3A-13P-2DS	CL0543-0190-7-00	13	28	24	
DF3A-14P-2DS	CL0543-0191-0-00	14	30	26	
DF3A-15P-2DS	CL0543-0192-2-00	15	32	28	

●Gold Plating

Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF3-2P-2DS(01)	CL0543-0031-3-01	2	6	2	100pcs per bag
DF3-3P-2DS(01)	CL0543-0032-6-01	3	8	4	
DF3-4P-2DS(01)	CL0543-0033-9-01	4	10	6	
DF3-5P-2DS(01)	CL0543-0034-1-01	5	12	8	
DF3-6P-2DS(01)	CL0543-0035-4-01	6	14	10	
DF3-7P-2DS(01)	CL0543-0036-7-01	7	16	12	
DF3-8P-2DS(01)	CL0543-0037-0-01	8	18	14	
DF3-9P-2DS(01)	CL0543-0038-2-01	9	20	16	
DF3-10P-2DS(01)	CL0543-0039-5-01	10	22	18	
DF3-11P-2DS(01)	CL0543-0040-4-01	11	24	20	
DF3-12P-2DS(01)	CL0543-0041-7-01	12	26	22	
DF3-13P-2DS(01)	CL0543-0042-0-01	13	28	24	
DF3-14P-2DS(01)	CL0543-0043-2-01	14	30	26	
DF3-15P-2DS(01)	CL0543-0044-5-01	15	32	28	

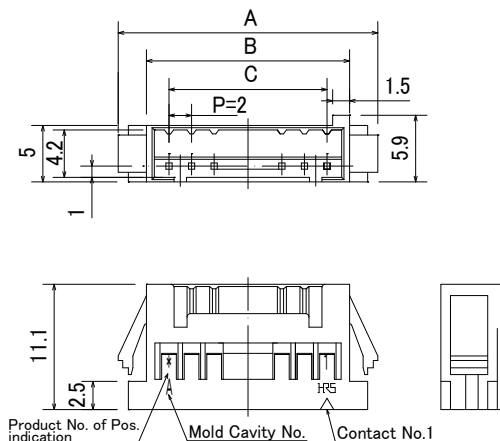
In-Line Plug



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF3-2EP-2C	CL0543-0064-2-00	2	6	2	100pcs per bag
DF3-3EP-2C	CL0543-0065-5-00	3	8	4	
DF3-4EP-2C	CL0543-0066-8-00	4	10	6	
DF3-5EP-2C	CL0543-0067-0-00	5	12	8	
DF3-6EP-2C	CL0543-0068-3-00	6	14	10	
DF3-7EP-2C	CL0543-0069-6-00	7	16	12	
DF3-8EP-2C	CL0543-0070-5-00	8	18	14	
DF3-9EP-2C	CL0543-0071-8-00	9	20	16	
DF3-10EP-2C	CL0543-0072-0-00	10	22	18	
DF3-11EP-2C	CL0543-0073-3-00	11	24	20	
DF3-12EP-2C	CL0543-0074-6-00	12	26	22	
DF3-13EP-2C	CL0543-0075-9-00	13	28	24	
DF3-14EP-2C	CL0543-0076-1-00	14	30	26	
DF3-15EP-2C	CL0543-0077-4-00	15	32	28	

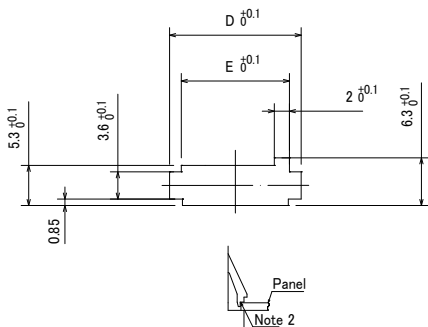
In-Line Plug with Panel Lock



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	D	E	Purchase Unit
DF3AA-2EP-2C	CL0543-0151-5-00	2	11	6	2	9.4	6.3	100pcs per bag
DF3AA-3EP-2C	CL0543-0152-8-00	3	13	8	4	11.4	8.3	
DF3AA-4EP-2C	CL0543-0153-0-00	4	15	10	6	13.4	10.3	
DF3AA-5EP-2C	CL0543-0154-3-00	5	17	12	8	15.4	12.3	
DF3AA-6EP-2C	CL0543-0155-6-00	6	19	14	10	17.4	14.3	
DF3AA-7EP-2C	CL0543-0156-9-00	7	21	16	12	19.4	16.3	
DF3AA-8EP-2C	CL0543-0157-1-00	8	23	18	14	21.4	18.3	
DF3AA-9EP-2C	CL0543-0158-4-00	9	25	20	16	23.4	20.3	
DF3AA-10EP-2C	CL0543-0159-7-00	10	27	22	18	25.4	22.3	
DF3AA-11EP-2C	CL0543-0160-6-00	11	29	24	20	27.4	24.3	
DF3AA-12EP-2C	CL0543-0161-9-00	12	31	26	22	29.4	26.3	
DF3AA-13EP-2C	CL0543-0162-1-00	13	33	28	24	31.4	28.3	
DF3AA-14EP-2C	CL0543-0163-4-00	14	35	30	26	33.4	30.3	
DF3AA-15EP-2C	CL0543-0164-7-00	15	37	32	28	35.4	32.3	

Panel Cutouts

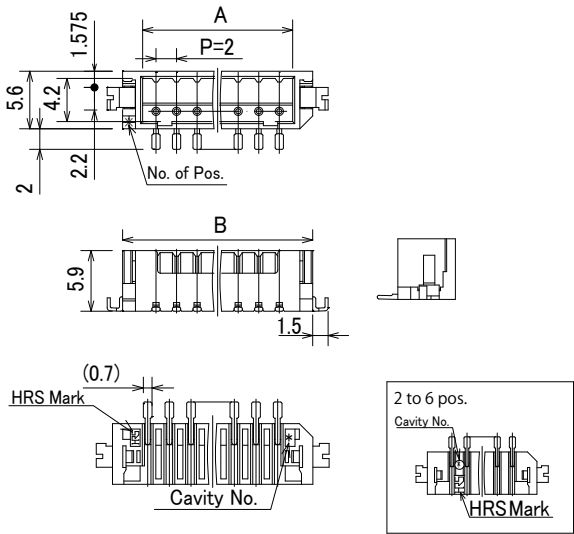
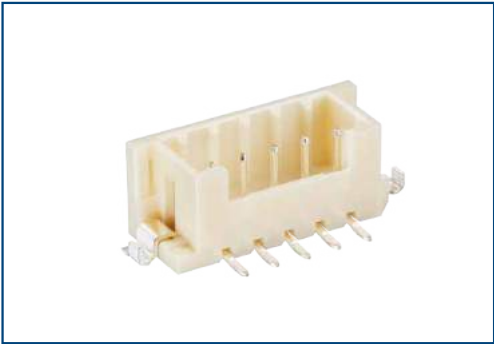


Note 1 : Applicable panel thickness is 1.6 to 1.0mm. (However, there is some rattling at thicknesses other than 1.6 and 1.2 mm.)

Note 2 : Use the non-radius surface at the hooking panel edge.

Note 3 : Contact No. indicates 1, 4, 8, 12, and 15.

Straight Pin Header (SMT)



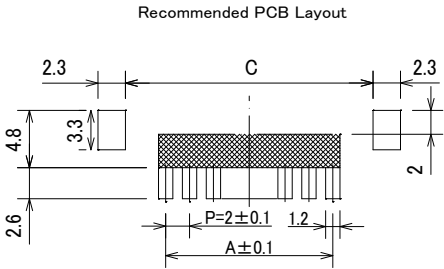
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF3EA-2P-2V(##)	CL0543-0315-0-##	2	2	8.5	8.74	1,000pcs per reel
DF3EA-3P-2V(##)	CL0543-0316-0-##	3	4	10.5	10.74	
DF3EA-4P-2V(##)	CL0543-0317-0-##	4	6	12.5	12.74	
DF3EA-5P-2V(##)	CL0543-0318-0-##	5	8	14.5	14.74	
DF3EA-6P-2V(##)	CL0543-0319-0-##	6	10	16.5	16.74	
DF3EA-7P-2V(##)	CL0543-0320-0-##	7	12	18.5	18.74	
DF3EA-8P-2V(##)	CL0543-0321-0-##	8	14	20.5	20.74	
DF3EA-9P-2V(##)	CL0543-0322-0-##	9	16	22.5	22.74	
DF3EA-10P-2V(##)	CL0543-0323-0-##	10	18	24.5	24.74	
DF3EA-11P-2V(##)	CL0543-0324-0-##	11	20	26.5	26.74	
DF3EA-12P-2V(##)	CL0543-0325-0-##	12	22	28.5	28.74	
DF3EA-13P-2V(##)	CL0543-0326-0-##	13	24	30.5	30.74	
DF3EA-14P-2V(##)	CL0543-0327-0-##	14	26	32.5	32.74	
DF3EA-15P-2V(##)	CL0543-0328-0-##	15	28	34.5	34.74	

[Specific No.] (##), ##
(21) : Tin plated packaging
(51) : Gold plated packaging

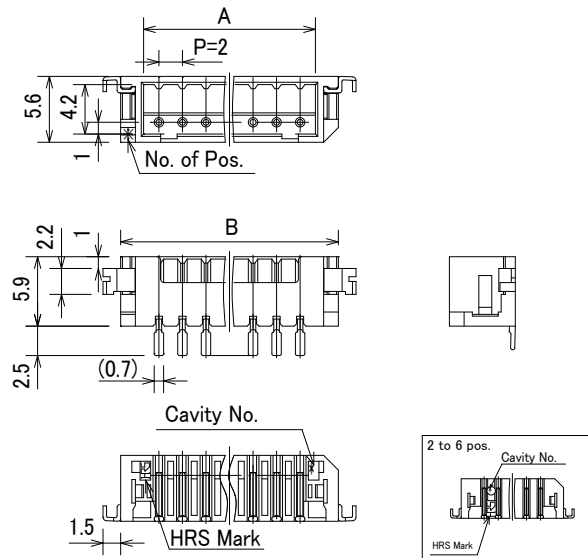
Note : For embossed tape dimensions, please refer to embossed tape carrier dimensions (JIS-C-0806 compliant).

PCB Mounting Pattern



(Note) If there is a pattern on part xxx and no resist is applied, there is a possibility of contact with the connector terminals.

Right Angle Pin Header (SMT)



Unit : mm

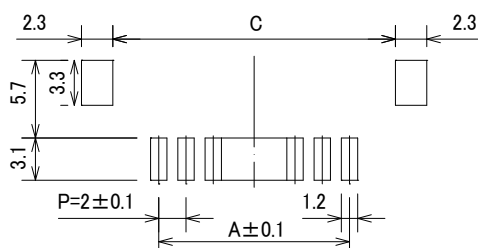
Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF3EA-2P-2H(##)	CL0543-0329-0-##	2	2	8.5	8.74	1,000pcs per reel
DF3EA-3P-2H(##)	CL0543-0330-0-##	3	4	10.5	10.74	
DF3EA-4P-2H(##)	CL0543-0331-0-##	4	6	12.5	12.74	
DF3EA-5P-2H(##)	CL0543-0332-0-##	5	8	14.5	14.74	
DF3EA-6P-2H(##)	CL0543-0333-0-##	6	10	16.5	16.74	
DF3EA-7P-2H(##)	CL0543-0334-0-##	7	12	18.5	18.74	
DF3EA-8P-2H(##)	CL0543-0335-0-##	8	14	20.5	20.74	
DF3EA-9P-2H(##)	CL0543-0336-0-##	9	16	22.5	22.74	
DF3EA-10P-2H(##)	CL0543-0337-0-##	10	18	24.5	24.74	
DF3EA-11P-2H(##)	CL0543-0338-0-##	11	20	26.5	26.74	
DF3EA-12P-2H(##)	CL0543-0339-0-##	12	22	28.5	28.74	
DF3EA-13P-2H(##)	CL0543-0340-0-##	13	24	30.5	30.74	
DF3EA-14P-2H(##)	CL0543-0341-0-##	14	26	32.5	32.74	
DF3EA-15P-2H(##)	CL0543-0342-0-##	15	28	34.5	34.74	

[Specific No.] (##), ##
 (21) : Tin plated packaging
 (51) : Gold plated packaging

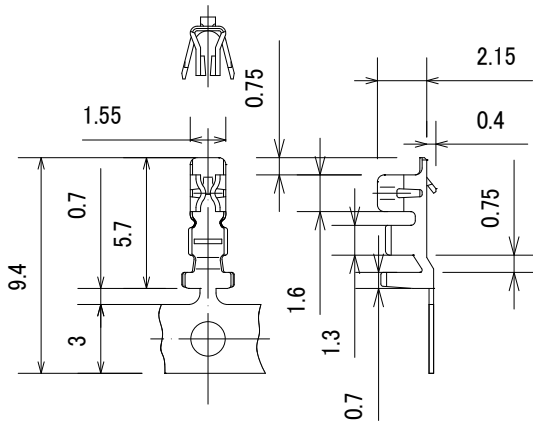
Note : For embossed tape dimensions, please refer to embossed tape carrier dimensions (JIS-C-0806 compliant).

PCB Mounting Pattern

Recommended PCB Layout



Crimping Contact for Socket



●Reel Contact (Applicable Tool : Applicator)

Part No.	HRS No.	Applicable Wire (Tin Plated Annealed Copper) (Note)				Purchase Unit	Finish
		UL	Jacket Diameter	AWG	Stranded Wire Structure		
DF3-22SCF	CL0543-0235-3-00	UL1061	1.2 to 1.5mm	22	17/0.16	10,000	Tin Plating
DF3-22SCFC	CL0543-0861-0-00			22	17/0.16		Gold Plating
DF3-2428SCF	CL0543-0001-2-00	UL1007 UL1061	0.75 to 1.5mm	24	11/0.16		Tin Plating
				26	7/0.16		
				28	7/0.127		
DF3-2428SCFC	CL0543-0046-0-00			24	11/0.16		Gold Plating
				26	7/0.16		
				28	7/0.127		

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

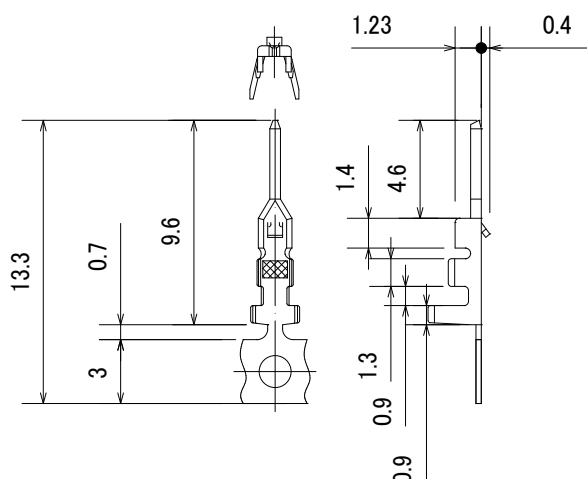
●Loose Piece Contact (Applicable Tool : Hand Crimping Tool)

Part No.	HRS No.	Applicable Wire (Tin Plated Annealed Copper) (Note)				Purchase Unit	Finish
		UL	Jacket Diameter	AWG	Stranded Wire Structure		
DF3-22SC	CL0543-0236-6-00	UL1061	1.3mm	22	17/0.16	100	Tin Plating
DF3-22SCC	CL0543-0862-3-00		1.3mm	22	17/0.16		Gold Plating
DF3-2428SC	CL0543-0002-5-00	UL1007	1.5mm	24	11/0.16		Tin Plating
			1.3mm	26	7/0.16		
			1.2mm	28	7/0.127		
DF3-2428SCC	CL0543-0047-3-00		1.5mm	24	11/0.16		Gold Plating
			1.3mm	26	7/0.16		
			1.2mm	28	7/0.127		

Note : When crimping with a manual crimping tool, only the wires listed above are compatible.

●Crimp Contact Extraction Tool : DF-C-PO(A)

Crimping Contact for In-Line Plug



●Reel Contact (Applicable Tool : Applicator)

Part No.	HRS No.	Applicable Wire (Tin Plated Annealed Copper) (Note)				Purchase Unit	Finish
		UL	Jacket Diameter	AWG	Stranded Wire Structure		
DF3-EP2428PCF	CL0543-0062-7-00	UL1007 UL1061	0.75 to 1.5mm	24	11/0.16	10,000	Tin Plating
				26	7/0.16		
				28	7/0.127		
DF3-EP2428PCFA	CL0543-0149-3-00			24	11/0.16		Gold Plating
				26	7/0.16		
				28	7/0.127		

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

●Loose Piece Contact (Applicable Tool : Hand Crimping Tool)

Part No.	HRS No.	Applicable Wire (Tin Plated Annealed Copper) (Note)				Purchase Unit	Finish
		UL	Jacket Diameter	AWG	Stranded Wire Structure		
DF3-EP2428PC	CL0543-0063-0-00	UL1007	1.5mm	24	11/0.16	100	Tin Plating
			1.3mm	26	7/0.16		
			1.2mm	28	7/0.127		
DF3-EP2428PCA	CL0543-0150-2-00		1.5mm	24	11/0.16		Gold Plating
			1.3mm	26	7/0.16		
			1.2mm	28	7/0.127		

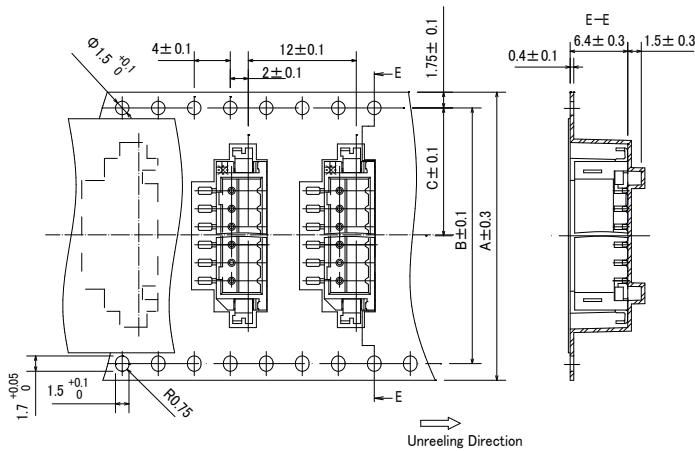
Note : When crimping with a manual crimping tool, only the wires listed above are compatible.

●Crimp Contact Extraction Tool : DF-C-PO(B)

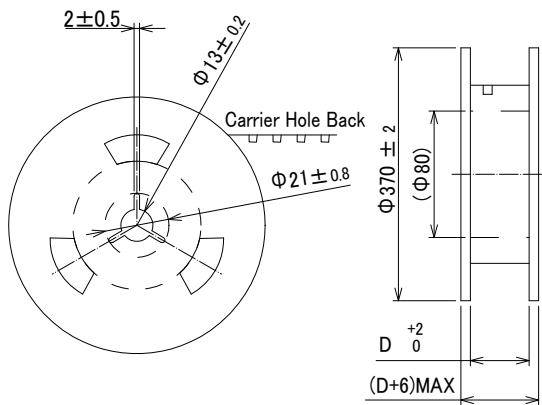
Embossed Carrier Tape Dimensions (JIS-C-0806 Compliant)

Straight Pin Header

Embossed Tape Dimensions



Reel Dimensions

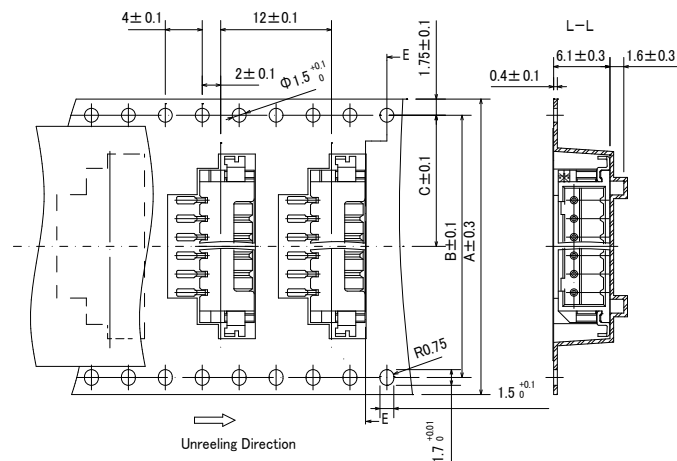


Unit : mm

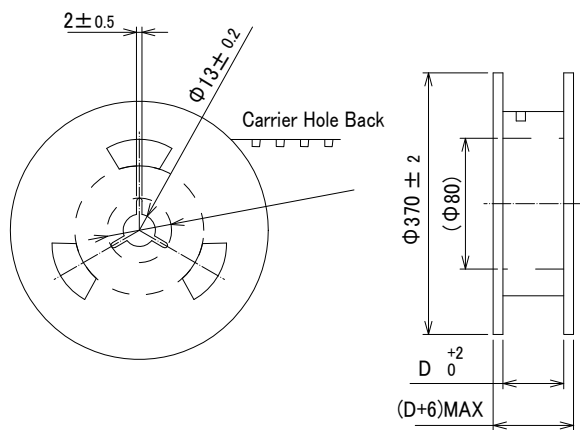
Part No.	No. of Pos.	A	B	C	D	Purchase Unit
DF3EA-#P-2V(##)	2 to 4	24.0	-	11.5	24.4	1,000pcs per reel
	5 to 7	32.0	28.4	14.2	32.4	
	8 to 10	44.0	40.4	20.2	44.4	
	11 to 15	56.0	52.4	26.2	56.4	

■Right Angle Pin Header

●Embossed Tape Dimensions

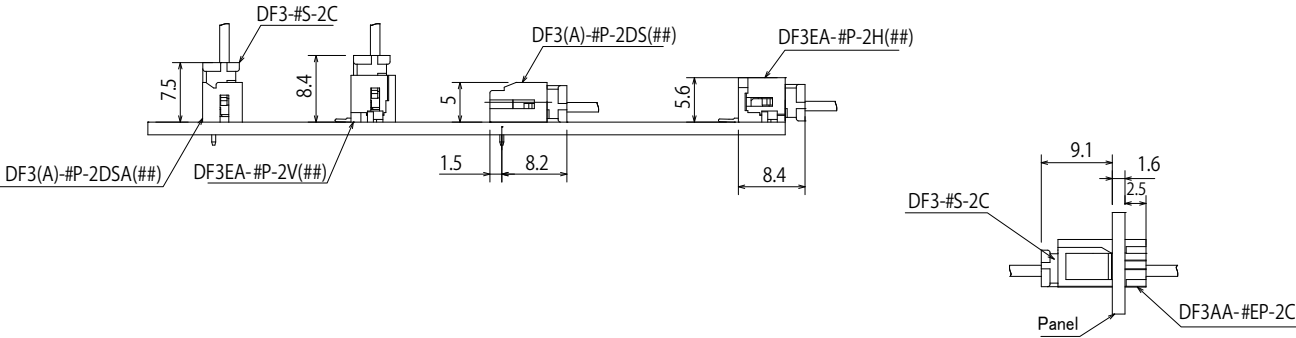


●Reel Dimensions



						Unit : mm
Part No.	No. of Pos.	A	B	C	D	Purchase Unit
DF3EA-#P-2H(##)	2 to 4	24.0	-	11.5	24.4	1,000pcs per reel
	5 to 7	32.0	28.4	14.2	32.4	
	8 to 10	44.0	40.4	20.2	44.4	
	11to 15	56.0	52.4	26.2	56.4	

Mated Dimensions



Applicable Crimping Tools

Type	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF3-2428S	CL0901-4503-3-00	DF3-2428SCF/SCFC
	AP105-DF3-22S	CL0901-4549-4-00	DF3-22SCF/SCFC
	AP105-DF3-EP2428P	CL0901-4508-7-00	DF3-EP2428PCF/PCFA
Press Body	CM-105C	CL0901-0001-0-00	-
Hand Tool	DF3-TA2428HC	CL0550-0164-5-00	DF3-2428SC/SCC
	DF3EP-TA2428HC	CL0550-0184-2-00	DF3-EP2428PC/PCA
	DF3-TA22HC	CL0550-0257-4-00	DF3-22SC/SCFC
Extraction Tool	DF-C-PO(A)	CL0550-0170-8-00	DF3-22SCF/SCFC DF3-22SC/SCC DF3-2428SCF/SCFC DF3-2428SC/SCC DF3-EP2428PCF/PCFA DF3-EP2428PC/PCA

Note 1 : Issues with non-Hirose specified tools are outside the scope of warranty.
Note 2 : Please conduct crimping work according to the Crimping Quality Standard "ETAD-H0958-00 and ETAD-H0959-00" and Crimp Conditions.
Note 3 : If you do not use our specified tools, please contact our sales representative for consultation on providing drawings.

Precautions for Crimping

■ Items Required Prior to Starting

The work-related documents listed below are required before starting harness assembly.

(The ● mark indicates a required document.)

When the documents shown below are not available, ask a Hirose sales personnel to provide them

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
① Instruction Manual for the Crimping Machine Main Unit	Explanation of main press machine unit	●	-	Bundled with the purchase of the main press machine unit.
② Applicator Handling Instructions	Crimping Operation Method			Bundled with the purchase of applicator.
③ Applicator Spare Parts Identification	Explanation for Applicator installation	●	-	
③ Crimp Conditions	Standard values of : Crimp Height, Tensile Strength	●	-	
④ Crimp Quality Standards ETAD-H0958-00 ETAD-H0959-00	Various standards for crimping conditions	●	-	
⑤ Operating Instructions for Hand Tool	Crimping Operation Method Standard values of : Crimp Height, Tensile Strength	-	●	Bundled with the purchase of hand tool.

■ Tools

Use tools designated by Hirose when crimping.

- Crimping performed using tools other than those specified is outside the scope of warranty.
 - The operating instructions manual is available for the crimping machine and the applicator.
- Be sure to carefully read the operating instructions manual before implementing the work.

■ Applicable Electric Wires

When using a wire other than the applicable wires please contact a Hirose representative.

[Precautions]

- Electric wires that are suitable for crimping connectors are tin-plated stranded soft copper wire.
- Avoid crimping solid wires, wires with polyester threads or tin-coated wires.
- Avoid crimping two electric wires together.
- The crimp height setting value (Note) may vary between tin-plated and gold-plated contacts even if the same electric wires are used.
- The crimp height setting value (Note) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note : The crimp height is an important item that determines crimping quality.

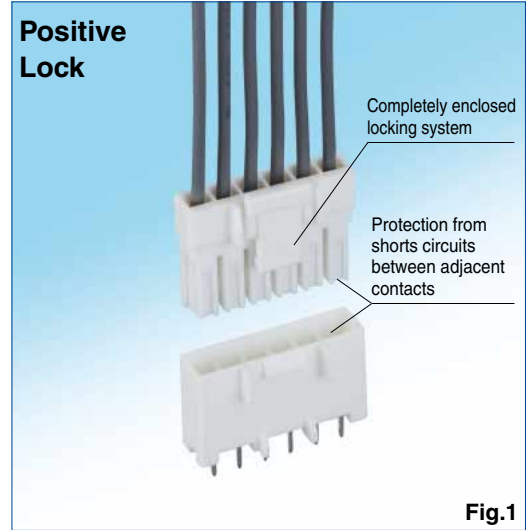
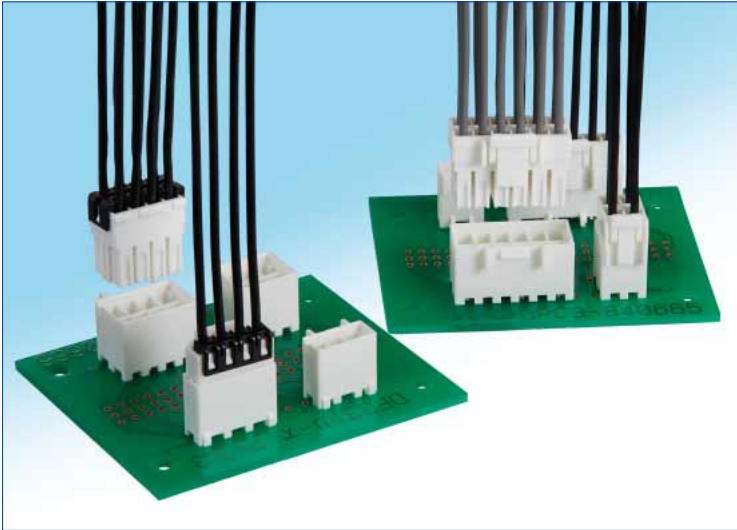
We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

Precautions

Recommended Temperature Profile (SMT)	[Condition] 1. Peak Temperature : 250°C Max., within 10 sec. 2. Heating Section : 230°C Min., within 60 sec. 3. Pre-Heating Section : 150 to 180°C, 90 to 120 sec. 4. Frequency : within 2 times *The measurement section is the terminal lead section. The type of cream solder, manufacturer, board size, and other mounting conditions may vary. Therefore, please check the mounting conditions before use. (Note1) This temperature profile is a recommended value.
Recommended Manual Soldering Conditions (SMT)	Soldering Iron Temperature : $290 \pm 10^{\circ}\text{C}$, Soldering Time : within 3 sec.
Recommended Screen Thickness (SMT)	0.15 to 0.2mm
Board Warpage (SMT)	Max. of 0.03mm at the center in reference to both ends of the connector
Recommended Soldering Conditions (DIP)	■ Flow Conditions with Automatic Soldering Equipment : Solder Temperature $250 \pm 5^{\circ}\text{C}$, Time within 10 sec. ■ Manual Soldering Conditions : Soldering Iron Temperature $290 \pm 10^{\circ}\text{C}$, Time within 2 sec.
Cleaning	See Guidelines for Wire-to-Board Connectors (ETAD-H1023-00). IPA cleaning is allowed. (Cleaning is not recommended due to potential changes in mating action and other variables. Please contact us if you use other cleaning agents.)
Assembly	See Guidelines for Wire-to-Board Connectors (ETAD-H1023-00).
Precautions	Please refer to the following documents when handling this product. ■ Crimp Quality Standard(ETAD-H0958-00, ETAD-H0959-00) ■ Guidelines for Wire-to-Board Connectors (ETAD-H1023-00)
Handling Instructions	This product may have a slight differences in color depending on the production lot. This difference does not have any influence on the performance. In addition, black spots may appear on the mold resin, but this also does not affect the quality of the product.

