PRODUCT CATALOG

HIROSE ELECTRIC CO.,LTD.

DF50 Series

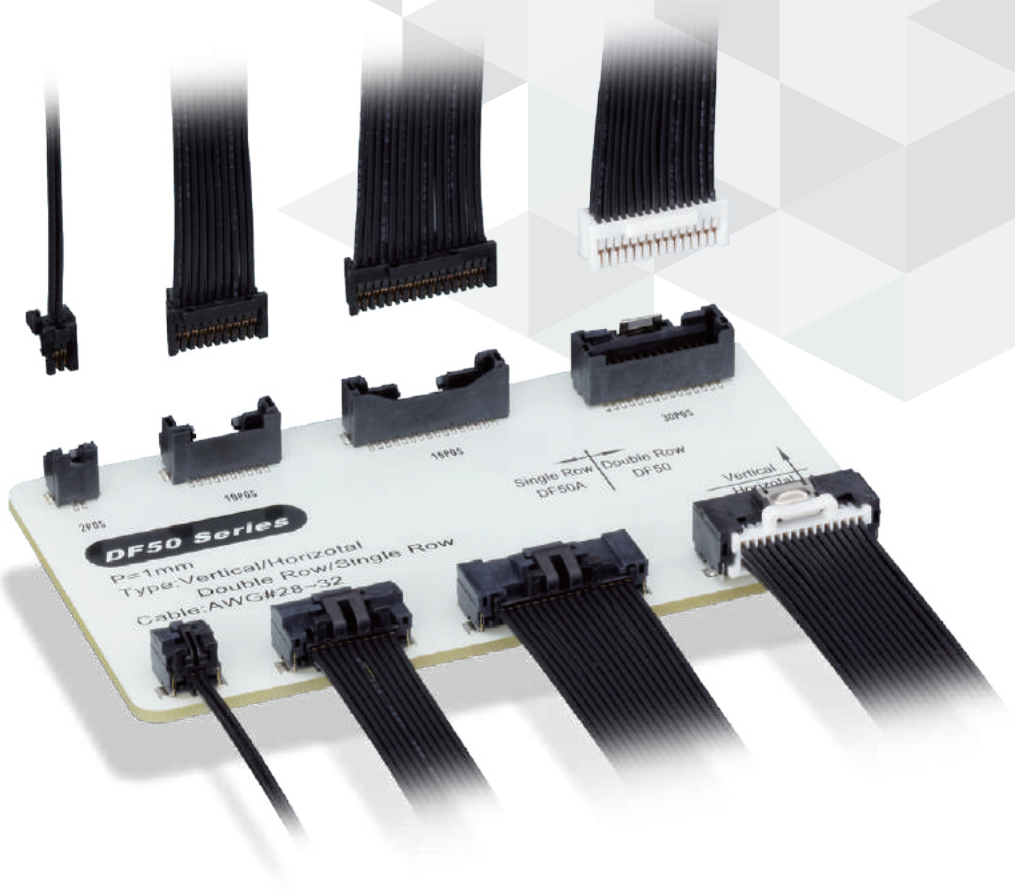
1mm Pitch, Positive Lock, Wire-to-Board Connector

SignalBee™

Positive-Lock

Robust

P= 1.0mm



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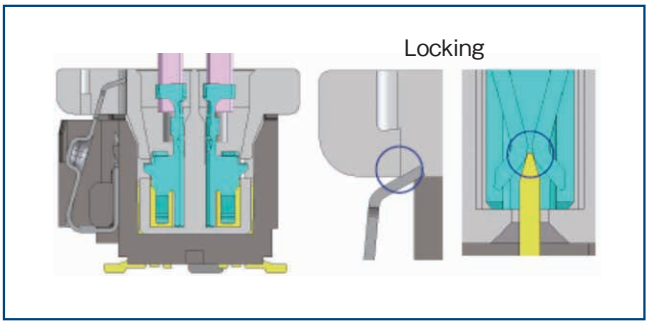
Product page
https://www.hirose.com/en/product/compare?searchType=series&targets=DF50%2CDF50A

