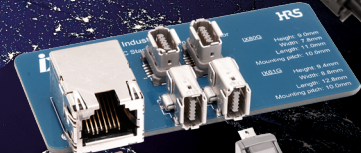


CONNECTING THE FUTURE

THE CONNECTOR SELECTOR 2022 / 2023

HRS® HIROSE
ELECTRIC
EUROPE B.V.



About HIROSE

HRS MANAGEMENT PRINCIPLES

Hirose will connect wisdom by thinking small, create new value, and contribute to the development of a global society.

"The principle of 'being small'" represents our aspiration that we should always consider ourselves small and remain a company with great potential. On the other hand, "connecting wisdom" represents our desire to absorb external knowledge and wisdom with honesty and humility, translate them into excellent original products by connecting them with our own internal knowledge and wisdom, and then provide such products to the world. In this way, we intend to produce even greater results as a means of realizing the aspiration described above.

With these basic principles, we aim to develop, manufacture, and distribute excellent connectors that can, with their "connecting" function, bring different parts and products—which are themselves crystallizations of people's wisdom—together, produce various new products, and contribute to the development of a global society.

GLOBAL NETWORK

Aiming to be a global connectors brand that is needed and trusted in the international market.

Our overseas business began in 1967, when we signed our first distribution agreement with overseas agency. We have steadily expanded our sphere of business since then, and now operate a sales network that links four main regions: Japan, Asia, America, and Europe, in addition to moving forward with the development of overseas production centers, so that we are able to meet international demand for connectors. We will continue to actively globalize our R&D function and strive to expand our world market share as a global brand.

JAPAN



TOHOKU
HIROSE
ELECTRIC
CO., LTD.



GOTANDA
OFFICE



ICHINOSEKI
HIROSE
ELECTRIC
CO., LTD.



KIKUNA
OFFICE



KORIYAMA
HIROSE
ELECTRIC
CO., LTD.



HEAD
QUARTERS



CORPORATE INFORMATION

CORPORATE DATA

Exchange rate: EUR 1.00 = JPY 128

NAME	HIROSE ELECTRIC CO., LTD.
FOUNDED	August 15, 1937
PAID-UP CAPITAL	735 M€ (9,404,000,000 yen) (listed on the first section of the Tokyo Stock Exchange)
SALES	1,278 M€ (163,670,000,000 yen) (for the year ended March 31, 2022/Consolidation)
OPERATING PROFIT	318.5 M€ (40,765,000,000 yen) (for the year ended March 31, 2022/Consolidation)
NUMBER OF EMPLOYEES	5,070 (for the year ended March 31, 2022/Consolidation)
BUSINESS ITEMS	The manufacture and sale of a wide variety of high-performance connectors for applications which include computers, peripheral equipment, terminal equipment, mobile/wired/wireless communications equipment, office automation equipment, consumer equipment, control equipment, and automotive uses.

HIROSE EUROPE

Hirose Electric Europe B.V., the European division of Hirose Electric Co., Ltd, has expanded its European network by increasing the number of sales offices. In addition to the European Headquarters based in The Netherlands, six more offices are now present; three are in Germany and the remainder are in the UK, France and Italy to provide a higher level of local customer service.

EUROPE



THE NETHERLANDS
(Amsterdam)
HIROSE ELECTRIC EUROPE B.V.
European Headquarters



GERMANY
(Hanover)
HIROSE ELECTRIC EUROPE B.V.
Hanover office



UNITED KINGDOM
(Milton Keynes)
HIROSE ELECTRIC EUROPE B.V.
UK branch



GERMANY
(Nuremberg)
HIROSE ELECTRIC EUROPE B.V.
Nuremberg office



FRANCE
(Paris)
HIROSE ELECTRIC EUROPE B.V.
Paris office



GERMANY
(Stuttgart)
HIROSE ELECTRIC EUROPE B.V.
German branch



ITALY
(Milan)
HIROSE ELECTRIC EUROPE B.V.
Milan office

About HIROSE

Becoming a corporate group that contributes to realize an affluent society.

By connecting wisdom and producing high value-added products.

Greetings.

Ever since it first began developing industry-leading original connectors with its own technologies, Hirose Electric has established its position in growing trust and recognition as a specialized manufacturer of connectors. Today, we are accelerating our efforts to further expand our global business. We also express our deep gratitude that we would not be where we are today without the kind support of our customers and business partners.

The entire Hirose Electric Group has a basic philosophy “a small company connecting wisdom.” This philosophy encapsulates our wish to produce original products by seeking outside knowledge with an honest and humble attitude, and then linking this vast store of available knowledge and wisdom with the ones we have cultivated on our own. It further puts our wish to be a company that continuously takes a leap toward tomorrow by using the closeness of communication, impetus, and efficiency that are advantages of small companies.

Our slogan “Creative Links to World Electronics” is also rooted in this philosophy.

TOP COMPANY MESSAGE

President
Kazunori Ishii



Looking forward, we believe the electronics field will see the continuing materialization of new functions and services. They will come not only from technical progress along traditional and conventional lines but also the mutual integration of new domains and different fields. And we feel strongly that the hardware to support them will, more than ever before, require the development of innovative connectors based on new concepts and technologies.

Hirose Electric has developed and supplied products that meet market demand by applying its marketing and innovative prowess. As we respond to changing times and markets, we will take on whatever challenges are necessary to satisfy our customers with always forward-looking product development and realize an affluent society through electronics products.

Our efforts here give us every confidence that we can look forward to the loyal support and patronage of our customers in the years to come.

A handwritten signature in black ink, reading 'Kazunori Ishii' in a cursive script.

About HIROSE

PRODUCT INTRODUCTION



HIROSE Electric is a world-class Japanese manufacturer of high quality connectors that are sold across all global markets in the electronics industry.

Since the establishment of Hirose in 1937, an excellent reputation has been built through the production of technically advanced connectors that incorporate the latest cutting-edge technology.

As a result, the functions and performance of Hirose connectors are more diversified and sophisticated to satisfy the growing demand for smaller, highly innovative connectors that provide superior connectivity. Such innovations include; enhanced locking mechanisms, ultra low height profiles, high retention forces, user friendly

assembly, high speed transmission, high contact reliability and many others. Hirose complies with ISO9001, ISO14001, IATF16949, ISO/IEC17025.

A wide product portfolio of over 50,000 connectors variations are available.

These include wire-to-board, board-to-board, circular, memory, interface, FFC/FPC, coaxial connectors and others, which are suitable for a wide range of applications such as; factory automation, industrial machinery, automotive, LED lighting, broadcasting, measurement & control, security devices, instrumentation, consumer electronics, automotive, telecom/datcom, computing & many more.



To find out more about Hirose products, please contact Hirose:

eu.info.3d@hirose-gl.com
www.hirose.com/eu

Left: BH12 Series, 20 A, Compact, Waterproof, Signal and Hybrid Connector for charging or providing a power connection for applications such as E-Bike, Electric Wheelchairs and AGV

Center: ix Industrial™ Series, compact and robust I/O connector for high-speed applications up to 10 Gbps

Right: FH67 Series, 0.5 mm pitch, 3.57 mm depth, vertical connection FPC/FFC/Shield connector. The One Action lock supports automatic assembly

Table of Contents

Automotive	P. 6
Battery storage	P. 20
Board-to-Board	P. 22
Shielded	P. 28
Hybrid	P. 30
Circular	P. 32
Coaxial	P. 36
Microwave	P. 36
75 Ω system	P. 38
Ultra Miniature	P. 40
RF Coaxial Switch	P. 42
Non-Magnetic	P. 43
FFC/FPC	P. 44
High speed	P. 50
I/O (Data transmission)	P. 52
Memory	P. 56
Modular - RJ45	P. 58
Power	P. 62
Rack & Panel	P. 66
Robotic	P. 68
Wire-to-Board	P. 74
Discrete	P. 74
Micro Coax	P. 82
Wire-to-Wire	P. 84
In-line	P. 84
Optical	P. 88
Appendix: Glow Wire Compliant Products List / FunctionMAX / EnerBee / SignalBee / SnapBee / IX / CX / Zero Screw / One Action / FL CoaxBridge / Applications / Board-to-Board and FFC/FPC Connector Variation Chart / AWG Chart / Index	P. 89
Distributors	P. 124 - 127

1. The characteristics and the specifications contained within this catalogue are for reference purposes. Please refer to the latest drawings prior to use.
Hirose Electric Europe B.V. do not accept any liability for misprints, errors or omissions in any part of this catalogue.
2. Please contact our Hirose representative if non-automotive connectors will be considered for use in automotive applications.
3. Please contact HRS for more information of availability/EOL.

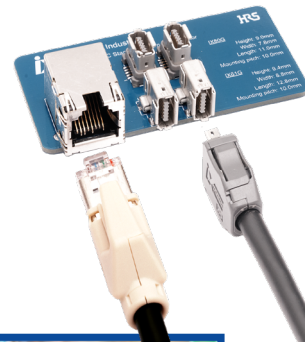


ix Industrial™ Ethernet connector

Ethernet communication between electronic equipment has increased with the “Industry 4.0” trend of automation and data exchange in manufacturing technologies. This brings efficiency of manufacturing with ICT (Information & Communications Technology). The ix Industrial™ connector features a small robust design for use in industrial environments. The high-speed transmission design contributes to equipment evolution and smart manufacturing applications.

The standard interface is compliant with IEC 61076-3-124. It can be widely used as a next generation standard connector.

- Compact: 75% smaller in size than a RJ45
- Robust: 5000 mating cycles
- High-speed: Ethernet 1 Gbps/10 Gbps
- High EMC resistance
- Complies with IEC 61076-3-124



SINBON *ix Industrial cables*

Buy online at the SINBON ix Industrial web shop <https://shop.sinbon.com/>
SINBON is the official partner for ix Industrial™ cable assemblies in Europe



Features

Compact

Reduces installation space by 75% compared to conventional RJ45 solutions, enables high design flexibility.

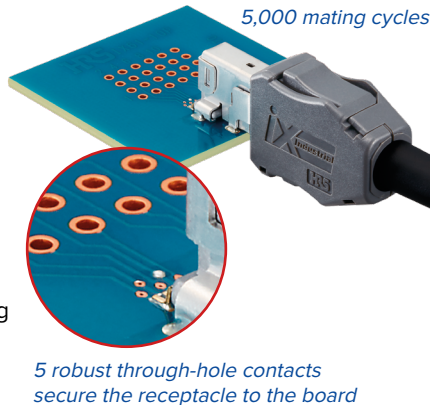
Keying variations:

- Type A, bottom left
- Type B, top left



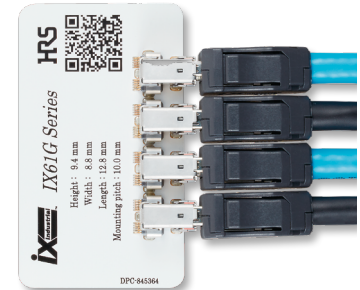
Robust

HRS's unique shell design offers maximum stability on the PCB, increases locking strength and provides durable cable connection of the plug. The robust structure also supports strong resistance to vibration and shock. 5,000 mating cycles can be achieved.



High EMC Resistance

Optimized shielding design guarantees high EMC resistance to secure safe data transmission. The receptacles enable parallel 10 mm pitch mounting, ideal for daisy-chaining applications. Contributes to unit size reduction.



High Data Rate Transmission

Cat.5e (1 Gbps) and Cat.6a (10 Gbps) high-speed Ethernet performance.



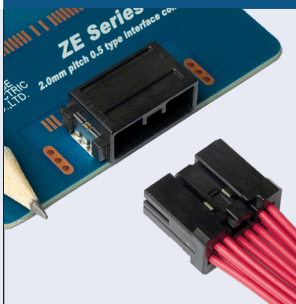
Simplified Tooling

The dedicated handtool is user-friendly. There are two slots to easily crimp the cable clamp and terminate the IDC contacts to reduce assembly time.



Automotive

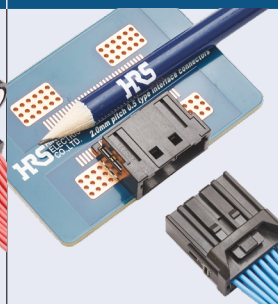
ZE05



ZE064W



ZH05

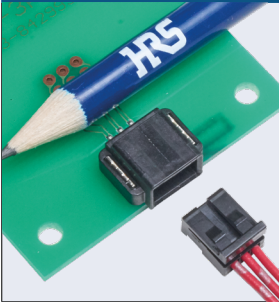
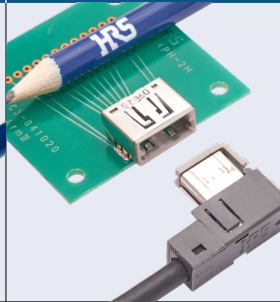
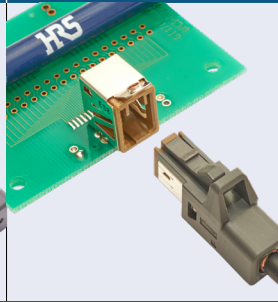
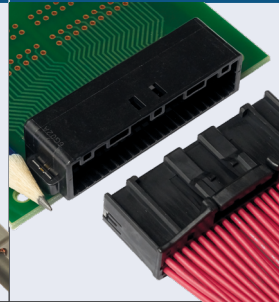


GT50



* Please contact HRS if a specific number of contacts is required
 ** Please contact HRS for detailed current rating specification
 *** Includes temperature rise caused by current flow

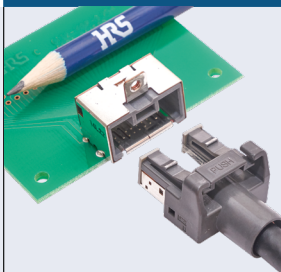
Contact pitch [mm]	2.0	2.2	2.0	1.0
Height [mm] / Depth [mm]	8.84 / 14.8 (Header - Horizontal)	25.5 / 26.7 Contact tab size: 0.5 size	9.8 / 18	5.97 / 10.5
Rated Current [A] **	5 (Mono-pole power supply) 2 (Full power supply)	5 (Mono-pole power supply) 2 (Full power supply)	2	2 (2, 4 contacts) 1.5 (6, 8, 12, 16 contacts)
Rated Voltage [V]	AC/DC 60	AC/DC 60	AC/DC 60	AC/DC 60
Operating temperature range [°C]***	-40 to +125	-40 to +125	-40 to +125	-40 to +125
Number of contacts	2, 4, 5 (1 Row) 8, 12, 16, 20, 24 (2 Rows)*	8, 14, 24	12, 16, 20, 24*	2, 4, 6, 8, 12, 16*
Mating cycles	30	30	30	10
Termination AWG	20 - 22 24 - 26 (Under development)	20 - 22	22 - 24	28
Contact plating specification	Tin	Tin	Tin	Gold
Remarks	High vibration resistance, Space saving design, Single or double row version option, Vertical version available, Compliant with LV-214 / USCAR, Mechanical coding available, ZE05 Hybrid 26/2 available	High vibration resistance, IP69K waterproof rating, Can be used in combination with ZE05, Space saving design, Mechanical coding available	High vibration resistance, High contact reliability, Finger protection design for high current application, Shock resistant design	Space saving, High vibration resistance, Low profile

GT8E	GT17	GT17H	GT17HN	GT25H2
				
2.0	2.0	2.0	2.0	2.2
7 / 12.85 (1 row) 9.83 / 14.85 (2 rows)	15.7 / 16.5	7.2 / 14.75	13.3 / 14.75	13/ 16.35
1	3	1	1	3
AC /DC 250	AC 250	AC 250	AC 250	AC 250
-40 to +105	-40 to +105	-40 to +105	-40 to +105	-40 to +105
2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24	6, 8, 10	4	4	4, 8, 12, 16, 20, 24, 32, 40
30	30	30	30	30
20 - 22 / 24 - 28	20 - 24 / 24 - 28 / 30	24 - 28	24 - 28	20 - 24 / 24 - 28
Gold, Tin	Tin	Tin	Tin	Tin
High contact reliability, in-line plug version option, SMT compatible	High-speed transmission, Supports USB, LVDS, Ethernet	Low profile, Keying options, High-speed transmission	Space saving design, Keying options, High-speed transmission	Space saving design, Horizontal and vertical version available, Low profile, SMT compatible

Automotive

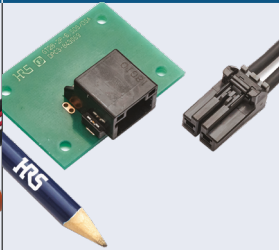
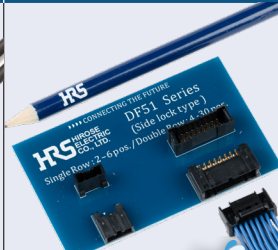
GT32

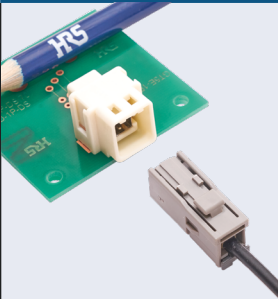
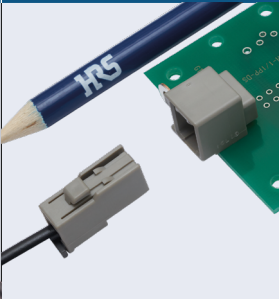
GT32F

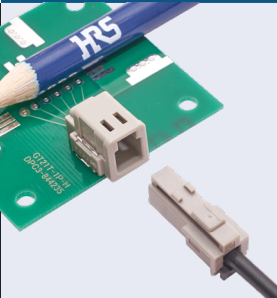
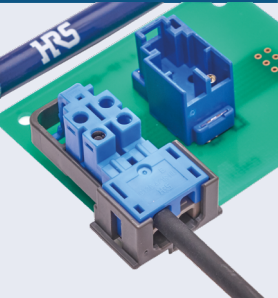
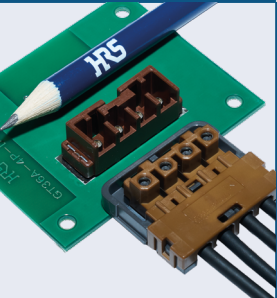


* Please contact HRS if a specific number of contacts is required
 ** Please contact HRS for detailed current rating specification
 *** Includes temperature rise caused by current flow

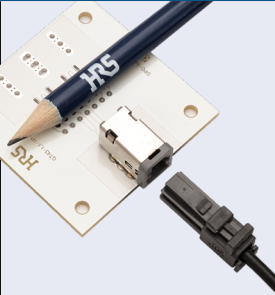
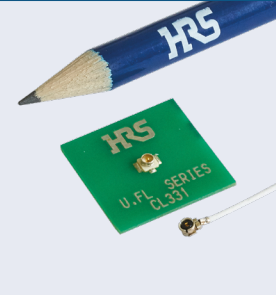
Contact pitch [mm]	1.5	1.5
Height [mm] / Depth [mm]	11.2 / 16.23 (4 contacts) 12.73 / 12.32 (19 contacts)	-
Rated Current [A] **	1	1
Rated Voltage [V]	AC 30	AC 30
Operating temperature range [°C]***	-40 to +105	-40 to +105
Number of contacts	4, 10, 19	4
Mating cycles	30	30
Termination AWG	24 - 28	24 - 28
Contact plating specification	Tin	Tin
Remarks	Pin-in-paste reflow method, Highly reliable 2-point contacts, Panel mounting screw option, Space saving design, Keying options, High-speed transmission	High-speed transmission 3 Gbps, Enhanced shielding, Robust lock

Automotive	HVH-280 (waterproof)	HVH-280 (non waterproof)	DF51
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow			
Contact pitch [mm]	9.5	6.5	2.0
Height [mm] / Depth [mm]	12.7 / 20.9	24.25 / 36.4	4.5 / 14.75 (1 row) 7.3 / 14.8 (2 rows)
Rated Current [A] **	30	30	2.5 3 (2 contact)
Rated Voltage [V]	AC/DC 600	AC/DC 600	AC/DC 250
Operating temperature range [°C]***	-40 to +125	-40 to +125	-55 to +105
Number of contacts	2 (Power) 2 (Signal)	2, 3	2 - 6 (1 row) 4 - 30 (2 rows)
Mating cycles	30	30	Tin plating: 30 Gold plating: 50
PCB orientation	-	-	-
Contact plating specification	Tin	Tin	Gold, Tin
Remarks	Connector position assurance, High voltage inter lock, IPX9K waterproof rating	Non-waterproof version	In-line version option, Right angle version option, Straight version option, Only au plating is applicable to Automotive

Automotive	GT5	GT13	GT16C/F	GT16G
Automotive * Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
V.S.W.R frequency range	1.5 or less (DC to 2 GHz)	1.5 or less (DC to 1 GHz)	1.5 or less (DC to 3 GHz)	1.5 or less (DC to 6 GHz)
Rated Current [A]	1	1 (Signal)** 3 (Power)**	1	1
Rated Voltage [V]	AC 250	AC 250	AC 250	AC 250
Operating Temperature range [°C]	-30 to +105	-30 to +105	-30 to +105	-30 to +105
Height [mm] / Depth [mm]	13.8 / 25 14.8 / 30	12.7 / 15.3	12.2 / 15.6	14 / 16.6
Number of contacts	1, 2, 3, 4	1, 2, 3, 4, 5	1, 2	1
Mating cycles	30	30	30	30
Termination AWG / Applicable cable	20 - 22 / 24 - 28 / 30	20 - 22 / 24 - 28 / 30	24 - 30	24 - 28
Contact plating specification	Tin	Tin	Tin	Tin
Remarks	Contact and shield crimped simultaneously, Cost efficient termination	Contact and shield crimped simultaneously, Co efficient termination, Space saving design	For antenna connection, Relay, Base version	Space saving design, Water proof inline connection, Cost effective, High vibration resistance, High frequency capable

GT19	GT21	GT36	GT36S	GT36A
				
Up to 1 GHz	1.5 or less (DC to 2.5 GHz)	1.5 or less (DC to 2.5 GHz)	1.5 or less (DC to 3 GHz)	1.5 or less (DC to 5.9 GHz)
1	1 (Signal) 3 (Power)	1**	1**	1
AC 125	DC 250	AC 50	DC 50	DC 50
-30 to +105	-30 to +105	-40 to +105	-40 to +105	-40 to +105
13.1 / 35	10 / 15	16.3 / 22.1	9.9 / 16.7	12 / 27.1
1	1, 2, 3, 4	1, 2, 3, 4*	1	1, 2, 3, 4*
30	30	30	30	30
20 - 30	0.8D, 1.5C, 1.5D, RG174, RG58LL + others	20 - 22	24 - 28	24 - 28
Tin	Tin	Tin	Tin	Tin
Cost efficient termination, Space saving design (GT19S)	Contact and shield crimped simultaneously, Cost efficient termination, Space saving design, High frequency capable, Wide variation	Clear tactile click, High vibration resistance, *Contact numbers 1 to 3 is available by de-embedding	For antenna connection, Board version, RoHS compliant, Compact and space saving design, Contact and shield crimped simultaneously, High speed transmission up to 3GHz	Low profile, Keying options, *Contact numbers 1 to 3 is available by de-embedding, Wide variation