3.3mm Pitch Small Size Connectors for Internal Power Source

DF33C Series



■ Features

1. 5 Amps capacity

When used with 20 AWG wire, this connector has a maximum capacity of 5A.

(For rated current with other types of wires, please refer to the table on the next page)

2. Secure lock mechanism

Outer locking mechanism prevents accidental unmating due to external shocks or drops. (Fig.1)

3. Accurate board placement

Guide posts are used to help with board placement and prevent incorrect mating to the PCB.

4. Supports resin sealing

Accepts resin sealing up to 6.5mm without affecting the performance.

5. Short circuit prevention

The housing protects each contact by enclosing them in a “box” which also makes each contact independent of each other. This design prevents short circuits between adjacent contacts.

6. Excellent contact retention

A retainer is available to increase contact/cable retention and to assure complete contact insertion. The retainer should also be used when any mechanical stress could be applied to the cable.

7. Prevents solder cracking

To avoid solder crack, a glass-filled resin is used in the header housing to decrease thermal shrinkage.

8. Easy mating operation

A clear tactile click is delivered upon the completion of the mating process. This simplifies mating and increases work efficiency, especially when operating in a noisy environment.

Product Specifications

Ratings	Rated Current (Note 1)	No. of rows	No. of Contacts	20 AWG	22 AWG	Operating Temperature Range	-35 to +85°C (Note 2)
		1	2 to 6 contacts	5A/pin	5A/pin	Operating Humidity Range	40 to 80% (Note 3)
		2	4 to 12 contacts	5A/pin	4A/pin	Storage Temperature Range	-10 to +60°C (Note 4)
	Rated Voltage	AC/DC 500V				Storage Humidity Range	40 to 70% (Note 4)

Items	Specifications	Conditions
1. Contact Resistance	No more than 10mΩ (initially)	Measured at 20mV or below and 1mA
2. Insulation Resistance	No less than 1,000MΩ	Measured at DC 500V
3. Withstanding Voltage	No flashover or breakdown	Apply AC 1500V for one minute
4. Contact Insertion and Extraction Forces	0.5N Min, 4.5N Max	Measured with a $\square$ 0.5 ±0.002 steel pin
5. Durability	Contact Resistance : no more than 20mΩ	30 mating cycles
6. Vibration Resistance	No electrical discontinuity of 1μs or greater	Frequency 10-55Hz, half amplitude 0.75mm, 3 directions, 10 times each
7. Shock Resistance	No electrical discontinuity of 1μs or greater	Acceleration : 490m/s ² , 11ms, Semi-sinusoidal 3 direction 3 times each.
8. Moisture-resistance	Contact Resistance : no more than 20mΩ Insulation Resistance : no less than 500MΩ	Left at temperature 40 ±2°C, humidity 90 to 95%, 96 hours
9. Temperature Cycles	Contact Resistance : no more than 20mΩ Insulation Resistance : no less than 1000MΩ	-55°C : 30 minutes → 85°C : 30 minutes 5 cycles
10. Soldering Heat Resistance	The resin parts should withstand the temperature and resist melting.	Flow : 260°C, 10 sec. Hand solder : Soldering iron temperature, 300°C, 3 sec.

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

If you split the current over multiple lines, please factor in your own safety margin. Please contact Hirose Electric for inquiries on the assignment of pins and on the currents that can be delivered.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The connector should be completely dry. (no condensation present)

Note 4 : Applicable to unused items in packaged state.

Note 5 : 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	Materials	Finish	UL rating
Crimp socket	Insulator	PBT	White	UL94V-0
Crimp contact	Contact	Copper alloy	Tin plating	————
Pin header	Insulator	PBT	White	UL94V-0
	Contact	Brass	Tin plating	————
Retainer	Insulator	PBT	Black	UL94V-0

Product Number Structure

●Connector

DF33C – 2 S – 3.3 C

①

②

③

④

⑤

●Contact

DF33A – 2022 SCF

⑥

⑦

① Series Name : DF33C	④ Contact pitch : 3.3 mm
② No. of contacts : 2 to 6 (single row product) : 4 to 12 (double row product)	⑤ Termination/terminal shape C : Crimp housing DSA : Straight pin header Blank : Retainer
③ Connector type S : Single row socket DS : Double row socket P : Single row pin header DP : Double row pin header RS : Single row retainer RDS : Double row retainer	⑥ Applicable wire size 2022 : 20 to 22 AWG
	⑦ Packing type SCF : Socket contact / reel SC : Socket contact / pack

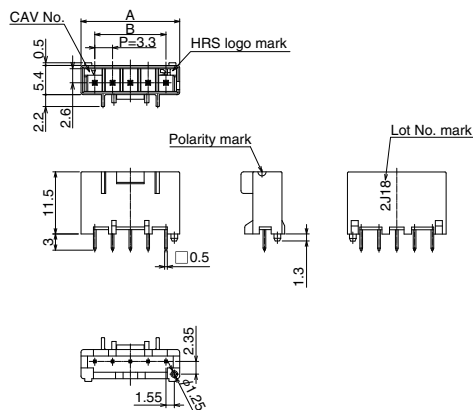
Single row straight pin header



Standard type (Resin: White)

Unit : mm

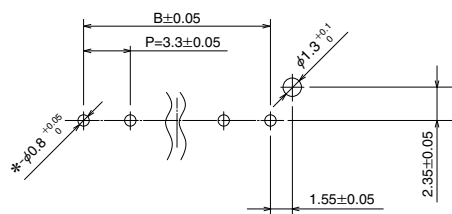
Part No.	HRS No.	No. of Contacts	A	B	Packing
DF33C-2P-3.3DSA(24)	676-1131-2 24	2	8.4	3.3	135pcs/tray
DF33C-3P-3.3DSA(24)	676-1132-5 24	3	11.7	6.6	95pcs/tray
DF33C-4P-3.3DSA(24)	676-1133-8 24	4	15.0	9.9	75pcs/tray
DF33C-5P-3.3DSA(24)	676-1134-0 24	5	18.3	13.2	60pcs/tray
DF33C-6P-3.3DSA(24)	676-1135-3 24	6	21.6	16.5	50pcs/tray



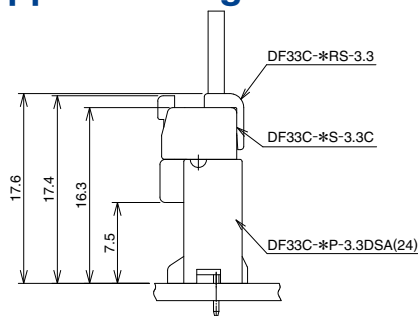
[Specification No.]

(24): Tin plating, tray package specification

Recommended PCB layout (Recommended PCB thickness $t=1.6 \pm 0.1$)



Dimensions in mated condition Application figure



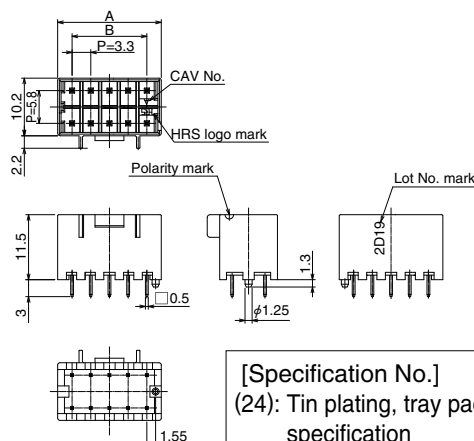
Double row, straight pin header



Standard type (Resin color: White)

Unit : mm

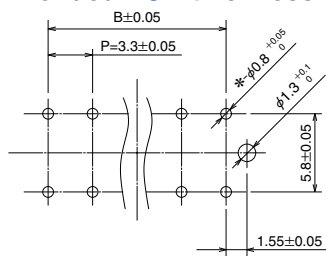
Part No.	HRS No.	No. of Contacts	A	B	Packing
DF33C-4DP-3.3DSA(24)	676-1113-0 24	4	8.4	3.3	135pcs/tray
DF33C-6DP-3.3DSA(24)	676-1114-3 24	6	11.7	6.6	95pcs/tray
DF33C-8DP-3.3DSA(24)	676-1115-6 24	8	15.0	9.9	75pcs/tray
DF33C-10DP-3.3DSA(24)	676-1116-9 24	10	18.3	13.2	60pcs/tray
DF33C-12DP-3.3DSA(24)	676-1117-1 24	12	21.6	16.5	50pcs/tray



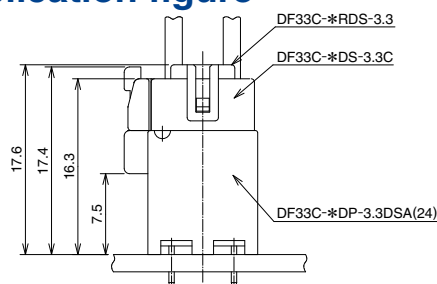
[Specification No.]

(24): Tin plating, tray package specification

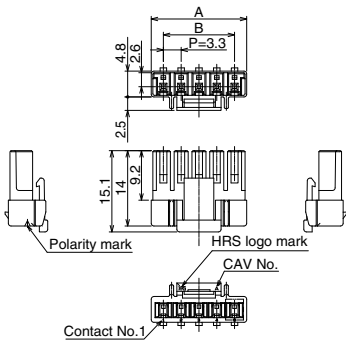
Recommended PCB layout (Recommended PCB thickness $t=1.6 \pm 0.1$)



Application figure



Single row socket

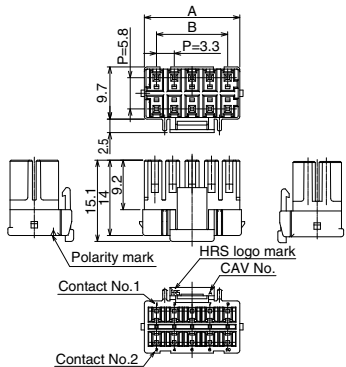


Standard type (Resin color: White) Unit : mm

Part No.	HRS No.	No.of Contacts	A	B	Packing
DF33C-2S-3.3C	676-1136-6 00	2	7.8	3.3	100pcs/ pack
DF33C-3S-3.3C	676-1137-9 00	3	11.1	6.6	
DF33C-4S-3.3C	676-1138-1 00	4	14.4	9.9	
DF33C-5S-3.3C	676-1139-4 00	5	17.7	13.2	
DF33C-6S-3.3C	676-1140-3 00	6	21.0	16.5	

*For the retainers, please refer to page 5.

Double row socket

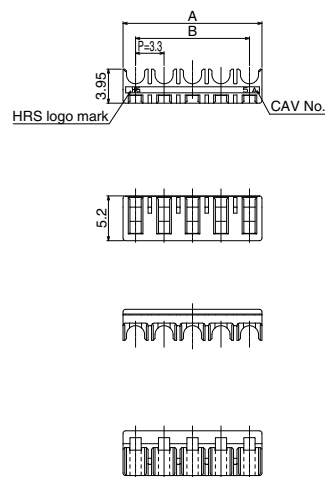
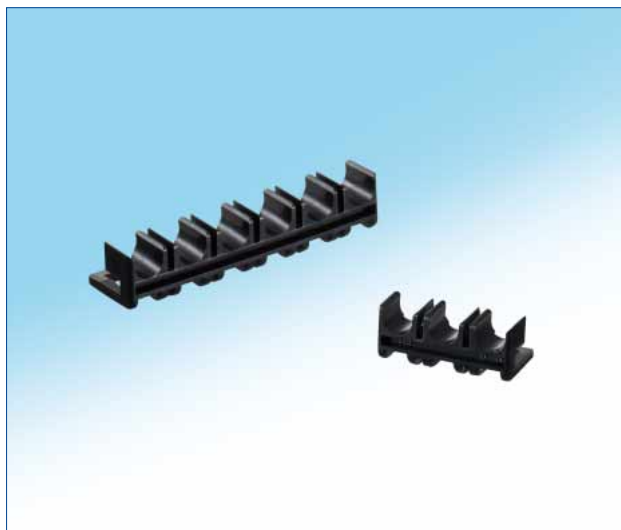


Standard type (Resin color: White) Unit : mm

Part No.	HRS No.	No.of Contacts	A	B	Packing
DF33C-4DS-3.3C	676-1119-7 00	4	7.8	3.3	100pcs/ pack
DF33C-6DS-3.3C	676-1120-6 00	6	11.1	6.6	
DF33C-8DS-3.3C	676-1121-9 00	8	14.4	9.9	
DF33C-10DS-3.3C	676-1122-1 00	10	17.7	13.2	
DF33C-12DS-3.3C	676-1123-4 00	12	21.0	16.5	

*For the retainers, please refer to page 5.

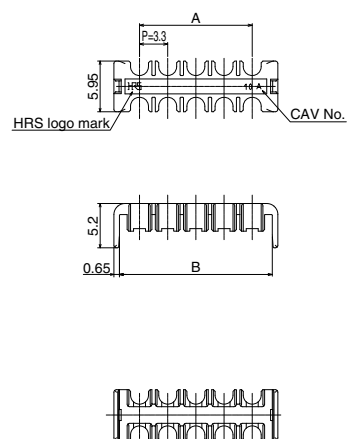
Single row retainer



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	Packing
DF33C-2RS-3.3	676-1141-6 00	2	6.2	3.3	100pcs/ pack
DF33C-3RS-3.3	676-1142-9 00	3	9.5	6.6	
DF33C-4RS-3.3	676-1143-1 00	4	12.8	9.9	
DF33C-5RS-3.3	676-1144-4 00	5	16.1	13.2	
DF33C-6RS-3.3	676-1145-7 00	6	19.4	16.5	

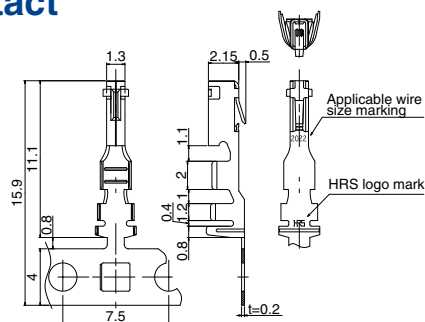
Double row retainer



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	Packing
DF33C-4RDS-3.3	676-1125-0 00	4	3.3	8.0	100pcs/ pack
DF33C-6RDS-3.3	676-1126-2 00	6	6.6	11.3	
DF33C-8RDS-3.3	676-1127-5 00	8	9.9	14.6	
DF33C-10RDS-3.3	676-1128-8 00	10	13.2	17.9	
DF33C-12RDS-3.3	676-1129-0 00	12	16.5	21.2	

◆ Socket crimp contact



Part No.	HRS No.	Applicable cable				Packaging	Finish
		Style	Jacket diameter	Wire size	Stranded wire conductor		
DF33A-2022SCF	676-1093-5 00	1007	φ1.5 to 1.9mm	22 AWG	17/0.16mm	10,000 /reel	Tin plated
				20 AWG	21/0.18mm		
DF33A-2022SC	676-1094-8	1007	φ1.7mm	22 AWG	17/0.06mm	100 /pack	
			φ1.8mm	20 AWG	21/0.18mm		

Note 1 : Applicable wire with tin plated solid soft conductor.

Note 2 : When using other than the recommended wire, contact your nearest Hirose representative.

Strip length: 2.7 to 3.5mm

◆ Applicable crimp tool

Type	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF33-2022S	901-4603-0 00	DF33A-2022SCF
	CHS893300H-UP(Note 3)	—	
Press main body	CM-105C	901-0001-0 00	—
Hand tool	HT304/DF33-2022S	550-0300-1	DF33A-2022SC
Contact unmating tool	DF33-C-PO	902-4551-2 00	DF33A-2022SCF DF33A-2022SC

Note 1 : Hirose does not guarantee products that have been damaged from the use of inapplicable tools

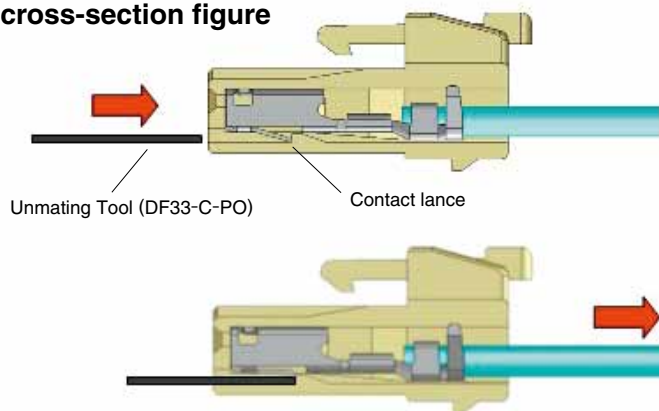
Note 2 : Please do the crimping operations according to the "Crimping quality standard" and "Crimp condition".

Note 3 : Applicator manufactured by JAPAN AUTOMATIC MACHINE (J.A.M.). Please access to HP of J.A.M., if you make

◆ Unmating Procedure

- Contact unmating tool: DF33-C-PO
- Applicable contact: DF33A-2022SCF, DF33A-2022SC
- Operation method (Example) DF33C-*S-3.3C, DF33A-2022SCF

Housing cross-section figure



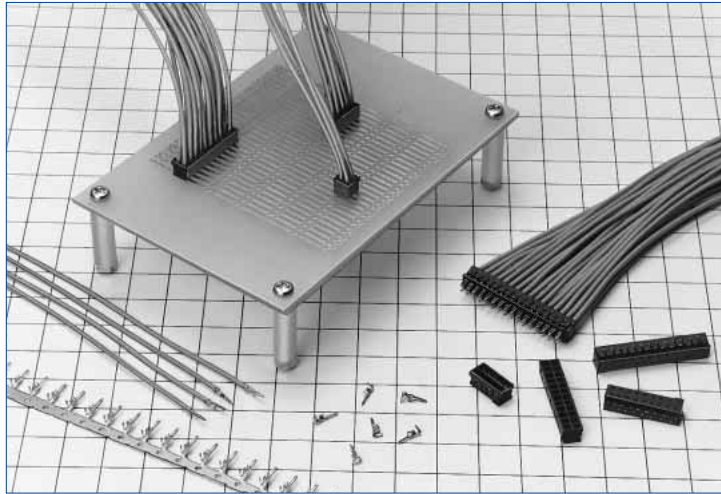
1. Insert the unmating tool and move or disengage the contact lance. (as shown in the example on the left)

2. Make sure that the lance has moved sufficiently enough to allow the terminated wire to be removed easily.

Note : Lance strength may have decreased due to the repair work. It is recommended to use new crimp terminals instead of reusing repaired crimp terminals. The case can be reused.

2mm Pitch Connector Directly Mounted on Board

DF4 Series



■Features

1. Cost Saving for Header

Thanks to the insertion/extraction socket and the harness product at the both connector edges, one of two headers necessary at both edge sockets can be saved without losing the function to separate individual boards.

2. Miniature and Multiple Contacts

The miniature connector has broad variations in contact number.

Board mounting height : **4.3mm (Crimping Single row)**

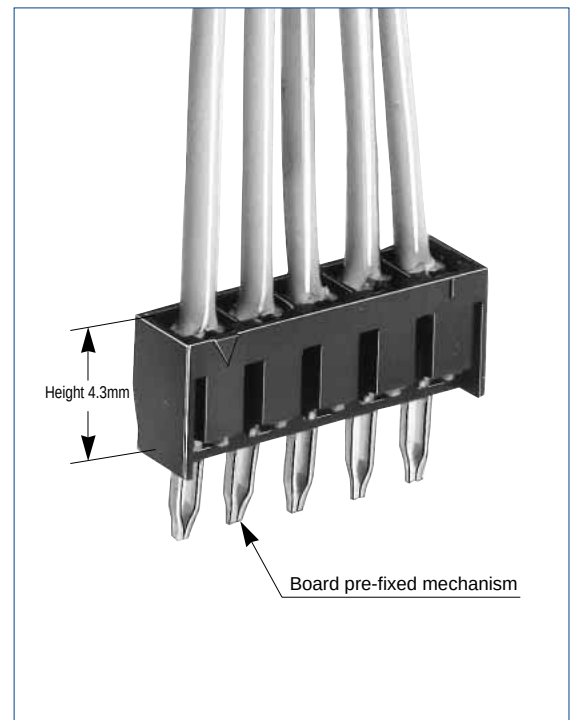
Maximum contact number : **28 contacts (Crimping Double row)**

3. Board Pre-fixed Mechanism

The insertion state to the board is a light crimping, which enables the pre-fixed process to the board.

■Applications

Note PC, Small business equipment



■Product Specifications

Rating	Current rating (Note 1)	Crimping	AWG 24 : 3A/pin AWG 26 : 2A/pin AWG 28 : 1A/pin	Operating Temperature Range	-30 to +85℃(Note 1)
				Operating Moisture Range	40 to 80%
	Voltage rating	Crimping	250V AC/DC	Storage Temperature Range	-10 to +60℃(Note 2)
				Storage Moisture Range	40 to 70%

Item	Specification	Condition
1. Insulation Resistance	1000M ohms Min	500V DC
2. Withstanding voltage	No flashover or insulation breakdown.	650V AC/1 minute
3. Crimping Area Resistance	30m ohms Max.	100mA
4. Vibration	No damage, cracks, or parts looseness.	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 directions.
5. Humidity (Steady state)	Contact resistance: 30m ohms Max Insulation resistance: 500M ohms Min	96 hours at temperature of 40℃ and humidity of 90% to 95%
6. Temperature Cycle	Contact resistance: 30m ohms Max Insulation resistance: 1000M ohms Min	Temperature -55 → 5 to 35 → +85 → -5 to 35℃ time 30 → 5 to 15 → 30 → 5 to 15 min under 5 cycles.
7. Resistance to Soldering heat	No deformation of components affecting performance.	Manual soldering: 300℃ for 3 seconds Flow: 250℃ for 10 seconds

Note 1: The rated current will be changed according to cable sizes for use.

Note 2: Includes temperature rise caused by current flow.

Note 3: The term "storage" refers to products 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.

Note 4: Information contained in this catalog represents general requirements for this Series. Contact us for the drawings and specifications for a specific part number shown.

■Material

Product	Part	Material	Finish	Remarks
Crimping Plug	Insulator	Polyamide	Black	UL94V-0
Crimping Contact for Plug	Contact	Brass	Tin plating	———

■Ordering Information

●Connector

DF4 - * **P** - **2** **C**
① ② ③ ④ ⑤

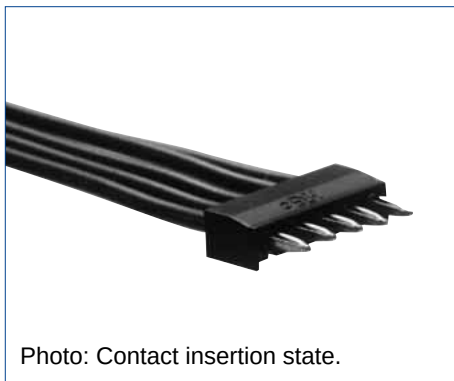
① Series Name: DF4	④ Contact Pitch: 2mm
② Number of Contact: 2 to 9, 4 to 28	⑤ Connection Type
③ Connector Type P: Single row plug DP: Double row plug	C: Crimping socket

●Contact

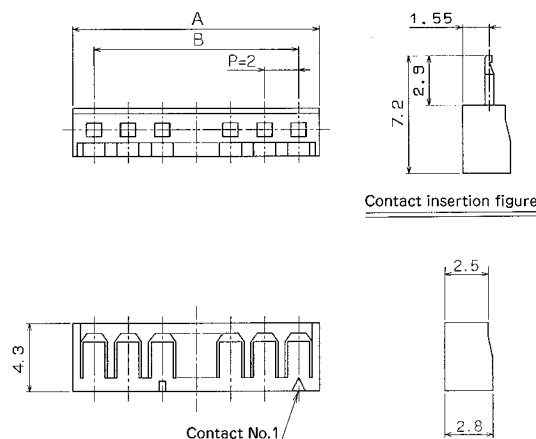
DF4 - **2428-** **PCF**
① ②

① Applicable cable size 2428 : AWG24 to 28	② Packaging Type PCF: Plug contact/Reel PC: Plug contact/Bag

Single Row Crimping Plug



●Applicable Through-hole Diameter : $\phi 0.8 \pm 0.1$

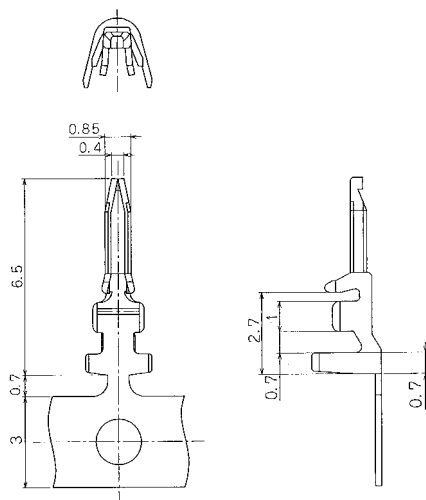


Unit:mm

Part Number	CL No.	Number of Contacts	A	B	RoHS2
DF4- 2P-2C	544-0003-4	2	4.5	2.0	Yes
DF4- 3P-2C	544-0004-7	3	6.5	4.0	
DF4- 4P-2C	544-0005-0	4	8.5	6.0	
DF4- 5P-2C	544-0006-2	5	10.5	8.0	
DF4- 9P-2C	544-0010-0	9	18.5	16.0	

Note 1.The quantity at the specific No. "None" is delivered per bag (100pcs.). If needed, please order the products per bag.

Crimping Contact



Part Number	CL No.	Packaging Type	Quantity	Finish	RoHS2
DF4-2428PCF(05)	544-0020-3-05	Reel	10,000	Tin plating	Yes
DF4-2428PC(05)	544-0021-6-05	Bag	100	Tin plating	

●Applicable Cable (Tin plating Annealed copper wire)

Conductor Size	Recommended Cable	Jacket Diameter
AWG24 (11 cores./0.16mm)	UL1061	$\phi 0.75$ to $\phi 1.2$ mm
AWG 26 (7cores./0.16mm)		
AWG 28 (7cores./0.127mm)	UL1061/1007	

Note:If other cables are used instead of the applicable cable, contact Hirose sales department.

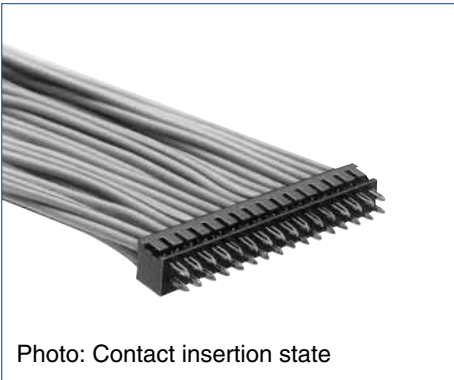
● Strip Length: 1.3 to 1.9mm

Applicable Crimping Tool

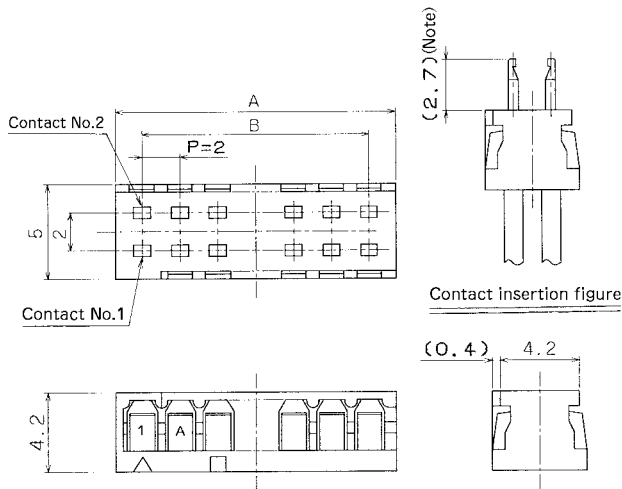
Type	Part Number	CL No.	Applicable Contact
Applicator	AP105-DF4-2428P	901-4539-0	DF4-2428PCF(05)
Press Main Unit	CM-105	901-0005-4	—
Manual Crimping Tool	DF4-TA2428HC	550-0173-6	DF4-2428PC(05)
Extraction Tool	DF-C-PO (B)	550-0179-2	DF4-2428PCF(05)

Note: If any trouble has occurred due to other tools, which are not designated by Hirose, Hirose won't guarantee any products.