Aug. 2023

Features

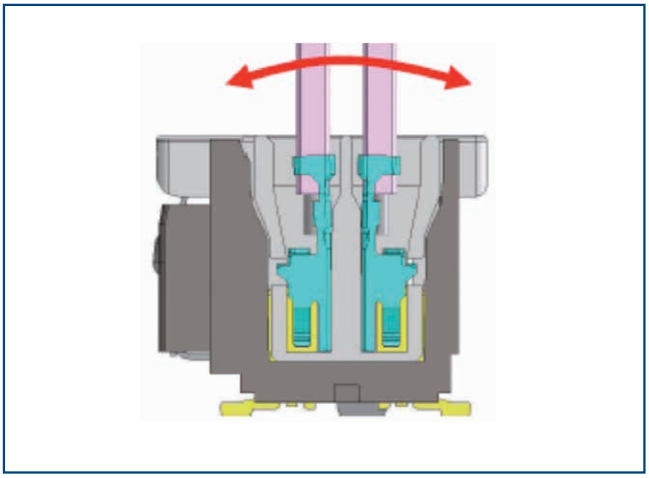
1. Secure lock with clear tactile click

Locking function and contact mating occur simultaneously for a clearer tactile click.



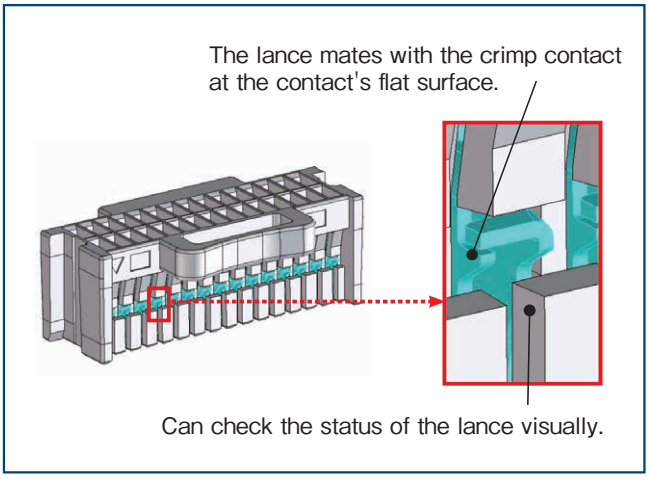
2. Robust design resists prying

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.



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4. Vacuum pick up area is provided, no suction cap needed

While compact the DF50 Series has sufficient adsorption area for Pick & Place Mounting without a suction cap.
(*Specifications for adsorption cap may be provided according to your requirements)

5. Compatible with 26 to 32 AWG

1mm pitch product compatible with up to 26 AWG (0.88mm jacket diameter Max.)

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Product Specifications

Rated Current (Note 1)	No. of Pos.	26～28 AWG	30 AWG	32 AWG	Operating Temperature (Note 2)	-35 to +85℃
	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℃
Rated Voltage	100V AC/DC				Storage Humidity Range (Note 4)	40 to 70%

Item	Specifications	Conditions
Insulation Resistance	500MΩ Min.	100V DC
Withstand Voltage	No Flashover or Breakdown	300V AC for 1 min.
Contact Resistance	30mΩ Max.	20mV Max., at 1mA.
Vibration Resistance	No Electrical Discontinuity of 1μs or Longer	Frequency 10-55Hz, Single Amplitude of 0.75mm 3 Directions, 10 Cycles in Each Direction.
Shock Resistance	No Electrical Discontinuity of 1μs or Longer	Acceleration : 490m/s^2, 11ms, Half Sine Wave in 3 Directions, 3 Times for Each Direction
Moisture Resistance	Contact Resistance : 50mΩ Max. Insulation Resistance : 100MΩ Min.	Temperature : 40±2℃ : Humidity : 90 to 95%, Left for 96 Hours
Temperature Cycles	Contact Resistance : 50mΩ Max. Insulation Resistance : 500MΩ Min.	(-55℃ : 30 min. → +5 to +35℃ : 2 to 3 min. → +85℃ : 30 min. → +5 to +35℃ : 2 to 3 min.) 5 Cycles
Durability	Contact Resistance : 50mΩ 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℃ 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.