Automotive

Automotive		GT43	U.FL
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow			
V.S.W.R frequency range		1.5 or less (DC to 3 GHz)	1.3 or less (DC to 8 GHz)
Rated Current [A]		1	-
Rated Voltage [V]		DC 50	-
Operating Temperature range [°C]		-40 to +105	-40 to +105
Height [mm] / Depth [mm]		10.6 / 18.3	1.9 - 2.4 / 3.1
Number of contacts		1	1
Mating cycles		30	30
Termination AWG / Applicable cable		24 - 28	30 - 36
Contact plating specification		Tin	Gold
Remarks		Low profile, Keying options, Contact and shield crimped simultaneously, Low noise	Standard connector for W-LAN, Only available as a cable assembly, Cable dia: Ø 0.81, Ø 0.95, Ø 1.13, Ø 1.32, Ø 1.37 mm

Automotive

FX20

FX23

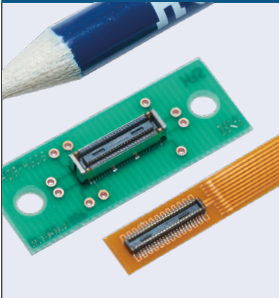
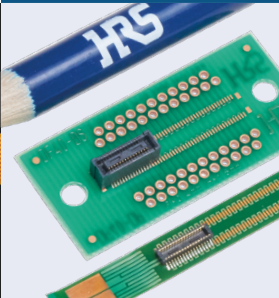
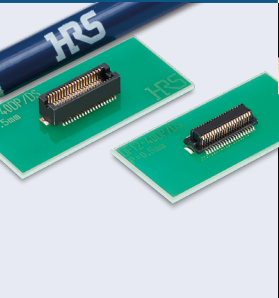
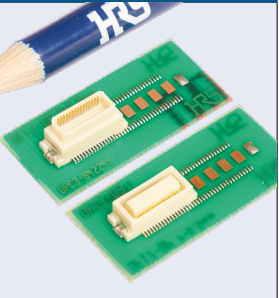
FX23L

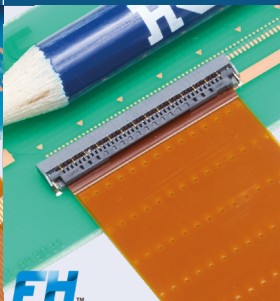
FX26

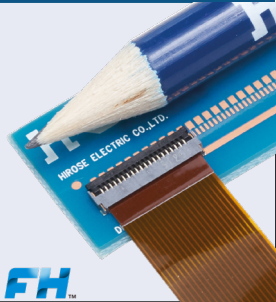
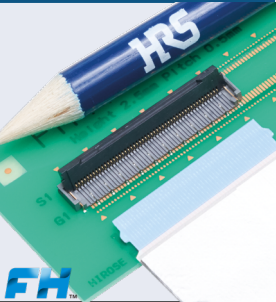
* Please contact HRS if a specific number of contacts is required
 ** Please contact HRS for detailed current rating specification
 *** Includes temperature rise caused by current flow



Contact pitch [mm]	0.5	0.5	0.5	1.0
Stacking Height [mm] (Parallel)	15, 20, 25, 30	15, 20, 25, 30	8, 10, 12	15, 18, 20, 23, 25
Rated Current [A] **	0.5	0.5 (Signal) 3.0 (Power)	0.5 (Signal) 3.0 (Power)	0.5
Rated Voltage [V]	AC 50	AC 50 (Signal) AC 200 (Power)	AC 50 (Signal) AC 200 (Power)	AC/DC 125
Operating temperature range [°C]***	-55 to +85	-55 to +105	-55 to +105	-40 to +140
Number of contacts	20, 40, 60, 80, 100, 120, 140	20, 40, 60, 80, 100, 120 (Signal) 4 (Power)	20, 40, 60, 80, 100, 120 (Signal) 4 (Power)	20, 30, 40, 50, 60*
Mating cycles	50	100	100	10
PCB orientation	Parallel, right angle	Parallel, right angle	Parallel, right angle	Parallel
Contact plating specification	Gold	Gold	Gold	Gold
Remarks	Highly reliable double beam contacts, Floating design, Automatic mating, self alignment, Combination use with FX18 series, Long effective mating length 1.5 mm	High-speed transmission 8 Gbps, Stacking version option, Vertical version option, Floating design	High-speed transmission 8 Gbps, Floating design, Low profile design	Floating design with ± 0.7 mm range in X and Y directions, High vibration resistance, High contact reliability, Supports powertrain applications.

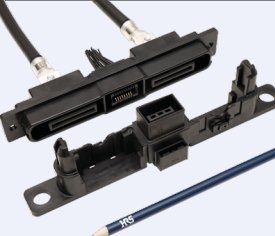
DF40GT	DF40T	DF12N	DF17
			
0.4	0.4	0.5	0.5
1,5	1,5, 2,5, 3,0, 3,5, 4,0	3,0, 3,5, 4,0, 5,0	4,0 - 8,0
0.3	0.3	0.3	0.3
AC 30	AC/DC 30	AC 50	AC 50
-55 to +125	-55 to +125	-55 to +125 (105°C in Automotive Vibration Environment)	-35 to +85
10	10, 20, 30, 34, 40, 50	10, 14, 20, 30, 32, 36, 40, 50, 60, 80	20, 26, 30, 40, 50, 60, 70, 80
30	10	50	50
Parallel	Parallel	Parallel	Parallel
Gold	Gold	Gold	Gold
Supports PCI express 4.0, 16 Gbps, Shielded, Space saving, depth 3.68 mm	High-speed transmission 10 Gbps, Supports USB 3.1 Gen. 2	Alignment guide post options, Metal fitting options for strong board retention	Shock resistant design, Metal fitting options for strong board retention

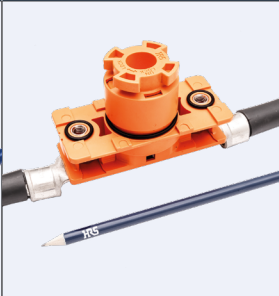
Automotive	FH35C	FH55/M	FH52K	FH28K
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]	0.3	0.4, 0.5	0.5	0.5
Height [mm] / Depth [mm]	0.9 / 3.2	1.5 / 4	2.0 / 5.7	2.55 / 6.5
Contact position	Top / Bottom	Bottom	Bottom	Bottom
Rated Current [A] **	0.2	0.4 (0.4 pitch) 0.5 (0.5 pitch)	0.5	0.5
Rated Voltage [V]	AC/DC 30	AC/DC 40, 50	AC/DC 50	AC/DC 50
Operating temperature range [°C]***	-55 to +85	-55 to +85	-40 to +125	-40 to +125
Number of contacts	9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 45, 49, 51, 55, 61	10, 22 (FH55), 31, 40	6, 8, 10, 12, 15, 18, 20, 22, 24, 25, 26, 30, 32, 34, 40, 45, 50, 60, 68, 80	10, 15, 20, 28, 30, 40, 45, 50, 55, 60, 64, 68, 74, 80
Mating cycles	10	20	20	20
Contact plating specification	Gold	Gold	Gold	Gold
FFC/FPC thickness [mm]	0.2	0.3±0.03	0.3±0.05	0.3±0.05
Remarks	Shares same land pattern as FH26, Halogen-free (IEC61249-2-21)	High-speed transmission 5 Gbps+, Supports USB 3.0, Serial ATA Gen. 3, HDMI 1.4a, Display port 1.3, Halogen-free (IEC61249-2-21)	Long metal fittings for strong board retention, RoHS compliant, Compliant with severe automotive requirements, Halogen-free (IEC61249-2-21)	Robust design, PCB patterning space underneath, Enhanced FPC/FFC retention force

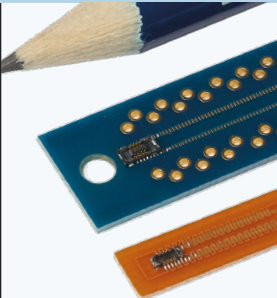
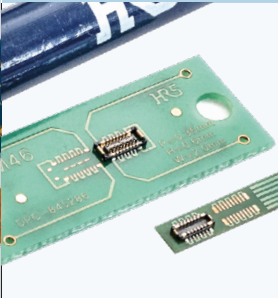
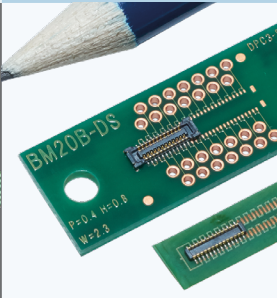
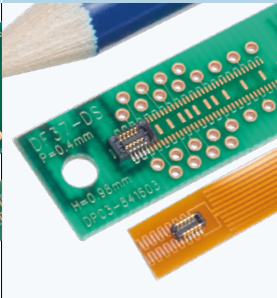
FH34	FH40	FH41	FH48	FH63S
				
0.5	0.5	0.5	0.5	0.5
1.0 / 3.2	5.8 / 3.55	2.5 / 6.20	6.18 / 4.70	2.8 / 5.15
Top/Bottom	Bottom	Bottom	Bottom	Bottom
0.5	0.5	0.5	0.5	0.5
AC/DC 50	AC/DC 50	AC/DC 50	AC/DC 50	AC/DC 50
-55 to +105	-40 to +105	-40 to +105	-40 to +85	-55 to +125
4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 30, 32, 34, 40, 45, 50	10, 20, 24, 30, 40, 45, 50, 60, 64, 80	15, 20, 28, 30, 31, 40, 50, 60, 68	20, 21, 30, 31, 40, 50, 68	10, 20, 30, 40, 50
20	20	20	20	10
Gold	Gold	Gold (Signal contact) Tin (Shielded / Ground contact)	Gold (Signal contact) Tin (Shielded / Ground contact)	Gold (Signal contact) Tin (Shielded / Ground contact)
0.3±0.03	0.3	0.3±0.03	0.3±0.05	0.3±0.05
Back flip lock, Halogen-free (IEC61249-2-21)	Robust design, Easy FPC Insertion, Halogen-free (IEC61249-2-21)	Supports next generation chip V-by-One HS by Thine, High-speed 3.75 Gbps, EMI Shielded, Can use same FFC as FH48, Halogen-free (IEC61249-2-21)	Supports next generation chip V-by-One HS by Thine, High-speed transmission, EMI Shielded, Can use same FFC as FH41, Halogen-free (IEC61249-2-21)	High operability one action lock for robot assembly, Compliant with severe automotive requirements, Supports USB 3.0, Embedded Display Port 1.3, HDMI 1.4a, V-by-One HS, Halogen-free Bottom contact, Halogen-free (IEC61249-2-21)

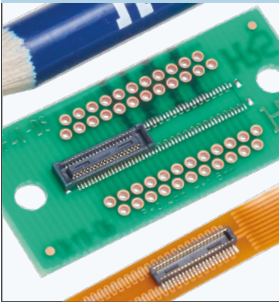
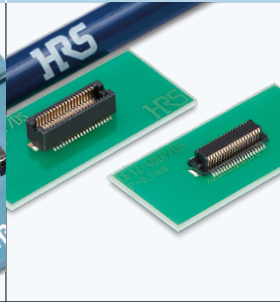
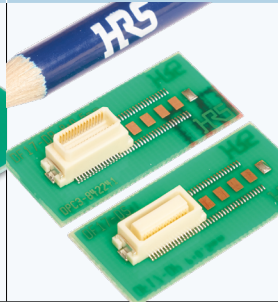
Automotive

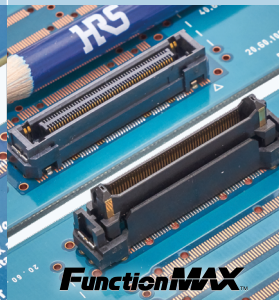
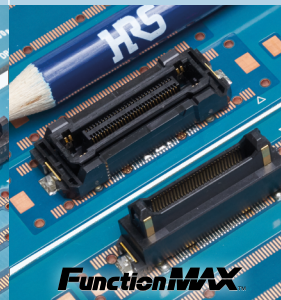
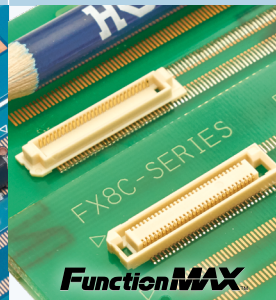
Automotive	FH65	FH67	FH69	FH75
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]	0.5	0.5	0.5	0.5
Height [mm] / Depth [mm]	1.2 / 3.57	5.2 / 3.57	2.3 / 8.68	2.0 / 5.7
Contact position	Bottom	Bottom	Top / Bottom	Bottom
Rated Current [A] **	0.5	0.5	0.5	0.5
Rated Voltage [V]	AC/DC 50	AC/DC 50	AC/DC 50	AC/DC 50
Operating temperature range [°C]***	-40 to +125	-55 to +125	-40 to +125	-40 to +125
Number of contacts	8, 10, 12, 15, 34	10, 20, 30, 40, 50	60	40, 60
Mating cycles	20	10	10	20
Contact plating specification	Gold	Gold (Signal contact) Tin (Shielded / Ground contact)	Gold	Gold
FFC/FPC thickness [mm]	0.3±0.05	0.3±0.05	0.3±0.05	0.3±0.05
Remarks	Ultra low profile, Compliant with severe automotive requirements, Halogen-free (IEC61249-2-21)	High operability for robot assembly, 105°C heat resistant, FPC/FFC/Shielded FFC Connector, Halogen-free	Back flip lock, Independent 2-point contact, Highly reliable contact resistant to dust intrusion, shock and vibration	Highly reliable 2-point contacts, High FPC retention force

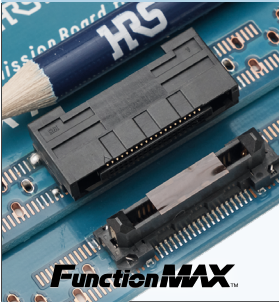
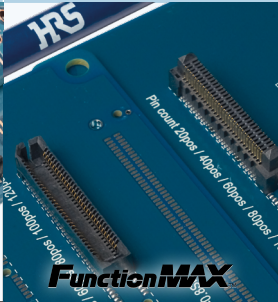
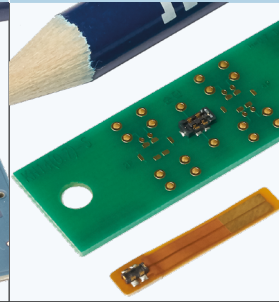
Battery storage	Battery	DF60	MQ221	PS3F	EM12M
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow 				
	Rated Current [A]**	65	105 (Power) 1 (Signal)	125 (Power) 1 (Signal)	130
	Rated Voltage [V]	AC/DC 1000	AC/DC 600 (Power) AC/DC 200 (Signal)	AC/DC 1000 (Power) AC/DC 250 (Signal)	AC/DC 1000
	Operating temperature range [°C]***	-55 to +105	-40 to +105	-40 to +105	-25 to +105
	Termination AWG	8 - 12	2, 4, 8 (Power) 22 - 30 (Signal)	3 (Power) 20 - 22 (Signal)	2 - 6
	Locking mechanism	Latch	No	No	Latch
	Mating cycles	30	100	100 (Power) 30 (Signal)	30
	Contact plating specification	Gold	Gold (Signal) Silver (Power)	Gold (Signal) Silver (Power)	Silver
	Remarks	Robust lock, DF60F Finger protection version, Highly reliable 5-point contact design, Wire-to-Board version options, UL, C-UL compliant, For glow wire compliance see page 89.	Floating design to absorb mounting misalignment +/- 2 mm in XY direction, Finger protection, Long effective mating length, Contact mating sequence design	Front access plug in design, Finger protection (IP2X as per IEC60950), UL/C-UL compliant, Floating design to absorb mounting misalignment +/- 2.5 mm in XY direction	Finger protection, UL compliant

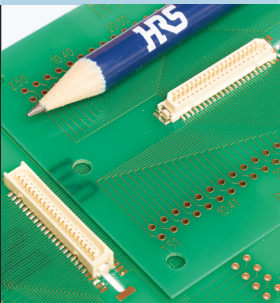
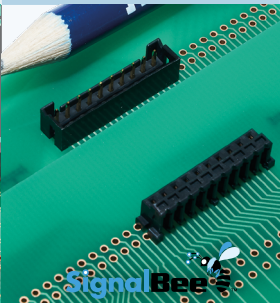
PS3C	PS3	EM30MSD	PS4
			
210 150 (UL/C-UL)	210 (Power) 150 (Power) (UL/C-UL) 1A (Signal)	200 (Power) 1 (Signal)	300
AC/DC 1000	AC/DC 1000	AC/DC 1500 (Power) AC/DC 250 (Signal)	AC/DC 600
-40 to +105	-40 to +105	-40 to +105	-40 to +105
1/0 - 5	1/0 - 5 (Power) 20 - 22 (Signal)	4/0 (Power) 28 - 22 (Signal)	Bus bar connection
Latch	No	Bayonet	No
100	100 (Power) 30 (Signal)	50 (Plug-Receptacle) 30 (Receptacle-GT8E's plug)	50
Silver	Gold (Signal) Silver (Power)	Tin (Signal) Silver (Power)	Silver
Space saving design, PS3CS low profile version, Finger protection (IP2X), UL, C-UL compliant	Plug-in design, Power and signal contacts, Finger protection, UL, C-UL compliant	IP68 waterproof rating, Finger protection IP2X, Anti-vibration design	Floating design to absorb mounting misalignment +/- 2 mm in XY direction

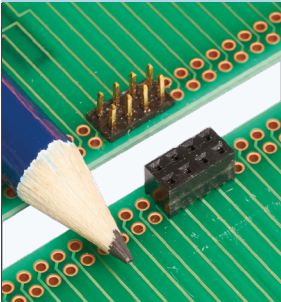
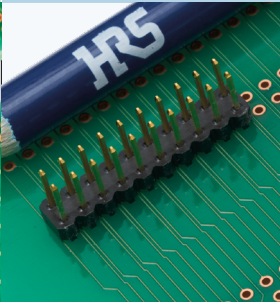
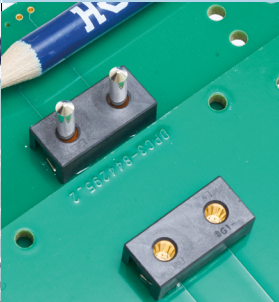
Board-to-Board		BM23FR	BM46	BM20	DF37
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow					
Contact pitch [mm]		0.35	0.35	0.4	0.4
Mated height [mm] / Depth [mm]		0.6, 0.8 / 1.98	0.6 / 2.0	0.6, 0.8 / 2.3	0.98, 1.5 / 2.6, 2.98
Rated Current [A]**		0.3	0.3	0.3	0.3
Rated Voltage [V]		AC/DC 30	AC/DC 30	AC 30	AC 30
Operating temperature range [°C]***		-55 to +85	-55 to +85	-35 to +85	-35 to +85
PCB orientation		Parallel	Parallel	Parallel	Parallel
Solder technology		SMT	SMT	SMT	SMT
Number of contacts		6, 8, 10, 12, 16, 18, 20, 24, 30, 34, 40, 50, 60	12	10, 16, 20, 24, 30, 34, 40, 50, 60	10, 16, 20, 24, 30, 34, 40, 44, 50, 60, 70
Mating cycles		10	10	10	10
Contact plating specification		Gold	Gold	Gold	Gold
Speed (Gbps) / Supporting Signal Protocol		USB 3.1 Gen. 2 (10 Gbps)	Thunderbolt 3	USB 4 Gen. 2 (10 Gbps)	-
Remarks		Highly reliable 2-point contacts, Metal fittings for strong board retention	Multi-RF Board-to-Board connector, Robust mating guide	Highly reliable 2-point contacts, Shock resistant design, Space saving design	Highly reliable 2-point contacts, Shock resistant design, Space saving design

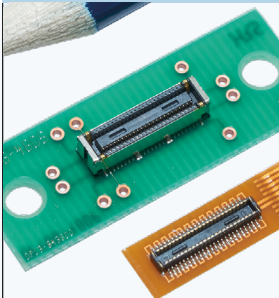
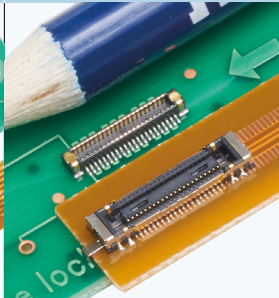
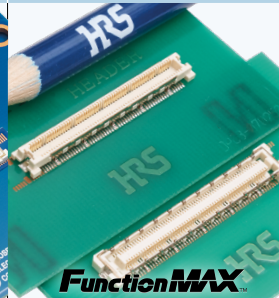
DF40	FX25	DF12N	DF17	FX20
				
0.4	0.4	0.5	0.5	0.5
1.5 - 4.0 / 3.38	7.0 / 5.4	3.0, 3.5, 4.0, 5.0 / 4.6	4.0, 5.0, 5.5, 6.0, 6.5, 7.0, 8.0 / 5.7	15, 20, 25, 30 / 9.5
0.3	0.4	0.3	0.3	0.5
AC 30	AC 50	AC 50	AC 50	AC 50
-35 to +85	-55 to +85	-55 to +125	-35 to +85	-55 to +85
Parallel	Right Angle	Parallel	Parallel	Parallel, Right Angle
SMT	SMT	SMT	SMT	SMT
10, 12, 20, 24, 30, 34, 40, 44, 50, 60, 70, 80, 90, 100, 120	80, 110*	10, 14, 20, 30, 32, 36, 40, 50, 60, 80	20, 26, 30, 40, 50, 60, 70, 80	20, 40, 60, 80, 100, 120, 140
30	10	50	50	50
Gold	Gold	Gold	Gold	Gold
USB 4 Gen. 2 (10 Gbps), High-speed transmission 5 Gbps,	2.5 Gbps	5 Gbps	-	-
Highly reliable contacts, Clear tactile click, Supports USB 2.0, USB 3.0, MIPI, SATA, PCIe	Floating design, Low profile design	Alignment guide post options, Metal fitting options for strong board retention	Shock resistant design, Metal fitting options for strong board retention	Highly reliable double beam contacts, Floating design, Long effective mating length 1.5 mm