Double Row Crimping Plug



● Applicable Through-hole Diameter $\phi 0.9 \pm 0.05$

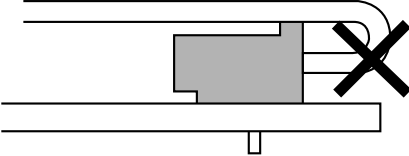


Note:The dip side may be deviated according to the cable thickness and the crimping contact bent up/down.

Unit:mm					
Part Number	CL No.	Number of Contacts	A	B	RoHS2
DF4- 4DP-2C	544-0078-3	4	4.8	2.0	YES
DF4-12DP-2C	544-0082-0	12	12.8	10.0	
DF4-16DP-2C	544-0084-6	16	16.8	14.0	
DF4-18DP-2C	544-0085-9	18	18.8	16.0	
DF4-26DP-2C	544-0089-0	26	26.8	24.0	
DF4-28DP-2C	544-0090-9	28	28.8	26.0	

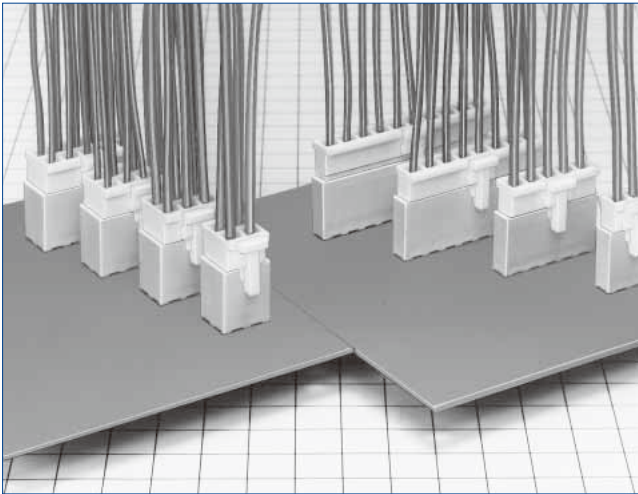
Note 1.The quantity at the specific No. "None" is delivered per bag (100pcs.). If needed, please order the products per bag.

◆Precautions

1. Recommended Soldering Condition	Flow: 250℃ for 3 seconds Manual soldering: 290±10℃ for 2 seconds ■ If the cable neighboring the connector is bent and unstraightened, secure a large bending radius because the Jacket will be broken by the solder heat and the contact wire will be exposed.The Jacket in this part will be tore.  ■ After the soldering process. If a stress is applied to the cable in the state where the connector and the cable has heat inside, the Jacket hold area will be loosen. Therefore, carry out the post-soldering operation after the connector has returned to the room temperature..
2. Cleaning Condition	Refer to "Wire-to-Board Connector Guidelines". Don't use a solvent such ass trichloroethylene which invades the cable Jacket. In addition, avoid heat cleaning by a solvent.
3. Connection Condition	Refer to "Wire-to-Board Connector Guidelines : ETAD-H1023-00".

5mm Pitch Miniature Potting Connectors for Secondary Power Supply

DF5 Series



Single row type

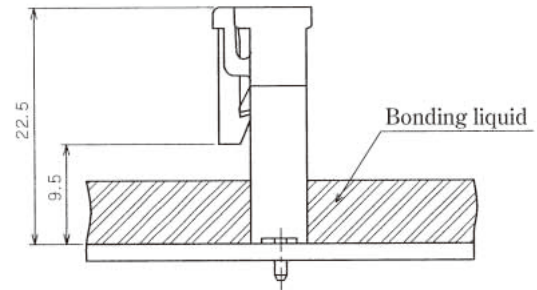


Fig.1-1

■Features

1. Potting Product

This connector is capable of potting 9mm maximum, and 22.5mm mounting height is a low profile. (Fig.1)

2. Prevent Mis-insertion

When the socket and pin header are mated, this connector is equipped with a mechanism to prevent reverse insertion or dissimilar contact insertion.

3. Means to Prevent Solder Cracks

The pin header employs glass enforced resin, and takes countermeasures to prevent solder cracks due to heat shrinkage.

4. Prevent Reverse Insertion in Printed Board

Boss is added to the pin header, and prevents reverse insertion in the printed board.

5. Full Lock Mechanism

The outer lock system employs full lock mechanism.

6. Current Capacity of 8A

Power can be supplied at 8A maximum. Specification will change according to applicable cable, number of contacts, number of rows. For further information, refer to product specifications as listed on next page.

7. UL and C-UL Certified

8. Glow Wire Compliance (Compliant with IEC 60695-2-11)

Double row type

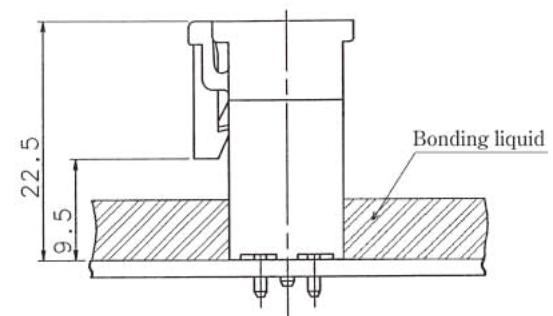


Fig.1-2

Product Specifications

Rating	Current rating	No. of rows	No. of contacts	18 AWG	20 AWG	22 AWG	Operating Temperature Range Operating Moisture Range	-35 to +85℃(Note 2) 40 to 80%	
		Single row	2 to 8	8A/pin	6A/pin	5A/pin			
		Double row	4						
			6						
			8	7A/pin					
			10						
			12						
	Voltage rating	Specification	500V AC/DC	UL/C-UL File No. and Recognition No.			Storage Temperature Range	-10 to +60℃(Note 3) 40 to 70%(Note 3)	
		UL/C-UL	500V AC/DC	UL : E52653 C-UL : E52653					Storage Humidity Range

Item	Specification	Condition
1. Insulation Resistance	1000MΩ min.	500V DC
2. Withstanding voltage	No flashover or insulation breakdown.	1500V AC/1minute
3. Contact Resistance	30mΩ max.	100mA
4. Single Insertion/ Extraction Force	0.3N (30gt) min., 4.5N (450gt) max.	Measured with 1.14±0.002mm steel pin
5. Vibration	No electrical discontinuity of 10μs or more	Frequency : 10 to 55Hz, single amplitude of 0.75mm, 2 hours in each of the 3 directions.
6. Humidity (Steady state)	Contact resistance : 30mΩ max., Insulation resistance : 500MΩ min.	96 hours at temperature of 40°C and humidity of 90% to 95%
7. Temperature Cycle	Contact resistance : 30mΩ max., Insulation resistance : 1000MΩ min.	(-55°C : 30 minutes→15 to 35°C : 10 minutes→85°C : 30 minutes→5 to 35°C : 10 minutes) 5 cycles
8. Durability (Mating/un-mating)	Contact resistance : 30mΩ max.	30 cycles
9. Resistance to Soldering heat	No deformation of components affecting performance.	Flow : 260°C for 10 seconds
		Manual soldering : 350°C for 3 seconds

Note 1 : Includes temperature rise caused by current flow.

Note 2 : The connector should be completely dry (no condensation present).

Note 3 : The term "storage" refers to products 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.

Note 4 : 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	Part	Material	Finish	Remarks
Crimping Socket	Insulator	Polyamide	White	UL94V-0
Crimping Contact for Socket	Contact	Phosphor bronze	Tin plated	_____
Pin header	Insulator	Polyamide	Beige	UL94V-0
	Contact	Brass	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

DF5A - * S - 5 C

① ② ③ ④ ⑤

① Series Name : DF5A	④ Contact Pitch : 5mm
② Number of contacts : Single row : 2 to 8 Double row : 4 to 12	⑤ Contact type C : Crimping Socket DSA: Straight pin header
③ Connector type S : Single row socket DS : Double row socket P : Single row header DP : Double row header	

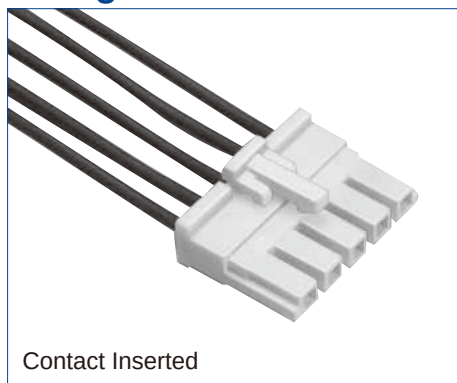
Contact

DF5A - 1822 SCF

① ② ③

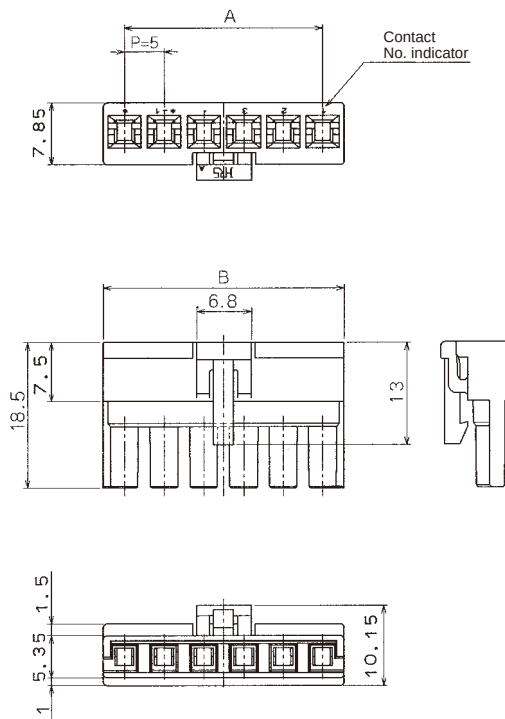
① Applicable cable type None : UL 1007 equivalent (jacket diameter 1.5 to 2.2mm) A : UL 1015 equivalent (jacket diameter 2.2 to 2.9mm)	③ Packaging type SCF : Socket contact / reel SC : Socket contact / pack
② Applicable cable size 1822 : 18 to 22 AWG	

Single Row Socket



Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	RoHS2
DF5A- 2S-5C	676-0007-8	2	5.0	10.5	YES
DF5A- 3S-5C	676-0008-0	3	10.0	15.5	
DF5A- 4S-5C	676-0009-3	4	15.0	20.5	
DF5A- 5S-5C	676-0010-2	5	20.0	25.5	
DF5A- 6S-5C	676-0011-5	6	25.0	30.5	
DF5A- 8S-5C	676-0013-0	8	35.0	40.5	



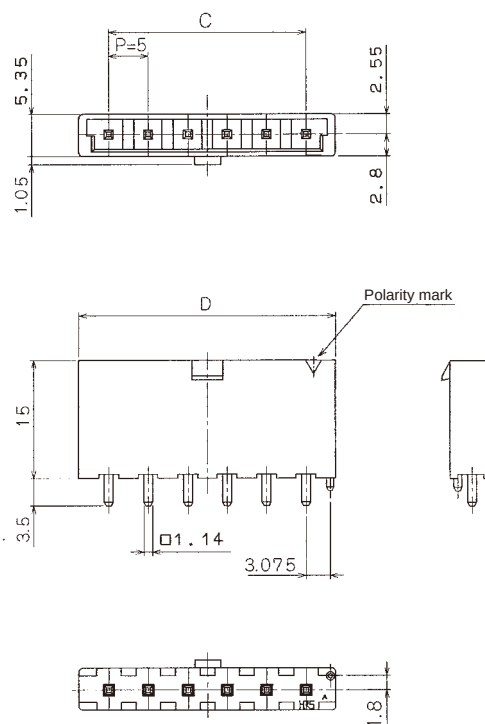
Note : A packaging quantity is delivered by the bag unit (100 pcs.).

Single Row Pin Header



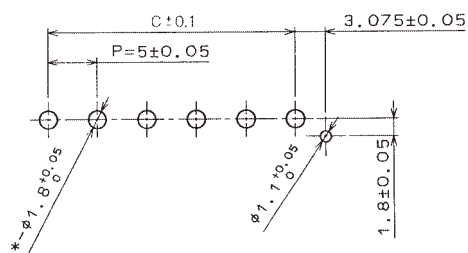
Unit : mm

Part No.	HRS No.	No. of Contacts	C	D	RoHS2
DF5A- 2P-5DSA(35)	676-0016-9 35	2	5.0	12.5	YES
DF5A- 3P-5DSA(35)	676-0017-1 35	3	10.0	17.5	
DF5A- 4P-5DSA(35)	676-0018-4 35	4	15.0	22.5	
DF5A- 5P-5DSA(35)	676-0019-7 35	5	20.0	27.5	
DF5A- 6P-5DSA(35)	676-0020-6 35	6	25.0	32.5	
DF5A- 8P-5DSA(35)	676-0022-1 35	8	35.0	42.5	

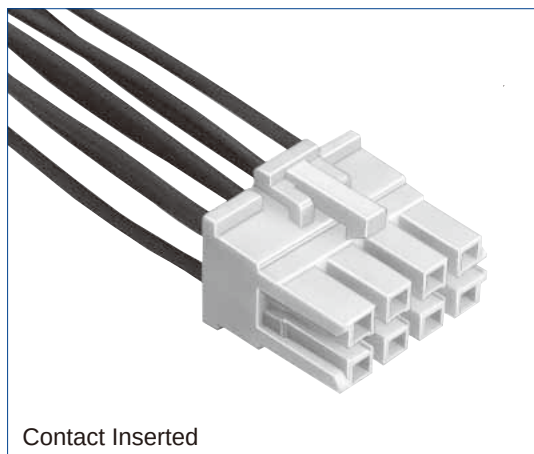


Note : A packaging quantity is delivered by the bag unit (100 pcs.).

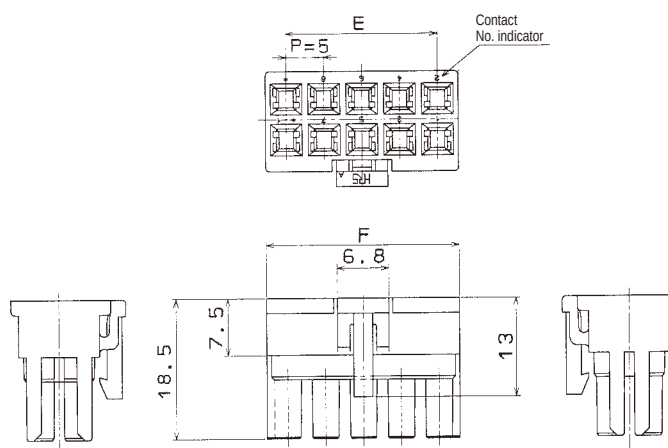
PCB Mounting Pattern (Board thickness = 1.6±0.1)



Double Row Socket



Contact Inserted

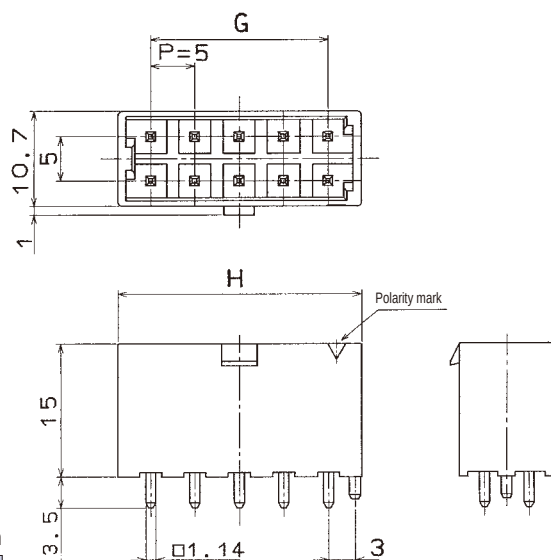


Unit : mm

Part No.	HRS No.	No. of Contacts	E	F	RoHS2
DF5A- 4DS-5C	676-0025-0	4	5.0	10.5	YES
DF5A- 6DS-5C	676-0026-2	6	10.0	15.5	
DF5A- 8DS-5C	676-0027-5	8	15.0	20.5	
DF5A-10DS-5C	676-0028-8	10	20.0	25.5	
DF5A-12DS-5C	676-0036-6	12	25.0	30.5	

Note : A packaging quantity is delivered by the bag unit (100 pcs.).

Double Row Pin Header

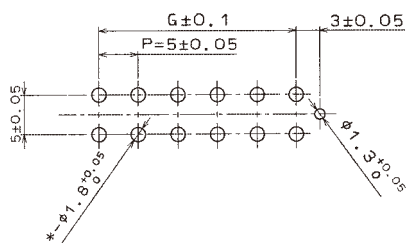


Unit : mm

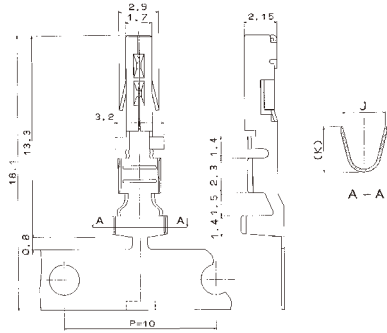
Part No.	HRS No.	No. of Contacts	G	H	RoHS2
DF5A- 4DP-5DSA(35)	676-0029-0 35	4	5.0	12.5	YES
DF5A- 6DP-5DSA(35)	676-0030-0 35	6	10.0	17.5	
DF5A- 8DP-5DSA(35)	676-0031-2 35	8	15.0	22.5	
DF5A-10DP-5DSA(35)	676-0032-5 35	10	20.0	27.5	
DF5A-12DP-5DSA(35)	676-0033-8 35	12	25.0	32.5	

Note : A packaging quantity is delivered by the bag unit (100 pcs.).

PCB Mounting Pattern (Board thickness = 1.6±0.1)



◆ Socket Crimping Contact



Unit : mm

Part No.	HRS No.	Applicable Cable				Packaging	J	K	RoHS2
		ULStyle	Jacket Diameter	Wire Size	Stranded Wire Conductor				
DF5-1822SCF	676-0001-1	1007	φ1.5 to 2.2mm	18 AWG	43/0.18mm	5,000 / reel	2.8	3	Yes
				20 AWG	21/0.18mm				
				22 AWG	17/0.16mm				
DF5-1822SC	676-0002-4	1007	φ2.1mm	18 AWG	43/0.18mm	100 / pack			
			φ1.8mm	20 AWG	21/0.18mm				
			φ1.6mm	22 AWG	17/0.16mm				
DF5A-1822SCF	676-0003-7	1015	φ2.2 to 3.2mm	18 AWG	43/0.18mm	5,000 / reel	3.8	4	
				20 AWG	21/0.18mm				
DF5A-1822SC	676-0004-0	1015	φ2.2 to 3.2mm	22 AWG	17/0.16mm	100 / pack			
				φ2.9mm	18 AWG				43/0.18mm
				φ2.6mm	20 AWG				21/0.18mm
				φ2.4mm	22 AWG				17/0.16mm

Note 1 : Applicable wire with tin plated solid soft conductor.

Note 2 : When using other than the recommended wire, contact your nearest Hirose representative.

Note 3 : Strip length : 3.0 to 4.0mm

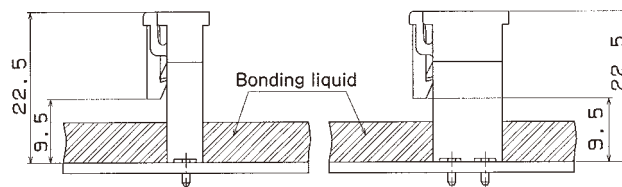
◆ Applicable Crimping Tools

Type	Item	Part No.	HRS No.	Applicable Contact
Auto-matic	Press unit	CM-105C	901-0001-0	_____
	Applicator	AP105-DF5-1822S	901-4542-5	DF5-1822SCF
		AP105-DF5A-1822S	901-4546-6	DF5A-1822SCF
Manual	Manual crimping tool	DF5-1822/CR-HT	550-0264-0	DF5-1822SC
		DF5A-1822/CR-HT	550-0265-2	DF5A-1822SC
—	Extraction tool	RP13-PC-TP	150-0021-5	DF5/DF5A-1822SCF

Note 1 : If any trouble has been caused due to other tools, which are not designated by Hirose, Hirose won't guarantee any product.

Note 2 : For the crimping process, refer to "crimping quality standards" and "crimping condition".

◆ Application Pattern



◆ Precautions

1. Recommended soldering condition	Flow : 260°C for 10 seconds Manual soldering : 350°C for 3 seconds
2. Cleaning condition	Refer to the "Wire-to-Board Connector Guidelines : ETAD-H1023-00"
3. Connecting condition	Refer to the "Wire-to-Board Connector Guidelines : ETAD-H1023-00"
4. Cautions	■The color phase of this product may be slightly differ from that of the formed product according to the manufacturing lot, and consequent storage condition, however, the difference affects no performance.
5. Precautions	Refer to the "Wire-to-Board Connector Guidelines : ETAD-H1023-00"

DF50 Series

1mm Pitch, Positive Lock, Wire-to-Board Connector



Positive-Lock



Robust



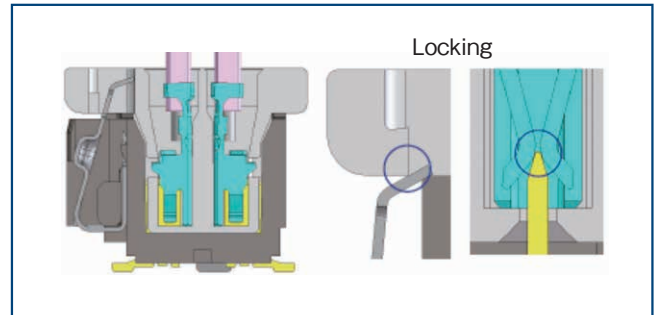
P= 1.0 mm



Features

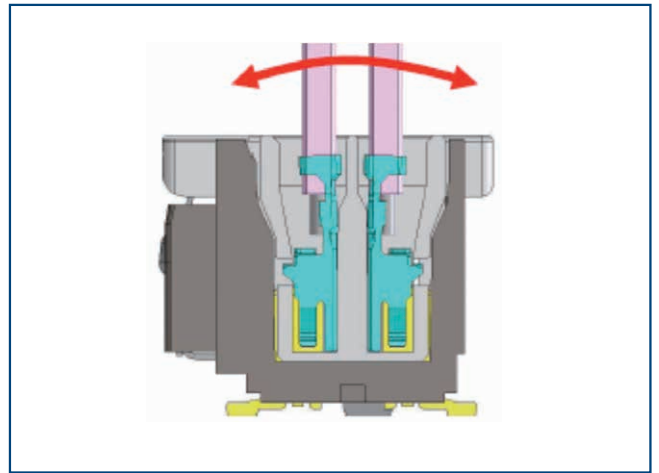
1. Secure lock with clear tactile click

Locking function and contact mating occur simultaneously for a clearer tactile click.



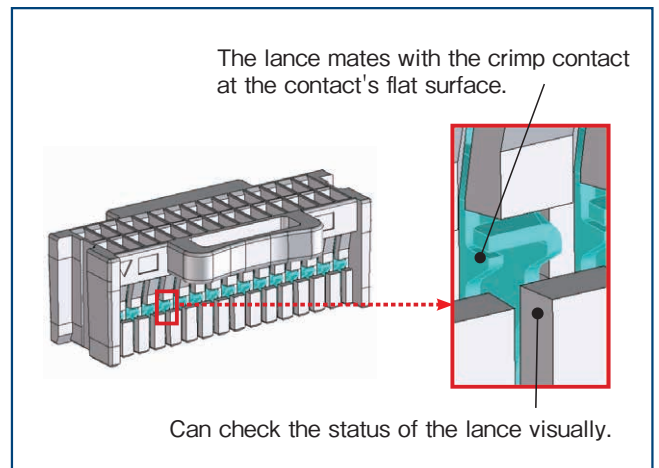
2. Robust design resists prying

Thick and robust housing wall provides higher strength against cracking. Insertion depth for mating housings protects against prying.



3. Robust and reliable lance design

The lance mates with the crimp contact at a flat surface for high lance strength.



Product Specifications

Rated Current (Note 1)	No. of Pos.	26 ~ 28 AWG	30 AWG	32 AWG	Operating Temperature (Note 2)	-35 to +85°C
	2	2A/pin	0.9A/pin	0.7A/pin	Operating Humidity Range (Note 3)	20 to 80%
	3 ~ 50	1A/pin	0.9A/pin	0.7A/pin	Storage Temperature (Note 4)	-10 to +60°C
Rated Voltage	100V AC/DC				Storage Humidity Range (Note 4)	40 to 70%

Item	Specifications	Conditions
Insulation Resistance	500M Ω Min.	100V DC
Withstand Voltage	No Flashover or Breakdown	300V AC for 1 min.
Contact Resistance	30m Ω Max.	20mV Max., at 1mA.
Vibration Resistance	No Electrical Discontinuity of 1 μ s or Longer	Frequency 10-55Hz, Single Amplitude of 0.75mm 3 Directions, 10 Cycles in Each Direction.
Shock Resistance	No Electrical Discontinuity of 1 μ s or Longer	Acceleration : 490m/s ² , 11ms, Half Sine Wave in 3 Directions, 3 Times for Each Direction
Moisture Resistance	Contact Resistance : 50m Ω Max. Insulation Resistance : 100M Ω Min.	Temperature : 40 $\pm$ 2°C : Humidity : 90 to 95%, Left for 96 Hours
Temperature Cycles	Contact Resistance : 50m Ω Max. Insulation Resistance : 500M Ω Min.	(-55°C : 30 min. $\rightarrow$ +5 to +35°C : 2 to 3 min. $\rightarrow$ +85°C : 30 min. $\rightarrow$ +5 to +35°C : 2 to 3 min.) 5 Cycles
Durability	Contact Resistance : 50m Ω Max.	30 mating cycles
Solder Heat Resistance	The resin parts should withstand the temperature and resist melting.	Reflow : According to the Recommended Temperature Profile Hand Soldering : 350°C for 3 to 4 sec.

Note 1 : This is the maximum current rating while all pins are powered or used as all power lines. When isolating power lines into multiple circuits, current ratings may go above the stated current ratings. Please consult Hirose for specific details before doing this.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The connector should be completely dry. (No condensation present.)

Note 4 : The term "storage" refers to the long-term storage condition of unused products before PCB mounting.

The operating temperature and humidity ranges are applied while in a non-energized state, while in transport or after PCB mounting.

Materials / Finish

Product	Part	Materials	Color / Finish	Specification
Pin Header (On the Board Side)	Insulator	LCP	Black	UL94V-0
	Contact	Brass	Gold Plating	-
	Retention Tab	Brass (Note)	Tin Plating	-
	Lock Metal (DF50)	Stainless Steel	-	-
Crimp Socket	Insulator	PBT	Black (DF50A)	-
			White (DF50S)	UL94V-0
Crimp Contact	Contact	Phosphor Bronze	Gold Plating	-

Note : Phosphor bronze is applied only to the single row straight pin header.