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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 (##)
❶ ❷ ❸ ❹ ❺ ❻

●Crimp Contact

DF50 - 2830 SCF A
❶ ❼ ❽ ❾

❶ Series Name	DF50 (Double Row Pin Header) DF50S (Double Row Crimp Socket) DF50A (Single Row)	❻ Specifications	51 : SMT Color : Black Embossed Packaging 52 : SMT Color : Black Embossed Packaging, With Adsorption Cap
❷ No. of Pos.	20, 30, 40, 50 (Double Row) 2 to 16 (Single Row)	❼ Applicable Conductor	26 : 26 AWG 2830 : 28, 30 AWG 3032 : 30, 32 AWG
❸ Connector Type	DP : Double Row Pin Header DS : Double Row Socket P : Single Row Pin Header S : Single Row Socket	❽ Packaging Style	SCF : Socket Contact, Reel
❹ Contact Pitch	1mm	❾ Plating Specifications	A : Gold Plating
❺ Mounting Style / Wiring Type	C : Crimp Socket V : SMT Straight Type H : SMT Right Angle Type		

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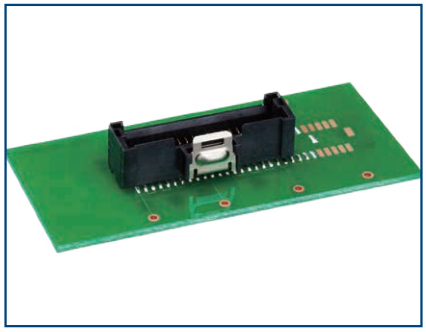
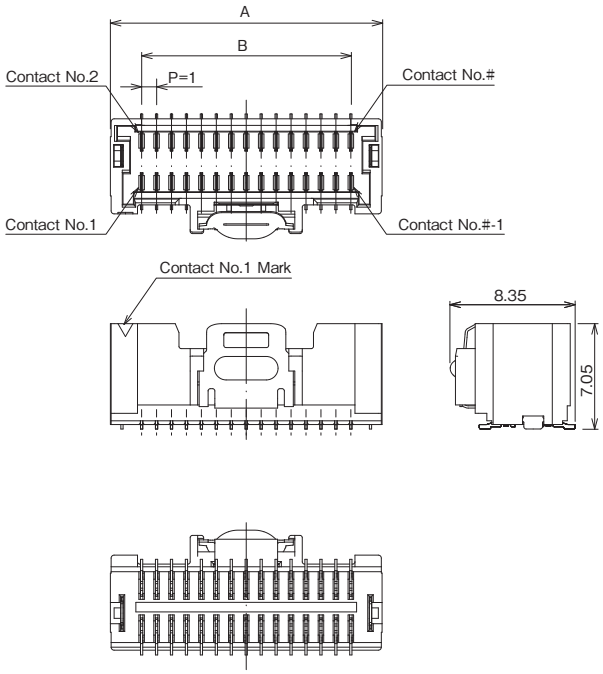
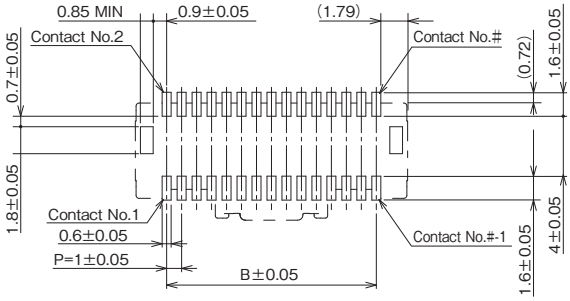
Double Row Straight Pin Header





●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

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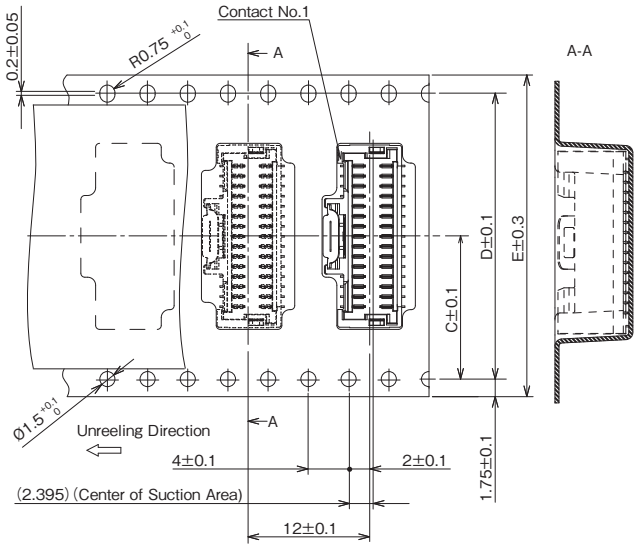
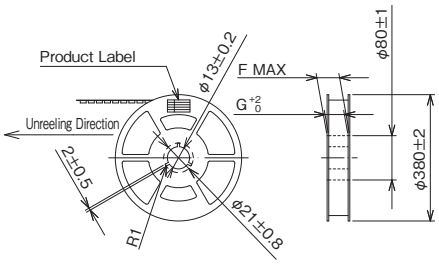
●Embossed Tape Dimensions (JIS C 0806 Compliant)