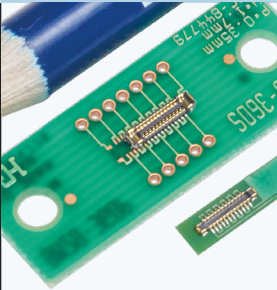
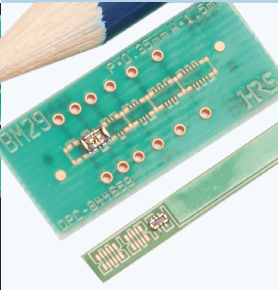
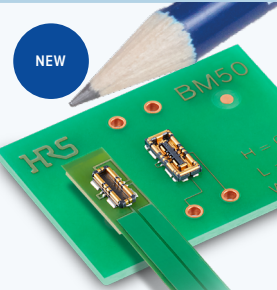
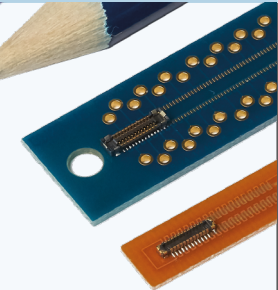
Board-to-Board	FX22	FX23	FX23L	FX8/FX8C
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]	0.5	0.5	0.5	0.6
Mated height [mm] / Depth [mm]	4.2 / 8.55	15, 20, 25, 30/8.90 9, 11, 13, 14, 19, 21, 23 (When combined with FX23L)/8.90	8, 10, 12/10.5 9, 11, 13, 14, 19, 21, 23 (When combined with FX23)/ 10.5	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 16 / 7
Rated Current [A]**	0.7	0.5 (Signal) 3.0 (Power)	0.5 (Signal) 3.0 (Power)	0.4
Rated Voltage [V]	AC 50	AC 50 (Signal) AC 200 (Power)	AC 50 (Signal) AC 200 (Power)	AC 100
Operating temperature range [°C]***	-55 to +105	-55 to +105	-55 to +105	-55 to +85
PCB orientation	Coplanar	Parallel, Right Angle	Parallel, Right Angle	Parallel
Solder technology	SMT	SMT	SMT	SMT
Number of contacts	40, 50, 60, 80	20, 40, 60, 80, 100, 120 (Signal) 4 (Power)	20, 40, 60, 80, 100, 120 (Signal) 4 (Power)	40, 60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280
Mating cycles	50	100	100	50
Contact plating specification	Gold	Gold	Gold	Gold
Speed (Gbps) / Supporting Signal Protocol		up to 8+ Gbps	up to 8+ Gbps	3.125 Gbps
Remarks	Highly reliable double beam contacts, Floating design, Long effective mating length 1.5 mm	Stacking version option, Vertical version option, Floating design	Floating design, Low profile design	Double ganged version option, Highly reliable contacts

FX18	ER8	FX27	FX26	KN14	Board-to-Board
					
0.8	0.8	0.8	1.0	1.0	
10, 15, 20, 25, 30, 35, 40, 45 / 7.8	7, 9, 10, 12 / 5.6	22 min / 8.4	15, 17, 18, 20, 23, 25 / 14.3	0.7 / 2.2	
0.5 (Signal) 3.0 (Power)	0.5	0.5	0.5	0.6 (Signal) 6.0 (Power)	
AC 100	AC 100	AC 100	AC/DC 125	AC/DC 50	
-55 to +85	-55 to +85	-55 to +105	-40 to +140	-35 to +85	
Coplanar, Parallel, Right angle	Parallel, Right angle	Parallel	Parallel	Parallel	
SMT	SMT	SMT	SMT	SMT	
40, 60, 80, 100, 120, 140, 160, 180	10, 20, 30, 40, 50, 60, 70, 80, 100, 120	40, 60, 80, 100, 120	20, 30, 40, 50, 60*	2 (Signal) 2 (Power)	
500	100	100	10	10	
Gold	Gold	Gold	Gold	Gold	
10 Gbps	10+ Gbps	PCI Express Gen. 1, 2.5 Gbps	-	-	
Multi-functional contacts, Self-alignment design	Self-alignment design	Floating design, Card edge version, Easy board-to-board height change	Floating design, High vibration resistance, High contact reliability, Supports powertrain applications	Power and signal contacts, Highly reliable 2-point contacts	

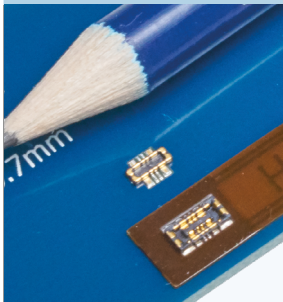
Board-to-Board		DF9	HIF6A	DF3	DF11
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow					
Contact pitch [mm]		1.0	1.27	2.0	2.0
Mated height [mm] / Depth [mm]		4.3 / 5.6	14.8 / 8	5, 6.6, 7.5 / 5, 7.2, 7.6, 8.4	7.55, 7.8, 8.2, 8.45 / 5, 8, 9.2, 10
Rated Current [A]**		0.5	0.5	3	2
Rated Voltage [V]		AC 150	AC 125	AC 250	Crimping AC 250, IDC AC 100
Operating temperature range [°C]***		-45 to +125	-55 to +85	-55 to +105	-30 to +85
PCB orientation		Parallel	Coplanar, Parallel, Right angle	Parallel / Right angle	Parallel / Right angle
Solder technology		SMT	THT	THT / SMT	THT / SMT
Number of contacts		9, 11, 13, 15, 17, 19, 21, 23, 25, 31, 41, 51	20, 26, 32, 34, 40, 50, 52, 60, 68, 80, 100	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 40
Mating cycles		Tin plating: 30 Gold plating: 100	500	Tin plating: 30 Gold plating: 50	Tin plating: 30 Gold plating: 50
Contact plating specification		Gold, Tin	Gold	Gold, Tin	Gold, Tin
Speed (Gbps) / Supporting Signal Protocol		FPDI-1	-	-	-
Remarks		Incorrect insertion prevention, Easy lock mechanism	Guides to prevent incorrect insertion	Wire-to-Board version option, In-line version option, UL, C-UL, CSA compliant	Wire-to-Board version option, In-line version option, UL and CSA compliant

A3B / A3C	A1	FX30B	IT-P	DF59S/SN	Board-to-Board
					
2.0	2.54	3.81	12	-	
5.1, 6 / 4	12.04 / 5.08	20, 25, 30 / 11, 16.6	10-66/13	1.2 / 1.7, 2.7	
1	3	25	60	3	
AC 200	AC 200	AC/DC 150, 250, 600	AC/DC 300	AC/DC 300	
-55 to +85	-55 to +85	-55 to +105	-55 to +85	-35 to +105	
Parallel / Right angle	Parallel / Right angle	Coplanar, Parallel, Right angle	Parallel	Coplanar	
THT/SMT	THT	THT	THT	SMT	
4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 40, 44, 48, 50	6, 8, 10, 12, 14, 16, 18, 20, 24, 26, 30, 34, 40, 50, 60, 64	2, 3, 4, 5	2	1	
100	500	100	100	10	
Gold	Gold	Gold	Gold, Silver	Tin	
-	-	-	-	-	
Wide variations	Board-to-Board version option using HIF3H	Offset absorption design, Long effective mating length 2 mm, Highly reliable multi-point contacts, Robust design, UL compliant	High current version, Wide misalignment tolerance design, 3-piece design for flexibility	Misalignment absorption design, Slim fit and low profile, Patented, Halogen-free	

Board-to-Board		DF40GB	DF40GL	FX10	FX11/FX11L
SHIELDED					
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow					
Contact pitch [mm]		0.4	0.4	0.5	0.5
Mated height [mm] / Depth [mm]		1.5, 3, 3.5 / 3.68	1.5 / 3.68	4 - 8 (2-piece type) / 7.3 8 - 13 (3-piece type) / 7.7	2, 2.5, 3 / 6.2
Rated Current [A]**		0.3	0.35	0.3	0.3
Rated Voltage [V]		AC 30	AC/DC 30	AC 50	AC 50
Operating temperature range [°C]***		-35 to +85	-55 to +85	-55 to +85	-55 to +85
PCB orientation		Parallel	Parallel	Parallel	Parallel
Solder technology		SMT	SMT	SMT	SMT
Number of contacts		10, 30, 48 (1.5mm height) 48, 70 (3 mm height) 36 (1.5mm height)	44	80, 96, 100, 120, 140, 144, 168 80/8, 100/10, 120/12, 140/14, 200/20	68, 72, 80, 92, 100, 116, 140, 60/6, 80/8, 100/10, 120/12
Mating cycles		30	30	50	50
Contact plating specification		Gold	Gold	Gold	Gold
Speed (Gbps) / Supporting Signal Protocol		USB 4 Gen 2. (10 Gbps)	USB 4 Gen. 2 (10 Gbps), SATA 3.0 (6 Gbps), PCI Express Gen. 2 (5 Gbps)	15+ Gbps	10+ Gbps
Remarks		EMI Shielded version	EMI Shielded version, Robust lock	EMI Shielded matched impedance version	Low profile design, Highly reliable contacts

Board-to-Board		BM28	BM29	BM50	BM23PF
Board-to-Board	HYBRID				
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]		0.35	0.35	0.35	0.35
Mated height [mm] / Depth [mm]		0.6 / 1.7	0.6 / 1.5	0.6 / 2.0	0.8 / 1.98
Rated Current [A]**		0.3 (Signal) 5 (Power)	0.3 (Signal) 3 (Power)	0.3 (Signal) 15 (Power)	0.3 (Signal) 5 (Power)
Rated Voltage [V]		AC/DC 30	AC/DC 30	AC/DC 60	AC/DC 30
Operating temperature range [°C]***		-40 to +85	-40 to +85	-55 to +85	-55 to +85
PCB orientation		Parallel	Parallel	Parallel	Parallel
Solder technology		SMT	SMT	SMT	SMT
Number of contacts		6,10,16,18,20,24,30,34,36,40,44,46,50,58,60(Signal) 2(Power)	2, 4, 6, 24 (Signal) 2 (Power)	4 (Signal) 2 (Power)	10, 14, 20, 24, 30, 40, 42, 44, 46, 50, 54, 64
Mating cycles		10	10	10	10
Contact plating specification		Gold	Gold	Gold	Gold
Speed (Gbps) / Supporting Signal Protocol		USB 4 Gen.2 (10 Gbps)	-	-	USB 3.1 Gen.2 (10 Gbps)
Remarks		Highly reliable 2-point contacts, Power and signal contacts, Halogen-free	Highly reliable 2-point contacts, Power and signal contacts, Metal fittings for strong board retention, Halogen-free	Highly reliable multi-point contacts, Wide self-alignment range, Robust design	Highly reliable 2-point contacts, Metal fittings for strong board retention, Halogen-free

BM25



0.4

0.7 / 2.6

0.3 (Signal)
10 (Power)

AC/DC 30

-40 to +85

Parallel

SMT

4 (Signal)
2 (Power)

10

Gold

USB 3.1 Gen.2 (10 Gbps)

Wide self-alignment range,
Halogen-free

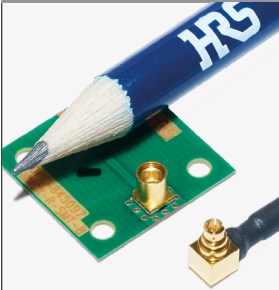
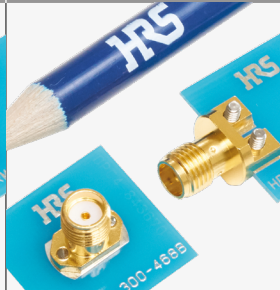
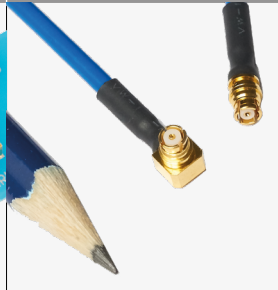
Circular	HR25/HR25A	HR10	HR10A/G	HR22
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Shell size [mm]	7, 9	7, 10, 13	7, 10, 13	12
Rated Current [A]**	1	2	2	2
Rated Voltage [V]	AC 30 / DC 42	AC 150, DC 200 (4 contacts) / AC 100, DC 140	AC 150, DC 200 (4 contacts) / AC 100, DC 140	AC 100 / DC 140
Locking mechanism	Push-pull	Push-pull	Screw or Push-pull	Screw
Termination AWG	30	26	26 - 30	24 - 28
Shell materials	Metal	Metal	Metal	Metal
Number of contacts	4, 6, 8, 12, 16, 20	4, 5, 6, 10, 12, 20	4, 5, 6, 10, 12, 20	20
Operating temperature range [°C]***	-25 to +85	-25 to +85	-25 to +85	-25 to +85
Mating cycles	1,000	1,000	1,000	100
Termination type	Solder, Crimp	Solder, Crimp	Solder, Crimp	Solder, Crimp
Contact plating specification	Gold	Gold	Silver / Gold (coaxial contact)	Gold, Silver
Remarks	High-speed transmission 100 Base TX, Small size with high density, EMI prevention design	Terminating jig available	Terminating jig available, HR10G: EMI Shielded type, HR10B, RF embedded type, Dust cap available	IP67 and IP68 waterproof rating, Compact circular connector, Non-waterproof type available

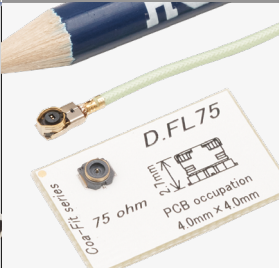
HR08D	HR30	HR34B	LF	RM
				
12	6, 7, 8	12	7, 10, 13	12, 15, 21, 24
3	5 (3 contact) 2 (6, 10, 12 contact)	5 (4 contact) 3 (10 contact)	10	10
AC 200 / DC 250	AC 30, DC 42 (10, 12 contact) AC 100, DC 140 (3, 6 contact)	AC 200, DC 250 (10 contact) AC 200, 400 / DC 200, 400 (4 contact)	AC 30, 125 / DC 42, 125, 175	AC 350, 500, 600 / DC 490, 700, 840
Bayonet	Push-pull	Bayonet	Bayonet	Screw or Bayonet
20 - 25	20 - 22 (3 contact) 26 - 30 (6, 10, 12 contact)	20 - 25	26 - 30	20 - 28
Plastic, Metal	Plastic	Plastic, Metal	Metal	Metal
2, 10	3, 6, 10, 12	4, 10	3, 4, 6, 11, 12, 20	2, 3, 4, 5, 6, 7, 8, 10, 12, 15, 20, 31
-20 to +85	-25 to +85	-25 to +125	-25 to +85	-25 to +85
500	1,000	500	1,000	2,000
Solder, Crimp	Solder, Crimp	Solder, Crimp	Solder, Crimp	Solder, Crimp
Gold	Gold	Gold, Silver	Gold	Silver
IP67 and IP68 waterproof rating, Oil-proof, Multi-directional cable exit, Automatic locking (one-step mating)	IP67 and IP68 waterproof rating, Polarized and mating mark, Lightweight and small size, Caps available	IP67 and IP68 waterproof rating, Oil-proof, Multi-directional cable exit, Automatic locking (one-step mating)	IP67 and IP68 waterproof rating, EMI Shielded, Receptacle caps available	Waterproof options (RM-W series), Receptacle and plug caps available

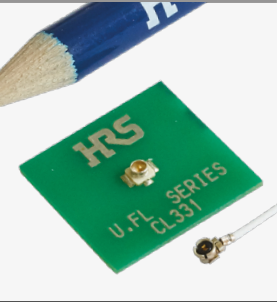
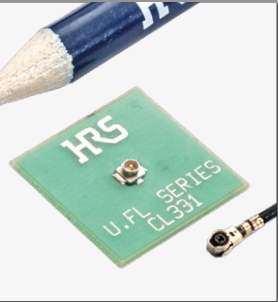
Circular		RM-W	HR41A	HR41	JR
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Shell size [mm]		15, 21, 24	17	25	13, 16, 21, 25
Rated Current [A]**		10	13	38 (Ambient temperature 25°C) 20 (4 contacts with ground removed)	30
Rated Voltage [V]		AC 350, 500, 600 / DC 490, 700, 840	AC/DC 1000	AC/DC 1000	AC 250, 1000 / DC 350, 1400
Locking mechanism		Screw	Bayonet	Bayonet	Screw or Bayonet
Termination AWG		10	16 - 20	10 - 18	16 - 28
Shell materials		Metal	Plastic	Plastic	Metal
Number of contacts		2, 3, 4, 8, 10, 12, 15, 20, 31	3, 5	3, 5	3, 4, 5, 7, 10, 14, 16, 24, 26
Operating temperature range [°C]***		-25 to +85	-40 to +105	-40 to +105	-25 to +85
Mating cycles		2,000	500	200	500
Termination type		Solder	Crimp	Crimp	Solder, Crimp
Contact plating specification		Gold, Silver	Gold, Silver	Gold	Silver
Remarks		IP68 waterproof rating, Multi-directional cable exit	IP67 and IP68 waterproof, Lightning surge protection, Sequential mating, hot swapping (UL1977), Water resistant caps available, UL compliant	IP67 and IP68 waterproof rating, Lightning surge protection, Easy field assembly and mating marks, Sequential mating, hot swapping (UL1977) UL compliant	JIS C 5432 compliant, Threaded receptacle cap available

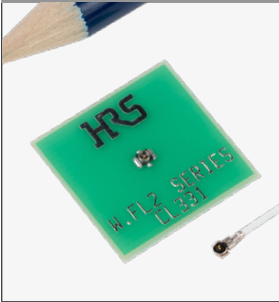
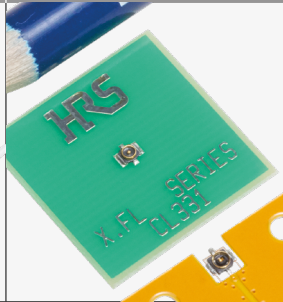
JR-W	EM52M	EM30M	EM40M	BH12
				
13, 16, 21, 25	52	30	40	13.8
30	130 (Waterproof) 140 (Non-Waterproof)	175 (Waterproof) 200 (Non-Waterproof)	410 (Waterproof) 450 (Non-Waterproof)	20 (Power) 1 (Signal)
AC 100, 300 / DC 140, 420	AC 600, 1000 / DC 750, 1000	AC/DC 600, 1000	AC/DC 600, 1000	AC 30 / DC 42
Screw	Bayonet	Bayonet	Bayonet	Latch
16 - 28	2, 4	1, 1/0 (42.42-60.57mm ²)	3/0 (76.28-96.3mm ²) 4.7/0 (117.2-152.05mm ²)	14 - 16 (Power) 22 - 24 (Signal)
Metal	Plastic	Plastic	Plastic	Plastic
3, 4, 5, 7, 10, 16, 24	4	1	1	3, 4
-25 to +85	-20 to +90 (Waterproof) -25 to +105 (Non-Waterproof)	-20 to +90 (Waterproof) -25 to +105 (Non-Waterproof)	-20 to +90 (Waterproof) -25 to +105 (Non-Waterproof)	-40 to +105
500	50	50	50	30
Solder, Crimp	Crimp	Crimp	Crimp	Crimp, Solder
Silver	Silver	Silver	Silver	Tin
IP67 and IP68 waterproof rating, Corrosion resistant, Threaded receptacle waterproof cap available	Single-action bayonet, Robust and light weight, IP67 waterproof rating option, IP2X Finger protection, Sequential mating, UL compliant	Single-action bayonet, Robust and light weight, IP67 waterproof rating option, IP2X Finger protection, UL compliant	Single-action bayonet, Robust and light weight, IP67 waterproof rating option, IP2X Finger protection, UL compliant	Front and rear mount type, IPX6/IPX7 waterproofing, Easy cable assembly, Lightweight

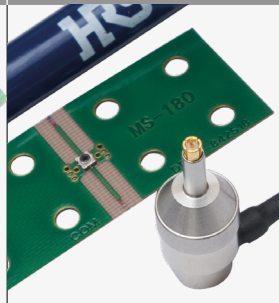
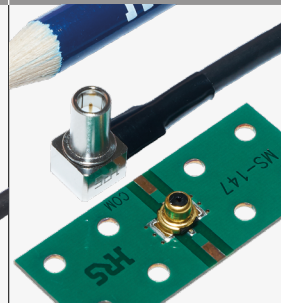
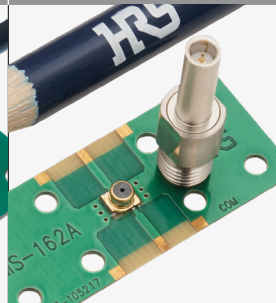
Coaxial	N	1.85MM	2.92MM	2.4MM
MICROWAVE				
<i>* Please contact HRS if a specific number of contacts is required</i> <i>** Please contact HRS for detailed current rating specification</i> <i>*** Includes temperature rise caused by current flow</i>				
Characteristic impedance [Ω]	50	50	50	50
V.S.W.R. frequency range (Voltage Standing Wave Ratio)	1.2 or less (DC to 6GHz) 1.3 or less (DC to 10GHz)	1.5 or less (DC to 65 GHz)	1.15 or less (DC to 18GHz) 1.20 or less (18 to 26.5 GHz) 1.35 (26.5 to 40GHz)	1.35 or less (DC to 26.5 GHz) 1.4 or less (26.5 to 40 GHz) 1.45 or less (40 to 50GHz)
Operating temperature range [°C]***	-30 to +60 -55 to +85	-55 to +105 -55 to +125	-55 to +105 -55 to +125	-55 to +105
Mating cycles	500, 1,000, 5,000	500	500, 1,000	500
Locking mechanism	Screw	Screw	Screw	Screw
Contact plating specification	Gold, Silver	Gold	Gold	Gold
Applicable cable range / Applicable coaxial cable diameter	3D-2V, 5D-2V, 5D-2W RG-8/U, RG-9/U, RG-9A/U	SF085N / 0.085 inch semi-flexible cable	SF085 / 0.085 inch flexible cable	SS085 / 0.085 inch flexible cable
Accessories	Conversion adapter, terminator, attenuator, cap	Attenuator, Terminator	Attenuator, Terminator, In-line adapter	Attenuator, PCB receptacle
Remarks	Waterproof version options, MIL-C39012/MIL STD 348-304	V connector, Reflection-free termination, Attenuator	MIL-STD-348D compliant, Flexible PCB thickness	MIL-STD-348D compliant, Flexible PCB thickness

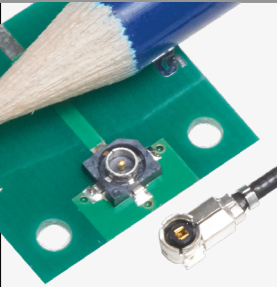
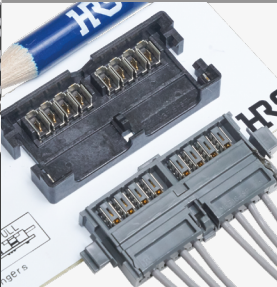
MMCX	HRM (SMA)	HRM(G) (SMA)	SMP	SMPM
				
50	50	50	50	50
1.2 or less (DC to 4GHz) 1.4 or less (4 to 6 GHz)	1.23 or less (DC to 18 GHz)	1.4 or less (DC to 18 GHz) 1.5 or less (18 to 20 GHz) 1.7 or less (20 to 28 GHz)	1.25 or less (DC to 20 GHz) 1.35 or less (20 to 30 GHz) 1.4 or less (30 to 40 GHz)	Return loss: 15 dB or more (DC to 26.5 GHz) 10 dB or more (26.5 to 40 GHz) 7 dB or more (40 to 65 GHz)
-55 to +85	-55 to +125	-55 to +85	-55 to +125	-55 to +125
500	500, 1,000	500	500, 1,000	100, 500
Snap	Screw	Screw	Snap	Snap
Gold	Gold	Gold	Gold	Gold
RG-178B/U / Ø1.8 mm RG-316/U / Ø2.59 mm, CO-6F-FH-SB, RF-MF507, DFSS111-U1979 / Ø1.48 mm	1.5D-HQEV, 1.5D-HQEW, RG-402, RG-405, RG-405/U	-	SF085 / 0.085 inch flexible cable	SF047N / 0.047 inch semi-flexible cable SF085N / 0.085 inch semi-flexible cable. 532 / 5.32 mm. 1270 / 12.70 mm
Conversion adapter, terminator, cap	Conversion adapter, terminator, attenuator, cap	Conversion adapter, attenuator	Conversion adapter, terminator, attenuator	Conversion adapter, terminator, In-line adapter
Ultra miniature snap-on design, Designed for ultra thin cable	MIL-STD-348B compliant, Robust design, Wide variations	MIL-STD-348B compliant, Flexible PCB thickness	MIL-STD-348B compliant, Cable, Receptacle, Relay adapter	MIL-STD-348A Notice 5 compliant, Straight jack, Right angle jack