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

DF50 - # DP - 1 V (##)

① ② ③ ④ ⑤ ⑥

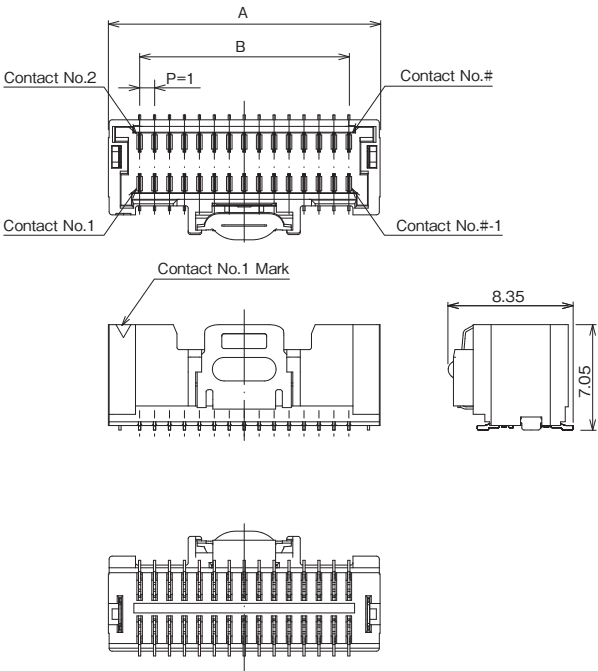
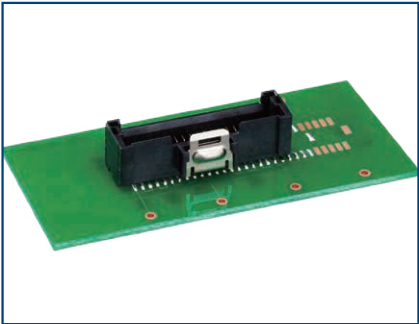
●Crimp Contact

DF50 - 2830 SCF A

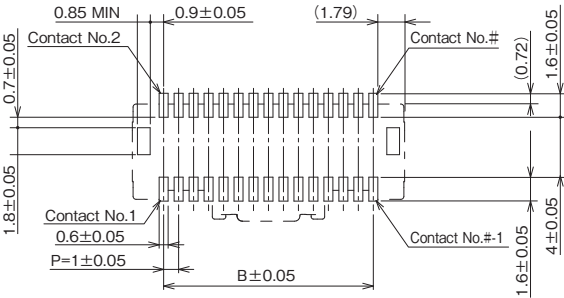
① ⑦ ⑧ ⑨

① Series Name	DF50 (Double Row Pin Header) DF50S (Double Row Crimp Socket) DF50A (Single Row)	⑥ Specifications	51 : SMT Color : Black Embossed Packaging 52 : SMT Color : Black Embossed Packaging, With Adsorption Cap
② No. of Pos.	20, 30, 40, 50 (Double Row) 2 to 16 (Single Row)	⑦ Applicable Conductor	26 : 26 AWG 2830 : 28, 30 AWG 3032 : 30, 32 AWG
③ Connector Type	DP : Double Row Pin Header DS : Double Row Socket P : Single Row Pin Header S : Single Row Socket	⑧ Packaging Style	SCF : Socket Contact, Reel
④ Contact Pitch	1mm	⑨ Plating Specifications	A : Gold Plating
⑤ Mounting Style / Wiring Type	C : Crimp Socket V : SMT Straight Type H : SMT Right Angle Type		

Double Row Straight Pin Header



Recommended PCB Layout

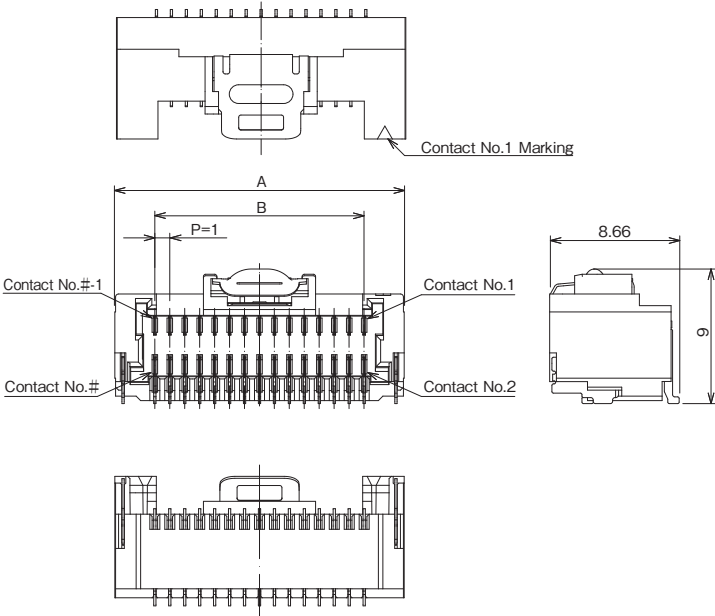
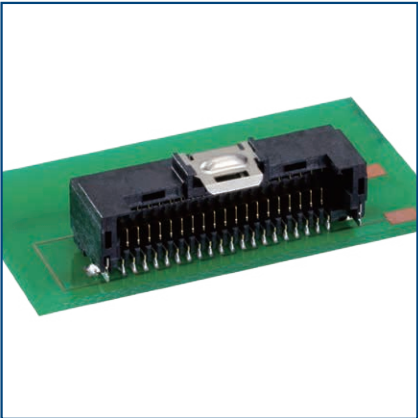


Unit : mm

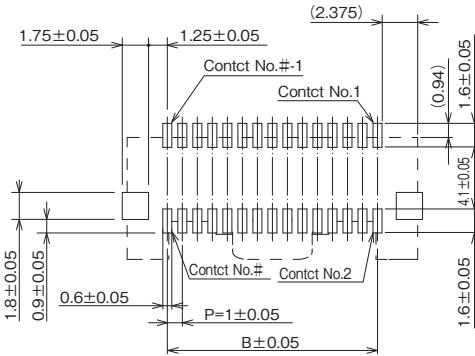
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	F	G	Purchase Unit
DF50-20DP-1V(##)	CL0665-0019-3-##	20	13.18	9	14.2	28.4	32	38.4	32.4	1,000pcs per reel
DF50-30DP-1V(##)	CL0665-0001-8-##	30	18.18	14	14.2	28.4	32	38.4	32.4	
DF50-40DP-1V(##)	CL0665-0005-9-##	40	23.18	19	20.2	40.4	44	50.4	44.4	
DF50-50DP-1V(##)	CL0665-0011-1-##	50	28.18	24	20.2	40.4	44	50.4	44.4	

[Specification No.] -##, (##)
 (51) Color : Black, Embossed packaging
 (52) Color : Black, Embossed packaging, with adsorption cap

Double Row Right Angle Pin Header



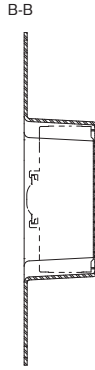
●Recommended PCB Layout



Unit : mm										Purchase Unit
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	E	G	
DF50-20DP-1H(51)	CL0665-0016-5-51	20	14.35	9	14.2	28.4	32	38.4	32.4	600pcs per reel
DF50-30DP-1H(51)	CL0665-0015-2-51	30	19.35	14	20.2	40.4	44	50.4	44.4	
DF50-40DP-1H(51)	CL0665-0014-0-51	40	24.35	19	20.2	40.4	44	50.4	44.4	
DF50-50DP-1H(51)	CL0665-0013-7-51	50	29.35	24	20.2	40.4	44	50.4	44.4	

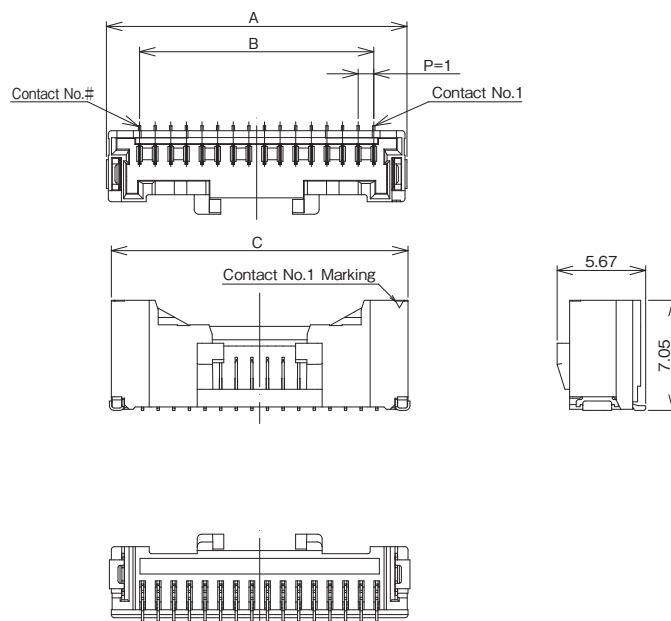
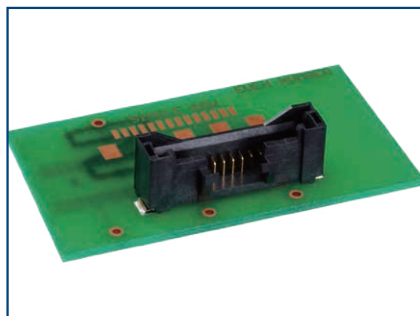
[Specification No.]
(51) Color : Black, Embossed packaging

Oct.1.2023 Copyright 2023 HIROSE ELECTRIC CO., LTD. All Rights Reserved.

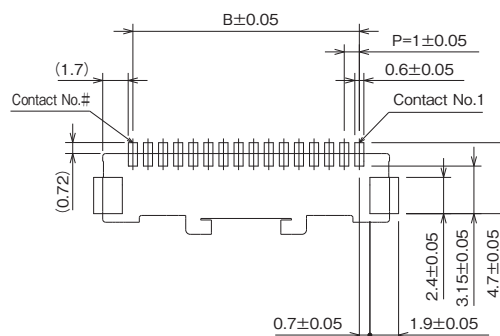


Technical drawing of a mechanical part (Fig. 10.10). The part is a circular disc with a central hole of diameter $\phi 13.0 \pm 0.2$. It has a feed hole of diameter $\phi 1.5$. The outer diameter is $\phi 21.0 \pm 0.8$. The thickness is 80 ± 1 mm. The part has a flange with a radius $R1$ and a feed hole with a diameter of 1.5 mm. The part is labeled "Product Label" and "F MAX" and "G 3/2".

Single Row Straight Pin Header



● Recommended PCB Layout



Unit : mm

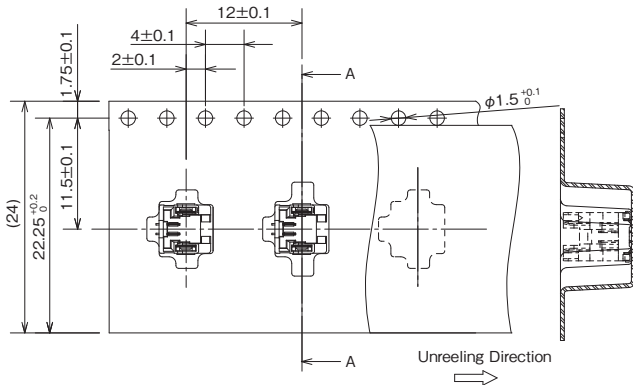
Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF50A-2P-1V(51)	CL0665-1001-3-51	2	5.25	1	5	1,000pcs per reel
DF50A-3P-1V(51)	CL0665-1004-1-51	3	6.25	2	6	
DF50A-4P-1V(51)	CL0665-1006-7-51	4	7.25	3	7	
DF50A-5P-1V(51)	CL0665-1008-2-51	5	8.25	4	8	
DF50A-6P-1V(51)	CL0665-1010-4-51	6	9.25	5	9	
DF50A-7P-1V(51)	CL0665-1012-0-51	7	10.25	6	10	
DF50A-8P-1V(51)	CL0665-1014-5-51	8	11.25	7	11	
DF50A-9P-1V(51)	CL0665-1016-0-51	9	12.25	8	12	
DF50A-10P-1V(51)	CL0665-1017-3-51	10	13.25	9	13	
DF50A-11P-1V(51)	CL0665-1019-9-51	11	14.25	10	14	
DF50A-12P-1V(51)	CL0665-1021-0-51	12	15.25	11	15	
DF50A-13P-1V(51)	CL0665-1023-6-51	13	16.25	12	16	
DF50A-14P-1V(51)	CL0665-1025-1-51	14	17.25	13	17	
DF50A-15P-1V(51)	CL0665-1027-7-51	15	18.25	14	18	
DF50A-16P-1V(51)	CL0665-1029-2-51	16	19.25	15	19	

[Specification No.]

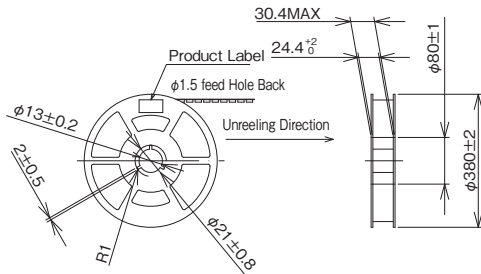
(51) Color : Black, Embossed packaging

● Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-2P-1V-DF50A-8P-1V (No. of Pos. 2-8)

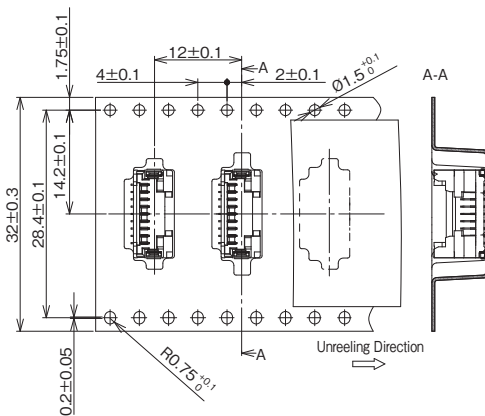


● Reel Dimensions

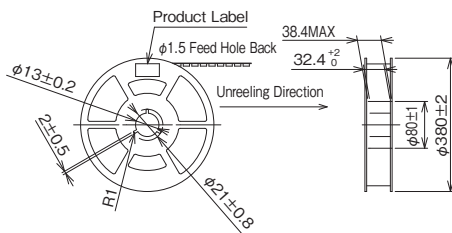


● Embossed Tape Dimensions (JIS C 0806 Compliant)

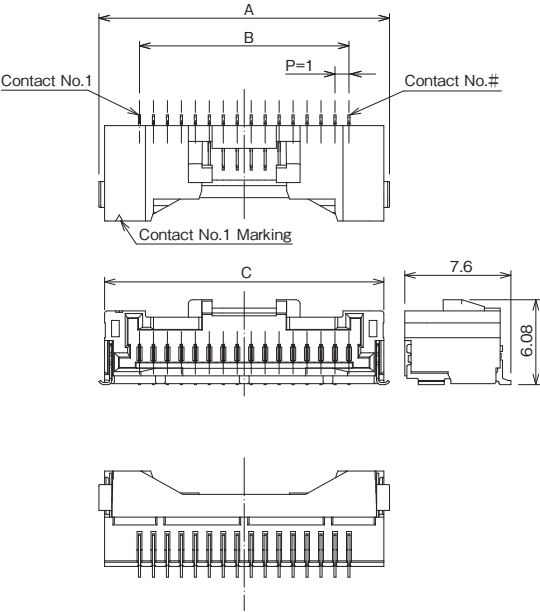
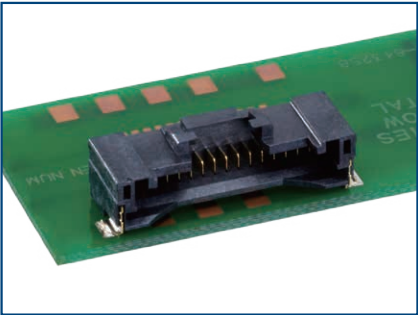
DF50A-9P-1V-DF50A-16P-1V (No. of Pos. 9-16)



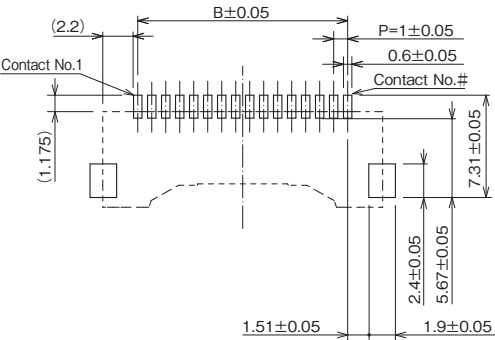
● Reel Dimensions



Single Row Right Angle Pin Header



Recommended PCB Layout



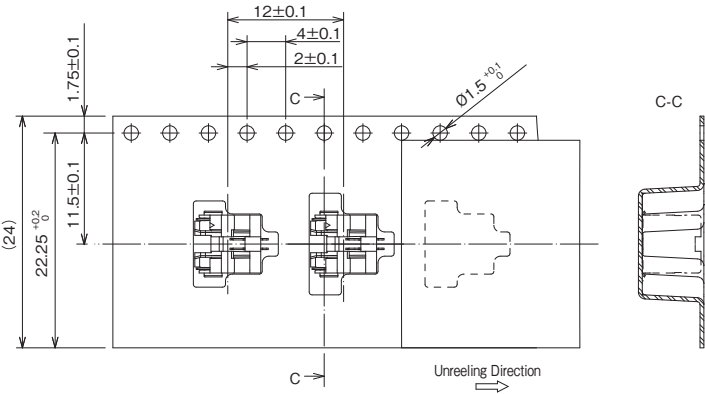
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF50A-2P-1H(51)	CL0665-1031-4-51	2	6.81	1	6	1,000pcs per reel
DF50A-3P-1H(51)	CL0665-1032-7-51	3	7.81	2	7	
DF50A-4P-1H(51)	CL0665-1033-0-51	4	8.81	3	8	
DF50A-5P-1H(51)	CL0665-1034-2-51	5	9.81	4	9	
DF50A-6P-1H(51)	CL0665-1035-5-51	6	10.81	5	10	
DF50A-8P-1H(51)	CL0665-1037-0-51	8	12.81	7	12	
DF50A-10P-1H(51)	CL0665-1039-6-51	10	14.81	9	14	
DF50A-12P-1H(51)	CL0665-1041-8-51	12	16.81	11	16	
DF50A-16P-1H(51)	CL0665-1045-9-51	16	20.81	15	20	

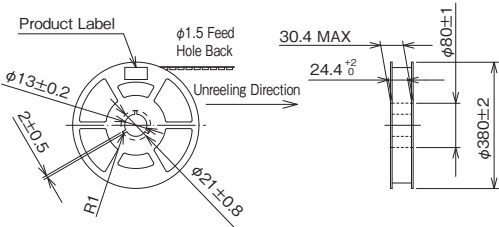
[Specification No.]
(51)Color : Black, Embossed packaging

● Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-2P-1H-DF50A-6P-1H (No. of Pos.2-6)

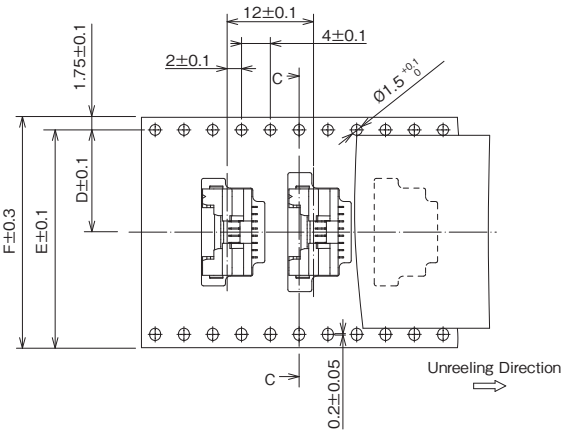


● Reel Dimensions

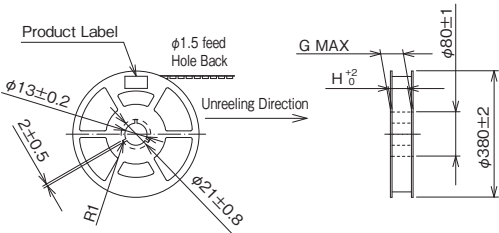


● Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-8P-1H-DF50A-16P-1H (No. of Pos.8-16)



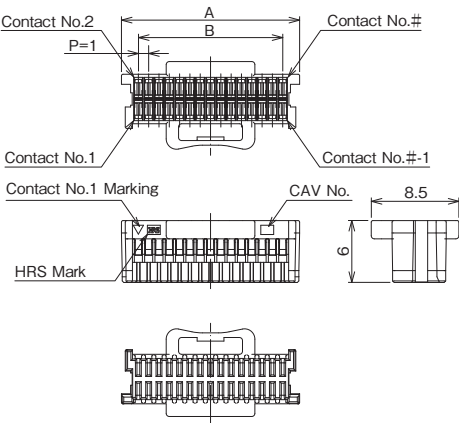
● Reel Dimensions



Unit : mm

Part No.	HRS No.	No. of Pos.	D	E	F	G	H	Purchase Unit
DF50A-8P-1H(51)	CL0665-1037-0-51	8	14.2	28.4	32	38.4	32.4	1,000pcs per reel
DF50A-10P-1H(51)	CL0665-1039-6-51	10	14.2	28.4	32	38.4	32.4	
DF50A-12P-1H(51)	CL0665-1041-8-51	12	14.2	28.4	32	38.4	32.4	
DF50A-16P-1H(51)	CL0665-1045-9-51	16	20.2	40.4	44	50.4	44.4	

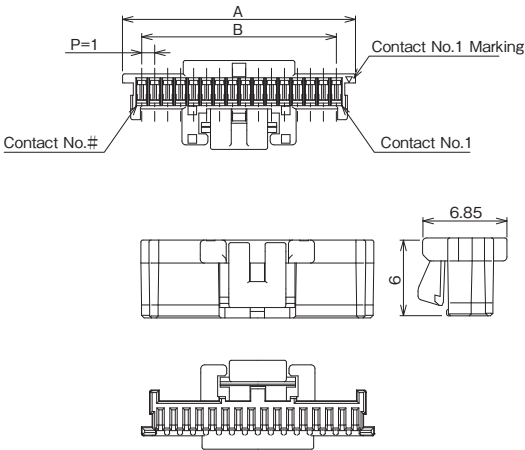
Double Row Crimp Socket



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF50S-20DS-1C	CL0665-0020-2-00	20	12.28	9	100pcs per bag
DF50S-30DS-1C	CL0665-0021-5-00	30	17.28	14	
DF50S-40DS-1C	CL0665-0022-8-00	40	22.28	19	
DF50S-50DS-1C	CL0665-0012-4-00	50	27.28	24	

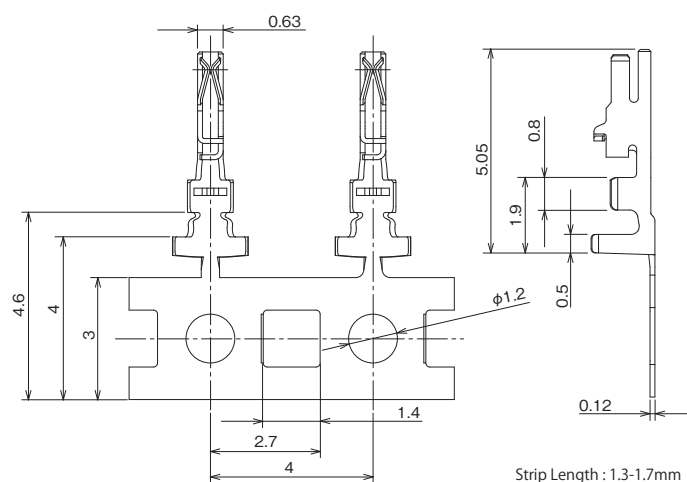
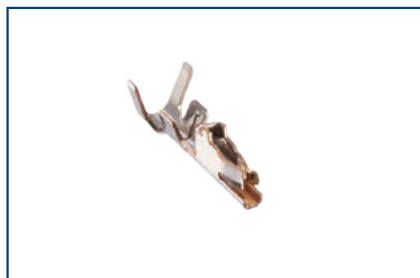
Single Row Crimp Socket



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF50A-2S-1C	CL0665-1002-6-00	2	3.95	1	100pcs per bag
DF50A-3S-1C	CL0665-1005-4-00	3	4.95	2	
DF50A-4S-1C	CL0665-1007-0-00	4	5.95	3	
DF50A-5S-1C	CL0665-1009-5-00	5	6.95	4	
DF50A-6S-1C	CL0665-1011-7-00	6	7.95	5	
DF50A-7S-1C	CL0665-1013-2-00	7	8.95	6	
DF50A-8S-1C	CL0665-1015-8-00	8	9.95	7	
DF50A-9S-1C	CL0665-1100-5-00	9	10.95	8	
DF50A-10S-1C	CL0665-1018-6-00	10	11.95	9	
DF50A-11S-1C	CL0665-1020-8-00	11	12.95	10	
DF50A-12S-1C	CL0665-1022-3-00	12	13.95	11	
DF50A-13S-1C	CL0665-1024-9-00	13	14.95	12	
DF50A-14S-1C	CL0665-1026-4-00	14	15.95	13	
DF50A-15S-1C	CL0665-1028-0-00	15	16.95	14	
DF50A-16S-1C	CL0665-1030-1-00	16	17.95	15	

Crimp Contact



Part No.	HRS No.	Applicable Wire (Tin Plated Annealed Copper) (Note 1)					Purchase Unit
		UL	AWG	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF50-26SCFA	CL0665-0023-0-00	3302	26	7/0.160mm	0.141mm ²	0.88mm	30,000pcs per reel
DF50-2830SCFA	CL0665-0002-0-00	1061	28	7/0.127mm	0.089mm ²	0.80 to 0.88mm	
			30	7/0.102mm	0.057mm ²		
DF50K-2830SCFA	CL0665-0017-8-00	1571	28	7/0.127mm	0.089mm ²	0.58mm	
			30	7/0.102mm	0.057mm ²		
DF50-3032SCFA	CL0665-0026-0-00	1571	30	7/0.102mm	0.057mm ²	0.54 to 0.56mm	
			32	7/0.080mm	0.035mm ²		

Note 1 : When using cables not specified by Hirose, please contact a Hirose sales representative

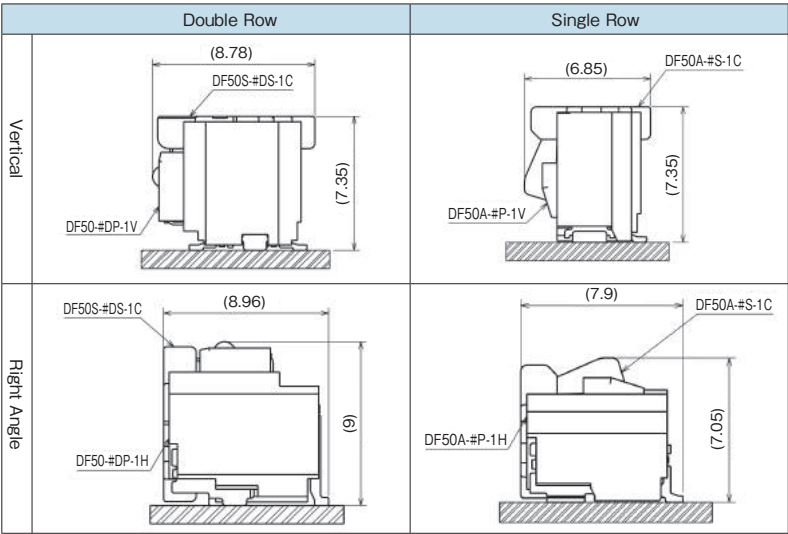
Note 2 : The strip length is for reference. Adjust each dimension after crimping so that the specified value is satisfied.
Refer to the crimping quality standards (ETAD-H0616-00) for details.

Applicable Crimping Tools

Type	Part No.	HRS No.	Applicable Contact	Remarks
Applicator	AP105-DF50-2630S	CL0901-4641-7-00	DF50-26SCFA	
			DF50-2830SCFA	
	AP105-DF50K-2830S	CL0901-4628-9-00	DF50K-2830SCFA	
	AP105-DF50-3032S	CL0901-4648-0-00	DF50-3032SCFA	
	DHS799100-BH(-UP)	-	DF50-2830SCFA	Manufactured by Japan Automatic Machine Co., Ltd. (Note 4)
	DHX001800K(-UP)	-	DF50K-2830SCFA	
Press Body	CM-105C	CL0901-0001-0-00	-	
Hand Tool	HT305/DF50-2830HC (Note 3)	CL0902-4634-8-00	DF50-2830SCFA	
Extraction Tool	DF-C-PO(B)	CL0550-0179-2-00	DF50(K)-####SCFA	

Note 1 : Please conduct crimping work according to the Crimping Quality Standard (ETAD-H0616-00) and Crimping Condition Table.
Note 2 : Issues with non-Hirose specified tools are outside the scope of warranty
Note 3 : The compatible wire is limited to UL1061, 28 to 30 AWG.
Note 4 : Applicator manufactured by JAPAN AUTOMATIC MACHINE (J.A.M.).

Mated Dimensions



Crimping

■ Items Required Prior to Starting

The work-related documents listed below are required before starting harness assembly.

(The ● mark indicates a required document.)

When the documents shown below are not available, ask a Hirose sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
① Instruction Manual for the Crimping Machine Main Unit	Explanation of main press machine unit	●	—	Bundled with the purchase of the main press machine unit.
② Applicator Spare Parts Identification	Explanation for Applicator installation	●	—	Bundled with the purchase of applicator.
③ Crimp Conditions	Standard values of : Crimp height, Tensile strength	●	—	
④ Crimp Quality Standards	Various standards for crimping conditions	●	—	
⑤ Operating Instructions for Hand Tool	Inspection items of : Crimp height, Tensile strength, and others	—	●	Bundled with the purchase of hand tool.
⑥ Cable Assembly Procedure DF50 : ETAD-H0354-00 DF50A : ETAD-H0437-00	Harness procedure	●	●	Ask a HRS sales representative.

■ Tools

Use tools designated by Hirose when crimping.

- Crimping performed using tools other than those specified is outside the scope of warrant
- The operating instructions manual is available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before beginning work.

■ Applicable Cables

Check that the cables to be used are within the applicable range

If you intend to use a cable other than those recommended, ask a HRS sales personnel.