● Reel Dimensions



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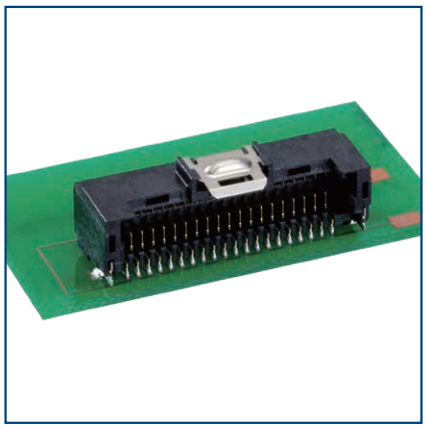
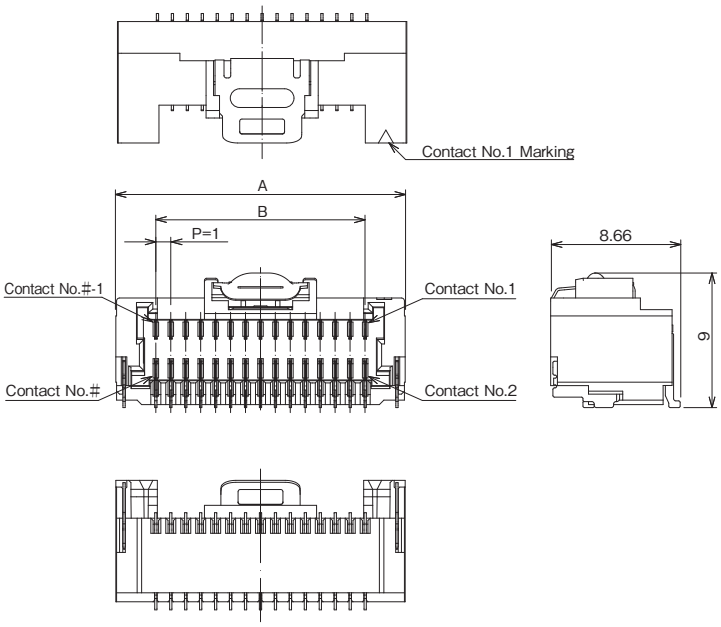
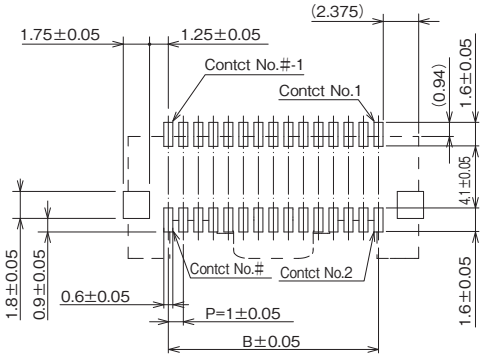
Double Row Right Angle Pin Header





●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

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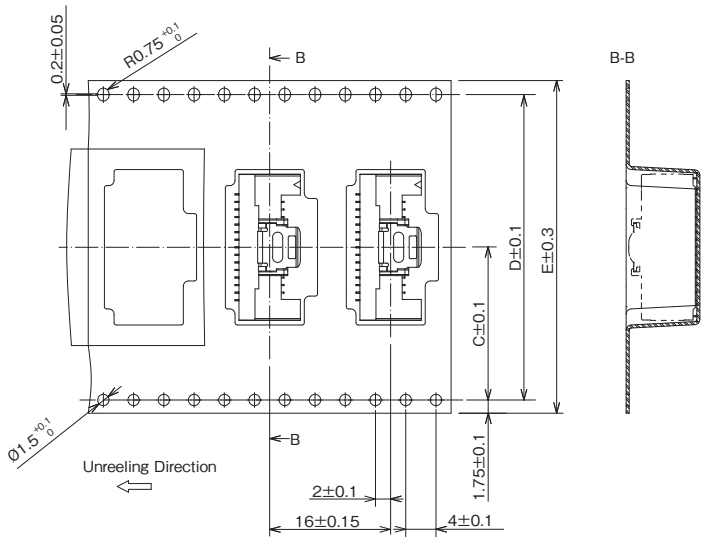
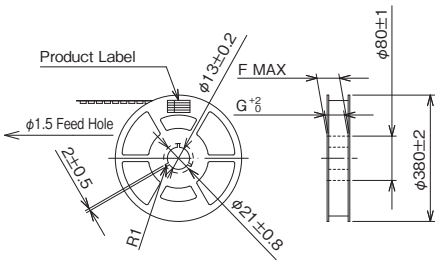
●Embossed Tape Dimensions (JIS C 0806 Compliant)