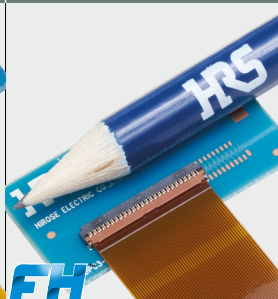
Coaxial	Coaxial	BNC75	D.FL75	MRF20
	75 Ω <i>* Please contact HRS if a specific number of contacts is required</i> <i>** Please contact HRS for detailed current rating specification</i> <i>*** Includes temperature rise caused by current flow</i>			
	Characteristic impedance [Ω]	75	75	75
	V.S.W.R frequency range (Voltage Standing Wave Ratio)	1.29 or less (DC to 3 GHz) 1.43 or less (3 to 12 GHz)	Return loss: 17.7 dB or more (0 to 3 GHz). 13.9 dB or more (3 to 12 GHz)	Return loss: 15 dB or more (0 to 1.5 GHz) 10 dB or more (1.5 to 3 GHz)
	Operating temperature range [$^{\circ}\text{C}$] ^{***}	-40 to +85	-40 to +105	-40 to +85
	Mating cycles	500, 1,000, 5,000	20	1,000
	Locking mechanism	Bayonet	No	Push-pull
	Contact plating specification	Gold, Silver	Gold	Gold
	*Applicable cable range / Applicable coaxial cable diameter	1.5CCA-EXBV(LF), 1.5C-QEV, CW, 1.5C-QEW, 1.5C-QEW: CW, RG-59B/U	084N / $\varnothing 1.5$ mm	X-60340 Outside dia. 7.0 ± 0.4 mm, 26-30 AWG x 2 contact (Power) 30 AWG x 10 contacts (Signal) 75 Ω coaxial cable, 1.5 mm x 1 contact
	Remarks	12G/6G/3G SDI	Conversion adapter	Coaxial: 1 contact 75 Ω coaxial, Power supply terminal 2 contacts 2 A, Signal terminal 10 contacts 1 A *Coaxial cable $\varnothing 1.5$ mm x 1 contact

Coaxial		C.FL	H.FL	U.FL	U.FL(A)
ULTRA MINIATURE <i>* Please contact HRS if a specific number of contacts is required</i> <i>** Please contact HRS for detailed current rating specification</i> <i>*** Includes temperature rise caused by current flow</i>					
Characteristic impedance [Ω]	50	50	50	50	50
V.S.W.R frequency range (Voltage Standing Wave Ratio)	1.4 or less (DC to 15 GHz) 1.5 or less (15 to 20 GHz) 1.6 or less (20 to 30 GHz)	1.3 or less (DC to 3 GHz)	1.3 or less (DC to 6 GHz)	2 or less (DC to 18 GHz)	
Operating temperature range [$^{\circ}\text{C}$] ^{***}	-40 to +90	-40 to +90	-40 to +90	-40 to +90	-40 to +105
Mating cycles	20	50	30	30	
Mated height [mm]	0.92	3	1.9, 2.3, 2.4	2.1	
Contact plating specification	Gold	Gold, Silver	Gold	Gold	
Connector X/Y dimensions [mm]	2 x 2 (receptacle)	4.5 x 5 (receptacle)	3.1 x 3 (receptacle)	3.1 x 3 (receptacle)	
Remarks	Only available as a cable assembly, Cable dia: $\varnothing 0.64$ mm	Only available as a cable assembly, Cable dia: $\varnothing 1.32$, $\varnothing 1.48$ mm	Standard connector for W-LAN, Only available as a cable assembly, Cable dia: $\varnothing 0.81$, $\varnothing 0.95$, $\varnothing 1.13$, $\varnothing 1.32$, $\varnothing 1.37$ mm	Standard connector for W-LAN, Only available as a cable assembly, Cable dia: $\varnothing 1.13$, $\varnothing 1.37$ mm	

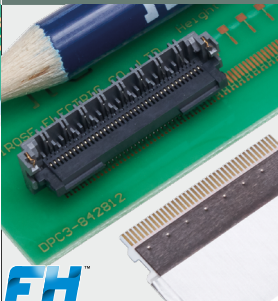
W.FL2	X.FL	X.FL BOARD TO BOARD
		
50	50	50
1.3 or less (DC to 3 GHz) 1.4 or less (3 to 6 GHz)	1.3 or less (DC to 3 GHz) 1.4 or less (3 to 6 GHz) 1.7 or less (6 to 12 GHz)	1.3 or less (DC to 3 GHz) 1.5 or less (3 to 6 GHz)
-40 to +90	-40 to +90	-40 to +90
20	20	20
118	0.94, 1.2	0.95
Gold	Gold	Gold
2 x 2 (receptacle)	2 x 2 (receptacle)	2 x 2 (receptacle) 2.28 x 2.24 (plug receptacle)
Only available as a cable assembly, Cable dia: Ø 0.5, Ø 0.64, Ø 0.81, Ø 0.95 mm, Halogen-free options (IEC61249-2-21)	X.FL receptacle is mountable, on the same PCB layout of W.FL and W.FL2, Cable dia: Ø 0.5, Ø 0.64, Ø 0.81, Ø 1.13 mm, Halogen-free options (IEC61249-2-21)	X.FL receptacle is mountable on the same PCB layout of W.FL2

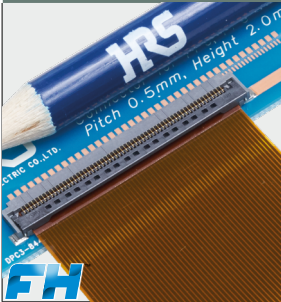
Coaxial	MS-156C	MS-180	MS-147	MS-162B
RF COAXIAL SWITCH				
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Power rating [W]	2	2	4	4
V.S.W.R frequency range (Voltage Standing Wave Ratio)	1.2 or less (DC to 2.5 GHz) 1.3 or less (2.5 to 6 GHz) 1.5 or less (6 to 11 GHz)	1.2 or less (DC to 3 GHz) 1.3 or less (3 to 6 GHz) 1.4 or less (6 to 11 GHz)	1.2 or less (DC to 3 GHz) 1.5 or less (3 to 6 GHz)	1.2 or less (DC to 3 GHz) 1.5 or less (3 to 6 GHz) 1.7 or less (6 to 10 GHz)
Height [mm]	1.35	0.85	3.9	2.5
Temperature range [°C]	-40 to +85	-40 to +85	-30 to +85	-40 to +85
Mating cycles	100	100	12,000	12,000
Contact plating specification	Gold	Gold	Gold	Gold
Connector X/Y dimensions [mm]	2.3 x 2.3 (receptacle)	1.8 x 1.8 (receptacle)	5.8 x 5.4 (receptacle)	3.1 x 3.5 (receptacle)
Remarks	Low insertion loss, Halogen-free (IEC61249-2-21) MS-156C can be used with coax cable for external antenna connection	Test plug and SMA conversion adapter are available, Low insertion loss, Space saving design	Low insertion loss, Space saving design	Low insertion loss, Space saving design

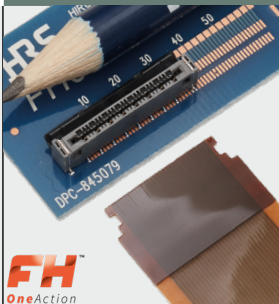
Coaxial	H.FL/S	MRF14	MRF18
NON-MAGNETIC <i>* Please contact HRS if a specific number of contacts is required</i> <i>** Please contact HRS for detailed current rating specification</i> <i>*** Includes temperature rise caused by current flow</i>			
Characteristic impedance [Ω]	50	50	50
V.S.W.R frequency range (Voltage Standing Wave Ratio)	1.3 or less (DC to 3 GHz)	1.3 or less (DC to 0.5 GHz) 1.5 or less (0.5 to 1 GHz)	1.3 or less (DC to 1 GHz) 1.4 or less (1 to 2 GHz)
Temperature range [°C]	-40 to +90	-40 to +85	-40 to +125
Mating cycles	50	60,000	30
Mated height [mm]	3	-	6.4
Contact plating specification	Gold, Silver	Gold	Gold
Applicable cable range / Applicable coaxial cable diameter	Hitachi CO-6F / FH-SB Junkosha A(2B0733) Hitachi 1-25C-6FFH Cable dia: $\varnothing$ 1.37 mm / $\varnothing$ 1.48 mm	Cable dia: $\varnothing$ 1.37 mm	Cable dia: $\varnothing$ 1.13 mm - 1.8mm
Remarks	Low profile, Space saving, Only available as a cable assembly	High durability, Low insertion/withdrawal force, Suitable for MRI	Straight mate, Right angle cable exit, Robust lock, Suitable for MRI

FFC/FPC		FH58/M	FH62	FH64MA	FH26W
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]		0.2 (FH58) 0.25 (FH58M)	0.25	0.25	0.3
Height [mm] / Depth [mm]		0.9 x 3.1	1.1 x 4.0	0.5 x 3.15	1.0 x 3.2
Contact position		Top / Bottom	Top	Top	Bottom
Rated Current [A] **		0.2	0.25	0.2	0.2
Rated Voltage [V]		AC/DC 30	AC/DC 30	AC/DC 30	AC/DC 30
Number of contacts		21, 31, 35, 41, 51 (FH58) 7 (FH58M)	13, 17, 21, 31, 35, 39, 41, 55, 61	5, 7, 11, 15, 17, 19, 25	13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 45, 51, 57, 61, 71
Mating and lock direction		Horizontal - Back flip	Horizontal - One Action	Horizontal - Back flip	Horizontal - Front flip
Contact plating specification		Gold	Gold	Gold	Gold
Operating temperature range [°C]**		-55 to +85	-55 to +85	-55 to +85	-55 to +85
Mating cycles		10	10	10	10
Remarks		Supports USB 3.0, Embedded Display Port ver 1.3, MIPI D-PHY ver 1.1, FPC insertion tool is available, Halogen-free (IEC61249-2-21)	High operability by one action lock, Suitable for robot assembly, Supports USB 3.0, Embedded Display Port 1.4, MIPI (D-PHY)	Ultra low profile, Halogen-free (IEC61249-2-21)	Easy FPC Insertion, Clear tactile click, Halogen-free (IEC61249-2-21)

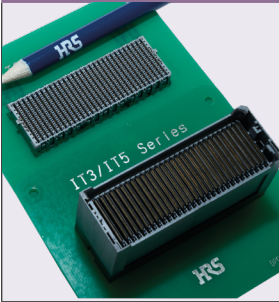
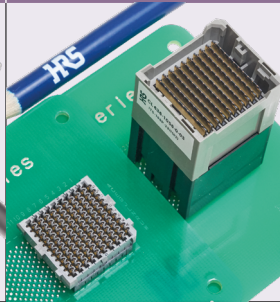
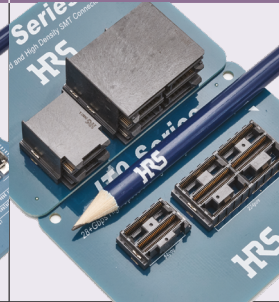
FH35C	FH72	FH55/M	FH28K	FH34
				
0.3	0.3	0.4 (FH55M) 0.5 (FH55)	0.5	0.5
0.9 x 3.2	0.9 x 3.5	1.5 x 4.2	2.55 x 6.5	1.0 x 3.8
Top / Bottom	Top	Bottom	Bottom	Top / Bottom
0.2	0.2	0.4 (FH55M) 0.5 (FH55)	0.5	0.5
AC/DC 30	AC/DC 30	AC/DC 40 (FH55M) AC/DC 50 (FH55)	AC/DC 50	AC/DC 50
9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 45, 49, 51, 55, 61	11, 15, 21, 31	10, 31, 40 (FH55M) 21, 31, 40 (FH55)	10, 15, 20, 28, 30, 40, 45, 50, 55, 60, 64, 68, 74, 80	4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 30, 32, 34, 40, 45, 50
Horizontal - Back flip	Horizontal - One Action	Horizontal - Front flip	Horizontal - Front flip	Horizontal - Back flip
Gold	Gold	Gold	Gold	Gold
-55 to +85	-55 to +85	-55 to +85	-40 to +125	-55 to +105
10	10	20	20	20
Easy FPC Insertion, Halogen-free (IEC61249-2-21)	Space saving design, High operability by one action lock, High FPC Retention Force	High-speed transmission 5 Gbps+, Supports USB 3.0, Serial ATA Gen. 3, HDMI 1.4a, Display port 1.3, Halogen-free (IEC61249-2-21)	Robust design, PCB patterning space underneath, Enhanced FPC/FFC retention force	High FPC retention force, Easy FPC Insertion, Halogen-free (IEC61249-2-21)

FFC/FPC		FH40	FH41	FH48	FH52
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]	0.5	0.5	0.5	0.5	0.5, 1.0
Height [mm] / Depth [mm]	5.8 x 3.55	2.5 x 6.2	6.18 x 4.70	2.0 x 5.7	
Contact position	Bottom	Bottom	Bottom	Bottom	Bottom
Rated Current [A] **	0.5	0.5	0.5	0.5	0.5
Rated Voltage [V]	AC/DC 50	AC/DC 50	AC/DC 50	AC/DC 50	AC/DC 50
Number of contacts	10, 20, 24, 30, 40, 45, 50, 60, 64, 80	15, 20, 28, 30, 31, 40, 50, 60, 68	20, 21, 30, 31, 40, 50, 68	6, 8, 10, 11, 12, 15, 18, 20, 22, 24, 25, 26, 28, 30, 32, 40, 42, 45, 50, 60	
Mating and lock direction	Vertical - Front flip	Horizontal - Front flip	Vertical - Front flip	Horizontal - Front flip	
Contact plating specification	Gold	Gold (Signal contact) Tin (Shielded / Ground contact)	Gold (Signal contact) Tin (Shielded / Ground contact)	Gold	
Operating temperature range [°C]***	-40 to +105	-40 to +105	-40 to +85	-40 to +105	
Mating cycles	20	20	20	20	
Remarks	Robust design, Easy FPC Insertion, Halogen-free (IEC61249-2-21)	Supports next generation chip V-by-One HS by THine, High-speed 3.75 Gbps, EMI Shielded, Can use same FFC as FH48, Halogen-free (IEC61249-2-21)	Supports next generation chip V-by-One HS by THine, High-speed transmission, EMI Shielded, Can use same FFC as FH41, Halogen-free (IEC61249-2-21)	Metal fittings for strong board retention, Robust design, PCB patterning space underneath, Halogen-free (IEC61249-2-21)	

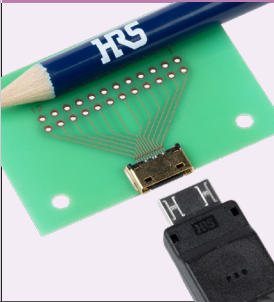
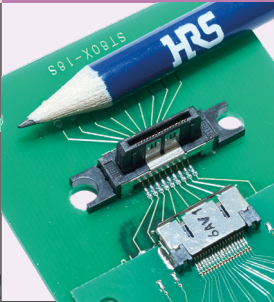
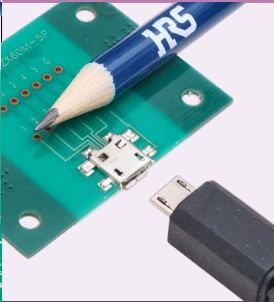
FH52E	FH52K	FH52T	FH63S	FH65
				
0.5, 1.0	0.5	0.5	0.5	0.5
2.0 x 5.7	2.0 x 5.7	2.0 x 5.7	2.8 x 5.15	1.2 x 3.57
Bottom	Bottom	Bottom	Bottom	Bottom
0.5	0.5	0.5	0.5	0.5
AC/DC 50	AC/DC 50	AC/DC 50	AC/DC 50	AC/DC 50
6, 8, 10, 15, 18, 20, 22, 24, 26, 30, 40, 45, 50, 60, 64, 68	6, 8, 10, 12, 15, 18, 20, 22, 24, 25, 26, 30, 32, 34, 40, 45, 50, 60, 68, 80	10, 24, 32, 50	10, 20, 30, 40, 50	8, 10, 12, 15, 34
Horizontal - Front flip	Horizontal - Front flip	Horizontal - Front flip	Horizontal - One Action	Horizontal - Front flip
Gold	Gold	Gold	Gold (Signal contact) Tin (Shielded / Ground contact)	Gold
-40 to +105	-40 to +125	-40 to +105	-55 to +125	-40 to +125
20	20	20	10	20
Long metal fittings for strong board retention, Robust design, PCB patterning space underneath, Halogen-free (IEC61249-2-21)	Long metal fittings for strong board retention, RoHS compliant, Compliant with severe automotive requirements, Halogen-free (IEC61249-2-21)	Long metal fittings for strong board retention, Highly reliable 2-point contacts, Halogen-free (IEC61249-2-21)	High operability by one action lock suitable for robot assembly, Compliant with severe automotive requirements, Supports USB 3.0, Embedded, Display Port 1.3, HDMI 1.4a, V-by-One HS, Halogen-free (IEC61249-2-21)	Ultra low profile, Compliant with severe automotive requirements, Halogen-free (IEC61249-2-21)

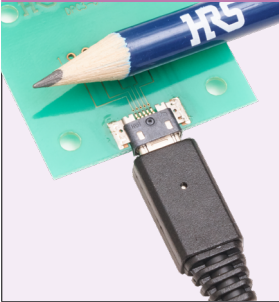
FFC/FPC	FH67	FH69	FH75	TF38
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]	0.5	0.5	0.5	0.5
Height [mm] / Depth [mm]	5.2 x 3.57	2.3 x 6.98	2 x 5.7	5.2 x 3.45
Contact position	Bottom	Top/Bottom	Bottom	Bottom
Rated Current [A] **	0.5	0.5	0.5	0.5
Rated Voltage [V]	AC/DC 50	AC/DC 50	AC/DC 50	AC/DC 50
Number of contacts	10, 20, 30, 40, 50	60	40, 60	16, 18, 20, 22, 24, 26, 30, 32, 36, 38, 40, 45, 50, 60
Mating and lock direction	Vertical - One Action	Horizontal - Back flip	Horizontal - Front flip	Vertical - Front flip
Contact plating specification	Gold (Signal contact) Tin (Shielded / Ground contact)	Gold	Gold	Gold
Operating temperature range [°C]***	-55 to +125	-55 to +125	-40 to +125	-40 to +85
Mating cycles	10	10	20	20
Remarks	High operability by one action lock suitable for robot assembly, 125°C heat resistant, FPC/FFC/ Shielded FFC Connector, Halogen-free	Highly reliable 2-point contacts, Back flip lock	Highly reliable 2-point contacts, High FPC retention force	Robust design, High FPC retention force

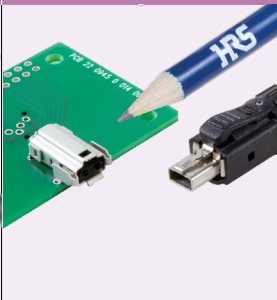
High Speed		FX23	ER8	FX10 (3 piece)	FX18
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow					
Speed (Gbps) / Supporting Signal Protocol		up to 8+	10+	10 (2 piece), 15 (3 piece)	10
Rated Current [A]**		0.5 (Signal) 3.0 (Power)	0.5	0.3	0.5 (Signal) 3.0 (Power)
Rated Voltage [V]		AC 50 (Signal) AC 200 (Power)	AC 100	AC 50	AC 100
Contact pitch [mm]		0.5	0.8	0.5	0.8
Mated height [mm]		15, 20, 25, 30, (9, 11, 13, 14, 19, 21, 23 when combined with FX23L)	7.0, 9.0, 10, 12	4 - 8 (2-piece type) 8 - 13 (3-piece type)	10, 15, 20, 25, 30, 35, 40, 45
Number of contacts		20, 40, 60, 80, 100, 120 (Signal) 4 (Power)	10, 20, 30, 40, 50, 60, 70, 80, 100, 120	80, 96, 100, 120, 140, 144, 168, 80/8, 100/10, 120/12, 140/14, 200/20	40, 60, 80, 100, 120, 140, 160, 180
Operating temperature range [°C]***		-55 to +105	-55 to +85	-55 to +85	-55 to +85
Contact plating specification		Gold	Gold	Gold	Gold
Mating cycles		100	100	50	500
Solder technology		SMT	SMT	SMT	SMT
Remarks		Vertical version option, Floating design, Automatic mounting possible	High mated retention force, Compatible with Samtec's Edge Rate®, Vertical variation available (120 pos)	Shielded matched impedance version, Floating design (+/-0.3 mm in XY with 3-piece design)	Multi-functional contacts, Self-alignment design

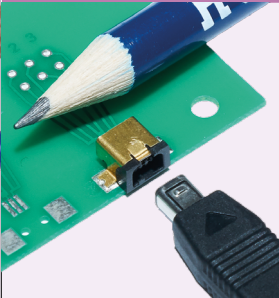
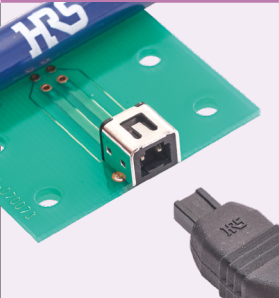
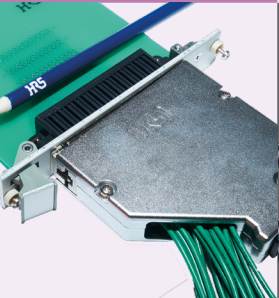
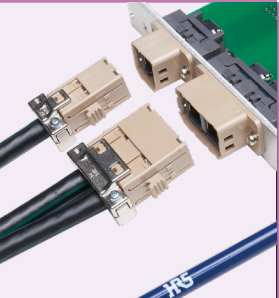
IT3	IX INDUSTRIAL	IT5	IT8	IT9
				