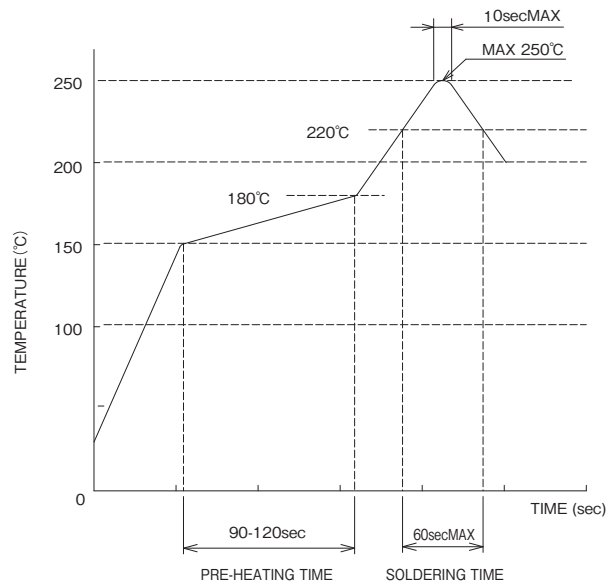
【Precautions】

- Electric wires that are suitable for crimp connectors are tin-plated stranded soft copper wire.
- Avoid crimping solid wires, wires with polyester threads or tin-coated wires.
- Avoid crimping two electric wires together.
- The crimp height setting value (Note) may vary between tin-plated and gold-plated contacts even if the same electric wires are used.
- The crimp height setting value (Note) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

Precautions

Recommended Temperature Profile (Compatible with Lead-Free Soldering)



[Conditions]

1. Peak Temperature : 250°C
2. Heating : 220°C min. for 60 sec. max.
3. Preheating : 150 to 180°C, 90 to 120 sec.
4. Number of Reflow Cycles : 2 cycles max.

* Temperature refers to the surface temperature of the board near the connector lead.
Soldering results may change depending on the conditions such as solder paste types, manufacturer, PCB size, and other soldering materials, so please fully check the mounting conditions before use.
(Note) This temperature profile is a recommended value.

Recommended Manual Soldering Conditions

Soldering iron temperature : $350 \pm 10^\circ\text{C}$, Soldering Time : 3 to 4 sec.

Recommended Metal Mask Thickness and Open Area to PCB Pattern Area Ratio

Thickness : 0.1mm, Aperture Ratio : 100%

Board Warpage

Max. of 0.02mm at the center in reference to both ends of the connector

Cleaning

IPA cleaning is allowed. (Cleaning is not recommended due to potential changes in mating action and other variables. Please contact us if you use other cleaning agents.)

Precautions

1. When inserting a crimped contact into a socket, please refrain from inserting at a diagonal as doing so may affect performance reliability.
2. Please refer to the "DF50 Series Cable Assembly Procedure" (ETAD-H0354), "DF50A Series Cable Assembly Procedure" (ETAD-H0437), and the DF50#-###SCFA(##) Crimp Quality Standards" and "Crimp Conditions".
3. Caution is required for mating and un-mating the connector when it is not mounted on a PCB. Doing so can damage or deform the contacts.
4. Do not remove the product by holding the cable as it may result in damage.
5. When soldering by hand do not apply flux that may result in flux rising.
6. The housing color may have slight variations depending on the production lot. This color variation does not affect performance.
7. Black spots may appear on the mold resin but this does not affect the product quality.

Handling Instructions

Please refer to the following documents when handling this product.

- Crimp Quality Standards (ETAD-H0616-00)
- Cable Assembly Procedure (ETAD-H0354-00, ETAD-H0437-00)
- Wire-to-Board Connector Use Handbook

DF50 Series

1mm Pitch, Positive Lock, Wire-to-Board Connector



Positive-Lock



Robust



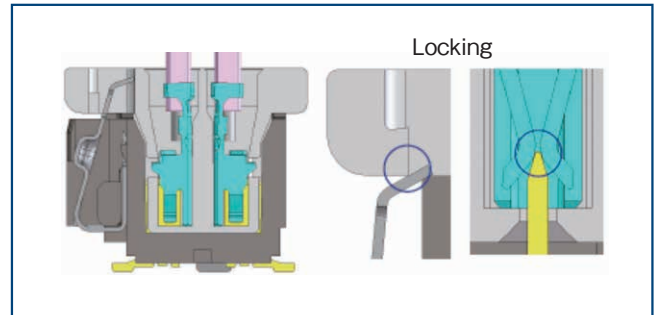
P= 1.0 mm



Features

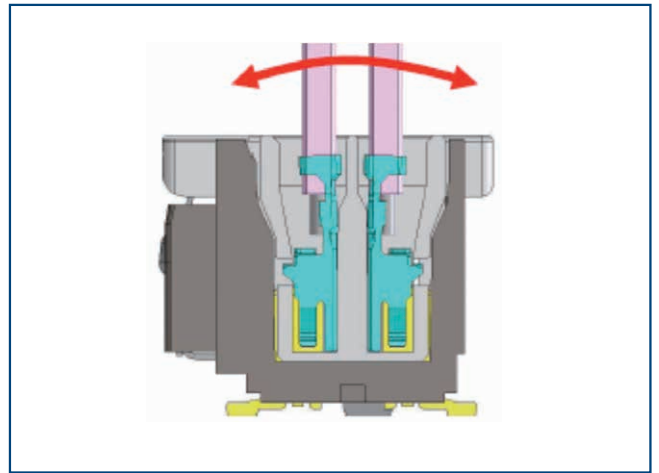
1. Secure lock with clear tactile click

Locking function and contact mating occur simultaneously for a clearer tactile click.



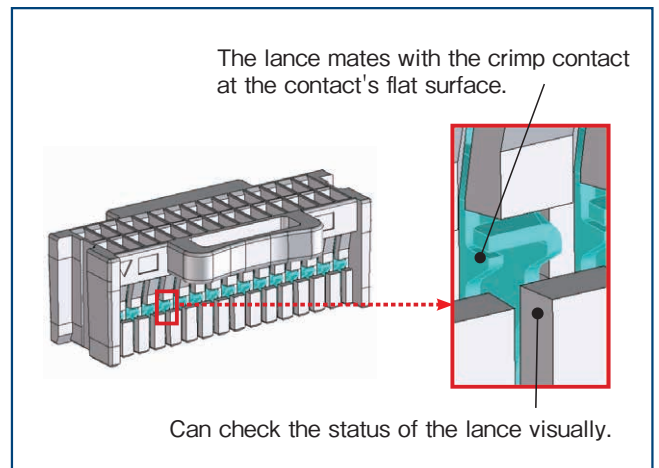
2. Robust design resists prying

Thick and robust housing wall provides higher strength against cracking. Insertion depth for mating housings protects against prying.



3. Robust and reliable lance design

The lance mates with the crimp contact at a flat surface for high lance strength.



Product Specifications

Rated Current (Note 1)	No. of Pos.	26 ~ 28 AWG	30 AWG	32 AWG	Operating Temperature (Note 2)	-35 to +85°C
	2	2A/pin	0.9A/pin	0.7A/pin	Operating Humidity Range (Note 3)	20 to 80%
	3 ~ 50	1A/pin	0.9A/pin	0.7A/pin	Storage Temperature (Note 4)	-10 to +60°C
Rated Voltage	100V AC/DC				Storage Humidity Range (Note 4)	40 to 70%

Item	Specifications	Conditions
Insulation Resistance	500M Ω Min.	100V DC
Withstand Voltage	No Flashover or Breakdown	300V AC for 1 min.
Contact Resistance	30m Ω Max.	20mV Max., at 1mA.
Vibration Resistance	No Electrical Discontinuity of 1 μ s or Longer	Frequency 10-55Hz, Single Amplitude of 0.75mm 3 Directions, 10 Cycles in Each Direction.
Shock Resistance	No Electrical Discontinuity of 1 μ s or Longer	Acceleration : 490m/s ² , 11ms, Half Sine Wave in 3 Directions, 3 Times for Each Direction
Moisture Resistance	Contact Resistance : 50m Ω Max. Insulation Resistance : 100M Ω Min.	Temperature : 40 $\pm$ 2°C : Humidity : 90 to 95%, Left for 96 Hours
Temperature Cycles	Contact Resistance : 50m Ω Max. Insulation Resistance : 500M Ω Min.	(-55°C : 30 min. $\rightarrow$ +5 to +35°C : 2 to 3 min. $\rightarrow$ +85°C : 30 min. $\rightarrow$ +5 to +35°C : 2 to 3 min.) 5 Cycles
Durability	Contact Resistance : 50m Ω Max.	30 mating cycles
Solder Heat Resistance	The resin parts should withstand the temperature and resist melting.	Reflow : According to the Recommended Temperature Profile Hand Soldering : 350°C for 3 to 4 sec.

Note 1 : This is the maximum current rating while all pins are powered or used as all power lines. When isolating power lines into multiple circuits, current ratings may go above the stated current ratings. Please consult Hirose for specific details before doing this.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The connector should be completely dry. (No condensation present.)

Note 4 : The term "storage" refers to the long-term storage condition of unused products before PCB mounting.

The operating temperature and humidity ranges are applied while in a non-energized state, while in transport or after PCB mounting.

Materials / Finish

Product	Part	Materials	Color / Finish	Specification
Pin Header (On the Board Side)	Insulator	LCP	Black	UL94V-0
	Contact	Brass	Gold Plating	-
	Retention Tab	Brass (Note)	Tin Plating	-
	Lock Metal (DF50)	Stainless Steel	-	-
Crimp Socket	Insulator	PBT	Black (DF50A)	-
			White (DF50S)	UL94V-0
Crimp Contact	Contact	Phosphor Bronze	Gold Plating	-

Note : Phosphor bronze is applied only to the single row straight pin header.

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

DF50 - # DP - 1 V (##)

1

2

3

4

5

6

●Crimp Contact

DF50 - 2830 SCF A

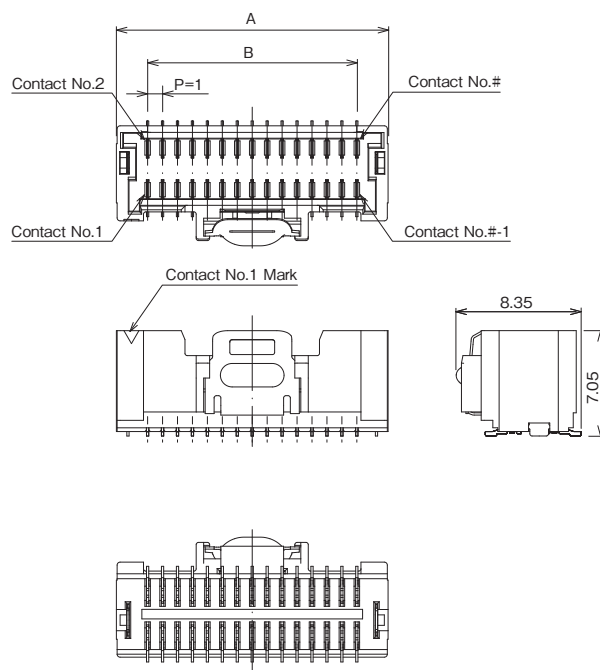
1

7

8

9

1 Series Name	DF50 (Double Row Pin Header) DF50S (Double Row Crimp Socket) DF50A (Single Row)	6 Specifications	51 : SMT Color : Black Embossed Packaging 52 : SMT Color : Black Embossed Packaging, With Adsorption Cap
2 No. of Pos.	20, 30, 40, 50 (Double Row) 2 to 16 (Single Row)	7 Applicable Conductor	26 : 26 AWG 2830 : 28, 30 AWG 3032 : 30, 32 AWG
3 Connector Type	DP : Double Row Pin Header DS : Double Row Socket P : Single Row Pin Header S : Single Row Socket	8 Packaging Style	SCF : Socket Contact, Reel
4 Contact Pitch	1mm	9 Plating Specifications	A : Gold Plating
5 Mounting Style / Wiring Type	C : Crimp Socket V : SMT Straight Type H : SMT Right Angle Type		

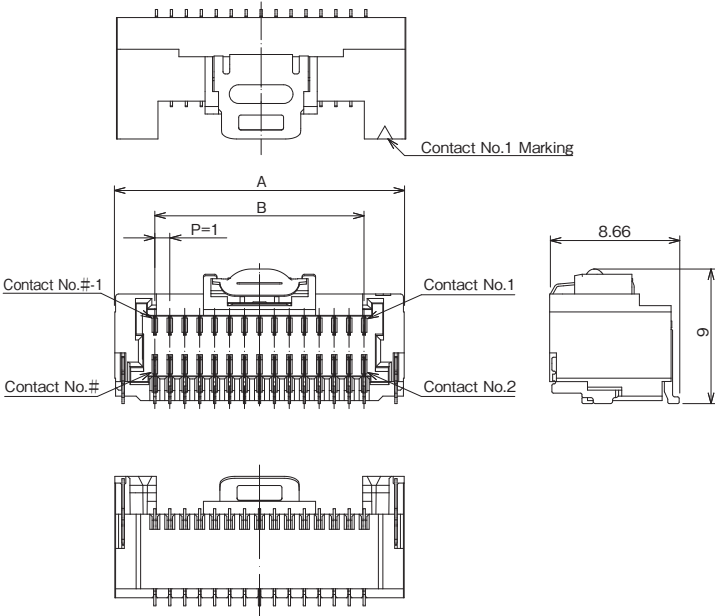
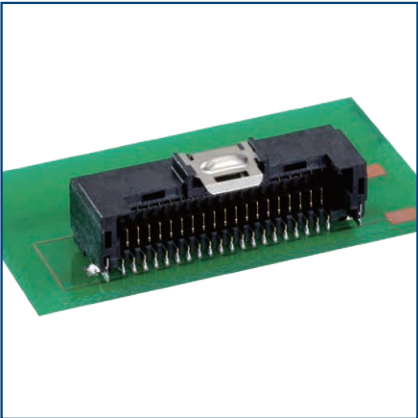


Technical drawing of a 16-pin connector with dimensions in mm. The drawing shows a top view of a rectangular connector with 16 pins. Dimensions include: 0.85 MIN (pin pitch), 0.9±0.05 (pin width), (1.79) (total width), 0.7±0.05 (pin height), 1.6±0.05 (total height), 1.8±0.05 (pin height), 0.6±0.05 (pin width), P=1±0.05 (pin pitch), B±0.05 (total width), 4±0.05 (pin height), and 1.6±0.05 (total height). Labels include Contact No.2, Contact No.1, Contact No.1, and Contact No.2.

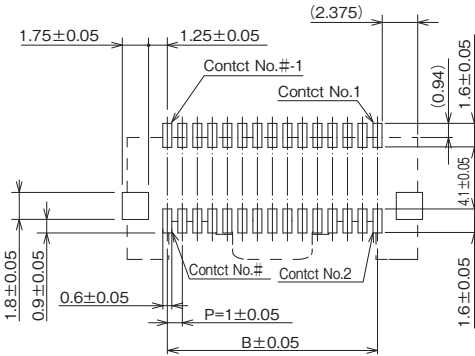
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	F	G	Purchase Unit
DF50-20DP-1V(##)	CL0665-0019-3-##	20	13.18	9	14.2	28.4	32	38.4	32.4	1,000pcs per reel
DF50-30DP-1V(##)	CL0665-0001-8-##	30	18.18	14	14.2	28.4	32	38.4	32.4	
DF50-40DP-1V(##)	CL0665-0005-9-##	40	23.18	19	20.2	40.4	44	50.4	44.4	
DF50-50DP-1V(##)	CL0665-0011-1-##	50	28.18	24	20.2	40.4	44	50.4	44.4	

(52) Color : Black, Embossed packaging, with adsorption cap

Double Row Right Angle Pin Header



●Recommended PCB Layout

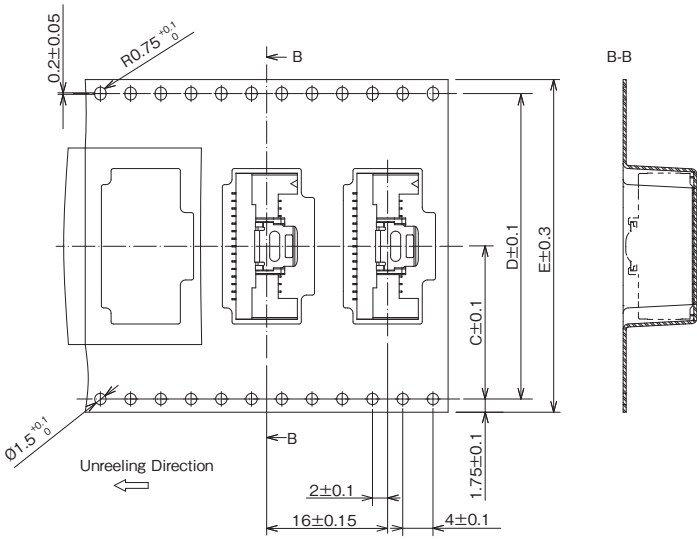


Unit : mm

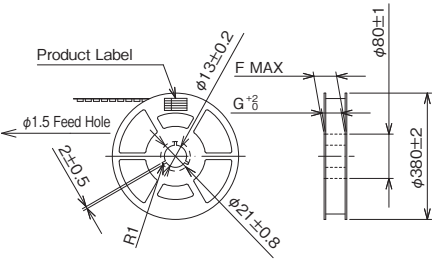
Part No.	HRS No.	No. of Pos.	A	B	C	D	E	E	G	Purchase Unit
DF50-20DP-1H(51)	CL0665-0016-5-51	20	14.35	9	14.2	28.4	32	38.4	32.4	600pcs per reel
DF50-30DP-1H(51)	CL0665-0015-2-51	30	19.35	14	20.2	40.4	44	50.4	44.4	
DF50-40DP-1H(51)	CL0665-0014-0-51	40	24.35	19	20.2	40.4	44	50.4	44.4	
DF50-50DP-1H(51)	CL0665-0013-7-51	50	29.35	24	20.2	40.4	44	50.4	44.4	

[Specification No.]
(51) Color : Black, Embossed packaging

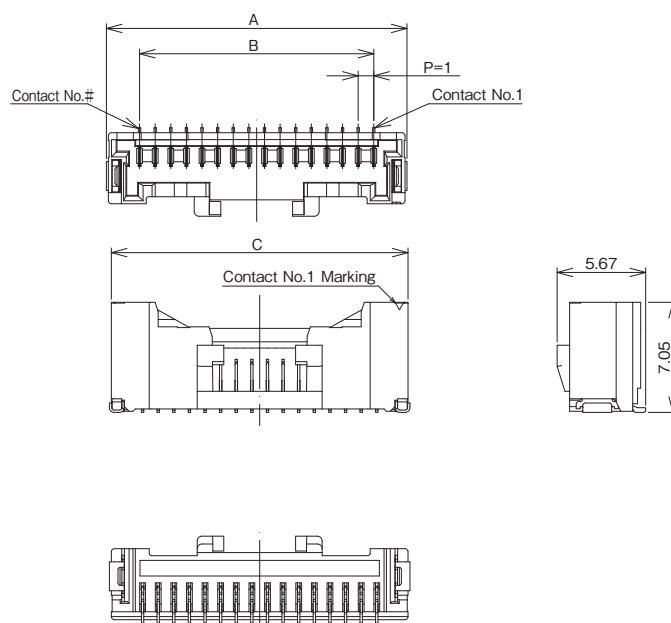
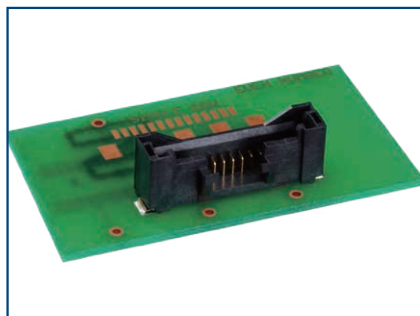
● Embossed Tape Dimensions
(JIS C 0806 Compliant)



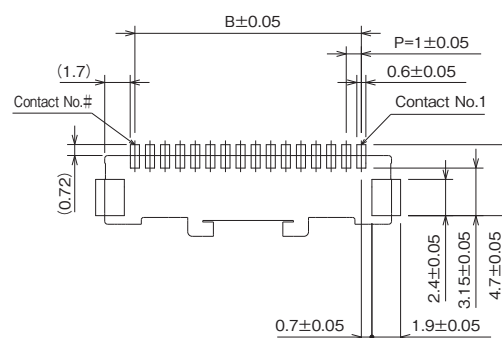
● Reel Dimensions



Single Row Straight Pin Header



● Recommended PCB Layout



Unit : mm

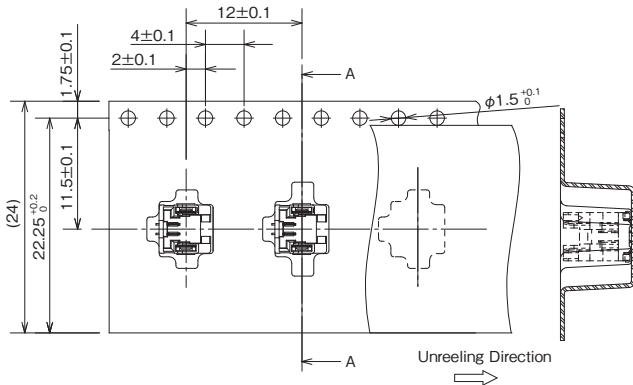
Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF50A-2P-1V(51)	CL0665-1001-3-51	2	5.25	1	5	1,000pcs per reel
DF50A-3P-1V(51)	CL0665-1004-1-51	3	6.25	2	6	
DF50A-4P-1V(51)	CL0665-1006-7-51	4	7.25	3	7	
DF50A-5P-1V(51)	CL0665-1008-2-51	5	8.25	4	8	
DF50A-6P-1V(51)	CL0665-1010-4-51	6	9.25	5	9	
DF50A-7P-1V(51)	CL0665-1012-0-51	7	10.25	6	10	
DF50A-8P-1V(51)	CL0665-1014-5-51	8	11.25	7	11	
DF50A-9P-1V(51)	CL0665-1016-0-51	9	12.25	8	12	
DF50A-10P-1V(51)	CL0665-1017-3-51	10	13.25	9	13	
DF50A-11P-1V(51)	CL0665-1019-9-51	11	14.25	10	14	
DF50A-12P-1V(51)	CL0665-1021-0-51	12	15.25	11	15	
DF50A-13P-1V(51)	CL0665-1023-6-51	13	16.25	12	16	
DF50A-14P-1V(51)	CL0665-1025-1-51	14	17.25	13	17	
DF50A-15P-1V(51)	CL0665-1027-7-51	15	18.25	14	18	
DF50A-16P-1V(51)	CL0665-1029-2-51	16	19.25	15	19	

【Specification No.】

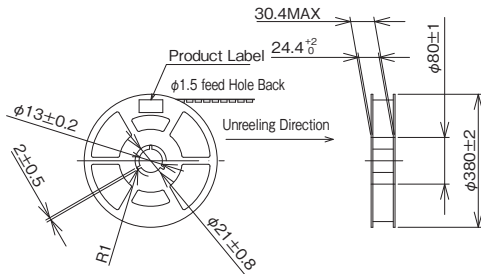
(51) Color : Black, Embossed packaging

● Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-2P-1V-DF50A-8P-1V (No. of Pos. 2-8)

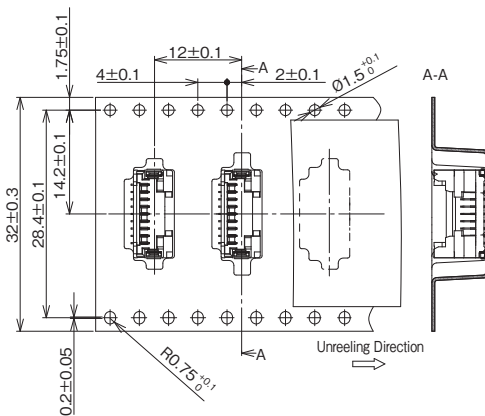


● Reel Dimensions

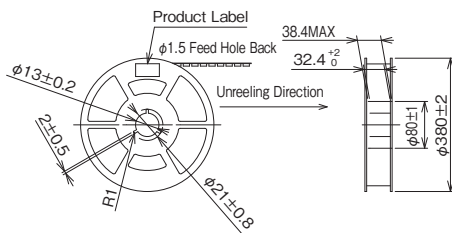


● Embossed Tape Dimensions (JIS C 0806 Compliant)

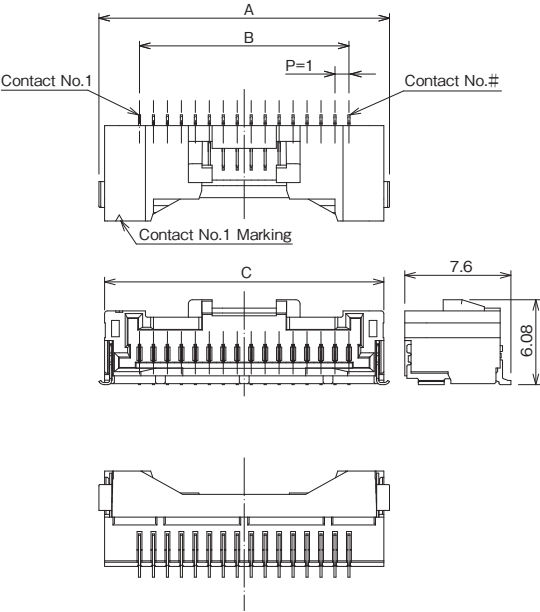
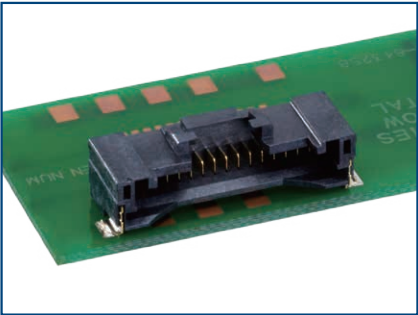
DF50A-9P-1V-DF50A-16P-1V (No. of Pos. 9-16)



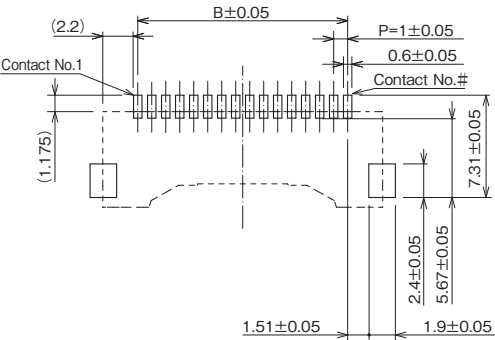
● Reel Dimensions



Single Row Right Angle Pin Header



Recommended PCB Layout



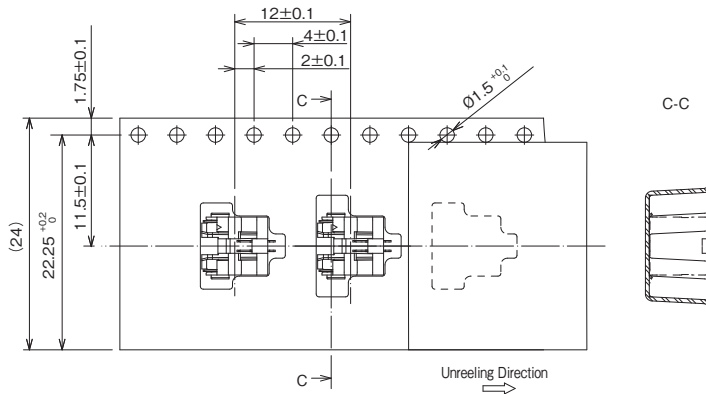
Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	C	Purchase Unit
DF50A-2P-1H(51)	CL0665-1031-4-51	2	6.81	1	6	1,000pcs per reel
DF50A-3P-1H(51)	CL0665-1032-7-51	3	7.81	2	7	
DF50A-4P-1H(51)	CL0665-1033-0-51	4	8.81	3	8	
DF50A-5P-1H(51)	CL0665-1034-2-51	5	9.81	4	9	
DF50A-6P-1H(51)	CL0665-1035-5-51	6	10.81	5	10	
DF50A-8P-1H(51)	CL0665-1037-0-51	8	12.81	7	12	
DF50A-10P-1H(51)	CL0665-1039-6-51	10	14.81	9	14	
DF50A-12P-1H(51)	CL0665-1041-8-51	12	16.81	11	16	
DF50A-16P-1H(51)	CL0665-1045-9-51	16	20.81	15	20	

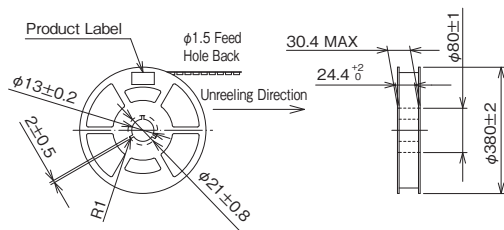
[Specification No.]
 (51)Color : Black, Embossed packaging

● Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-2P-1H-DF50A-6P-1H (No. of Pos.2-6)