● Reel Dimensions



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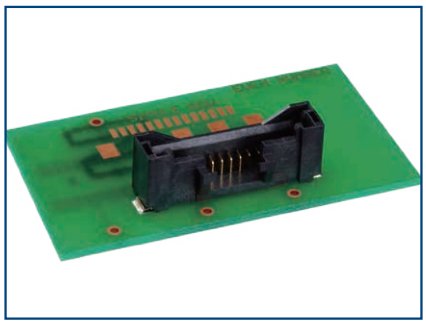
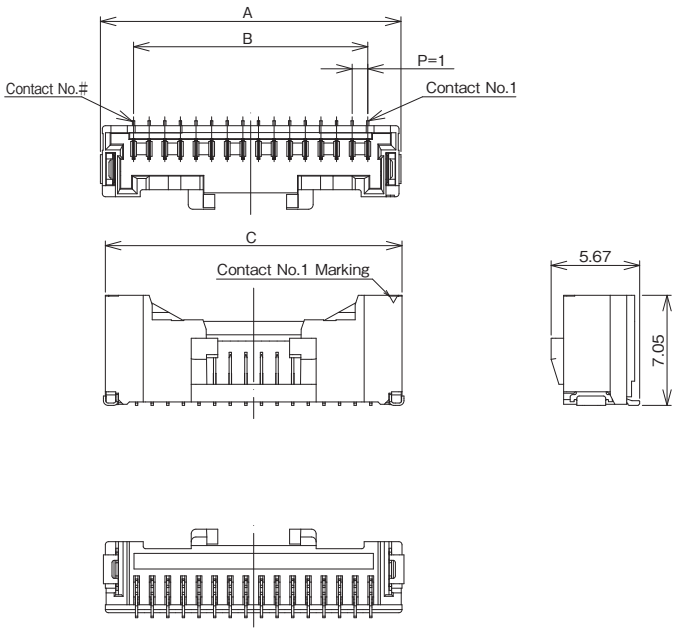
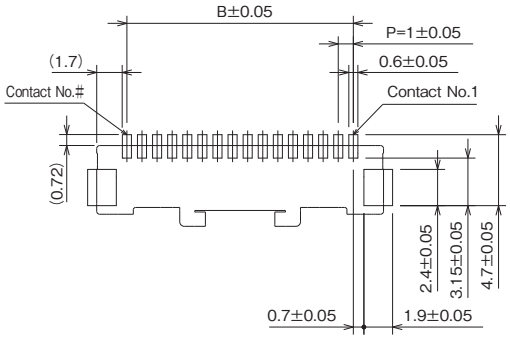
Single Row Straight Pin Header





●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

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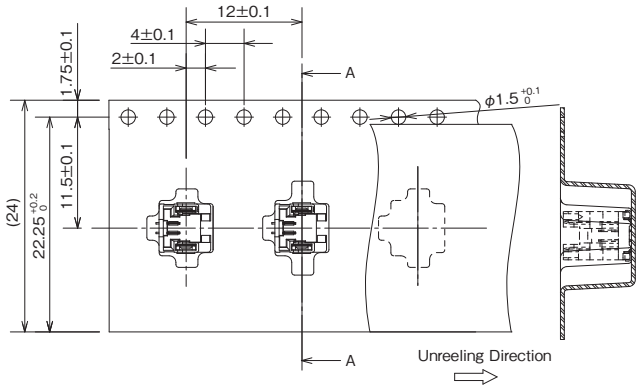
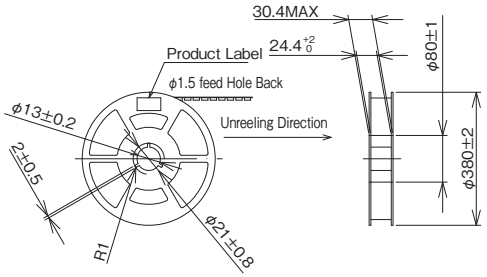
●Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-2P-1V-DF50A-8P-1V(No. of Pos. 2-8)