10+	10	25+	28 (2 piece), 56 (3 piece)	28+
0.5	1.5 (All contacts) 3 (4 contacts No. 1, 2, 6 & 7)	0.2	0.5	0.3 - 0.5
AC 50	AC 50 / DC 60	AC 50	AC 50	AC/DC 50
1.5 x 1.75 (staggered array)	1	1.5 x 1.75 (staggered array)	1	0.5
14 - 40 (Up to 42 mated with IT5 receptacle)	-	14 - 40	10, 11, 12, 13 (2 piece) 14 - 46 (3 piece)	-
100, 200, 300	10	100, 200, 300	120, 192, 288	84, 152, 224
-55 to +85	-40 to +85	-55 to +85	55 to +85	-55 to +85
Gold	Gold	Gold	Gold	Gold
100	5,000	30 (Stacking height: 14 to 16 mm) 100 (Stacking height: 18 to 40 mm)	100	100
BGA	THR / SMT	BGA	BGA	SMT
Self-alignment (large x/y axis tolerance) and mating tolerance due to 3-piece design, Can be inter-mateable with IT5 series	Next Gen. Ethernet, IEC 61076-3-124 compliant, High EMC resistance, Compact size, Keying variations, Right angle / vertical receptacle option, Right angle plug option, IDC & solder plug terminal	Self-alignment (large x/y axis tolerance) and mating tolerance due to 3-piece design, Acc. IEEE802.3ap, Additional GND pins (X/Y row)	85 and 100 Ω differential impedance design, Floating design to absorb mounting misalignment +/- 0.2 mm in XY direction	85 and 100 Ω differential impedance design, Floating design to absorb mounting misalignment +/- 0.16 mm in XY direction

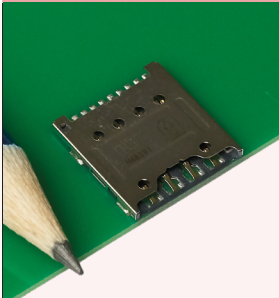
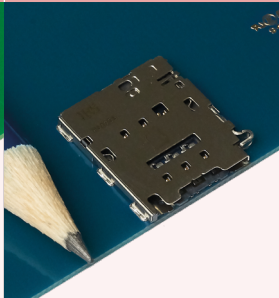
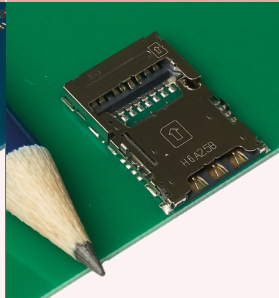
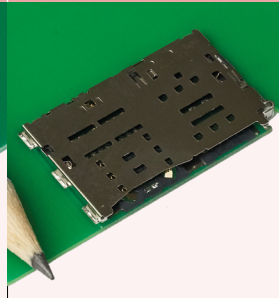
High Speed

I/O Data transmission	I/O Data transmission	DH	LX	ST	ZX
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
	Rated Current [A]**	0.5	0.5	0.5 (Signal) 3 (Power)	1.8
	Rated Voltage [V]	AC 125	AC 50	AC 100	AC 30
	Contact pitch [mm]	1.0	0.5	0.5	0.65
	Termination AWG	28	30	30	26 - 28
	Number of contacts	17, 27, 37, 51	12, 16, 20	10, 18, 24, 36	5
	Termination type	Solder, IDC	Solder	Solder	Solder
	Contact plating specification	Gold	Gold	Gold	Gold
	Locking mechanism	Screw, Latch	Latch	Latch (no locking on cradle type)	Latch
	Operating temperature range [°C]**	-25 to +85	-40 to +70	-30 to +80	-30 to +85
	Mating cycles	1,000	5,000	10,000	10,000
	Remarks	Impedance controlled, High-speed transmission 2.5 Gbps, Robust design	Low profile, Sequential mating, Robust design, High contact reliability	Robust lock, Plug for cradle and cable, Polarized	Micro-USB 2.0, High-speed transmission 480 Mbps, Type B, AB receptacle versions, Type A, B plug versions

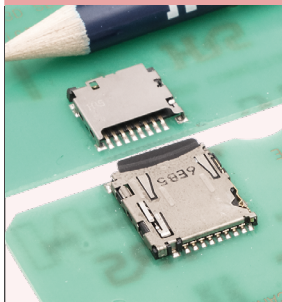
ZX62W	CX (CX60, CX70M, CX90B1)			CX80B1
				
1.8	5-6			5-6
AC 30	AC 20			AC 20
0.65	0.5			0.5
-	-			-
5	16, 24			24
Solder	Solder			Solder
Gold	Gold			Gold
Latch	Snap			Snap
-30 to +85	-40 to +85			-40 to +85
10,000	10,000			10,000
Micro-USB 2.0, Top-mount version option, Mid-mount version option, Bottom-mount version option, Splash-proof version	CX60: Plug unit, USB 3.1 Gen. 2 compliant, High-speed transmission 10 Gbps, Clear tactile click, 1000 mm cable harness available	CX70M: Mid-mount receptacle, USB 3.0 compliant, High-speed transmission 10 Gbps, Hybrid design, Short depth version option	CX90B1: Top-mount receptacle, USB 3.1 Gen. 2 compliant, High-speed transmission 10 Gbps, Robust design	Vertical mount receptacle, USB 3.1 Gen. 2 compliant, High-speed transmission 10 Gbps, THR mounting posts increase retention to the board

I/O Data transmission		CX90MWD2	CX90M-16P	IX INDUSTRIAL	T1 (coming soon)
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow					
Rated Current [A]**		0.25 (Signal) 1.25 (Power)	0.25 (Signal) 1.25 (Power)	1.5 (All contacts) 3 (4 contacts)	4
Rated Voltage [V]		AC 20	AC 20	AC 50 / DC 60	DC 60
Contact pitch [mm]		0.5	0.5	1.0	2.8
Termination AWG		-	-	22 - 28	22 - 28
Number of contacts		24	16	10	2
Termination type		Solder	Solder	Solder, IDC	Crimp
Contact plating specification		Gold	Gold	Gold	Gold
Locking mechanism		Snap	Snap	Latch	Latch
Operating temperature range [°C]**		-40 to +85	-40 to +85	-40 to +85	-40 to +85
Mating cycles		10,000	10,000	5,000	1,000
Remarks		Mid-mount receptacle, USB 3.1 Gen. 2 compliant, High-speed transmission 10 Gbps, Waterproof (IPX8) compliant, THR mounting posts increase, Retention to the board	Mid-mount receptacle, Single-row SMT*, CX90MW waterproof version available	Next Gen. Ethernet, Compact size, IEC/61076-3-124 compliant, High EMC resistance, High-speed transmission 10 Gbps, 10 pin version, Right angle version option	IEC 63171-6 (former IEC 61076-3-125) compliant, IP20, PoE Bandwidth 600 MHz, 1 Gbps

LF	MQ172	RP34L	TJ*A	TJ*L
				
10	3	5	4	4
AC 125 / DC 175	AC 40 / DC 30	AC 30 / DC 42	AC 30 / DC 130	AC/DC 100
-	0.8	-	-	-
16 - 26	24 - 32	18 - 22 / 24 - 28	16 - 22	18 - 22
3, 4, 6, 11, 12, 20	3, 4	3, 4	28, 41	4, 8
Solder, Crimp	Solder	Crimp	Crimp	Crimp
Gold	Gold	Silver	Gold	Gold
Bayonet	Snap	Snap	Latch	Latch
-25 to +85	-30 to +75	-25 to +85	-40 to +105	-40 to +85
1,000	5,000	1,000 (4 contacts) 5,000 (3 contacts)	500	500
IP67 and IP68 waterproof rating, EMI Shielded	For power supply and signals, Low profile, Dual contact for anti-vibration	Space saving design, Sequential mating	4-colour matching keys, for visual check, 1 6 key variations possible, Fits into 3U4HP rack	ISO/IEC11801 Class D compliant, Industrial Ethernet compliant

Memory		KP10 Micro SIM socket	KP13 Nano SIM socket	KP15B Combo SIM socket	KP15TL
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow					
Integrated media		micro SIM	nano SIM	micro SD + nano SIM	micro SD + nano SIM
Height [mm]		1.25 (KP10BH) 1.18 (KP10BJ, KP10S)	1.18 (KP13B), 1.12 (KP13C, KP13CH), 1.45 (KP13TS)	2.0	1.37
Media discharge method		Push-pull, push-push	Push-push, push-pull, Bar push tray	nano SIM (push-eject bar) micro SD (push-pull)	Bar push tray
Solder technology		SMT	SMT	DIP	SMT
Contact plating specification		Gold	Gold	Gold	Gold
Number of contacts		6, 8	6	6 (nano SIM) + 8 (micro SD)	12 (nano SIM) + 8 (micro SD)
Operating temperature range [°C]**		-30 to +85	-30 to +85	-30 to +85	-30 to +85
Mating cycles		5,000	3,000 (KP13TS) 5,000 (KP13B, C, CH)	5,000 (Nano Sim) 10,000 (Micro SD)	3,000
Remarks		Card detection switch, Reverse card insertion prevention, Halogen-free (IEC61249-2-21)	Card detection switch, Incorrect card insertion prevention, Card flying-out prevention (KP13B), Wide variations, Halogen-free (IEC61249-2-21)	Stacking type combo card, User friendly card removal, Card detection switch, Halogen-free (IEC61249-2-21)	3 in 2 Tray type combo card, Card detection switch, Halogen-free (IEC61249-2-21)

DM3



micro SD

1.15 (DM3NW) 1.55 (DM3D) 1.68
(DM3AT) 1.83 (DM3BT, DM3CS)

Push-pull, hinge, push-push
with and without ejection
mechanism

SMT

Gold

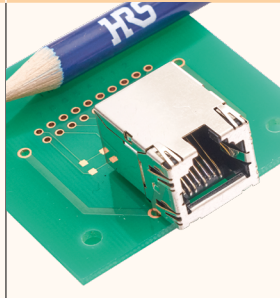
8

-25 to +85

5,000 (DM3AT, DM3B)
10,000 (DM3C, DM3D, DM3NW)

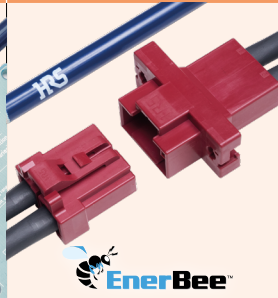
Compact size,
Reverse card insertion prevention,
Card detection switch,
High contact reliability, Effective
ground and shield configuration

Modular	TM11AP	TM11APA	TM11 Angled Cover	TM11R
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Transfer standard	CAT5	CAT5	Angled cover for TM11 Cover Extended operation temperature: -55°C to +85° C	CAT5
Rated Current [A]**	0.5	0.5		1
Rated Voltage [V]	AC 125	AC 125		AC 125
Operating temperature range [°C]***	-25 to +60	-25 to +60		-25 to +80
Number of contacts	8	8		8
Contact plating specification	Gold	Gold		Gold
Mating cycles	200	200		200
Termination AWG	26 - 27 Stranded	26 - 27 Stranded		-
Remarks	Extended operation temperature: -55°C to +85°C	Extended operation		Low profile, First make/last break shield contacts, THT Solder technology

TM11R-5M2-88	TM21DP	TM21R	TM21 COVER	TM31P	Modular
					
CAT5	CAT6	CAT5 / CAT5E	Cover for TM11, TM21 and TM31 plug Fold up cover with latch protector Available colors: light beige, medium grey, black, natural light grey, red, green, blue, yellow, orange (others by request)	CAT6A	
1	1	1		1	
AC 125	AC 125	AC 125		AC 125	
-25 to +80	-55 to +60	-55 to +85		-55 to +85	
8	8	8, 32, 48, 96		8	
Gold	Gold	Gold		Gold	
200	750	200		200	
-	24 - 27 Stranded	-		24-27 Stranded	
EMI Shielded version, Embedded Light indicator, THT, SMT Solder technology	1 Gbps transmission rate, Extended operation temperature: -55°C to +85° C	Extended operation temperature: -55°C to +85° C, THT Solder technology			

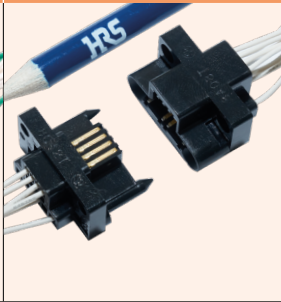
Modular	Modular	TM36P	HT601
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow		
	Transfer standard	CAT6A	Hand crimp tool for TM11, TM21 and TM31 Spare parts also available
	Rated Current [A]**	1	
	Rated Voltage [V]	AC 125	
	Operating temperature range [°C]**	-55 to +85	
	Number of contacts	8	
	Contact plating specification	Gold	
	Mating cycles	200	
	Termination AWG	24-27 Stranded	
	Remarks		

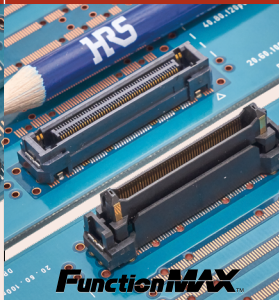
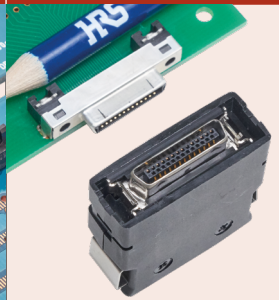
Power		DF63SF	HR31	HR41A	DF63
Power	Power * Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
	Rated Current [A]**	12 15 (2 contact, 7.92 mm pitch)	12	13	15
	Rated Voltage [V]	AC/DC 630	AC 250 / DC 350	AC/DC 1000	AC/DC 630
	Operating temperature range [°C]**	-55 to +105	-40 to +100	-40 to +105	-55 to +105
	Termination AWG	16 - 18	14 - 24	16 - 20	16 - 22
	Locking mechanism	Latch	Snap and Screw	Bayonet	Latch
	Shell size [mm]	-	-	17	-
	Shell materials	-	-	Plastic	-
	Number of contacts	2, 3	5	3, 5	1, 2, 3, 4, 5, 6
	Mating cycles	50	1,000	500	Tin plating: 30 Gold plating: 50
	Termination type	Crimp	Crimp	Crimp	Crimp
	Contact plating specification	Gold	Gold	Gold, Silver	Gold, Tin
	Remarks	Low profile design, Robust lock, THT Solder technology, For glow wire compliance see page 89. UL compliant	DeviceNet compliant, Straight type available, THT Solder technology	IP67 and IP68 waterproof, Lightning surge protection, Sequential mating, hot swapping (UL1977), Water resistant caps available, UL compliant	Robust lock, Keying and reverse PCB mounting prevention, Potting compatible, Compatible with DF63W, THT Solder technology, For glow wire compliance see page 89. UL/C-UL compliant

EF2	HR41	FX30B	DF60	EM35M
				
16 - 400	38 (Ambient temperature 25°C) 20 (4 contacts with ground removed)	25	65	70 (Ambient temperature 25°C)
AC/DC 600 (D30, D60, D150) AC 1000 / DC 1500 (D200, D250, D400)	AC/DC 1000	AC/DC 150, 250, 600	AC/DC 1000	AC/DC 1000
-25 to +105	-40 to +105	-55 to +105	-55 to +105	-40 to +125
1.25 to 200 mm ²	10 - 18	-	8 - 12	8 - 10
Snap	Bayonet	No	Latch	Latch
-	25	-	-	-
-	Plastic	-	-	Plastic
1	3, 5	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4
50	200	100	30	100
Crimp	Crimp	-	Crimp	Crimp
Tin	Gold	Gold	Gold	Tin
Terminal block alternative, Attachable to DIN rail, Visual mating state, UL compliant	IP68 waterproof rating, Easy crimp termination with standard tool, Sequential mating, User friendly and reliable mating operation	Offset absorption design, Long effective mating length 2 mm, Highly reliable multi-point contacts, THT Solder technology, Robust design, wide mating varieties	Robust lock, wide connection varieties, DF60F Finger protection (IP2X) version, Keying variations, Highly reliable 5-point contact design, For glow wire compliance see page XX, UL, C-UL compliant	Sequential mating, Easy crimp termination, DIN Rail and panel mount styles, 10 keying combinations, UL compliant

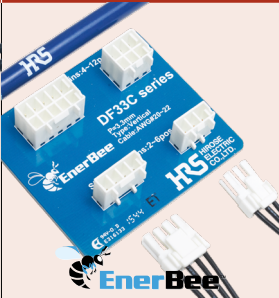
Power	Power	EV1	EM52M	EM30M	EM30MSD
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
	Rated Current [A]**	125	130 (Waterproof) 140 (Non-Waterproof) (Ambient temperature 25 °C)	175 (Waterproof) 200 (Non-Waterproof) (Ambient temperature 25 °C)	200 (Power) 1 (Signal)
	Rated Voltage [V]	AC 460 / DC 650	AC 600, 1000 / DC 750, 1000	AC/DC 600, 1000	AC/DC 1500 (Power) AC/DC 250 (Signal)
	Operating temperature range [°C]**	-40 to +125	-20 to +90 (Waterproof) -25 to +105 (Non-Waterproof)	-20 to +90 (Waterproof) -25 to +105 (Non-Waterproof)	-40 to +105
	Termination AWG	20 mm ²	2, 4	1	4/0 (Power) 28 - 22 (Signal)
	Locking mechanism	Screw	Latch	Bayonet	Bayonet
	Shell size [mm]	-	52	30	30
	Shell materials	Metal, Plastic	Plastic	Plastic	Plastic
	Number of contacts	2, 3	4	1	1 (Power) 2 (Signal)
	Mating cycles	50	50	50	200 (EM30MSD-A Plug-Receptacle) 50 (EM30MSD Plug-Receptacle) 30 (Receptacle-GT8E's plug)
	Termination type	Crimp, Screw	Crimp	Crimp	Crimp, Screw
	Contact plating specification	Silver	Silver	Silver	Tin (Signal) Silver (Power)
	Remarks	IP68 and IPX9K waterproof rating, Shielded, Finger protection, Space saving design	Single-action bayonet, Robust and light weight, IP67 waterproof rating option, IP2X Finger protection, Sequential mating, UL compliant	Single-action bayonet, Robust and light weight, IP67 waterproof rating option, IP2X Finger protection, UL compliant	IP68 waterproof rating, Finger protection IP2X, Vibration resistant design (ISO 16750-3), Service plug, UL compliant

EV2	PS4	EM40M	BH12
			
220 (Ambient temperature 25 °C)	300 (UL/C-UL)	410 (Waterproof) 450 (Non-Waterproof) (Ambient temperature 25 °C)	20 (Power) 1 (Signal)
AC/DC 800, 1000	AC/DC 600	AC/DC 600, 1000	AC 30 / DC 42
-40 to +105	-40 to +105	-20 to +90 (Waterproof) -25 to +105 (Non-Waterproof)	-40 to +105
40 mm ²	Bus bar connection	3, 4, 7	14 - 16 (Power) 22 - 24 (Signal)
Latch	No	Bayonet	Latch
-	-	40	13.8
-	-	Plastic	Plastic
1	1	1	3, 4
30	50	50	30
Crimp, Screw	-	Crimp	Crimp, Solder
Tin	Silver	Silver	Tin
IP68 and IPX9K waterproof rating, Space saving design, EMI Shielded, Vibration resistant design (ISO 16750-3)	Floating design to absorb mounting misalignment +/- 2 mm in XY direction, Large effective mating length, Compact design applicable to 1U size, UL/C-UL compliant	Single-action push-on bayonet, Robust and light weight, IP67 waterproof rating option, Contact touch protection, UL compliant	Front and rear mount type, IPX6/IPX7 waterproof rating, Easy cable assembly, Lightweight

Rack and Panel	QR/P4	QR/P8	QR/P6
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow			
Rated Current [A]**	3 (Power) 1 (Signal)	3 (Power) 2 (Signal)	10 (Power) 1 (Signal)
Rated Voltage [V]	AC 300 (Power) AC 250 (Signal)	AC 380 (Power) AC 30 (Signal)	AC 250
Operating temperature range [°C]**	-10 to +60	-10 to +60	-10 to +60
Termination AWG	20 - 28	20 - 28	14 - 28
Number of contacts	4 (Power) 4, 8, 12, 20, 28, 36 (Signal)	2 (Power) 4, 10, 18 (Signal)	2 (Power) 4, 10, 22 (Signal)
Mating cycles	1,000	1,000	1,000
Locking mechanism	No	No	No
Contact plating specification	Gold	Gold	Gold
Remarks	Guide pins, UL1977 compliant, CSA 22.2 (42) compliant, IEC 61984 compliant	Guide pins, UL1977 compliant, CSA 22.2 (42) compliant, IEC 61984 compliant	Guide pins, UL1977 compliant, CSA 22.2 (42) compliant, IEC 61984 compliant

Robotic		FX18	FX23	DH	DF50/DF50A
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
	Rated Current [A]**	0.5 (Signal) 3.0 (Power)	0.5 (Signal) 3.0 (Power)	0.5	1
	Rated Voltage [V]	AC 100	AC 50 (Signal) AC 200 (Power)	AC 125	AC/DC 100
	Operating temperature range [°C]***	-55 to +85	-55 to +105	-25 to +85	-35 to +85
	Number of contacts	40, 60, 80, 100, 120, 140, 160, 180	20, 40, 60, 80, 100, 120 (Signal) 4 (Power)	17, 27, 37, 51	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 (1 Row) 20, 30, 40, 50 (2 Rows)
	Connection type	Board-to-Board	Board-to-Board	I/O (Data transmission)	Wire-to-Board
	Termination AWG	-	-	28	26 - 32
	Locking mechanism	No	No	Screw or Latch	Latch
	Shell size [mm]	-	-	-	-
	Shell materials	-	-	Metal	-
	Contact plating specification	Gold	Gold	Gold	Gold
	Mating cycles	500	100	1,000	30
	Remarks	Multi-functional contacts, Self-alignment design, High-speed transmission 10 Gbps	High-speed transmission 8 Gbps, Stacking version option, Vertical version option, Floating design with floating range X & Y direction: ±0.6mm / up to ±1.2 mm by combining with FX23L, Rigid type available	Impedance controlled, High speed transmission 2.5 Gbps, Robust design	Robust lock, Robust design, 7, 9, 11, 13, 14, 15 contacts is vertical type only

TM11R	IX INDUSTRIAL	DF51	DF51K	HR22
				
1	3.0 (Power) 1.5 (Signal)	2	2	2
AC 125	AC 50 / DC 60	AC/DC 250	AC/DC 250	AC 100 / DC 140
-25 to +80	-40 to +85	-55 to +105	-55 to +105	-25 to +85
8	10	2 - 6 (1 Row) 4 - 30 (2 Rows)	2 - 6 (1 Row) 4 - 30 (2 Rows)	20
Modular - RJ45	I/O (Data transmission)	Wire-to-Board	Wire-to-Board	Circular
-	22 - 28	22 - 30	22 - 30	24 - 28
Latch	Latch	Latch	Latch	Screw
-	-	-	-	12
-	-	-	-	Metal
Gold	Gold	Gold, Tin	Gold, Tin	Gold, Silver
200	5,000	Tin plating: 30 Gold plating: 50	Tin plating: 30 Gold plating: 50	100
Low profile, First mate/last break shield contacts, THT Solder technology	Next Gen. Ethernet, Compact size, IEC/61076-3-124 compliant, High EMC resistance, High-speed transmission 10 Gbps, Right angle version option	In-line version option, Right angle version option, Straight version option, Only au plating is applicable to Automotive	Positive lock, Wire-to-Board connector UL and C-UL compliant	IP67 and IP68 waterproof rating, Compact circular connector, Non-waterproof type available