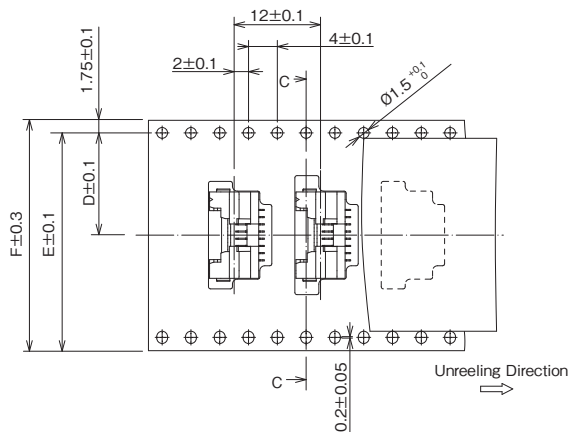


● Reel Dimensions

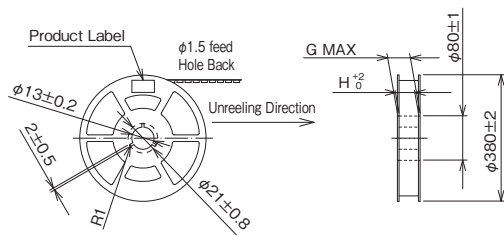


● Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-8P-1H-DF50A-16P-1H (No. of Pos.8-16)



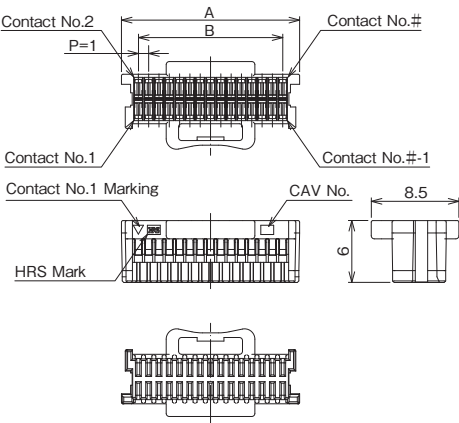
● Reel Dimensions



Unit : mm

Part No.	HRS No.	No. of Pos.	D	E	F	G	H	Purchase Unit
DF50A-8P-1H(51)	CL0665-1037-0-51	8	14.2	28.4	32	38.4	32.4	1,000pcs per reel
DF50A-10P-1H(51)	CL0665-1039-6-51	10	14.2	28.4	32	38.4	32.4	
DF50A-12P-1H(51)	CL0665-1041-8-51	12	14.2	28.4	32	38.4	32.4	
DF50A-16P-1H(51)	CL0665-1045-9-51	16	20.2	40.4	44	50.4	44.4	

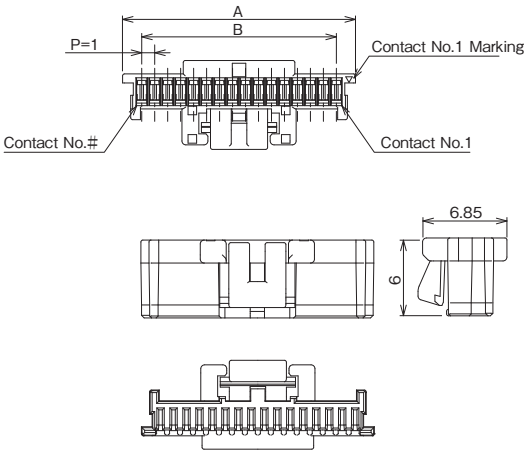
Double Row Crimp Socket



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF50S-20DS-1C	CL0665-0020-2-00	20	12.28	9	100pcs per bag
DF50S-30DS-1C	CL0665-0021-5-00	30	17.28	14	
DF50S-40DS-1C	CL0665-0022-8-00	40	22.28	19	
DF50S-50DS-1C	CL0665-0012-4-00	50	27.28	24	

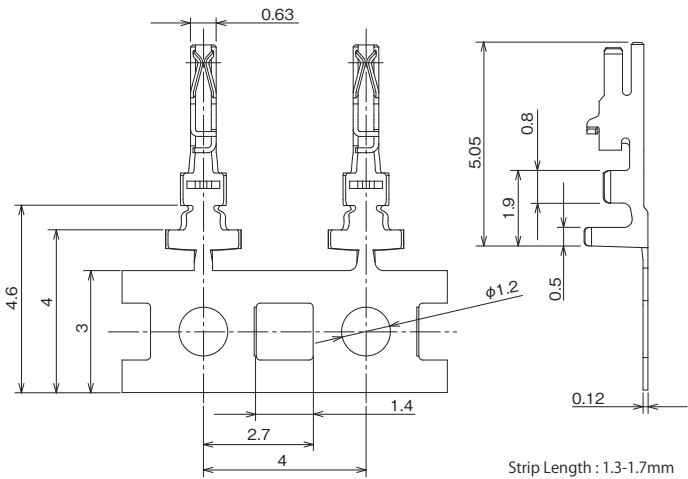
Single Row Crimp Socket



Unit : mm

Part No.	HRS No.	No. of Pos.	A	B	Purchase Unit
DF50A-2S-1C	CL0665-1002-6-00	2	3.95	1	100pcs per bag
DF50A-3S-1C	CL0665-1005-4-00	3	4.95	2	
DF50A-4S-1C	CL0665-1007-0-00	4	5.95	3	
DF50A-5S-1C	CL0665-1009-5-00	5	6.95	4	
DF50A-6S-1C	CL0665-1011-7-00	6	7.95	5	
DF50A-7S-1C	CL0665-1013-2-00	7	8.95	6	
DF50A-8S-1C	CL0665-1015-8-00	8	9.95	7	
DF50A-9S-1C	CL0665-1100-5-00	9	10.95	8	
DF50A-10S-1C	CL0665-1018-6-00	10	11.95	9	
DF50A-11S-1C	CL0665-1020-8-00	11	12.95	10	
DF50A-12S-1C	CL0665-1022-3-00	12	13.95	11	
DF50A-13S-1C	CL0665-1024-9-00	13	14.95	12	
DF50A-14S-1C	CL0665-1026-4-00	14	15.95	13	
DF50A-15S-1C	CL0665-1028-0-00	15	16.95	14	
DF50A-16S-1C	CL0665-1030-1-00	16	17.95	15	

Crimp Contact



Part No.	HRS No.	Applicable Wire (Tin Plated Annealed Copper) (Note 1)					Purchase Unit
		UL	AWG	Stranded Wire Structure	Calculated Cross-section	Jacket Diameter	
DF50-26SCFA	CL0665-0023-0-00	3302	26	7/0.160mm	0.141mm ²	0.88mm	30,000pcs per reel
DF50-2830SCFA	CL0665-0002-0-00	1061	28	7/0.127mm	0.089mm ²	0.80 to 0.88mm	
			30	7/0.102mm	0.057mm ²		
DF50K-2830SCFA	CL0665-0017-8-00	1571	28	7/0.127mm	0.089mm ²	0.58mm	
			30	7/0.102mm	0.057mm ²		
DF50-3032SCFA	CL0665-0026-0-00	1571	30	7/0.102mm	0.057mm ²	0.54 to 0.56mm	
			32	7/0.080mm	0.035mm ²		

Note 1 : When using cables not specified by Hirose, please contact a Hirose sales representative

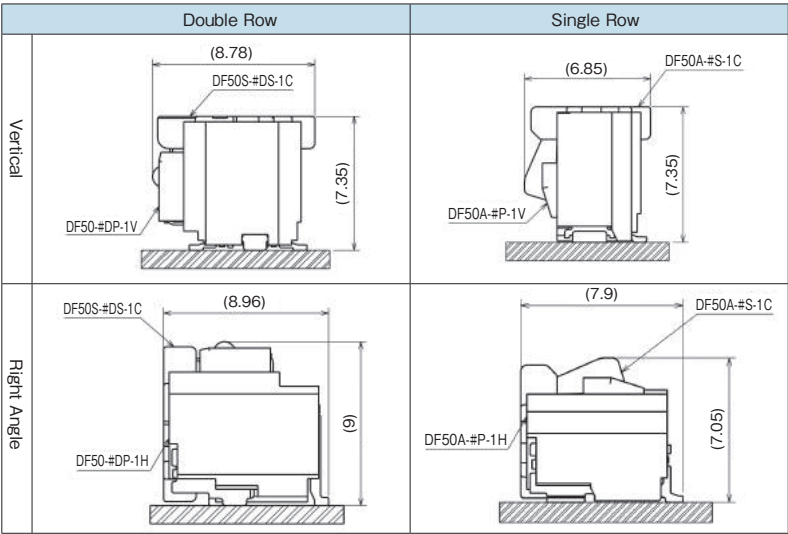
Note 2 : The strip length is for reference. Adjust each dimension after crimping so that the specified value is satisfied.
Refer to the crimping quality standards (ETAD-H0616-00) for details.

Applicable Crimping Tools

Type	Part No.	HRS No.	Applicable Contact	Remarks
Applicator	AP105-DF50-2630S	CL0901-4641-7-00	DF50-26SCFA	
			DF50-2830SCFA	
	AP105-DF50K-2830S	CL0901-4628-9-00	DF50K-2830SCFA	
	AP105-DF50-3032S	CL0901-4648-0-00	DF50-3032SCFA	
	DHS799100-BH(-UP)	-	DF50-2830SCFA	Manufactured by Japan Automatic Machine Co., Ltd. (Note 4)
	DHX001800K(-UP)	-	DF50K-2830SCFA	
Press Body	CM-105C	CL0901-0001-0-00	-	
Hand Tool	HT305/DF50-2830HC (Note 3)	CL0902-4634-8-00	DF50-2830SCFA	
Extraction Tool	DF-C-PO(B)	CL0550-0179-2-00	DF50(K)-####SCFA	

Note 1 : Please conduct crimping work according to the Crimping Quality Standard (ETAD-H0616-00) and Crimping Condition Table.
Note 2 : Issues with non-Hirose specified tools are outside the scope of warranty
Note 3 : The compatible wire is limited to UL1061, 28 to 30 AWG.
Note 4 : Applicator manufactured by JAPAN AUTOMATIC MACHINE (J.A.M.).

Mated Dimensions



Crimping

■ Items Required Prior to Starting

The work-related documents listed below are required before starting harness assembly.

(The ● mark indicates a required document.)

When the documents shown below are not available, ask a Hirose sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
① Instruction Manual for the Crimping Machine Main Unit	Explanation of main press machine unit	●	—	Bundled with the purchase of the main press machine unit.
② Applicator Spare Parts Identification	Explanation for Applicator installation	●	—	Bundled with the purchase of applicator.
③ Crimp Conditions	Standard values of : Crimp height, Tensile strength	●	—	
④ Crimp Quality Standards	Various standards for crimping conditions	●	—	
⑤ Operating Instructions for Hand Tool	Inspection items of : Crimp height, Tensile strength, and others	—	●	Bundled with the purchase of hand tool.
⑥ Cable Assembly Procedure DF50 : ETAD-H0354-00 DF50A : ETAD-H0437-00	Harness procedure	●	●	Ask a HRS sales representative.

■ Tools

Use tools designated by Hirose when crimping.

- Crimping performed using tools other than those specified is outside the scope of warrant
- The operating instructions manual is available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before beginning work.

■ Applicable Cables

Check that the cables to be used are within the applicable range

If you intend to use a cable other than those recommended, ask a HRS sales personnel.

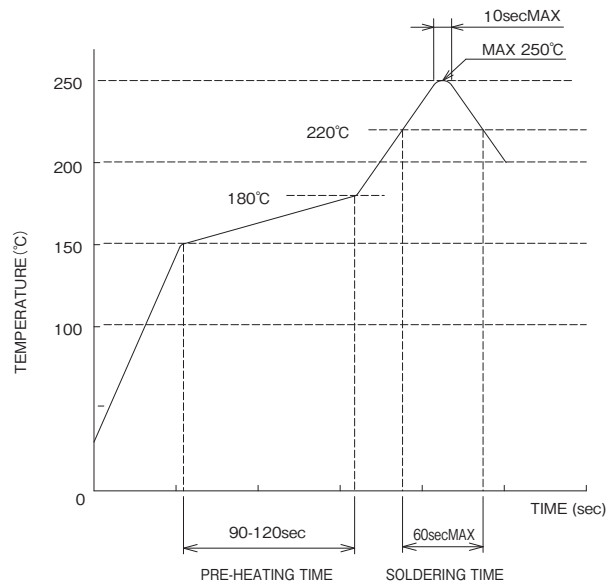
【Precautions】

- Electric wires that are suitable for crimp connectors are tin-plated stranded soft copper wire.
- Avoid crimping solid wires, wires with polyester threads or tin-coated wires.
- Avoid crimping two electric wires together.
- The crimp height setting value (Note) may vary between tin-plated and gold-plated contacts even if the same electric wires are used.
- The crimp height setting value (Note) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

Precautions

Recommended Temperature Profile (Compatible with Lead-Free Soldering)



[Conditions]

1. Peak Temperature : 250°C
2. Heating : 220°C min. for 60 sec. max.
3. Preheating : 150 to 180°C, 90 to 120 sec.
4. Number of Reflow Cycles : 2 cycles max.

* Temperature refers to the surface temperature of the board near the connector lead.
Soldering results may change depending on the conditions such as solder paste types, manufacturer, PCB size, and other soldering materials, so please fully check the mounting conditions before use.
(Note) This temperature profile is a recommended value.

Recommended Manual Soldering Conditions

Soldering iron temperature : $350 \pm 10^\circ\text{C}$, Soldering Time : 3 to 4 sec.

Recommended Metal Mask Thickness and Open Area to PCB Pattern Area Ratio

Thickness : 0.1mm, Aperture Ratio : 100%

Board Warpage

Max. of 0.02mm at the center in reference to both ends of the connector

Cleaning

IPA cleaning is allowed. (Cleaning is not recommended due to potential changes in mating action and other variables. Please contact us if you use other cleaning agents.)

Precautions

1. When inserting a crimped contact into a socket, please refrain from inserting at a diagonal as doing so may affect performance reliability.
2. Please refer to the "DF50 Series Cable Assembly Procedure" (ETAD-H0354), "DF50A Series Cable Assembly Procedure" (ETAD-H0437), and the DF50#-###SCFA(##) Crimp Quality Standards" and "Crimp Conditions".
3. Caution is required for mating and un-mating the connector when it is not mounted on a PCB. Doing so can damage or deform the contacts.
4. Do not remove the product by holding the cable as it may result in damage.
5. When soldering by hand do not apply flux that may result in flux rising.
6. The housing color may have slight variations depending on the production lot. This color variation does not affect performance.
7. Black spots may appear on the mold resin but this does not affect the product quality.

Handling Instructions

Please refer to the following documents when handling this product.

- Crimp Quality Standards (ETAD-H0616-00)
- Cable Assembly Procedure (ETAD-H0354-00, ETAD-H0437-00)
- Wire-to-Board Connector Use Handbook



■ Features

● Common to all series

1. High Operating Temperature

DF59's are rated at temperatures up to 105 °C.

● DF59

2. Swing Lock Structure (Wire-to-Board)

The DF59 features a "swing-lock" mechanism that employs both a positive and friction lock. This helps to prevent accidental unmating by severe wiring and mechanical stress.

3. Short-Circuit Pin

The Short-Circuit Pin allows the termination of an open circuit. Typically used at the end of a series of connected circuit boards.

4. Multi Function Design

The DF59 has the ability to function as either a Board-to-Wire or Board-to-Board System. The PCB mounted receptacle is designed to mate with the W-to-B, B-to-B, and Short Circuit Pin connectors. This multi function ability allows versatility while keeping connectors to a minimum.

5. Contact Design

The terminal design features two-point contact to ensure a highly reliable connection.

6. Common Applicator

Crimping can be performed using the applicator (AP105-DF11-22S) for the existing series DF11-22S C F(A), by replacing the die with the one for DF59 series.

* For crimping quality standards and crimping conditions, crimping needs to be performed in accordance with the specific conditions of DF59-22PCFA.

● Common to DF59/59S

7. Floating Structure (Board-to-Board)

The Board-to-Board connector can be used to connect two PCB together in a co-planar arrangement and features a "Stress free contact" that floats $\pm 0.5\text{mm}$ in the X, Y and Z dimensions.

8. Space Savings

The DF59 series offers high performance in a compact, space saving design; featuring a 2mm pitch and coupled with a mated height of only 2.48mm with AWG#22 cable. The single position floating plug DF59S is specifically designed to save space, and can be mounted in high density applications.

9. Robust locking structure on DF59M (W-to-B Connection)

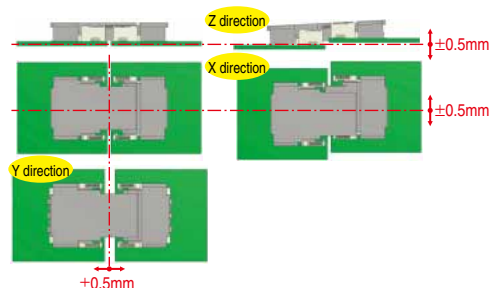
The lock mechanism on compact DF59M provides 16N horizontal lock strength. (Fig.4)

10. Standardization of PCB layout

The DF59S type is used on board-to-board connections, and the DF59M type is intended for wire-to-board connections. Although they have different receptacles, the PCB mounting pattern can be used for these two types. Different combinations of these connectors can be used in the same system with a common PCB. This allows for standardization of PCB. (Fig.5)

Note : Each stencil mask is necessary

DF59 floating amount $\pm 0.5\text{mm}$ (X,Y, Z directions)



DF59S floating amount

$\pm 0.5\text{mm}$ (X,Y direction), $\pm 0.2\text{mm}$ (Z direction)

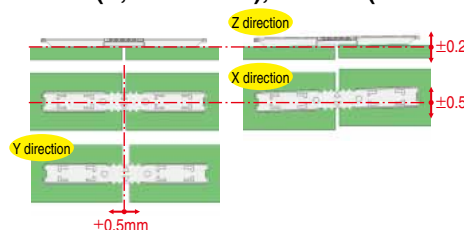


Fig.1

◆ Swing-Lock Structure (Board-to-Wire Type)

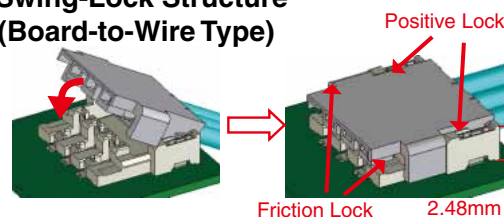


Fig.2

◆ Short-Circuit Pin

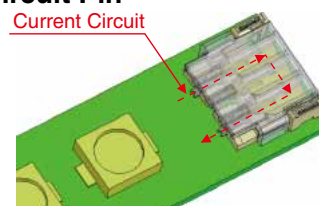


Fig.3

◆ W-to-B structure (DF59M)

Clear tactile click and high locking strength achieved by the robust locking mechanism
Mating force : 16N min. (in a horizontal direction)



Fig.4

◆ Standardization of PCB pattern

DF59S type and DF59M type can be used in the same system by using a common PCB.



Fig.5

Product Specifications

Ratings	Current rating	DF59/S	3A	Operating Temperature : -40 to 105°C (Note 1) Operating Humidity Range : 20 to 80%
		DF59M	6A (22 AWG), 5A (24 AWG) 4A (26 AWG), 3A (28 AWG)	
	Voltage rating	DF59/S	AC/DC 230V (Note 3)	Storage Temperature Range : -10 to 60°C (Note 2) Storage Humidity Range : 40 to 70% (Note 2)
		DF59M	AC/DC 300V (Note 3)	

Items	Specifications		Conditions
1.Contact resistance	DF59-*P-2FC/SP DF59S	50mΩ min.	Under 6V DC, must be measured by 100mA (DC or 1000Hz)
	DF59M-1S-H	45mΩ min.	
	DF59-*P-2C	30mΩ min.	
2.Vibration	No electrical discontinuity over 1μs.		Frequency 10 to 55Hz, single amplitude 0.75mm, 3 directions, 10 cycles each
3.Shock	No electrical discontinuity over 1μs.		Acceleration 490 m/s ² , 11ms; duration, sine half-wave 3 cycles in each of the 3 axis.
4.Humidity		■Contact resistance	Temperature 40 ± 2°C, humidity 90 to 95%, left for 96 hours
	DF59-*P-2FC/SP DF59S	50mΩ min.	
	DF59M	45mΩ min.	
	DF59-*P-2C	30mΩ min.	
5.Temperature cycle		■Contact resistance	(-55°C : 30 min. → 5-35°C : 2 to 3 min. → 85°C : 30 min. → 5-35°C : 2 to 3 min.) 5 cycles
	DF59-*P-2FC/SP DF59S	50mΩ min.	
	DF59M	45mΩ min.	
	DF59-*P-2C	30mΩ min.	
6. Operating Life		■Contact resistance	■Number of insertion and withdrawal force
	DF59-*P-2FC		30 times
	DF59-*P-2FC/SP DF59S	50mΩ min.	10 times
	DF59M	45mΩ min.	20 times
	DF59-*P-2C	30mΩ min.	30 times
7.Resistance to soldering heat	No melting of resin which affect the performance.		Reflow : Depends on recommended temperature profile. Hand soldering : Soldering iron temperature 350 ± 10°C, 3 sec.

Note 1 : Including temperature rise caused by current flow.

Note 2 : The term "storage" refers to products stored for long period of time prior to mounting and use.

Operating temperature and humidity range covers connectors after installation, storage, shipment or during transportation.

Note 3 : The rated voltage is the applied voltage when connectors are mounted parallel to each other on the PCB with a distance of 1.6mm or more between them. Hirose recommends this mounting distance.

This mounting distance is required in order to prevent creepage between the printed wiring to maintain an effective voltage of 300V, according to IEC 60664 and JIS C 60664 standards.

Materials / Finish

Items		Parts	Materials	Treatment	UL Specification
Receptacle	DF59	Insulator	LCP	Natural	UL94V-0
	DF59S	Contact	Phosphor bronze	Gold plated	_____
	DF59M		Copper Alloy	Tin plated	
Floating plug	DF59	Insulator	PBT	White	UL94V-0
		Contact	Brass	Gold plated	_____
	DF59S	Insulator	LCP	Natural	UL94V-0
		Contact	Brass	Tin plated	_____
Crimp contact	DF59M	Contact	Copper Alloy	Tin plated	_____
Short pin		Insulator	PBT	White	UL94V-0
		Contact	Brass	Gold plated	_____
Crimp case		Insulator	PBT	White	UL94V-0
Crimp contact		Contact	Phosphor bronze	Gold 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.

●Receptacle

<u>DF</u>	<u>59</u>	<u>#</u>	-	<u>*</u>	<u>S</u>	-	<u>*</u>	<u>V</u>
<u>①</u>	<u>②</u>	<u>③</u>		<u>④</u>	<u>⑤</u>		<u>⑥</u>	<u>⑦</u>
① Series Name : DF					⑥ Pitch None : Single contact type 2 : Standard 2mm (4mm : Without the central contact)			
② Series No. : 59								
③ None : Standard S : B-to-B type M : W-to-B type					⑦ Termination form V : SMT straight type (B-to-B type) H : SMT right angle type (W-to-B type)			
④ Number of contacts : 1, 2, 3, 4								
⑤ Type of connector S : Receptacle								

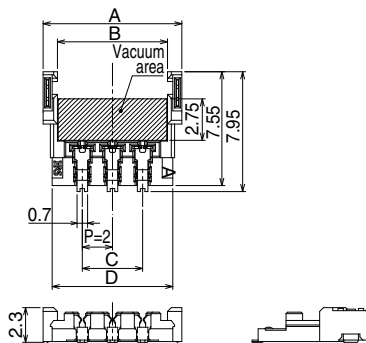
●Plug

<u>DF</u>	<u>59</u>	<u>#</u>	-	<u>*</u>	<u>P</u>	-	<u>*</u>	<u>FC</u>
①	②	③		④	⑤		⑥	⑦
① Series Name : DF					⑤ Type of connector P : Plug			
② Series No. : 59								
③ None : Standard S : Single contact type					⑥ Pitch 2 : DF59 : 2mm (4mm : Without the central contact) None : DF59S/M			
④ Number of contacts DF59 : 2, 3, 4 DF59S : 1					⑦ Termination form FC : Floating			

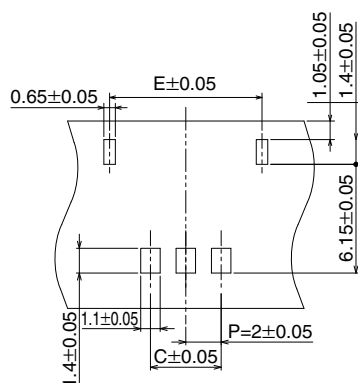
●Short-Circuit pin

<u>DF</u>	<u>59</u>	-	<u>*</u>	<u>P</u>	-	<u>2</u>	<u>SP</u>
①	②		③	④		⑤	⑥
① Series Name : DF				⑤ Pitch : 2mm			
② Series No. : 59				⑥ Termination form SP : Short Pin			
③ Number of contacts : 2, 3, 4							
④ Type of connector P : Plug							

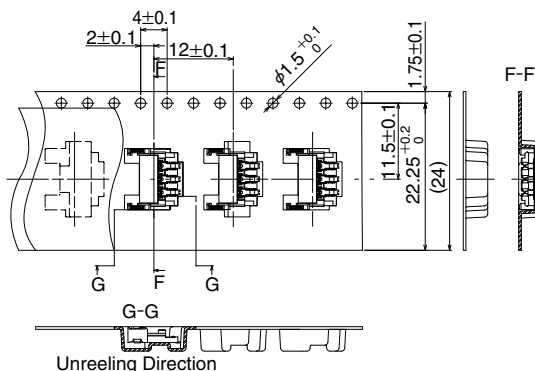
■Straight Receptacle (SMT)



●Recommended PCB Dimensions (t=1.6mm)



●Packaging Dimensions



[Specification No.]

(51) : Gold plating, emboss packaging

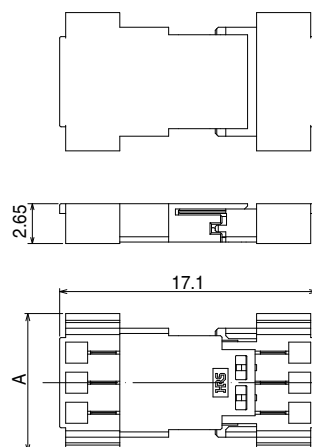
Unit : mm

Part No.	HRS No.	No. of contacts	A	B	C	D	E
DF59-2S-2V(51)	667-0001-0 51	2	7.2	5.3	2.0	6.0	6.62
DF59-3S-2V(51)	667-0002-3 51	3	9.2	7.3	4.0	8.0	8.62
DF59-4S-2V(51)	667-0003-6 51	4	11.2	9.3	6.0	10.0	10.62
DF59-2S-4V(51)	667-0021-8 51	2*	9.2	7.3	4.0	8.0	8.62

* DF59-2S-4V(51) is made by removing the middle pin of DF59-3S-2V(51) at the factory.

Note : Please order in full reel quantities. (2,000 pcs/reel)

■Floating Plug



[Specification No.]

(50) : Gold plating, tray packaging

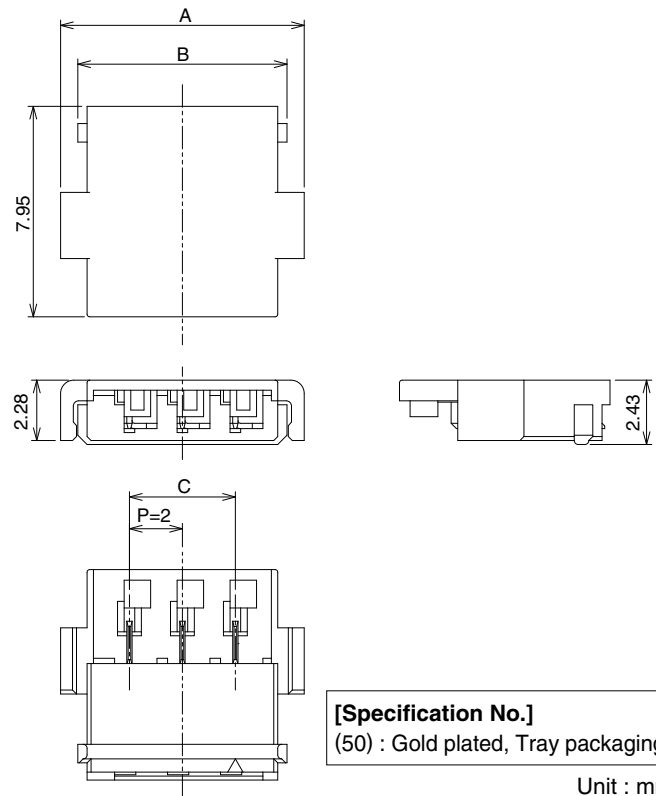
Unit : mm

Part No.	HRS No.	No. of contacts	A	B	Packaged Quantity/Tray
DF59-2P-2FC(50)	667-0006-4 50	2	7.2	2.0	50
DF59-3P-2FC(50)	667-0007-7 50	3	9.2	4.0	
DF59-4P-2FC(50)	667-0008-0 50	4	11.2	6.0	
DF59-2P-4FC(50)	667-0020-5 50	2*	9.2	4.0	

* DF59-2P-4FC(50) is made by removing the middle pin of DF59-3P-2FC(50) at the factory.