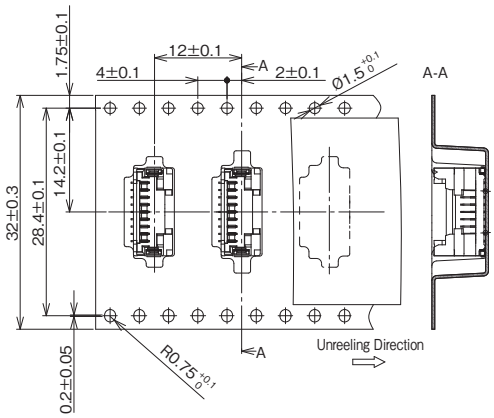


●Reel Dimensions

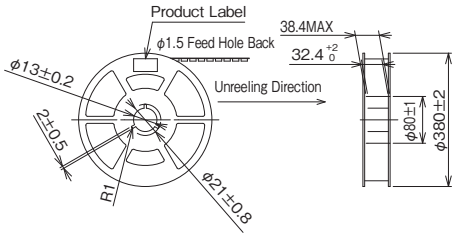


●Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-9P-1V-DF50A-16P-1V(No.of Pos.9-16)



●Reel Dimensions



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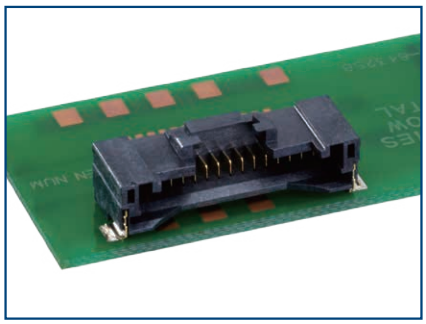
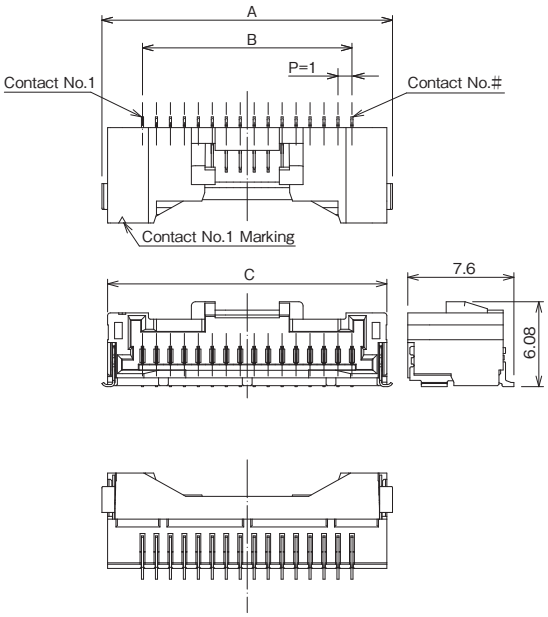
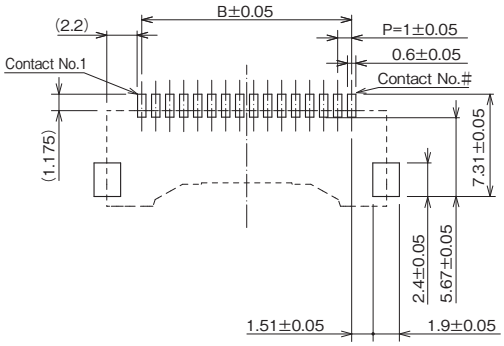
Single Row Right Angle Pin Header