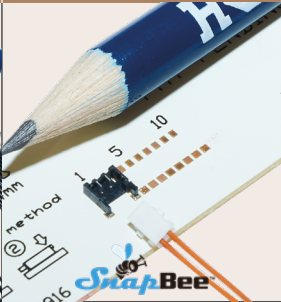
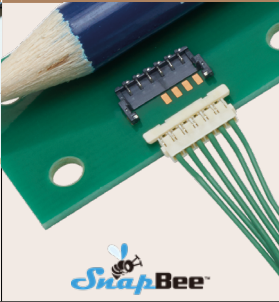
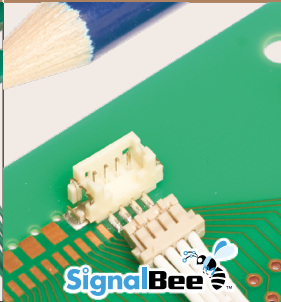
Robotic	DF62C	DF33C	LF	PQ50S
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Rated Current [A]**	4	5	2, 5, 10	12.5
Rated Voltage [V]	AC/DC 250	AC/DC 500	AC 30, 125 / DC 42, 125, 175	AC/DC 300
Operating temperature range [°C]**	-35 to +105	-35 to +85	-25 to +85	-40 to +105
Number of contacts	2, 3, 4, 5, 6, 7, 13, 24	2, 3, 4, 5, 6 (1 Row) 4, 6, 8, 10, 12 (2 Rows)	3, 4, 6, 11, 12, 20	48
Connection type	Wire-to-Wire	Wire-to-Board	Circular	Robotic
Termination AWG	22 - 24 / 28 - 30	20 - 22	16, 20, 26	16 - 28
Locking mechanism	Latch	Latch	Bayonet	Latch
Shell size [mm]	-	-	7, 10, 13	-
Shell materials	-	-	Metal	Plastic
Contact plating specification	Gold, Tin	Tin	Gold	Gold
Mating cycles	30	30	1,000	500
Remarks	Robust protected lock, For glow wire compliance see page 89.	Robust lock, Polarized, Potting compatible, For glow wire compliance see page 89.	IP67 and IP68 waterproof rating, EMI Shielded	Plastic resin shell, Robust design, Coding key options

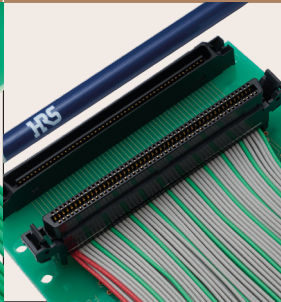
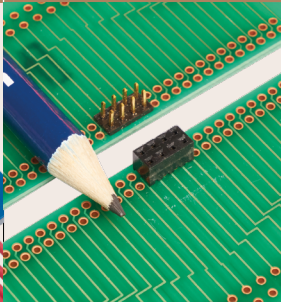
PQ50W	DF63	PQ50	PQ50WA	FX30B
				
12.5	15	19	19	25
AC/DC 300	AC/DC 630	AC/DC 600	AC/DC 600	AC/DC 150, 250, 600
-40 to +105	-55 to +105	-40 to +105	-55 to +105	-55 to +105
50	1, 2, 3, 4, 5, 6	20	92 (Maximum) (Dependent on the unit combination)	2, 3, 4, 5
Robotic	Wire-to-Board, Wire-to-Wire	Robotic	Robotic	Board-to-Board
16 - 28	16 - 22	14 - 22	14 - 28	-
Lever	Latch	Latch	Lever	No
-	-	-	-	-
Plastic	-	Metal	Metal	-
Gold	Gold, Tin	Gold	Gold	Gold
500	Tin plating: 30 Gold plating: 50	500	100	100
Plastic resin shell, Coding key options, IP65 waterproof rating	Robust lock, Polarized, Potting compatible, Compatible with DF63W, For glow wire compliance see page 89.	Zinc die cast shell, Clear tactile click, Coding key options	Aluminum die cast shell, Power and signal contacts, IP67 waterproof rating	Offset absorption design, Long effective mating length 2 mm, Highly reliable multi-point contacts, Robust design, UL compliant

Robotic

Robotic		PQ50WT	JR	DF60
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Rated Current [A]**		30	30	65
Rated Voltage [V]		AC/DC 600	AC 250, 1000 / DC 350, 1400	AC/DC 1000
Operating temperature range [°C]***		-55 to +105	-25 to +85	-55 to +105
Number of contacts		162 (Maximum) (Dependent on the unit combination)	3, 4, 5, 7, 10, 14, 16, 24, 26	1, 2, 3, 4, 5, 6
Connection type		Robotic	Circular	Wire-to-Board, Wire-to-Wire
Termination AWG		10 - 28	16 - 28	8 - 12
Locking mechanism		Lever	Screw or Bayonet	Latch
Shell size [mm]		-	13, 16, 21, 25	-
Shell materials		Metal	Metal	-
Contact plating specification		Gold	Silver	Gold
Mating cycles		100	500	30
Remarks		Aluminum die cast shell, Power and signal contacts, IP65	JIS C 5432 compliant, Threaded receptacle cap available	Robust lock, Polarized, Straight, right angle, in-line version options, UL and C-UL compliant, Finger protection version available, For glow wire compliance see page 89.

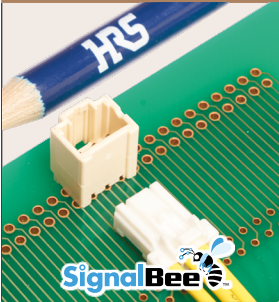
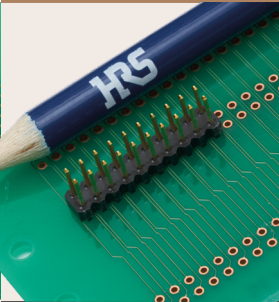
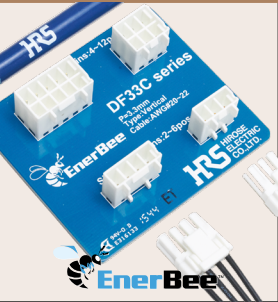
Wire-to-Board		DF59M	DF53	DF52	DF19
Wire-to-Board	Discrete				
	* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]		-	0.6	0.8	1.0
Rated Current [A]**		6	0.7 (All contacts) 1.3 + 0.5 (2 Power + other contacts)	2.5	1
Rated Voltage [V]		AC/DC 300	AC/DC 50	AC/DC 100	AC 100
Operating temperature range [°C]***		-40 to +105	-55 to +85	-40 to +85	-35 to +85
Number of contacts		1	14	2, 3, 4, 5, 6, 8, 10, 12, 14, 15, 16, 17, 20	8, 14, 20, 30
Contact plating specification		Gold, Tin	Tin	Tin	Gold
Mating cycles		20	20	20	30
Termination AWG		22 - 28	32	28 - 32	28 - 36
Termination type		Crimp	Crimp	Crimp	Crimp, Solder, FPC
Remarks		Low profile design, Latch lock	Low profile design	Low profile design, Robust design, Halogen-free (IEC61249-2-21)	LVDS High-speed differential signals, Top-mount, Offset mount, Reverse mount, Vertical mount

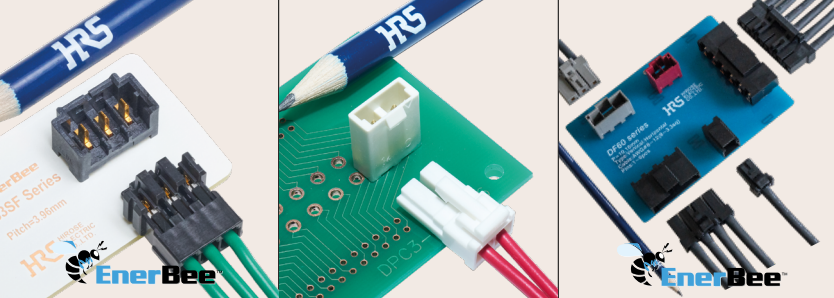
DF20	DF50/DF50A	DF57H	DF58	DF13
				
1.0	1.0	1.2	1.2	1.25
1	1	3	3	1
AC 100	AC/DC 100	AC/DC 50	AC/DC 100	AC 150
-35 to +85	-35 to +85	-35 to +85	-55 to +85	-35 to +85
10, 20, 30, 40, 50	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 (1 Row) 20, 30, 40, 50 (2 Rows)	2, 3, 4, 5, 6	2, 3, 4, 6	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 (1 Row) 10, 20, 30, 40 (2 Rows)
Gold	Gold	Gold, Tin	Tin	Gold, Tin
50	30	Tin plating: 30 Gold plating: 30	10	Tin plating: 30 Gold plating: 50
28 - 36	26 - 32	26 - 34	28 - 30	26 - 32
Crimp	Crimp	Crimp	Crimp	Crimp
LVDS compliant, Low profile design, Long effective mating length 1 mm	Robust lock, Robust design, 7, 9, 11, 13, 14, 15 contacts is vertical type only	Robust lock, Low profile design, UL and CSA compliant	Robust lock, Ultra low profile design, Halogen-free (IEC61249-2-21)	UL compliant

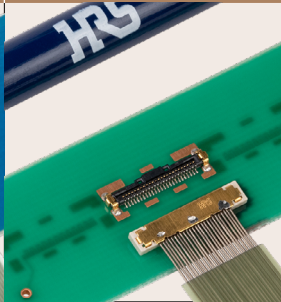
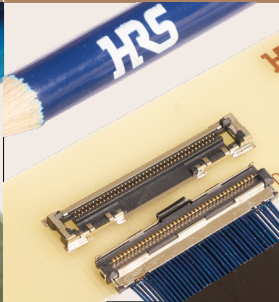
Wire-to-Board		DF14	FX2B	DF65	A3B/C, A4B
Discrete					
* Please contact HRS if a specific number of contacts is required					
** Please contact HRS for detailed current rating specification					
*** Includes temperature rise caused by current flow					
Contact pitch [mm]		1.25	1.27	1.7	2.0
Rated Current [A]**		1	0.5	4 (UL/C-UL)	2
Rated Voltage [V]		AC 150	AC 125	AC/DC 50 (UL/C-UL)	AC 200
Operating temperature range [°C]***		-35 to +85	-55 to +85	-40 to +105 (UL/C-UL)	-55 to +85
Number of contacts		2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30	20, 32, 40, 52, 60, 68, 80, 100	3, 4, 5, 6, 7	2 - 18 (1 Row) 4 - 50 (2 Rows)
Contact plating specification		Gold, Tin	Gold	Gold, Tin	Gold
Mating cycles		Tin plating: 30 Gold plating: 50	500	Tin plating: 30 Gold plating: 50	100
Termination AWG		26 - 32	28	24 - 28	26 - 36
Termination type		Crimp	IDC	Crimp	Crimp
Remarks		Ultra low profile design, Offset type: 2, 20 and 30 contacts	Locking options, Easy one-touch operation, Robust design	Low profile design, 1.8 mm mated height, Solder wicking prevention, UL and C-UL compliant	Board-to-Board version option

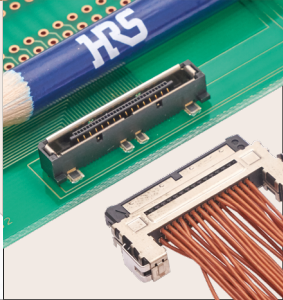
DF3	DF11	DF51	DF51K	DF59
				
2.0	2.0	2.0	2.0	2.0
3 (UL/C-UL/CSA)	2 (UL/CSA)	3 (UL/C-UL)	3 (UL/C-UL)	3 (UL/C-UL)
AC 250 (UL/C-UL/CSA)	AC/DC 30 (UL/CSA)	AC/DC 250 AC/DC 30 (UL/C-UL)	AC/DC 250 AC/DC 30 (UL/C-UL)	AC/DC 230 AC/DC 30 (UL/C-UL)
-55 to +105 (UL/C-UL/CSA)	-30 to +85 (UL/CSA)	-55 to +105 (UL/C-UL)	-55 to +105 (UL/C-UL)	-35 to +105 -40 to +85 (UL/C-UL)
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 40	2 - 6 (1 Row) 4 - 30 (2 Rows)	2 - 6 (1 Row) 4 - 30 (2 Rows)	2, 3, 4
Gold, Tin	Gold, Tin	Gold, Tin	Gold, Tin	Gold
Tin plating: 30 Gold plating: 50	Tin plating: 30 Gold plating: 50	Tin plating: 30 Gold plating: 50	Tin plating: 30 Gold plating: 50	10, 30
22 - 28	22 - 30	22 - 30	22 - 30	22
Crimp	Crimp, IDC	Crimp	Crimp	Crimp
In-line version option, Board-to-Board version option, UL, C-UL and CSA compliant	In-line version option, Board-to-Board version option, UL, CSA compliant	In-line version option, Right angle version option, Straight version option, UL and C-UL compliant	Positive lock, Wire-to-Board connector, UL and C-UL compliant	Floating design, (XYZ direction ± 0.5 mm), UL, C-UL compliant

Wire-to-Board		DF61	DF61Y	DF62	DF1B
Discrete					
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow					
Contact pitch [mm]	2.2	2.2	2 x 2.2	2.5	
Rated Current [A]**	5 (UL/C-UL)	4	4 (UL/C-UL)	3	
Rated Voltage [V]	AC/DC 350 (UL/C-UL)	AC/DC 350	AC/DC 250 (UL/C-UL)	AC/DC 250	
Operating temperature range [°C]***	-40 to +85 (UL/C-UL)	-40 to +105	-35 to +105 (UL/C-UL)	-35 to +85	
Number of contacts	2	2	13, 24	13, 14, 15, 16, 18, 20 (1 Row) 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 34, 36, 40 (2 Rows)	
Contact plating specification	Tin	Tin	Gold, Tin	Gold, Tin	
Mating cycles	30	30	30	Tin plating: 30 Gold plating: 50	
Termination AWG	22 - 28	24 - 28	22 - 30	20 - 30	
Termination type	Crimp	Crimp	Crimp	Crimp	
Remarks	Low profile design, Withstand voltage 1700 V, Contact touch protection, Red, white, yellow colour options, UL and C-UL compliant	Low profile design, Robust lock	Robust lock, Waterproof version option, UL and C-UL compliant	Potting receptacle option, In-line version option, Wire-to-Wire version option, In-line panel lock version option	

DF1E	A1/A2	HIF3M*W	DF33C	DF63
				
2.5	2.54	2.54	3.3	3.96, 7.92
3	3	1	5	15
AC 250	AC 200	AC 200	AC/DC 500	AC/DC 630
-35 to +85	-55 to +85	-55 to +85	-35 to +85	-55 to +105
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1 - 20 (1 Row) 6 - 64 (2 Rows)	10, 14, 16, 20, 26, 30, 34, 40, 50, 60, 64	2, 3, 4, 5, 6 (1 Row) 4, 6, 8, 10, 12 (2 Rows)	1, 2, 3, 4, 5, 6
Gold, Tin	Gold	Gold	Tin	Gold, Tin
Tin plating: 30 Gold plating: 50	500	500	30	Tin plating: 30 Gold plating: 50
20 - 30	22 - 26 / 26 - 30	28	20 - 22	16 - 22
Crimp	Crimp	IDC	Crimp	Crimp
Robust lock, Potting receptacle option, In-line version option, Wire-to-Wire version option, For glow wire compliance see page 89.	Compatible with HIF3B cable side and HIF3H receptacle side	Multiple variation options, Straight version option, Right angle version option, MIL-C-83503 compliant, UL compliant	Robust lock, Polarized, Potting compatible, For glow wire compliance see page 89.	Robust lock, Polarized, Potting compatible, Compatible with DF63W, UL and C-UL compliant, For glow wire compliance see page 89.

Wire-to-Board		DF63SF	DF5	DF60
Wire-to-Board	Discrete			
	* Please contact HRS if a specific number of contacts is required			
	** Please contact HRS for detailed current rating specification			
	*** Includes temperature rise caused by current flow			
	Contact pitch [mm]	3.96, 7.92	5.0	10, 16
	Rated Current [A]**	12 (UL/C-UL)	8	65 (UL/C-UL)
	Rated Voltage [V]	AC/DC 630 (UL/C-UL)	AC 500	AC/DC 1000 (UL/C-UL)
	Operating temperature range [°C]***	-55 to +105 (UL/C-UL)	-35 to +85	-55 to +105 (UL/C-UL)
	Number of contacts	2, 3	2, 3, 4, 5, 6, 7, 8, 9, 10 (1 Row) 4, 6, 8, 10, 12, 14, 16 (2 Row)	1, 2, 3, 4, 5, 6
	Contact plating specification	Gold	Tin	Gold
		Mating cycles	50	30
		Termination AWG	16 - 18	18 - 22
		Termination type	Crimp	Crimp
		Remarks	Low profile design, Robust lock, THR mount, UL, C-UL compliant For glow wire compliance see page 89.	Potting receptacle, Robust lock, UL and C-UL compliant, For glow wire compliance see page 89.
				Robust lock, Polarized, Straight, right angle, in-line version options, UL and C-UL compliant, For glow wire compliance see page 89.Finger protection version available

Wire-to-Board		DF56	DF36	DF81	DF80
Micro-Coax					
* Please contact HRS if a specific number of contacts is required					
** Please contact HRS for detailed current rating specification					
*** Includes temperature rise caused by current flow					
Contact pitch [mm]		0.3	0.4	0.4	0.5
Mated height [mm]		1.25 (1.35 Max)	1.5	0.9	1.72
Rated Current [A]**		0.2	0.25	0.3	0.5
Rated Voltage [V]		AC/DC 30	AC/DC 30	AC/DC 100	AC/DC 50
Temperature range [°C]		-35 to +85	-35 to +85	-35 to +85	-35 to +85
Contact plating specification		Gold, Tin	Gold, Tin	Gold	Gold, Tin
Number of contacts		26, 30, 40, 50	15, 20, 25, 30, 40, 45, 50	30, 40, 50	30, 40, 50
Mating cycles		20	30	30	30
Termination AWG		42 - 46	42 - 46	36 - 46 (micro coax) 34 - 36 (discrete wire)	40 - 46 (micro coax) 32 - 36 (discrete wire)
Remarks		Enhanced shielding and ground connections, Top entry mating, Space saving design, Halogen-free (IEC61249-2-21)	Enhanced shielding and ground connections, Top entry mating, DF36A Shielded version, Halogen-free (IEC61249-2-21)	High-speed transmission 5.4 Gbps, Supports eDP™ Embedded DisplayPort™ Ver 1.3, MIPI (D-PHY), Halogen-free (IEC61249-2-21)	High-speed transmission 2.7 Gbps & 5.4 Gbps, Supports eDP™ Embedded DisplayPort™ Ver 1.3, EMI Shielded version, Halogen-free (IEC61249-2-21)

FX16	FX15
	
0.5	1
-	-
0.5	0.5
AC/DC 60	AC/DC 100
-55 to +85	-55 to +85
Gold	Gold
21, 31, 41, 51	21, 31, 41, 51
50	50
36 - 40 (micro coax) 28 - 32 (discrete wire)	36 - 40 (micro coax) 28 - 32 (discrete wire)
V-By-One® Æ HS compliant, FFC version option	LVDS signal compliant, Space saving design

Wire-to-Wire	DF3	DF11	DF62B	DF62C
In-line				
* Please contact HRS if a specific number of contacts is required ** Please contact HRS for detailed current rating specification *** Includes temperature rise caused by current flow				
Contact pitch [mm]	2.0	2.0	2.2	2.2
Rated Current [A]**	3	2 1 (IDC/AWG26)	4	4
Rated Voltage [V]	AC 250 AC 30 (UL/CSA)	Crimping AC 250, IDC AC 100, AC 30 (UL/CSA)	AC/DC 250 AC/DC 29.9 (UL/C-UL)	AC/DC 250 AC/DC 29.9 (UL/C-UL)
Termination type	Crimp	IDC / Crimp	Crimp	Crimp
Operating temperature range [°C]***	-55 to +105	-40 to +85	-35 to +105 -35 to +75 (UL/C-UL)	-35 to +105 -35 to +75 (UL/C-UL)
Number of contacts	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 40	2, 3, 4, 5, 6, 7, 13, 24	2, 3, 4, 5, 6, 7, 13, 24
Contact plating specification	Gold, Tin	Gold, Tin	Gold, Tin	Gold, Tin
Mating cycles	Tin plating: 30 Gold plating: 50	Tin plating: 30 Gold plating: 50	30	30
Termination AWG	22 - 28	22 - 30	22 - 30	22 - 30
Remarks	Wire-to-Board version option, Board-to-Board version option, UL, C-UL and CSA compliant	Wire-to-Board version option, Board-to-Board version option, UL and CSA compliant	Robust lock, Compatible with DF62P, Wire-to-Board version option, UL and C-UL compliant. For glow wire compliance see page 89.	Robust protected lock, Compatible with DF62P, Wire-to-Board version option, UL and C-UL compliant For glow wire compliance see page 89.

DF62P	DF62W	DF1B/DF1E	DF63W	DF63
				
2.2	2.2	2.5	3.96	3.96, 7.92
4	5	3	14	15
AC/DC 250 AC/DC 29.9 (UL/C-UL)	AC/DC 250 AC/DC 29.9 (UL/C-UL)	AC/DC 250 AC/DC 29.9 (UL/C-UL)	AC/DC 630	AC/DC 630 AC/DC 600 (UL/C-UL) AC/DC 300
Crimp	Crimp	Crimp	Crimp	Crimp
-35 to +105 -35 to +75 (UL/C-UL)	-35 to +105 -35 to +75 (UL/C-UL)	-35 to +85	-40 to +105	-55 to +105
2, 3, 4, 5, 6, 7, 13, 24	2, 3, 4, 6, 9	2 - 16, 18, 20, 22, 24, 26, 28, 30, 34, 36, 40	2, 3, 4	1, 2, 3, 4, 5, 6
Gold, Tin	Gold, Tin	Gold, Tin	Tin	Gold, Tin
30	30	Tin plating: 30 Gold plating: 50	30	Tin plating: 30 Gold plating: 50
22 - 30	20 - 26	20 - 30	16 - 22	16 - 22
Robust lock, Panel mount version, Socket is same as for DF62B & DF62C series, UL and C-UL compliant. For glow wire compliance see page 89.	Robust lock, IP67 waterproof rating, UL and C-UL compliant. For glow wire compliance see page 89.	Wire-to-Board version option, Panel mount version option, Mis-insertion prevention, Retainer available (socket & in-line plug). For glow wire compliance see page 89.	Robust protected lock, IP67 waterproof rating, UL, C-UL compliant	Robust lock, Polarized, Panel mount version option, UL, C-UL compliant. For glow wire compliance see page 89.