Note : Please order in full tray quantities. (50 pcs/tray)

Short-Circuit Pin

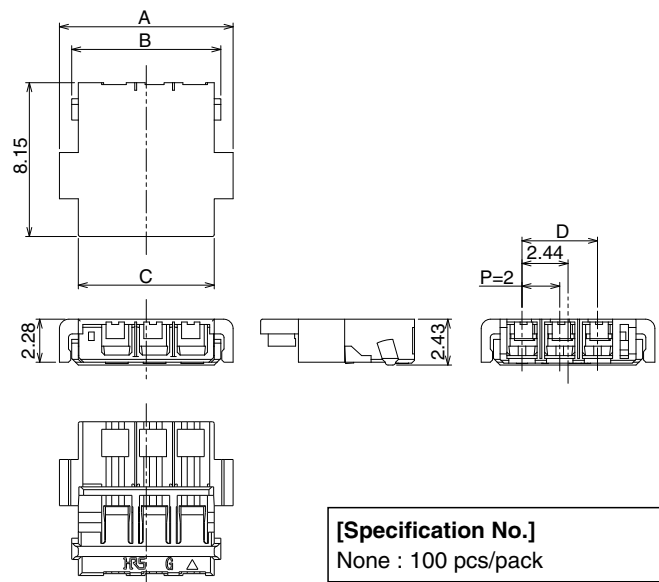
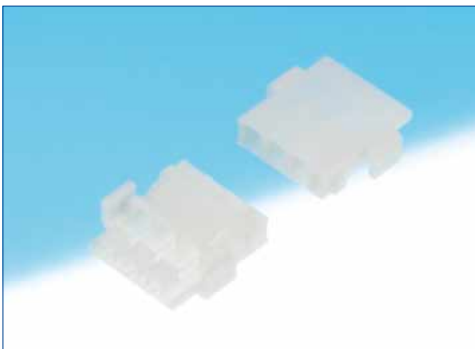


Part No.	HRS No.	No. of contacts	A	B	C	Packaged Quantity/Tray
DF59-2P-2SP(50)	667-0017-0 50	2	7.2	5.9	2.0	100
DF59-3P-2SP(50)	667-0018-3 50	3	9.2	7.9	4.0	
DF59-4P-2SP(50)	667-0046-9 50	4	11.2	9.9	6.0	

Note 1 : Please order in full tray quantities.

Note 2 : For 4 pos. type contact No.1 and 2, No.3 and 4 are connected respectively.

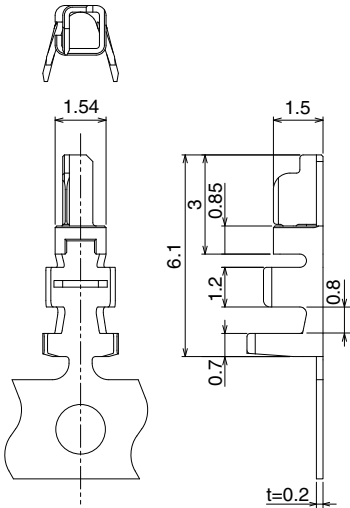
Crimp Socket



Part No.	HRS No.	No. of contacts	A	B	C	D
DF59-2P-2C	667-0011-4 00	2	7.2	5.9	5.2	2.0
DF59-3P-2C	667-0012-7 00	3	9.2	7.9	7.2	4.0
DF59-4P-2C	667-0013-0 00	4	11.2	9.9	9.2	6.0

Note : Please order in full pack quantities. (100 pcs/pack)

■Crimp contact



Part No.	HRS No.	Packaging	Quantity	Treatment
DF59-22PCFA	667-0016-8 00	Reel contact (Note 1)	10,000 contacts / reel	Gold plated
DF59-22PCA	667-0022-0 00	Bulk contact (Note 2)	100 contacts / pack	

Note 1 : Please order reel contacts by full reel quantities. (10,000 pcs/reel)

Note 2 : Please order loose piece contacts in full pack. (100 pcs/pack)

●Applicable Wire (Tin plated soft copper wire)

Conductor Size (Wire Constitution)	Jacket Diameter
22 AWG (17 /φ0.16mm)	UL1061 (φ1.26mm)
	UL3265 (φ1.38mm)

●Recommended Wire

UL1061, UL3265

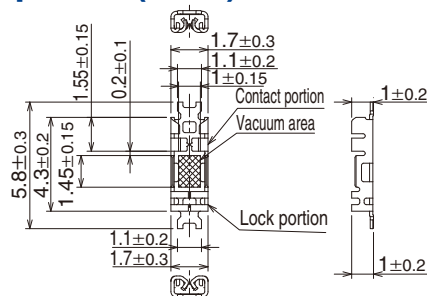
●Strip Length

1.7 to 2.3mm

Note 1 : In these cases please contact Hirose Sales Representative.

- Assemble with non-applicable wire.
- LED application usage.

Note 2 : The strip length is a reference value. Please make adjustments to match with dimensional specifications. Refer to the crimping quality standards (ETAD-H0504-00) for details.



Technical drawing of the lock portion of the PCB, showing dimensions and assembly instructions.

Dimensions:

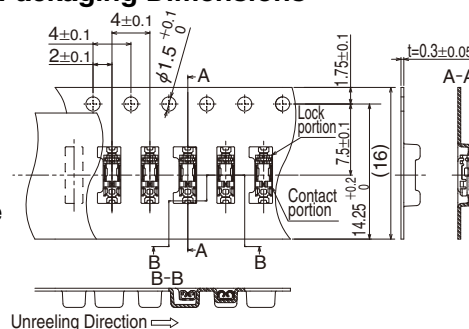
- 1.5±0.05
- 0.9±0.05
- 6.2±0.05
- 1.5±0.05
- 0.9±0.05
- 3.05±0.05

Labels:

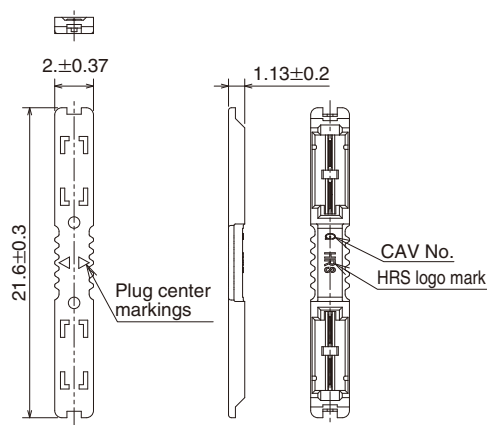
- Contact portion
- Lock portion
- Board edge
- Board edge

Assembly instructions:

- Distance between pads: 3.0mm Min.
- Mount the lock portion towards the board edge
- Distance between pads: 3.0mm Min.



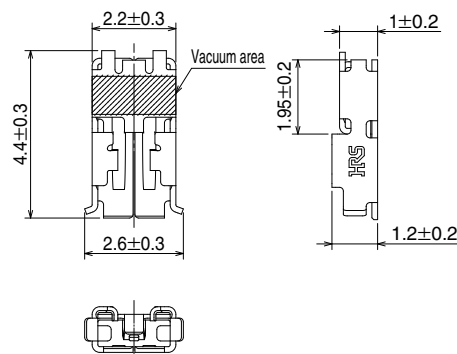
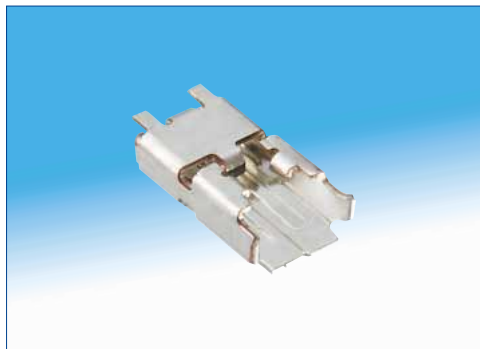
[Specification No.]
(21) : Tin plating, emboss packaging



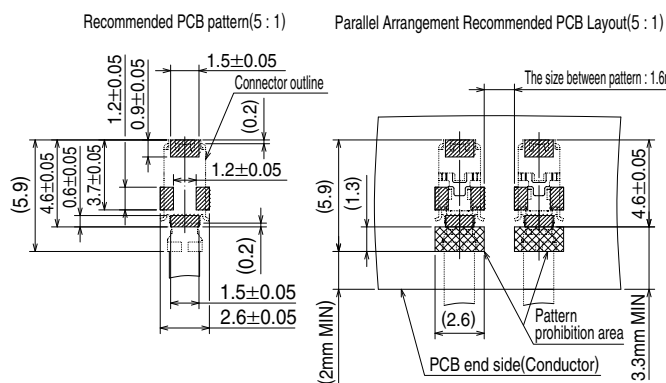
[Specification No.]
(21) : Tin plating, emboss packaging

HRS 7

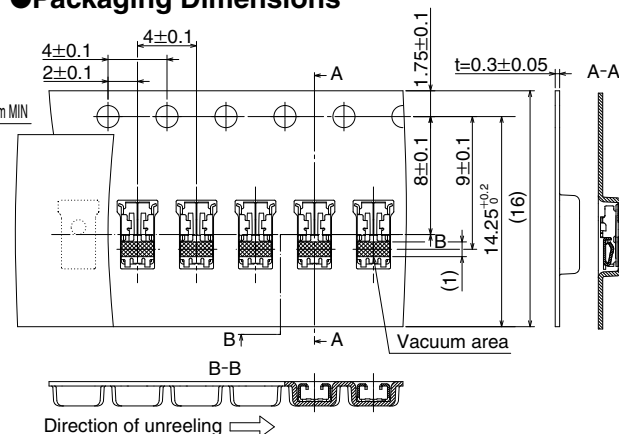
Single Contact Type Right Angle Receptacle (SMT)



Recommended PCB Dimensions (t=1.6mm)



Packaging Dimensions



Part No.	HRS No.
DF59M-1S-H(21)	667-0041-5 21

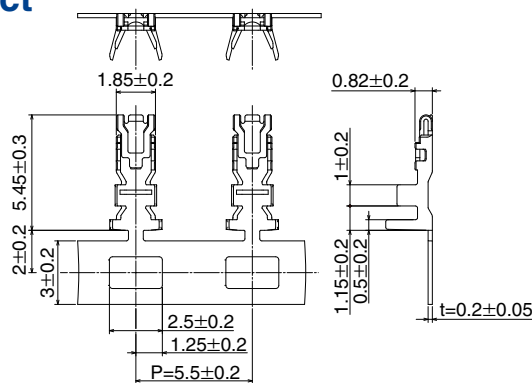
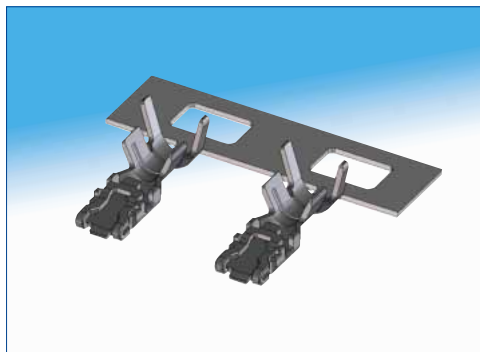
[Specification No.]

(21) : Tin plating, emboss packaging

Note 1 : Please order in full reel quantities. (10,000 pcs/reel)

Note 2 : This connector is designed to mate with Crimp contact of DF59M only. (P.8)

Single Contact Type Crimp Contact



Part No.	HRS No.	Applicable Wire				By Type	Quantity	Treatment
		Recommended Wire	Jacket Diameter	Conductor Size	Wire Constitution			
DF59M-2224PCF	667-0042-8 00	UL10368	φ1.11 to 1.26mm	22 AWG	17/φ0.16mm	Reel contact (Note 1)	15,000/reel	Tin plated
DF59M-2224PC	667-0044-3 00			24 AWG	11/φ0.16mm	Bulk contact (Note 2)	100/pack	
			φ1.26mm	22 AWG	17/φ0.16mm			
DF59M-2628PCF	667-0043-0 00		φ1.11mm	24 AWG	11/φ0.16mm	Reel contact (Note 1)	15,000/reel	
			φ0.88 to 0.98mm	26 AWG	7/φ0.16mm			
DF59M-2628PC	667-0045-6 00		φ0.98mm	26 AWG	7/φ0.16mm	Bulk contact (Note 2)	100/pack	
		φ0.88mm	28 AWG	7/φ0.17mm				

Note 1 : Please order reel contacts by full reel quantities. (15,000 pcs/reel)

Note 2 : Please order loose piece contacts in full pack. (100 pcs/pack)

Note 3 : In these cases please contact Hirose Sales Representative.

• Assemble with non-applicable wire.

• LED application usage.

Note 4 : The strip length is a reference value. Please make adjustments to match with dimensional specifications.

Refer to the crimping quality standards (ETAD-H0778-00) for details.

◆ Applicable Crimping Tool

Types	Part No.	HRS No.	Applicable Contact	Remarks
Applicator	AP105-DF59-22P	901-4619-8	DF59-22PCFA	
	AP105-DF59M-2224P	901-4638-2	DF59M-2224PCF	(Note 2) Manufactured by Japan Automatic Machine Co., Ltd.
	DHS887200H-UP	—		
	AP105-DF59M-2628P	901-4639-5	DF59M-2628PCF	(Note 2) Manufactured by Japan Automatic Machine Co., Ltd.
	DHS887300H-UP	—		
Press Unit	CM-105C	901-0001-0	-	
Hand Tool	HT801/DF59-22P	550-0404-7	DF59-22PCA ※UL1061 AWG#22 Only	
	HT801/DF59M-2224P	550-0420-3	DF59M-2224PC ※UL10368 AWG#22, 24 Only	
	HT801/DF59M-2628P	550-0421-6	DF59M-2628PC ※UL10368 AWG#26, 28 Only	
Extraction Tool (W-to-B)	DF-C-PO(B)	550-0179-2	DF59-22PCFA DF59-22PCA	
	DF-C-PO(A)	550-0170-8	DF59M Series	

Note 1 : Customers are strongly encouraged to utilize HRS application tooling or tooling created by a Hirose tooling partner.

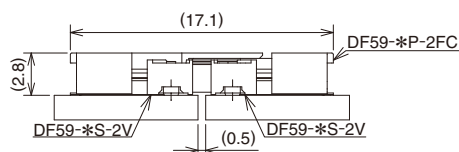
Hirose assumes no liability for customers using tooling from non-recognized sources.

Note 2 : Please contact Japan Automatic Machine Co., Ltd. (hereinafter J.A.M.) through their website regarding crimping issues

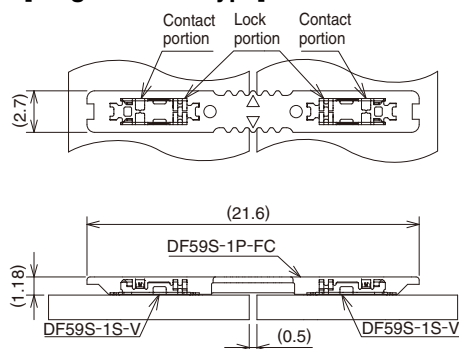
◆ Mating Dimensions

● Board-to-board connection (floating plug)

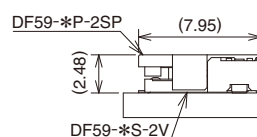
[Standard]



[Single contact type]

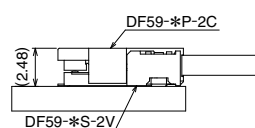


● Short-circuit pin connection

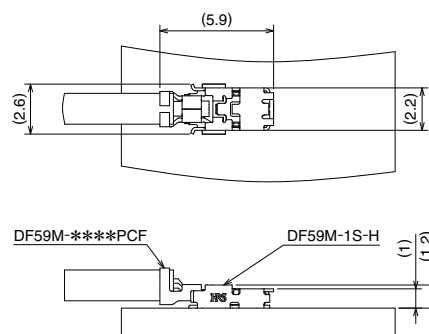


● Wire-to-Board connection

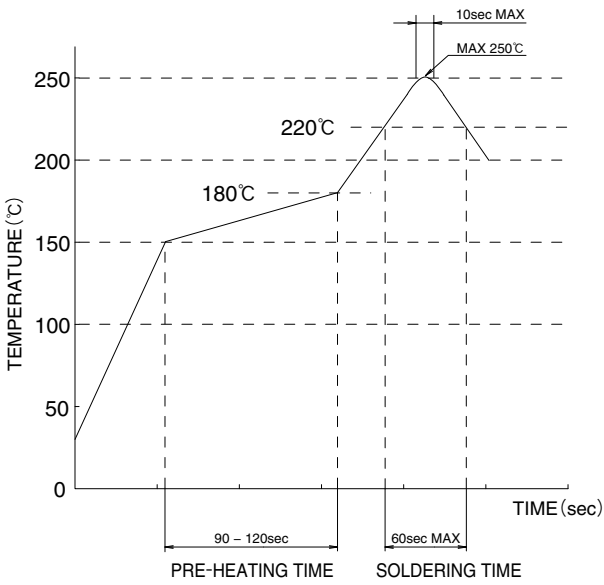
[Standard]



[Single contact type]

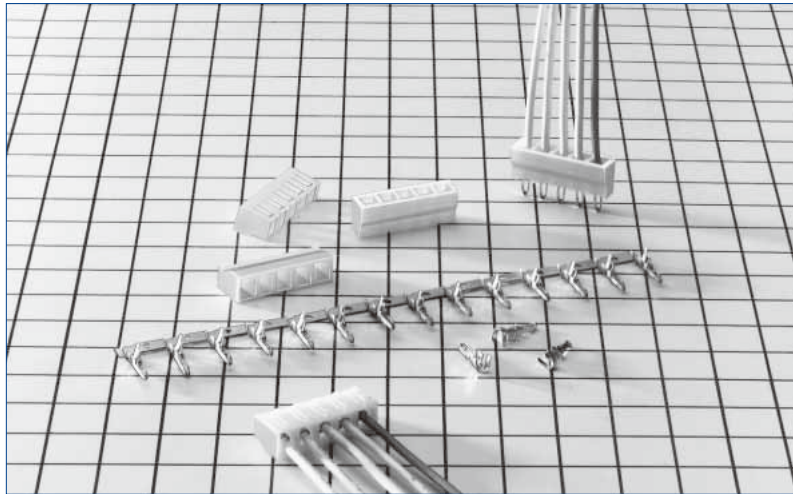


Operating Precautions

1. Recommended Temperature Profile (Lead-free soldering possible)	 [Applicable Conditions] 1. Peak Temperature : MAX 250°C 2. Heated Area : 220°C or above, within 60 sec. 3. Pre-heating Area : 150 to 180°C, 90 to 120 sec. 4. Number of Times : within 2 times *Measured at contact lead area Please be noted that the reflow condition may vary depending on soldering paste type, manufacturer of soldering material, board size, as well as conditions of other mounting materials. (*1) Above temperature profile is our recommended value.
2. Recommended Hand Solder Conditions	Soldering iron temperature : $350 \pm 10^{\circ}\text{C}$, soldering time : within 3 seconds
3. Recommended Screen Thickness, Open Ratio (Pattern Area Ratio)	Thickness 0.1mm, Open ratio : 100%
4. Warpage of PC board	Maximum of 0.02mm at the connector center, with both ends of the connector as reference points.
5. Cleaning Condition	Cleaning with IPA is possible. (Cleaning is not recommended. In case of cleaning, please evaluate if it causes a decrease in the performance which includes mechanical operation and environmental resistance.)
6. Precautions	■ When inserting crimp-type (solderless) terminals to crimping (solderless) sockets, to maintain reliable performance, please do not insert obliquely. ■ DO NOT mate/un-mate a non-terminated plug with a non-mounted receptacles. This may lead to damage or deformation of the contacts. ■ Please note that pulling on the wires or cable during un-mating may cause damage. ■ DO NOT apply flux to the contact terminals when hand soldering the receptacle to the board. Flux can wick into the electrical contact areas and may lead to connection failures. ■ Slight discoloration on the insulating materials will not affect form, fit or function of the connectors. Black spots may appear on the mold resin but this does not affect the product quality. ■ Please refer to the following for the points for proper handling regarding mating/unmating operations. “DF59 Insertion and Removal Manual” ETAD-H0496-00 “DF59S Insertion and Removal Manual” ETAD-H0651-00 “DF59M Operation manual” ETAD-H0779-00

3.96mm Pitch Connector Directly Mounted on Board

DF6 Series



■Features

1. Service Efficiency Up

Conventional thick cables are directly mounted on the board piece by piece, but connectorization has achieved soldering services in a batch. This product enhances soldering service efficiency.

2. Miniaturization

This product achieves miniaturization for thick cables.

Mounting height on board : 7.5mm

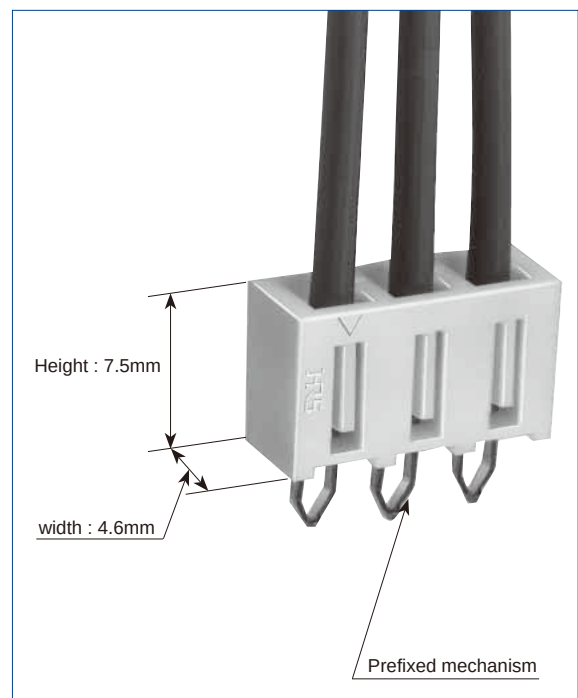
Width : 5.0mm

3. Board Prefixed Mechanism

Since the connector is softly press-fitted to the board for insertion, it can be prefixed to the board.

■Applications

Secondary power supply units for various equipment



Product Specifications

Rating	Current rating (Note 1)	18 AWG : 5A/pin	Operating Temperature Range	-35 to +85°C (Note 2)
		20 AWG : 4A/pin	Operating Moisture Range	40 to 80% (Note 3)
	Voltage rating	22 AWG : 3A/pin 300V AC/DC	Storage Temperature Range	-10 to +60°C
			Storage Humidity Range	40 to 70%

Item	Specification	Condition
1. Insulation Resistance	1000MΩ min.	500V DC
2. Withstanding voltage	No flashover or insulation breakdown.	1500V AC/1minute
3. Contact Resistance	15mΩ max.	100mA
4. Vibration	No damage, cracks, or parts looseness.	Frequency : 10 to 55Hz, single amplitude of 0.75mm, 2 hours in each of the 3 directions.
5. Humidity (Steady state)	No damage, cracks, or parts looseness.	96 hours at temperature of 40°C and humidity of 90% to 95%
6. Temperature Cycle	No damage, cracks, or parts looseness.	(-55°C : 30 minutes → 15 to 35°C : 10 minutes → 85°C : 30 minutes → 5 to 35°C : 10 minutes) 5 cycles
7. Resistance to Soldering heat	No deformation of components affecting performance	Flow : 250°C for 10 seconds
		Manual soldering : 300°C for 3 seconds

Note 1 : The rated current will be changed according to cable sizes for use.

Note 2 : Includes temperature rise caused by current flow.

Note 3 : The connector should be completely dry (no condensation present).

Note 4 : Information contained in this catalog represents general requirements for this Series. Contact us for the drawings and specifications for a specific part number shown.

Material

Product	Part	Material	Finish	Remarks	RoHS2
Crimping Plug	Insulator	Polyamide	White	UL94V-0	YES
Crimping Contact for Plug	Brass	Copper Alloy	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.

● Crimping Plug

DF6 - ***** **P** - **3.96** **C**

① ② ③ ④ ⑤

① Series Name : DF 6	④ Contact pitch : 3.96mm
② Number of contacts : 1~8, 10	⑤ C : Crimping plug
③ Connector type P : Plug	

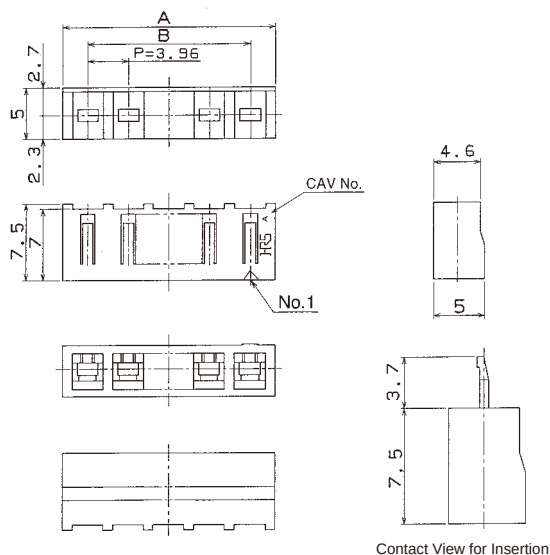
● Crimping Contact

DF6A - **1822** **PCF**

① ② ③

① Applicable cable type None : Jacket dia. 1.5mm to 2.2mm UL 1007 A : Jacket dia. 2.2mm to 2.9mm UL 1015	③ Packaging type PCF : Plug contact, reel packaging
② Applicable cable size 1822 : 18 to 22 AWG	

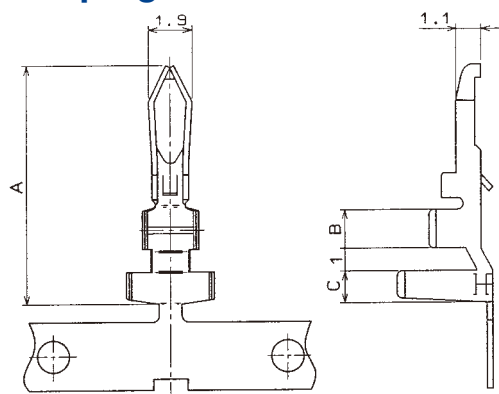
■Precrimping Plug



Part No.	HRS No.	Number of Contacts	A	B
DF6- 1P-3.96C	546-0001-1	1	4.92	—
DF6- 2P-3.96C	546-0002-4	2	8.88	3.96
DF6- 3P-3.96C	546-0003-7	3	12.84	7.92
DF6- 4P-3.96C	546-0004-0	4	16.80	11.88
DF6- 5P-3.96C	546-0005-2	5	20.76	15.84
DF6- 6P-3.96C	546-0006-5	6	24.72	19.80
DF6- 7P-3.96C	546-0007-8	7	28.68	23.76
DF6- 8P-3.96C	546-0008-0	8	32.64	27.72
DF6-10P-3.96C	546-0011-5	10	40.56	35.64

Note : A packaging quantity is delivered by the bag unit (100 pcs.).

■Crimping Contact



●Slip length

DF6-1822PCF : 2.1mm to 2.6mm

DF6A-1822PCF : 2.3mm to 2.8mm

●Applicable through-hole: $1.8^{+0.15}_0$

Part No.	A	B	C
DF6-1822PCF(05)	10.2	1.5	1.2
DF6A-1822PCF(05)	10.7	1.7	1.4

◆Reel Contact (5.000pcs/reel)

Part No.	HRS No.	Finish	Applicable Wire (Tin Plated Annealing Copper Wire) (Note 1)				
			UL Style	AWG	Wire Construction	Sectional Area	Jacket Diameter
DF6-1822PCF(05)	546-0009-3-05	Tin Plated	1007	18 AWG	34cores/0.18mm	0.865mm ²	1.5~2.2mm
DF6A-1822PCF(05)	546-0013-0-05	Tin Plated	1015	20 AWG	21cores/0.18mm	0.534mm ²	
				22 AWG	17cores/0.16mm	0.342mm ²	2.2~2.9mm

Note 1 : Please consult with our Hirose sales representative in using wires other than these applicable wires.

◆Applicable Crimping Tools

Type/Item	Part No.	HRS No.	Applicable Contact
Applicator	AP105-DF6-1822P	901-4505-9	DF6 -1822PCF(05)
	AP105-DF6A-1822P	901-4520-2	DF6A-1822PCF(05)
Press unit	CM-105	901-0005-4	—
Extraction tool	DF-C-PO(A)	550-0170-8	DF6/DF6A-1822PCF(05)

Note 1 : If a trouble has occurred due to tools which are not designated by Hirose, Hirose won't guarantee any product.

Note 2 : Please do the crimping operations according to the "Crimp quality standard" and "Crimping condition table".