●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

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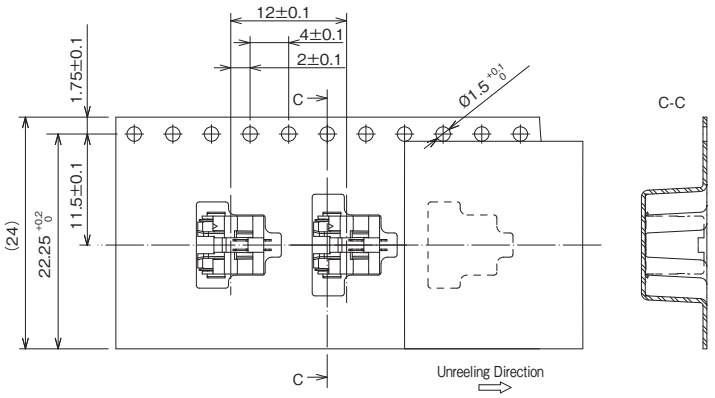
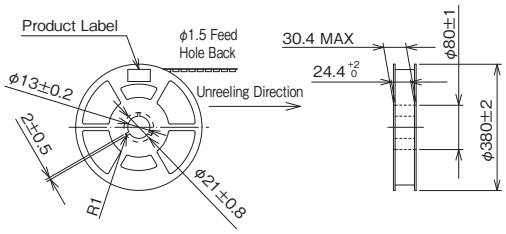
●Embossed Tape Dimensions (JIS C 0806 Compliant)

DF50A-2P-1H-DF50A-6P-1H(No. of Pos.2-6)

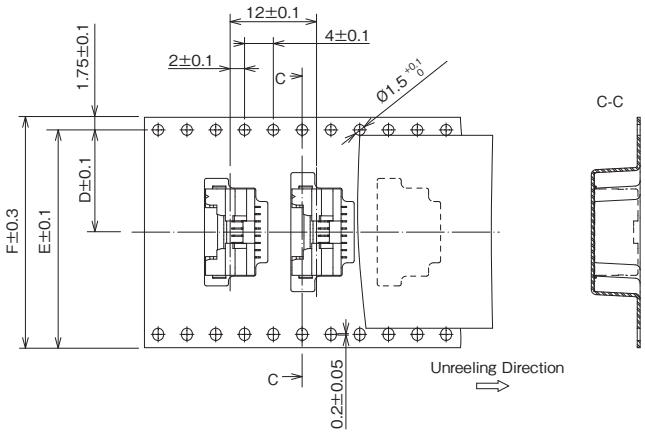


●Reel Dimensions

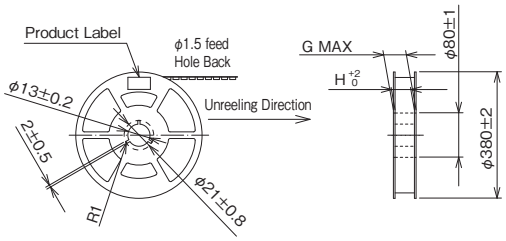


●Embossed Tape Dimensions (JIS C 0806 Compliant)

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	

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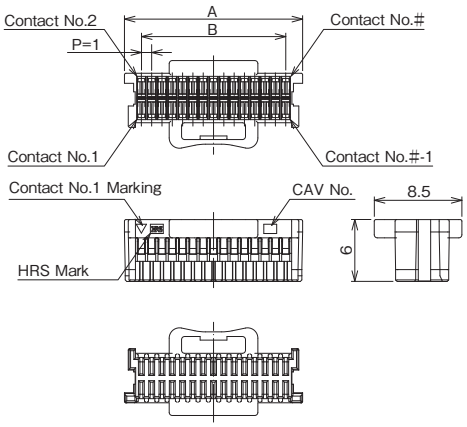
Double Row Crimp Socket



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	

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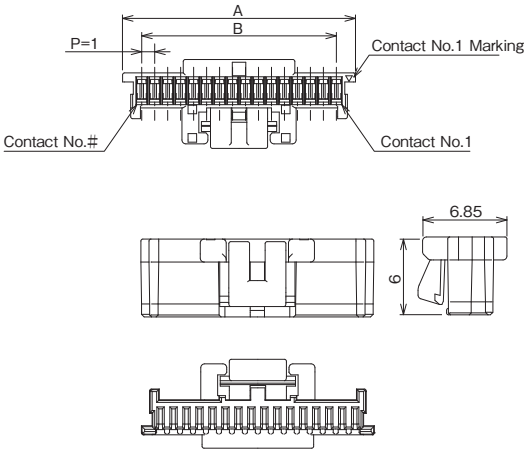
Single Row Crimp Socket