Wire-to-Wire

Wire-to-Wire

DF60

In-line

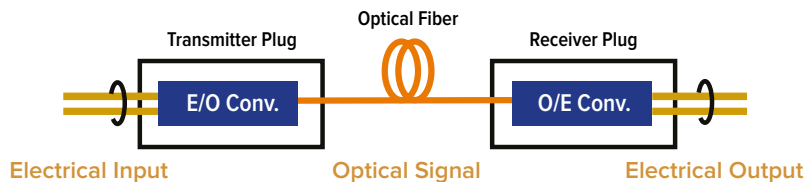
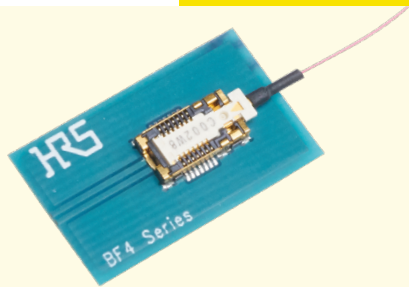
- * Please contact HRS if a specific number of contacts is required
- ** Please contact HRS for detailed current rating specification
- *** Includes temperature rise caused by current flow



Contact pitch [mm]	10.16
Rated Current [A]**	65
Rated Voltage [V]	AC/DC 1000 AC/DC 600 (UL/C-UL)
Termination type	Crimp
Operating temperature range [°C]***	-55 to +105
Number of contacts	1, 2, 3, 4, 5, 6
Contact plating specification	Gold
Mating cycles	30
Termination AWG	8 - 12
Remarks	Robust protected lock, Polarized & key variation, Wire-to-Board version option, UL, C-UL compliant, Finger protection (IP2X) version available, For glow wire compliance see page 89

Optical

BF4M SERIES

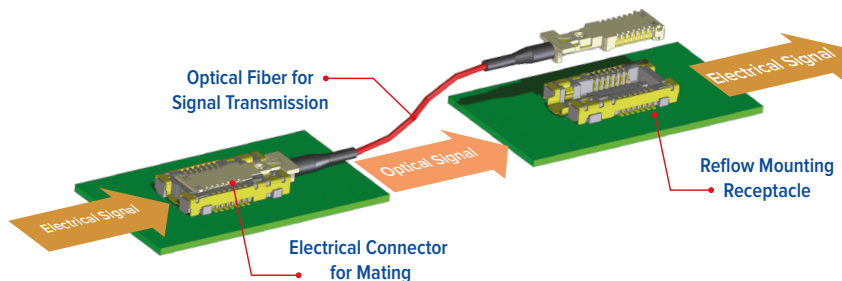


Optical Active Connector with Built-in E/O O/E devices.
Supporting 0.05 to 6.25 Gbps

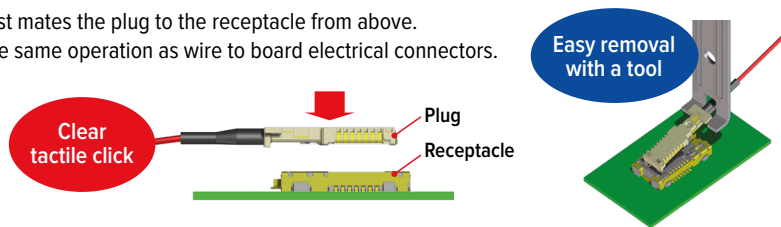
FEATURES

- Access-friendly optical interconnection with built-in E/O - O/E (Electric/Optic – Optic/Electric) converter
- Long distance transmission with excellent EMI resistance
- Space saving design
- Low power consumption (less than 120nW)
- Flexible optical cable

Optical Active Connector: BF4M



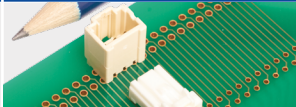
Just mates the plug to the receptacle from above.
The same operation as wire to board electrical connectors.



Glow Wire Compliant Products List

IEC 60695-2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products (GWEPT) Temperatures of glow wire: 850°C (Some exceptional products meet 750°C). For more information on Glow wire compliance above please contact HRS.

> Glow Wire compliant items are defined depending on size due to testing specification
* Number of contacts

Series	Compliant Product		
	Product Name	Pin Count	
DF1E/DF1B	DF1E-*S-2.5C DF1EC(G)-*P-2.5DSA DF1E(A)-*EP-2.5C DF1BZ-12DP-2.5DS	*=15 *=5~15 *=5~15 12	
DF5	All Released Products		
DF33C	DF33C-*S-3.3C DF33C-*DS-3.3C DF33C-*P-3.3DSA DF33C-*DP-3.3DSA	*=5, 6 *=10~14 *=4~6 *=8~14	
DF60	All Released Products		
DF62	DF62B-*S-2.2C DF62C-*S-2.2C DF62P-*S-2.2C DF62B-*EP-2.2C DF62P-*EP-2.2C DF62W-*S-2.2C DF62W-*EP-2.2C	*=24	
DF63	DF63(M)-*P-3.96DSA DF63(M)-*P-3.96DS DF63-*S-3.96C DF63W(A)-*EP-3.96C DF63W-2S-3.96C	*=4~6	
DF63SF	All Released Products		

To the Highest Peaks of Floating and High Speed Transmission

FunctionMAX™

Wide Product Range Compatible with Industrial Equipment and Automotive Devices

The FunctionMAX product family consists of a wide range of floating and high speed connectors. In addition, each product series has its own unique features to meet the requirements of various industrial and automotive applications.

Industrial Equipment PLC



FX23/FX23L

Customer Feedback

The floating design absorbs the case and board misalignment, making designing equipment easier.

Industrial Equipment Robot Controller

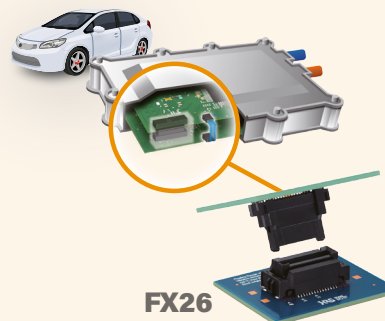


FX18

Customer Feedback

Easy choice due to the high speed signal support and wide connection varieties including parallel, right angle and coplanar types.

Automotive Devices Powertrain



FX26

Customer Feedback

Replacing the cable connector enabled us to reduce space and assembly man-hours. We also achieved significant cost benefits.



Check Here for
More Details

FX25 Series

■ 0.4mm Pitch

Floating Compact High Speed Right Angle

FX10/FX11 Series

■ 0.5mm Pitch

Floating High Speed Parallel

FX22 Series

■ 0.5mm Pitch

Floating 2-point Contact Low Profile Coplanar

FX8/FX8C Series

■ 0.6mm Pitch

High Speed Parallel

ER8 Series

■ 0.8mm Pitch

High Speed Parallel Right Angle Coplanar

FX18 Series

■ 0.8mm Pitch

High Speed With Power Contacts Parallel Right Angle
Coplanar

FX27 Series

■ 0.8mm Pitch

Floating Card Edge High Speed Parallel
Right Angle

FX30B Series

■ 3.81mm/7.62mm Pitch

Floating With Power Contacts Parallel Right Angle
Coplanar

FX20 Series

■ 0.5mm Pitch

Floating 2-point Contact Automotive Parallel
Right Angle

FX23/FX23L Series

■ 0.5mm Pitch

Floating High Speed With Power Contacts Up to 105°C
Automotive Parallel Right Angle

FX26 Series

■ 1.0mm Pitch

Floating Vibration Resistant Up to 140°C 2-point Contact
Automotive Parallel

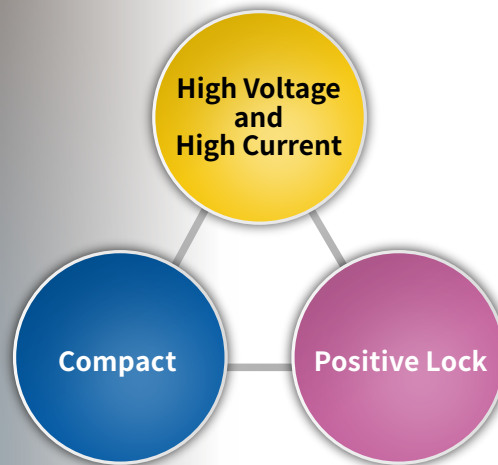
Automotive

High Power, High Reliability



A Legend in Compact, High-end Devices

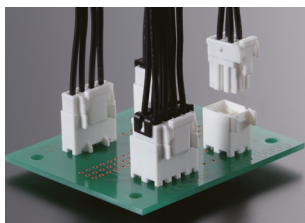
EnerBee - Your best choice for power cable connectors. In addition to superior performance, small size and high current/high voltage support, the EnerBee products have a positive lock mechanism to meet various requirements of industrial power supply and power sources. Switching to EnerBee allows you to maximize space-savings and achieve superior performance. Additionally, EnerBee's built-in positive lock mechanism enhances assembly quality and work efficiency.





Check Here for
More Details

DF33C Series

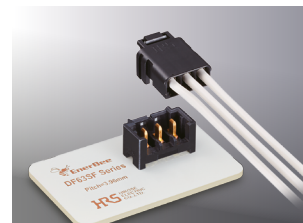


■ 3.3mm Pitch, 5A Max.

Potting

Center Lock

DF63SF Series



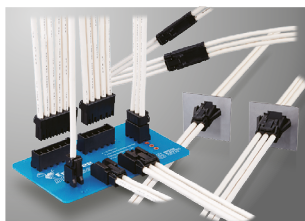
■ 3.96mm Pitch, 12A Max.

Multi-point Contact

Center Lock

UL/C-UL

DF63 Series



■ 3.96mm, 15A Max.

Polarization Key

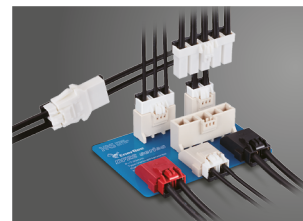
Potting

Multi-point Contact

Center Lock

UL/C-UL

DF22 Series



■ 7.92mm Pitch, 30A Max.

Polarization Key

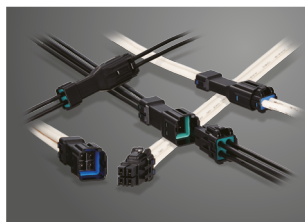
Potting

Multi-point Contact

Center Lock

UL/C-UL

DF63W Series



■ 3.96mm, 14A Max.

Polarization Key

Potting

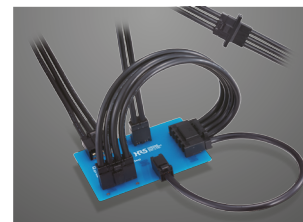
Multi-point Contact

Center Lock

Waterproof

UL/C-UL

DF60 Series



■ 10.16mm Pitch, 65A* Max.

Polarization Key

Multi-point Contact

Center Lock

UL/C-UL

* UL Standard

**With Hirose,
you always play the
winning hand.**



Accumulated Technology that Leads to Solutions

SignalBee, a sister brand to our power cable brand EnerBee, is your solution for signal cable connectors. It represents the concept of compact size with high performance.

The wide product line-up is versatile and provides the best solutions to meet users' application requirements. SignalBee demonstrates high performances in many fields, including industrial machinery. The various options contribute to space reduction and assembly time savings.

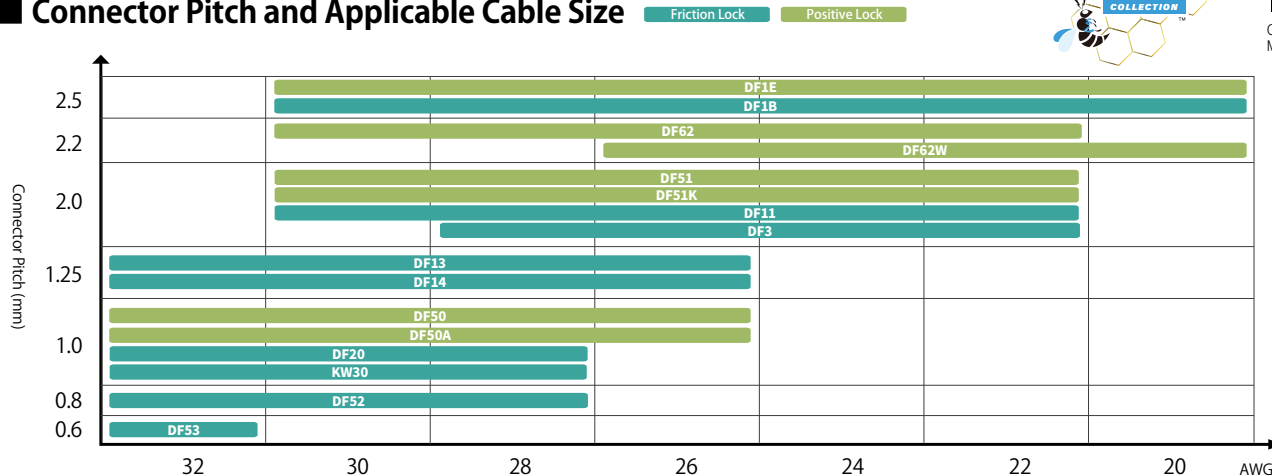
SignalBee - Your best choice for signal cable connectors.



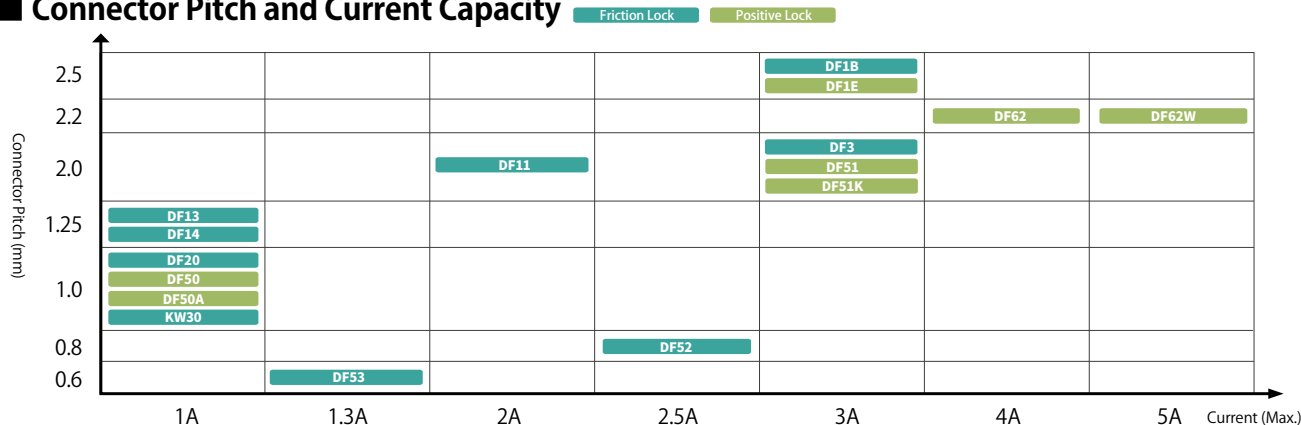


Check Here for
More Details

■ Connector Pitch and Applicable Cable Size



■ Connector Pitch and Current Capacity

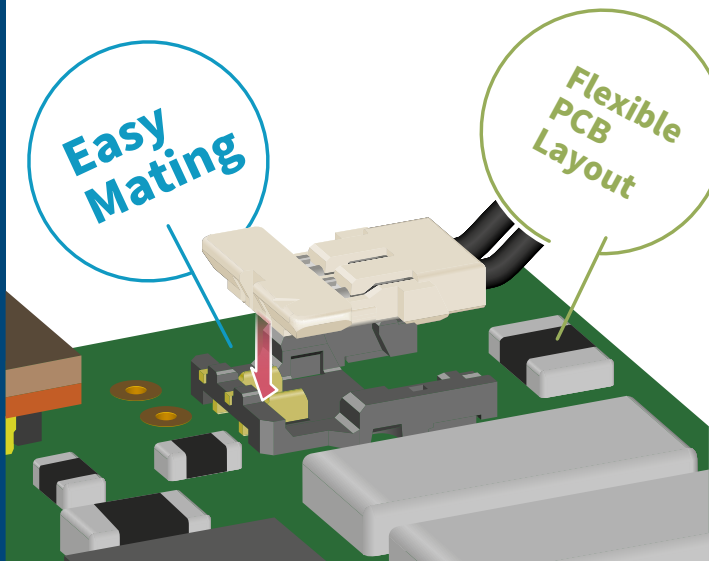


Top Mate Snap Lock : For Smaller, Tougher Devices.



Easy
Mating

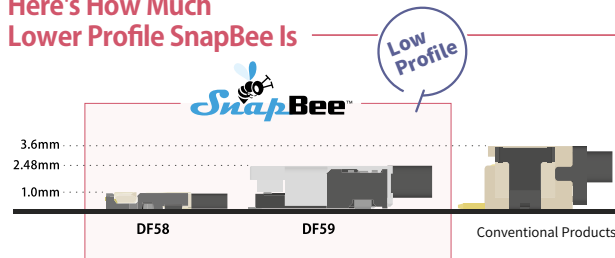
Flexible
PCB
Layout



The Best Solution for Vertical Mating Lock

SnapBee - Your best choice for top entry, side feed wire-to-board connectors. This product family is used widely in small equipment power supply applications. In the industrial equipment industry as well as the consumer electronics market, demand for even smaller and thinner products are on the rise along with increased space restrictions. SnapBee offers high performance, compact design and a top entry lock (snap lock) to solve structural component interference and enhance workability.

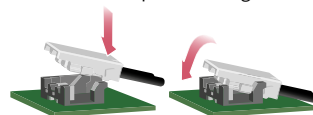
Here's How Much Lower Profile SnapBee Is



Snap Lock Design

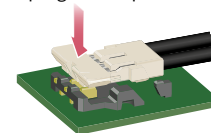
1 Swing Lock

After inserting from the cable side, push down the front side to complete mating.



2 ViSe Lock

Press down on the center of the plug to complete mating.





■ Product Overview

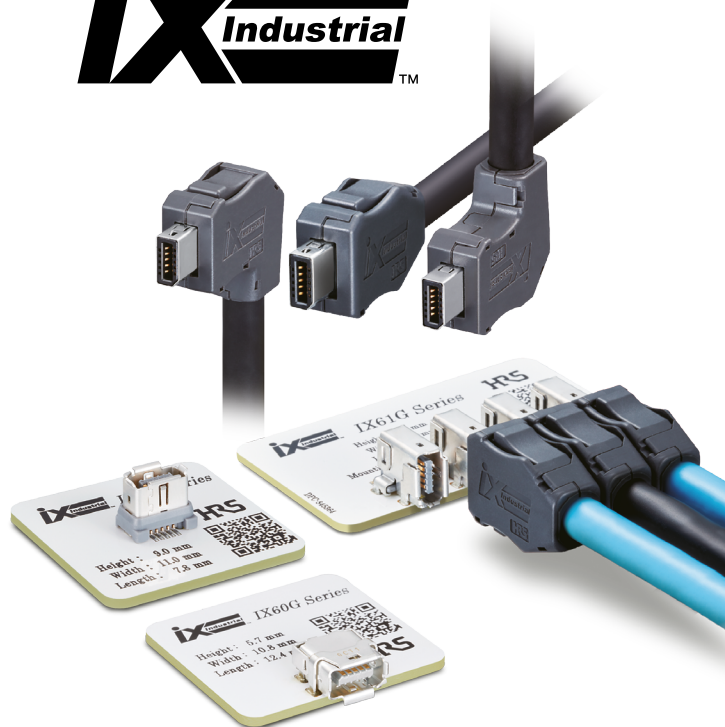
Series		DF57H	DF58	DF59	DF61	DF61Y	DF65
Pitch		1.2mm (Middle Pin of 3pos. Removed : 2.4mm)	1.2mm	2.0mm (Middle Pin of 3pos. Removed : 4.0mm)	2.2mm	2.2mm	1.7mm
No. of Pos.		2 to 6	2 to 4, 6	2 to 4	2	2	3 to 7
Size	Height	1.4mm (26 AWG : 1.6mm)	1.0mm	2.48mm	2.38mm	2.0mm	1.8mm
	Depth	4.65mm	4.97mm	8.15mm	7.35mm	7.35mm	6.3mm
	Mounted Space	17.83mm ²	22.86mm ²	58.68mm ²	37.48mm ²	37.48mm ²	49.14mm ²
Rating	Current	2.5A Max. (Middle Pin of 3pos. Removed : 3A)	3A Max.	3A Max.	5A Max.	4A Max.	4A Max.
	Voltage	50V AC/DC (Middle Pin of 3pos. Removed : 100V AC/DC)	100V AC/DC	230V AC/DC	350V AC/DC	350V AC/DC	50V AC/DC
Applicable Cable		26 to 34 AWG	28 to 30 AWG	22 AWG	22 to 28 AWG	24 to 28 AWG	24 to 28 AWG
Lock		Swing	ViSe	Swing	Swing	ViSe	ViSe

*DF61Y and DF65 use the same crimp contacts.

*Current rating depends on cable/number of positions.

*The above specifications are for the standard type. Please contact your Hirose sales representative if you considering to use the products outside of the specifications.

Advance with ix Industrial



Are you experiencing these obstacles?

Existing connectors are too big and don't allow for free use of the mounting space...

It takes such a long time to transmit a large amount of data...

The connector breaks so easily...

These Obstacles

ix Industrial™ can solve them!

3 Special Features



Check Here for
More Details

1



Compact

Compact

Compact for Enhanced Design Freedom

ix Industrial offers a size reduction of 75% compared to conventional RJ45 modular solutions. The receptacle allows for parallel 10mm pitch mounting. More flexible PCB design is made possible due to the high density, space reducing mounting.



Compared to
RJ45

75%
Volume
Reduction

2

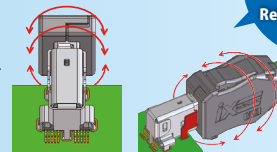


Robust

Robust

Shell that Resists Prying for High PCB Retention

The receptacle shell is mounted into through-holes on the PCB. The through-holes are located near the SMT leads to reduce stress. The shell design allows through-hole mounting close to the mating area for secure retention on the PCB.



Reduce
Prying Stress
and Maintain
High PCB
Retention Force

3



CAT 6A

High Speed

Supports Industry 4.0 Data Growth

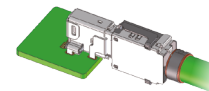
Stable Cat.5e (1Gbps) and Cat.6A (10Gbps) high speed Ethernet performance.



Additional Feature

Excellent Noise Protection

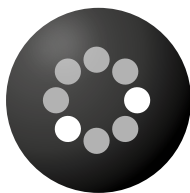
The signal contact is covered with a shield near the mounting area for high EMC resistance.



USB Type-C Connector

USB from Hirose Electric:
Standard connections, inspired solutions.