Note 3 : When non-authorized tools are used, Please consult with Hirose sales representative about provision of the drawing of the crimping tool.

◆ Crimping Precautions

■ Items required prior to start crimping

The work-related documents shown below are required before starting the harness connections.
(The ● mark shows the document required.)

When the documents shown below are not available, ask our sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
(1) Main unit of crimping machine instruction manual	Explanation of main press machine unit	●	—	When purchasing main press machine unit, it is bundled.
(2) Operating Instructions for Hand Tool	Crimp operation	●	—	When purchasing Applicator, it is bundled.
(3) Applicator Spare Parts Identification	Explanation for Applicator installation	●	—	
(4) Crimp Conditions	Standard values of : Crimp height ; Tensile strength	●	—	
(5) Crimp Quality Standards	Various standards for crimping conditions	●	—	When purchasing Hand Tool, it is bundled.
(6) Operating Instructions for Hand Tool	Inspection items of : Crimp height ; Crimp operation Tensile strength	—	●	
(7) Cable Assembly Procedure	Cable Assembly Procedure	●	●	Ask our sales personal to provide them.

■ Tools

When crimping work is applied to our contacts, the tool designated by Hirose should be used.
Crimping work by using tools other than as designated must not be done because it may result in contact failure, disconnection of cable, etc.

*The operating instructions manual is available for the crimping machine and the applicator.

Be sure to carefully read the operating instructions manual before implementing the work.

■ Applicable electric wires

Check that the electric wire to be used is in the range of application.

If you intend to use an electric wire other than the recommended one, ask our sales personnel.

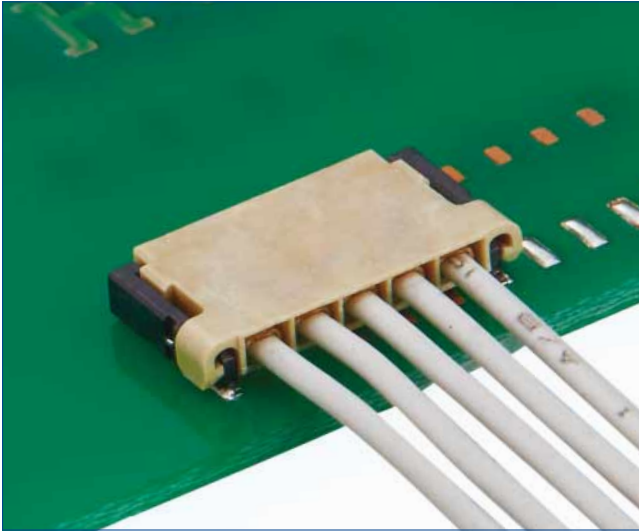
[Precautions]

- Electric wires that are applicable for crimping connectors shall, principally, be the tin-plated stranded soft-copper wire.
- Crimping of electric wires wherein single wires, polyester yarns, etc., exist and crimping of tin-coated wires should be avoided.
- Avoid crimping two electric wires together.
- The setting values of crimp height (Note 1) may vary between tin-plated and gold-plated terminals even if the same electric wires are used.
- The setting values of crimp height (Note 1) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note 1 : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

◆ Operating Precaution

1. Cleaning condition	Refer to the "User Guide for Wire-to-Board Connector". Don't use solvent to degrade the cable jacket like trichloroethane. In addition, avoid heat cleaning with solvent.
2. Connecting condition	Refer to the "User Guide for Wire-to-Board Connector".
3. Precautions	Slight discoloration on the insulating materials will not affect form, fit or function of the connectors. Refer to "User Guide for Wire-to-Board Connector".
4. Handling notes	Please refer the following documents. ■ Crimping Quality Standard (ETAD-H0907-00) ■ User Guide for Wire-to-Board Connector



Features

1. Enhanced contact reliability and lock structure

The unique locking structure reinforces the engagement between the wire side portion and the header. This prevents the wire side from becoming misaligned due to stress from poorly routed wiring. (Fig.1) (Patented)

2. Vertical mating provides superior handling

The use of vertical mating style reduces assembly time and maximizes precious board space which gives designers more freedom when designing other components on the PCB. (Fig.2)

3. Highly reliable contact structure

The two point contact structure provides optimum reliability, a low mated height of 1.8mm and an effective mating length of 0.35mm.

4. Increased cable retention

The header is designed to press the terminal lance down during the mating operation; this prevents the lance from moving and enhances its strength.

5. High current of MAX 4A (24 AWG)

By utilizing highly conductive material for the female terminals and suppressing the contact resistance, the DF65 series can handle a maximum of 4A with 24 AWG wire.

6. Solder wicking prevention

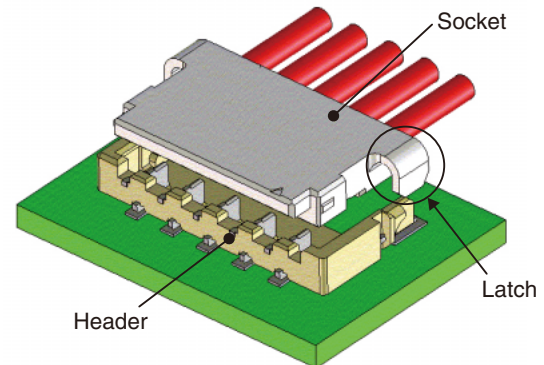
Molding is done in a way that removes the gap between the contacts and the housing to prevent wicking.

7. Prevents Accidental unmating

The molded structure is designed to prevent accidental unmating due to poorly routed wiring and harsh loads.

8. UL and C-UL Certified

Lock structure and operation



Latches are deflected slightly during mating.

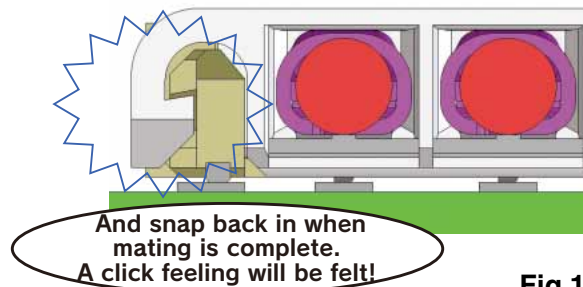
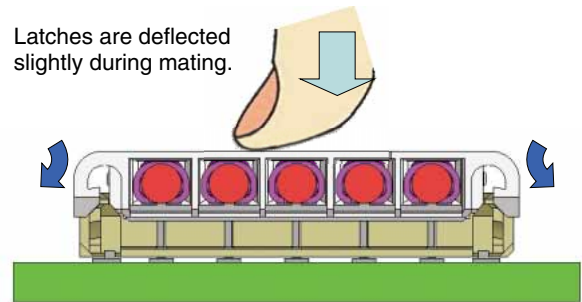
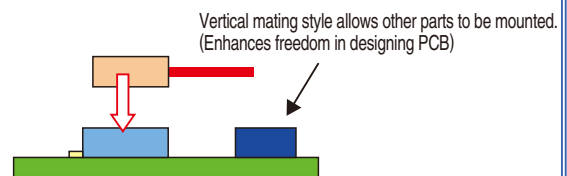


Fig.1

Vertical mating provides superior operability and maximizes board space.

Vertical mating type

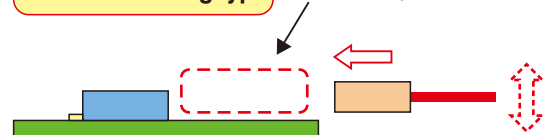
Side view of the PCB



The mating face is easy to see, resulting in proper insertion.

Horizontal mating type

Unused, open area



The mating face can be hard to see, which can lead to awkward insertion.

Fig.2

Product Specifications

Ratings	Current Rating	No. of Contacts	24 AWG	26 AWG	28 AWG	Operating Temperature Range	−40 to +105°C (Note 2)
		3	4A/pin	2.5A/pin	2.5A/pin	Operating aHumidity Range	20 to 80% (Note 3)
		4				Storage Temperature Range	−10 to +60°C (Note 4)
		5					
		6	3.5A/pin	2A/pin	2A/pin	UL/C-UL/File No. and Recognition No. UL : E52653 C-UL : E52653	
	7						
	Voltage Rating	Specification	AC/DC 50V				

Item	Specifications	Conditions
1. Insulation resistance	100MΩ min.	Measured at DC 100V
2. Withstand voltage	No flashover or breakdown	AC 500V is applied for one minute.
3. Contact resistance	10mΩ max.	Measured at 1mA and no higher than 20mV
4. Vibration Resistance	No electrical discontinuity for more than 1μs	10 cycles in each of three directions at frequency 10-55 Hz, half amplitude 0.75mm
5. Shock Resistance	No electrical discontinuity for more than 1μs	Accelerated velocity : 490m/s ² , for 11 ms, half-sine in 3 directions, 3 times for each of the three directions
6. Moisture-resistance	Contact resistance : 20mΩ max. Insulation resistance : 500MΩ min.	Temperature : 40 ± 2°C ; humidity : 90 to 95%, left as it is for 96 hours
7. Temperature cycles	Contact resistance : 20mΩ max. Insulation resistance : 500MΩ min.	−55°C : 30 minutes → 5 - 35°C : 2 - 3 minutes → 85°C : 30 minutes → 5 - 35°C : 2 - 3 minutes) 5 cycles
8. Durability	Contact resistance : 20mΩ max.	Tin plated : 30 mating cycles Gold plated : 50 mating cycles
9. Resistance to solder heat	The resin components will not become deformed or lose performance due to deformities	Reflow : according to the recommended temperature profile Hand soldering : temperature of soldering iron at 350°C ± 10°C for 3 seconds

Note 1 : This is the maximum current rating while all pins are powered or used as all power lines. Depending on pin assignment, more current may flow. When dividing the current more than the specified amount into multiple circuits, the actual current value may exceed the rated value. Please contact Hirose Electric, for inquiries on the assignment of pins and on the currents that can be delivered.

Note 2 : Includes the temperature rise of power lines.

Note 3 : Use without condensation on parts.

Note 4 : The storage condition refers to long-term storage of the product on the shelf before assembly. Please use the operating temperature for temporary storage such as pre-assembly and during shipping.

Note 5 : Information contained in this catalog represents general requirements for this Series.

Please contact us for the drawings and specifications for a specific part number shown.

Materials / Finish

Product	Part	Materials	Finish	UL specification	RoHS2
Header	Insulator	LCP	Black	UL94V-0	YES
	Contact	Brass	Tin Plated or Gold plated	—	
Crimp socket	Insulator	LCP	Beige	UL94V-0	
Crimp contact	Contact	Copper Alloy	Tin Plated or Gold 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.

Header connector

DF 65 - * P - 1.7 V

① ② ③ ④ ⑤ ⑥

① Series Name : DF	⑥ Mounting style V : SMT Straight Type
② Series No. : 65	
③ Number of contacts : 3, 4, 5, 6, 7	
④ Connector type P : Header	
⑤ Pitch : 1.7mm	

Socket connector

DF 65 - * S - 1.7 C

① ② ③ ④ ⑤ ⑥

① Series Name : DF	⑤ Pitch : 1.7mm
② Series No. : 65	⑥ Termination form C : crimp case
③ Number of contacts : 3, 4, 5, 6, 7	
④ Connector type S : socket	

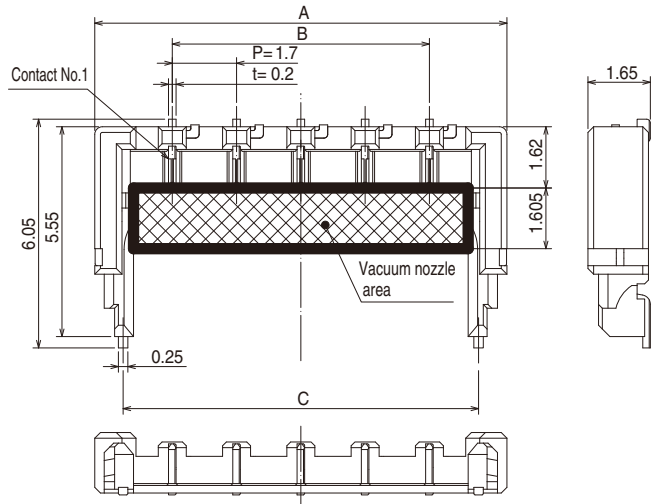
Crimp contact

DF 65 - 2428 SCF

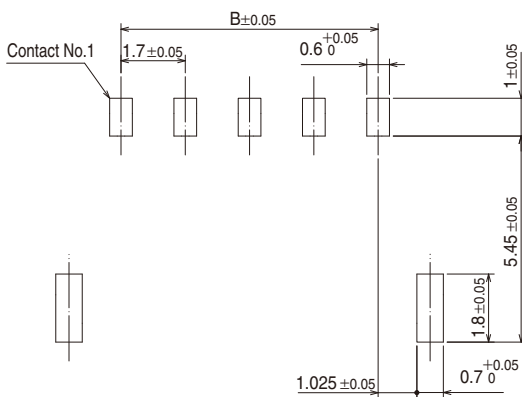
① ②

① Applicable wire size 2428 : 24 to 28 AWG	② Packaging style SCF : Socket contact·Reel·Tin plated SCFA : Socket contact·Reel·Gold plated

Straight pin header



Recommended PCB layout (t=1mm)



[Specification Number]**
 (21) : Tin plated, embossed packaging
 (78) : Gold plated, embossed packaging

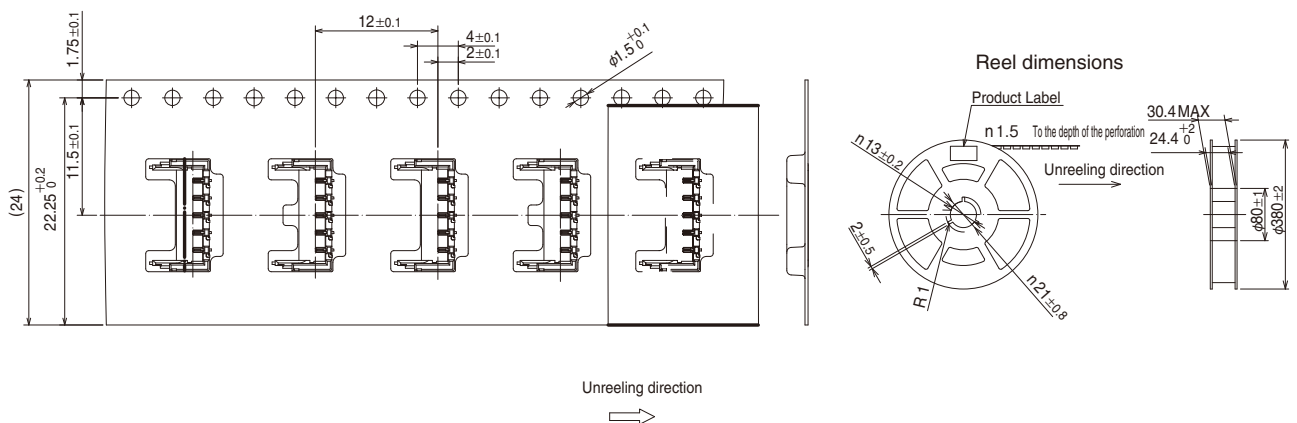
Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C
DF65-3P-1.7V(**)	666-6004-5 **	3	7.5	3.4	6
DF65-4P-1.7V(**)	666-6006-0 **	4	9.2	5.1	7.7
DF65-5P-1.7V(**)	666-6001-7 **	5	10.9	6.8	9.4
DF65-6P-1.7V(**)	666-6008-6 **	6	12.6	8.5	11.1
DF65-7P-1.7V(**)	666-6014-9 **	7	14.3	10.2	12.8

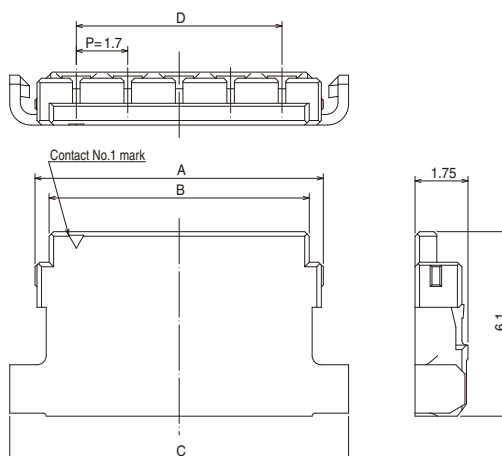
Note 1 : This product is sold per reel with 4,000 connectors pcs/reel. Please order by reel quantities.

Note 2 : Please contact Hirose representative if you have request for (78) specification.

Tape and Reel Dimensions



■ Crimp socket



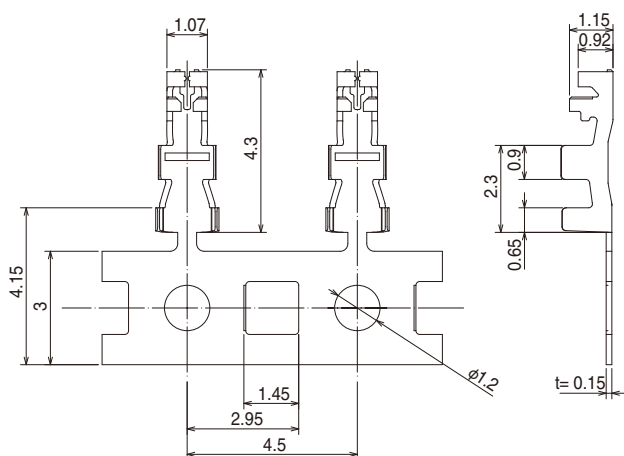
Unit : mm

Part No.	HRS No.	No. of Contacts	A	B	C	D
DF65-3S-1.7C(**)	666-6005-8 **	3	6.13	5.2	7.8	3.4
DF65-4S-1.7C(**)	666-6007-3 **	4	7.83	6.9	9.5	5.1
DF65-5S-1.7C(**)	666-6002-0 **	5	9.53	8.6	11.2	6.8
DF65-6S-1.7C(**)	666-6009-9 **	6	11.23	10.3	12.9	8.5
DF65-7S-1.7C(**)	666-6015-1 **	7	12.93	12	14.6	10.2

[Specification Number]**
None : 1 package contains
100 pcs/pack

Note : Each package contains 100 pcs/pack. Please order in full package quantities.

◆ Crimp contact



[Specification Number]**
None : 18,000 pcs/reel
(07) : 18,000 pcs/reel · Gold plated

Part No.	HRS No.	Description	Quantity	Finish
DF65-2428SCF	666-6003-2	Reel contact	18,000 pcs/reel	Tin plated
DF65-2428SCFA(**)	666-6016-4 **	Reel contact	18,000 pcs/reel	Gold plated

Note : This product is sold per reel (18,000 pcs/reel), please order by reel quantities.

● Applicable wire (Tinned, annealed copper wire)

Conductor size (Core structure)	Jacket Diameter
24 AWG (11 pieces/ ϕ 0.16 mm)	ϕ 1.11mm
26 AWG (7 pieces/ ϕ 0.16 mm)	ϕ 0.98mm
28 AWG (7pieces/ ϕ 0.127 mm)	ϕ 0.88mm

● Recommended wire
UL10368

● Strip length
1.4 to 1.8mm

Note : Please contact your local Hirose sales rep if you plan on using wires other than those listed above.

◆ Tooling Information

Item	Part No.	HRS No.	Applicable contact
Applicator	AP105-DF65-2428S	901-4630-0	DF65-2428SCF, DF65-2428SCFA
Press body	CM-105C	901-0001-0	—
Hand tool	HT305/DF65-2428S (Note3)	550-0306-8	DF65-2428SCF, DF65-2428SCFA
Extraction tool	DF-C-PO (B)	550-0179-2	DF65-2428SCF

Note 1 : Hirose does not cover damage created by the use of unapproved Hirose Tools. Please contact your local Hirose Sales for clarification.

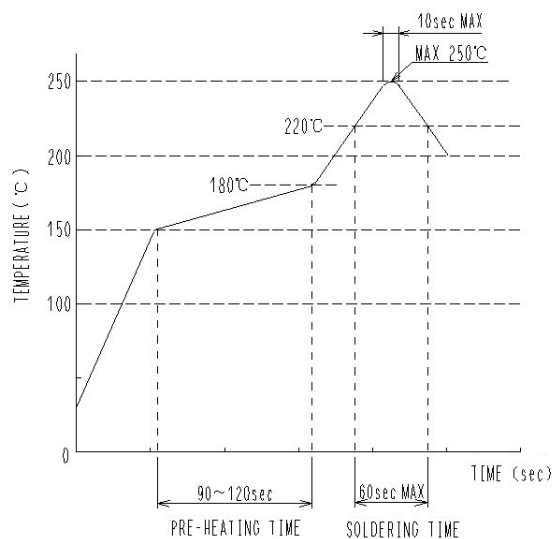
Note 2 : Please conduct crimping work according to the "Crimping work standards" and "Crimping condition table".

Note 3 : The compatible wire is limited to UL10368, 24 to 28 AWG.

Note 4 : When non-authorized tools are used, please consult with a Hirose sales representative regarding requests for the hand tool die drawing.

◆ Precautionary notes

1. Recommended Soldering Profile
(Compatible with lead-free soldering)



[Applicable Conditions]

1. Peak temperature : MAX 250°C

2. Heating Area : 220°C or above, within 60sec .

3. Preheating Area : 150~180°C, 90~120sec.

* Measurement is conducted at the contact lead part

Please check the mounting conditions before use, conditions such as solder paste types, manufacturer, PCB size and any other soldering materials may alter the performance of such materials.

(Note 1) This temperature profile is a recommended value only ; please contact your Hirose Sales Rep for more information

2. Recommended hand soldering conditions

Temperature of soldering iron : $350 \pm 10^\circ\text{C}$, soldering time : no more than 3 seconds

3. Recommended screen thickness, aperture ratio (pattern surface ratio)

Thickness : 0.1mm, aperture opening ratio : 100%

4. Warping of PC Board

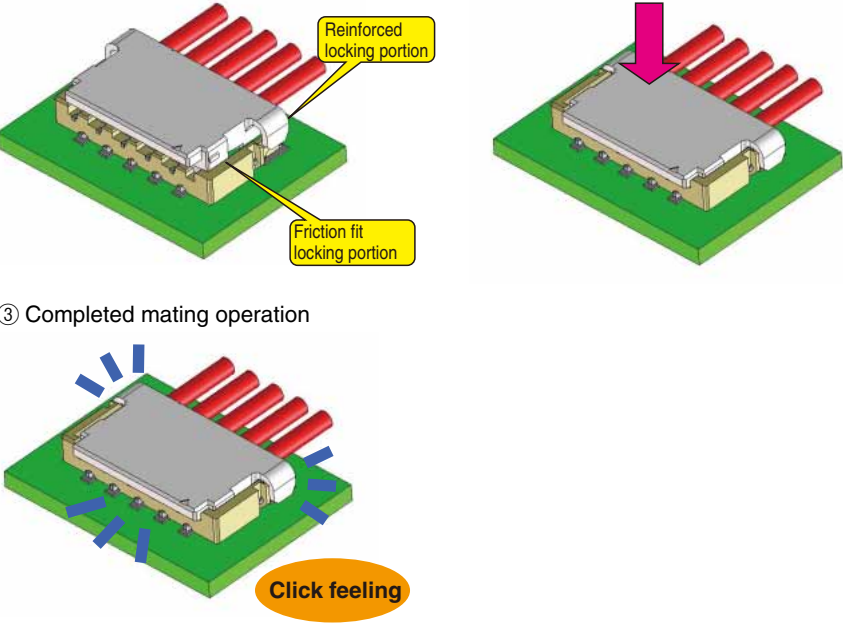
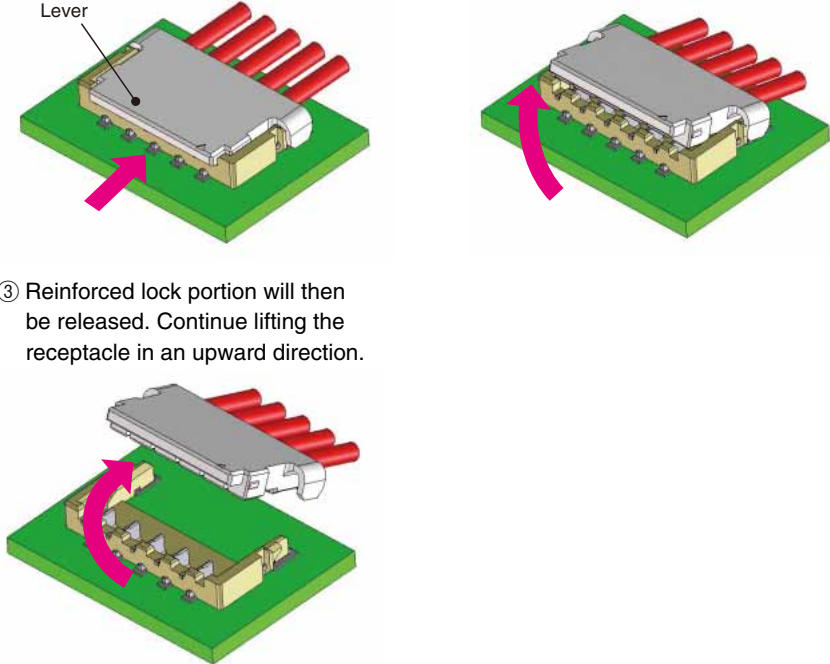
A maximum of 0.02mm at the center of connector, as measured from either end of the connector

5. Cleaning Conditions

IPA cleaning is allowed. (Cleaning is not recommended because cleaning may change the push/pull feeling etc. Please contact your local Hirose representative prior to the use of any cleaning agents.)

6. Precautions

- When inserting the crimp contact into the crimp socket, do not insert it at a slanted angle to maintain the reliability of its performance.
- Please use caution when mating/unmating this connector if it has not been mounted onto the PCB, doing so could deform or damage the contacts.
- Do not pull on the wires of this connector as this may cause damage to the connector.
- During the hand soldering process, make sure to not apply too much flux. Doing so may cause a solder wicking problem.
- This product may experience some differences in color from one production lot to another. This color difference does not influence the performance of the connector. Black spots may appear on the mold resin but this does not affect the product quality.

7. Precautions	Please refer to the following documents. ■ Crimp Quality Standard (ETAD-H0733-00) ■ Cable Assembly Procedure (ETAD-H0736-00) ■ Mating/Unmating Operation Instruction Manual (ETAD-H0803-00) ■ Procedures for Using the Crimp Terminal Extracting Tool (ETAD-H0249-00) ■ Board-to-Wire Connector Guidelines (ETAD-H1023-00)
8. Mating and Unmating Operation	Mating operation ① Align the receptacle over the header ② Insert and press down on the receptacle in the direction of the arrow.  ③ Completed mating operation Unmating operation ① Start by lifting up on the front edge of the receptacle. ② Pull it upward to release the friction fit lock portion.  ③ Reinforced lock portion will then be released. Continue lifting the receptacle in an upward direction.

Crimping

■ Items Required Prior to Starting

The work- related documents listed below are required before starting harness assembly.

(The ● mark indicates a required document.)

When the documents shown below are not available, ask a Hirose sales personnel to provide them.

Document Title	Description	Automatic Crimping Machine	Hand Crimping Tool	Remarks
(1) Main Unit of Crimping Machine Instruction Manual	Explanation of main press machine unit	●	—	Bundled with the purchase of the main press machine unit.
(2) Applicator Spare Parts Identification	Explanation for Applicator installation	●	—	Bundled with the purchase of applicator.
(3) Crimp Conditions	Standard values of : Crimp height, tensile strength	●	—	
(4) Crimp Quality Standards	Various standards for crimping conditions	●	—	
(5) Operating Instructions for Hand Tool	Inspection items of : Crimp height, tensile strength, other	—	●	Bundled with the purchase of hand tool.
(6) Cable Assembly Procedure	Cable assembly procedure	●	●	Ask a HRS sales representative.

■ Tools

Use tools designated by Hirose when crimping.

- Crimping performed using tools other than those specified is outside the scope of warranty.
- The operating instructions manual is available for the crimping machine and the applicator. Be sure to carefully read the operating instructions manual before implementing the work.

■ Applicable Electric Wires

When using a wire other than the applicable wires please contact a Hirose representative.

[Precautions]

- Electric wires that are suitable for crimping connectors are tin-plated stranded soft copper wire.
- Avoid crimping solid wires, wires with polyester threads or tin-coated wires.
- Avoid crimping two electric wires together.
- The crimp height setting value (Note) may vary between tin-plated and gold-plated contacts even if the same electric wires are used.
- The crimp height setting value (Note) may vary depending on the difference in the core wire configuration even if the computed cross-sectional area is the same.

Note : The crimp height is an important item that determines crimping quality. We execute crimping tests for each electric wire to ensure the optimal value for the crimp height with high precision, thereby ensuring optimal setup values.

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Киров (8332)68-02-04
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35

Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(7172)727-132

Киргизия +996(312)96-26-47

<https://hirose.nt-rt.ru/> || hes@nt-rt.ru