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	

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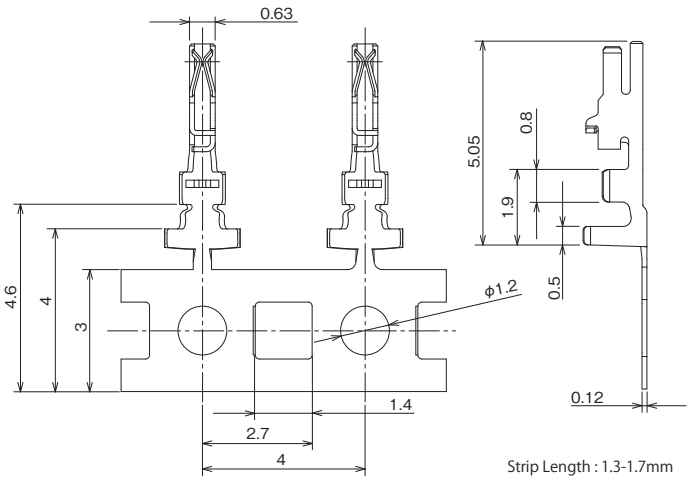
Crimp Contact



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.

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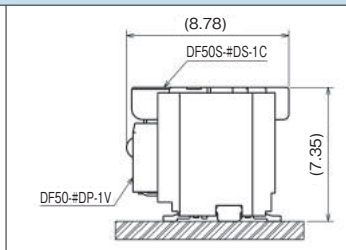
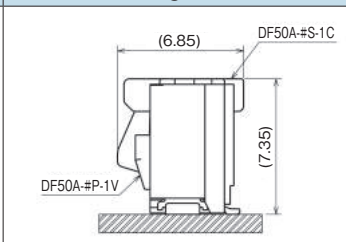
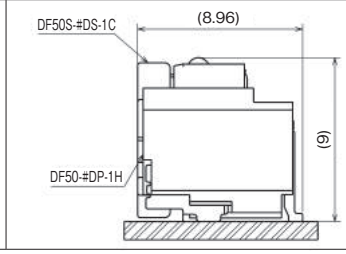
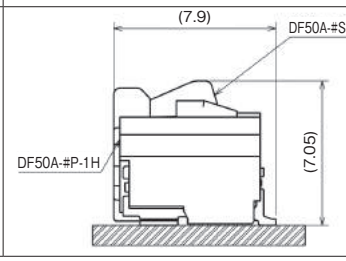
Applicable Crimping Tools

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.).
Please contact J.A.M. via the URL below regarding inquiries on the applicator or crimp defects.
(URL : http://www.jam-net.co.jp)

Mated Dimensions

	Double Row	Single Row
Vertical		
Right Angle		

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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.

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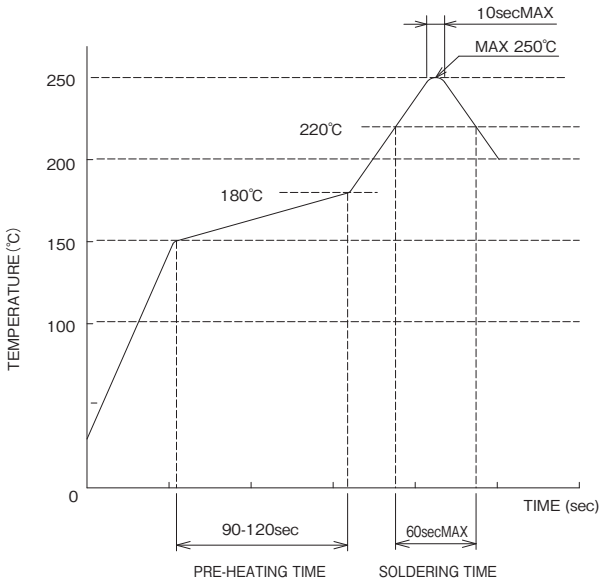
Precautions

Recommended Temperature Profile (Compatible with Lead-Free Soldering)	 [Conditions] 1. Peak Temperature : 250℃ 2. Heating : 220℃ min. for 60 sec. max. 3. Preheating : 150 to 180℃, 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 ± 10℃ , 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

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While Taking into Consideration

Specifications mentioned in this catalog are reference values.
When considering to order or use this product, please review 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, the warranty of the product may be affected.
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.

HIROSE

HIROSE ELECTRIC CO.,LTD. 2-6-3,Nakagawa Chuoh,Tsuzuki-Ku,Yokohama-Shi 224-8540,JAPAN
https://www.hirose.com

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