CXTM
series



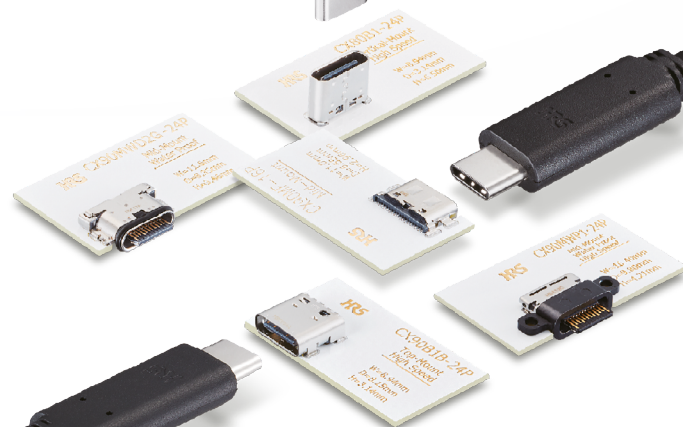
Wide
Variations



Clear Tactile
Click



20Gbps / USB4
Gen.2x2



HRS



USB Type-CTM
connector



Check Here for
More Details

Connector Type	Board Mounting Method	Mounting Method	Part No.	3D Image	No. of Pos.	Transmission Speed	Rated Current	Waterproofing	TID (Certification Number)	Features
Plug Unit	Paddle Card	SMT (2 Rows)	CX60-24S-UNIT		24	20Gbps (USB4 Gen.2×2)	5A	-	5,200,000,291	•Slim Type
Plug Shell	-	-	CX60-SLDA		-	-	-	-	-	•Slim Type
Plug Cable Assembly (1m Length Plugs on Both Sides)	-	-	CX60-24S-1000-C1		24	20Gbps (USB4 Gen.2×2)	5A	-	5648	•Slim Type
			CX60-24S-1000-CD		24	20Gbps (USB4 Gen.2×2)	5A	-	-	•Screw Lock Type (2 Locations on Both Sides)
			CX60-24S-1000-CS		24	20Gbps (USB4 Gen.2×2)	5A	-	-	•Screw Lock Type (1 Location in Center)
Receptacle	Mid-Mount	Right Angle Hybrid (SMT+THR)	CX70M-24P1		24	5Gbps	5A	-	5,200,000,077	•Space-saving Type •8.35mm Depth
			CX70M-24P2		24	5Gbps	5A	-	-	•Space-saving Type •7.95mm Depth
		Right Angle (2 Row SMT)	CX90MWD2-24P		24	5Gbps	5A	IPX8	-	•Without Gasket
			CX90MWD2G-24P		24	5Gbps	5A	IPX8	-	•With Gasket
			CX90MWP1-24P		24	5Gbps	6A	IPX4	-	•Molded Shell •Screw Mounting Type
		Right Angle (1 Row SMT)	CX90MW6-16P		16	480Mbps	6A	IPX8		•Screw Mounting Type •With Gasket
			CX90M-16P		16	480Mbps	6A	-	-	•Space-saving Type
	Top-Mount	Vertical (SMT)	CX80B1-24P		24	20Gbps (USB4 Gen.2×2)	5A	-	5,200,000,701	•Low Profile Type
		Right Angle (2 Row SMT)	CX90B1-24P		24	20Gbps (USB4 Gen.2×2)	5A	-	5,200,000,499	•Rugged Type •0.6mm Shell Through Hole Height
			CX90B1B-24P		24	20Gbps (USB4 Gen.2×2)	5A	-	-	•Rugged Type •1.2mm Shell Through Hole Height
		Right Angle (1 Row SMT)	CX90B-16P		16	480Mbps	5A	-	-	•Space-saving Type
			CX90BW-16P		16	480Mbps	6A	IPX4	-	•With Gasket

Next-Generation Terminal Block that Connects in a Single Action

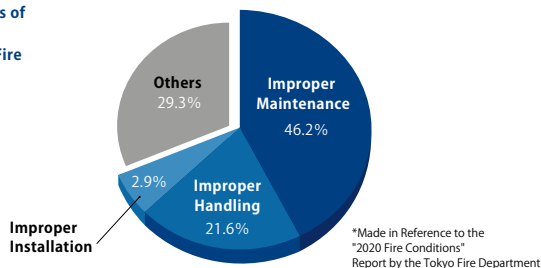
The Zero Screw Solution.

ZERO SCREW™

1 Reduced Electrical Equipment Fire Risk

Maintains Stable Connection

Major Causes of
Electrical
Equipment Fire



An electrical fire not only endangers the life of building users, it also lowers trust in developers, construction companies and fire source product suppliers. About 70% of the cause of electrical fires is poor handling and lack of maintenance. More specifically, screw looseness can be identified as the cause of these fires. Periodic maintenance and inspection of screws is required. Even with periodic maintenance, it is difficult to completely prevent an accident.

The ZERO SCREW terminal block maintains a highly reliable connection for a long time with its unique, screw-less design that reduces fire risk caused by loose screws in electrical equipment to zero.

The ZERO SCREW™ terminal block achieves enhanced safety and reduces construction time.

The ZERO SCREW terminal block (EF2 Series) can be connected in a single action without screws.

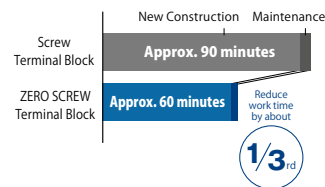
Simply insert the ring terminal to connect. Since a highly reliable contact can be maintained over a long time period, maintenance work is also reduced. It is a new choice of terminal block that improves the work quality, construction time and the safety of electrical facilities.

2 Shortens Construction Time Drastically

Reduce All Processes Related to Screws

With screw type terminal blocks, screwing and unscrewing is required for new construction and torque checking is needed during maintenance. Since the ZERO SCREW Terminal Block has no screws, it can reduce the number of work hours by more than one-third compared to a conventional screw terminal block for a dramatic reduction in construction time.

Work Hours Comparison with
Screw Terminal Block



D400
400A



D250
310A



D200
175A, 240A



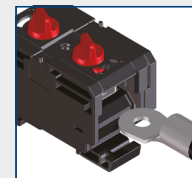
Check Here for
More Details



Easy Operation

Simply Insert to Connect No screws needed.

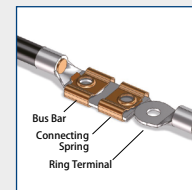
Quick and secure single action positive lock design. Unlike a conventional screw terminal block, an operator with less experience can easily maintain stable work quality. Visual confirmation of the insertion status from the top after mating ensures safety.



Long-term Stable Connection

Highly Reliable Connection with Unique Contact Spring Design

Unique design presses the ring terminal directly against the bus bar for connection, improving contact reliability and maintaining a stable, long-term connection.



Positive Lock

Fully Locked State is the Standard Position

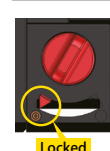
EF2 is always in a locked state when connected. The safety design prevents the ring terminal from coming out unless the button is pressed and the ring terminal is removed. This design also prevents workers from forgetting to lock the connector and the ring terminal from falling out.

Can visually
check the
insertion state
from the top
after mating.

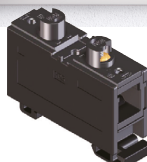
Push Type



Twist Type



D150
94A, 132A, 175A



D60
40A, 50A, 70A



D30
16A, 21A, 30A, 40A

FPC/FFC Connectors that Connects in One Action

One Action, Simple and Easy

One Action FH™

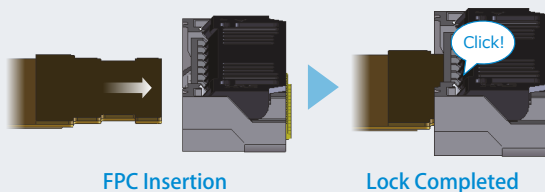
3 Features of One Action FH™ that Realize Design Freedom and Automated Assembly

OneAction FH can be connected by simply inserting the FPC/FFC, no actuator operation required.

It is also effective for robot assembly, and by reducing the number of operations steps from three to one, the work time can be greatly reduced.

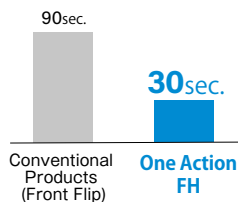
Feature 1 Easy and Simple Connection Just by Insertion

Unlike the conventional connection process of opening the actuator, inserting the FPC/FFC and then closing the actuator, connection is completed by just inserting the FPC/FFC with One Action FH. The work time and number of operation steps are reduced to 1/3rd for a significant reduction in man-hours.



Assembly Time Comparison

*For 30 Pieces



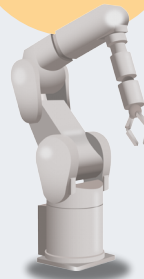
Work Time

1
3

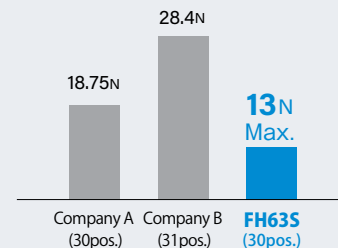
Feature 2 Supports Robot Assembly Contributes to Automation

The unique spring design reduces the insertion force of the FPC/FFC and dramatically improves the insertion performance, enabling easy operation for both humans and robots.

Compatible with Automated Assembly



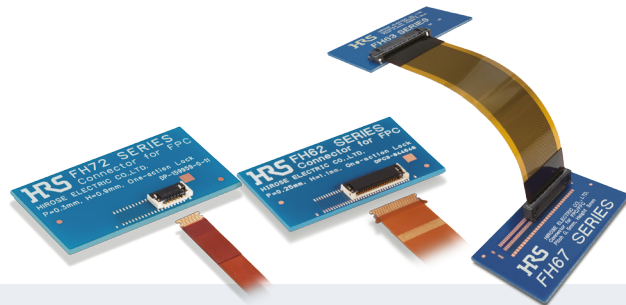
FPC Insertion Force Compared to Competitors



The spring design does not interfere with the FPC/FFC insertion and reduces insertion force.



Check Here for
More Details



Feature

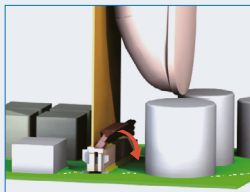
3

Easy Connection in Narrow Spaces

Increased Design Flexibility

Convention products require actuator operation when inserting the FPC/FFC. Therefore, it is difficult to open and close the actuator if there is another component placed nearby. With One Action FH, only insertion is required. As long as there is space for FPC/FFC insertion then connection can be achieved even in narrow spaces.

FH12-SV

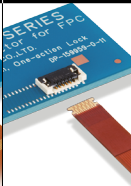
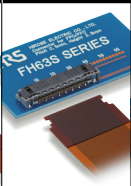


Cannot close the actuator well
if there is a component nearby.

FH67

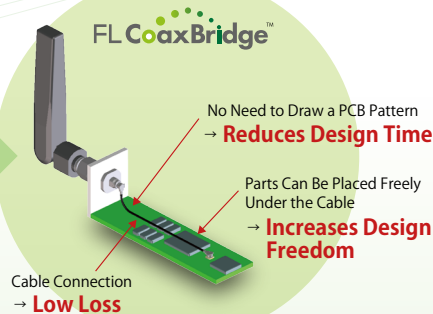
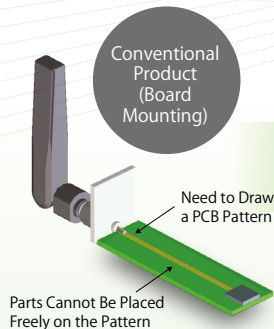
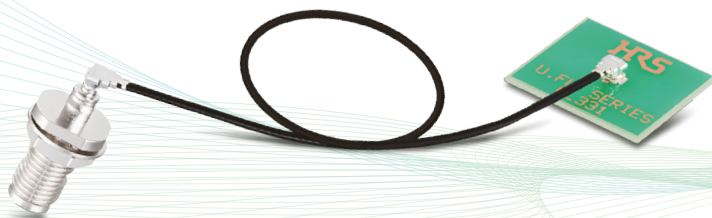


No problems even
with other parts
nearby since only
insertion is
required.

Series Name	FH62		FH72	FH63S	FH67
					
Contact Pitch (mm)	0.25		0.3	0.5	
Product Height (mm)	0.65	1.1	0.9	2.8	5.2
Rated Current (A)	0.2	0.3		0.5	
Rated Voltage (V)	30 AC/DC			50 AC/DC	
Operating Temperature	-55 to +85°C			-55 to +125°C	
Supported Cables	FPC			FPC, FFC, Shielded FFC	
FPC/FFC Thickness (mm)	0.2±0.02	0.3±0.03	0.2±0.03	0.3±0.05	0.33±0.03
No. of Pos. (Including Those Planned for Development)	8 to 14	13 to 61	7 to 31	10 to 60	

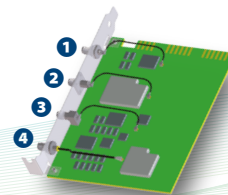
Fast Track to Design Flexibility

FL CoaxBridge™



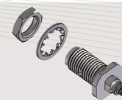
Supporting the Development of IoT Products

The FL CoaxBridge is a solution that combines Hirose's micro coaxial connector, the FL Series (supporting 50Ω/75Ω), and coaxial machining technology. FL CoaxBridge reduces the number of board design steps and frees up PCB space for additional component placement, enhancing design flexibility. CoaxBridge is a coaxial bridge that leads to problem solving of various design challenges by connecting the Output signal to the Input signal.



FL CoaxBridge Types

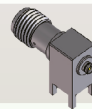
1 Bulkhead Type (Nut Lock)



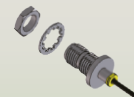
2 Screw Type



3 Board Mount Type



4 Cable Assembly Type





50Ω	SMA, TNC/U.FL Panel Mounting Adapter	
8GHz	Bulkhead Type HRMJ-U.FLJ-BPAD-5	● Cable outer dia. : 0.81mm, Center Conductor : 36 AWG U.FL-2LPHF6-04N1TV-A-100 ● Cable outer dia. : 1.32mm, Center Conductor : 32 AWG U.FL-2LPHF6-066N1-A-100 ● Cable outer dia. : 1.13mm, Center Conductor : 32 AWG U.FL-2LPHF6-068N1T-A-100 ● Cable outer dia. : 1.37mm, Center Conductor : 30 AWG U.FL-2LPHF6-088N1T-A-100 UFL-2LPHF6-088N1PD-A-100 ● Cable outer dia. : 0.95mm, Center Conductor : 33 AWG UFL-2LPHF6-062N1D-A-100
	Screw Type HRMJ-U.FLJ-PA4 (4 Holes) HRMJ-U.FLJ-PA2 (2 Holes) TNC(R)J-U.FLJ-PA-2* (2 Holes)	
	Board Mount Type HRMJ-U.FLJ-PC	
15GHz	Under Development Bulkhead Type HRMGJ-U.FLAJ-BPA	● Cable outer dia. : 1.13mm, Center Conductor : 32 AWG UFL-2LPA-068Y1T-A-100 ● Cable outer dia. : 1.37mm, Center Conductor : 30 AWG UFL-2LPA-088Y1T-A-100

* R : Polarity Reversal

50Ω	SMA/U.FL Cable Assembly	
8GHz	Bulkhead Type HRM-200-*** BPJD *0.81mm dia. Under Development	● Cable outer dia. : 0.81mm, Center Conductor : 36 AWG U.FL-LP-040HF ● Cable outer dia. : 1.13mm, Center Conductor : 32 AWG U.FL-LP-068HF ● Cable outer dia. : 1.32mm, Center Conductor : 32 AWG U.FL-LP-066HF ● Cable outer dia. : 1.37mm, Center Conductor : 30 AWG U.FL-LP-088HF(06)
	Bulkhead Type (Panel Waterproof) HRM-200-*** WBPJBN	
	Screw Type HRM-200-*** PJ4BN(40) (4 Holes) HRM-200-*** PJ2BN(40) (2 Holes)	
15GHz	Bulkhead Type HRM(G)-200-*** BPJBN	● Cable outer dia. : 1.13mm, Center Conductor : 32 AWG U.FL(A)-LP-068 ● Cable outer dia. : 1.37mm, Center Conductor : 30 AWG U.FL(A)-LP-088

***= 040 is for 0.81mm dia., 066 is for 1.32/1.13mm dia., 088 is for 1.37mm dia.

75Ω	BNC75/D.FL75 Panel Mounting Adapter	
12GHz	Bulkhead Type BNC(75)J-D.FL75J-BPA	● Cable outer dia. : 1.5mm, Center Conductor : 35 AWG DFL75-2LPP-084N9D-A-100

● Cable Color: White, Black and Gray. (SMA, TNC/U.FL cable assembly is black only) ● Cable Length: Available from 50mm. Contact your Hirose sales representative for more information.

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Smart Grid



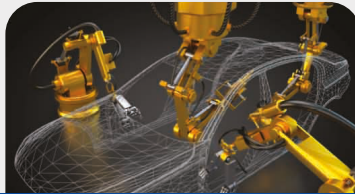
Automotive



Mobile Communication Devices



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Industrial Automation



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Industries

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Other Industrial Equipment

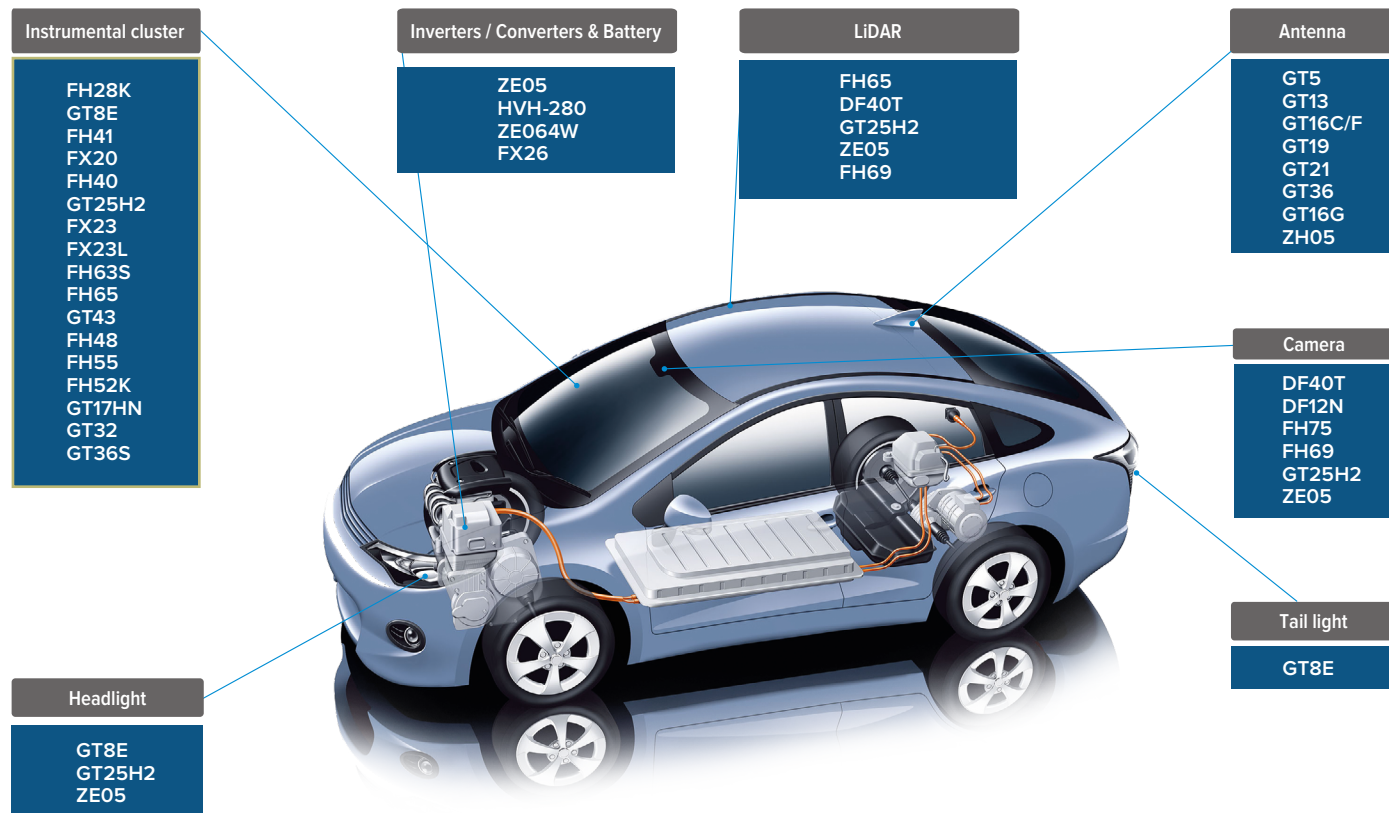


Office Automation

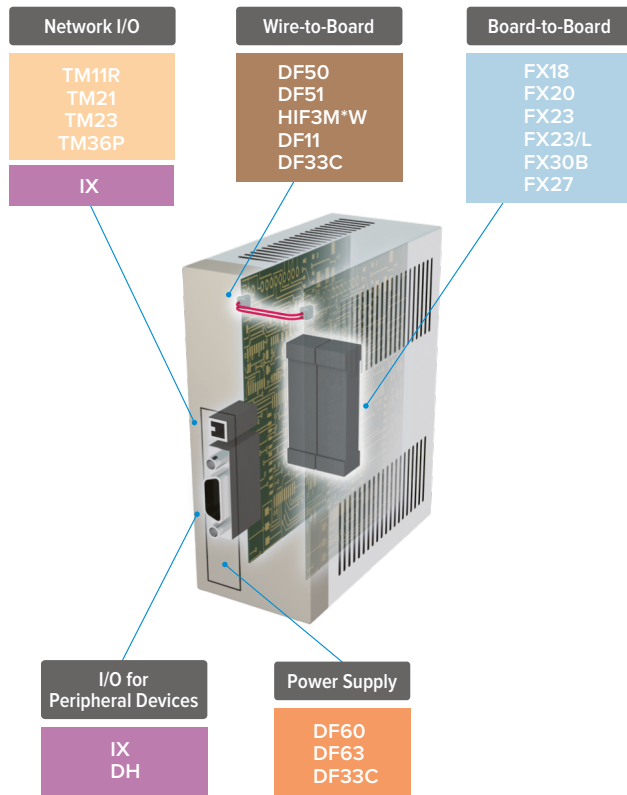


Home Appliances

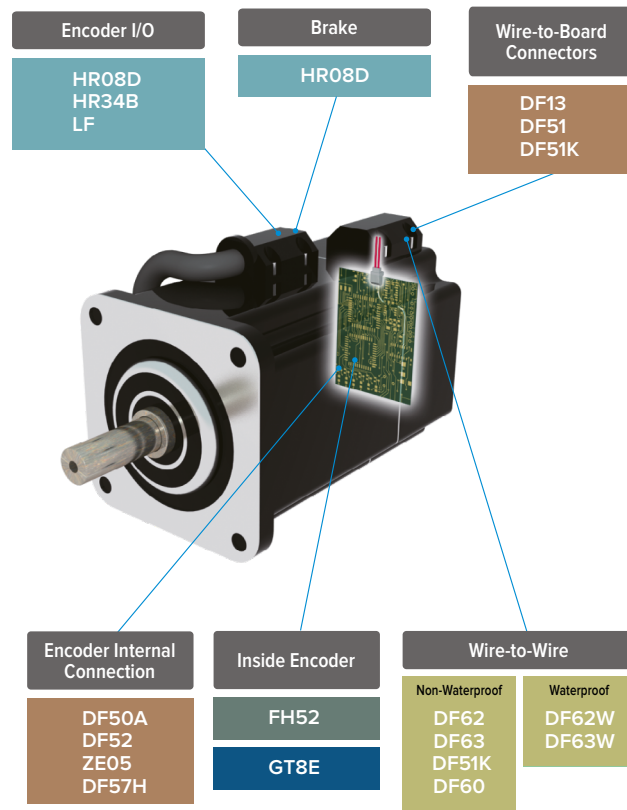
Automotive



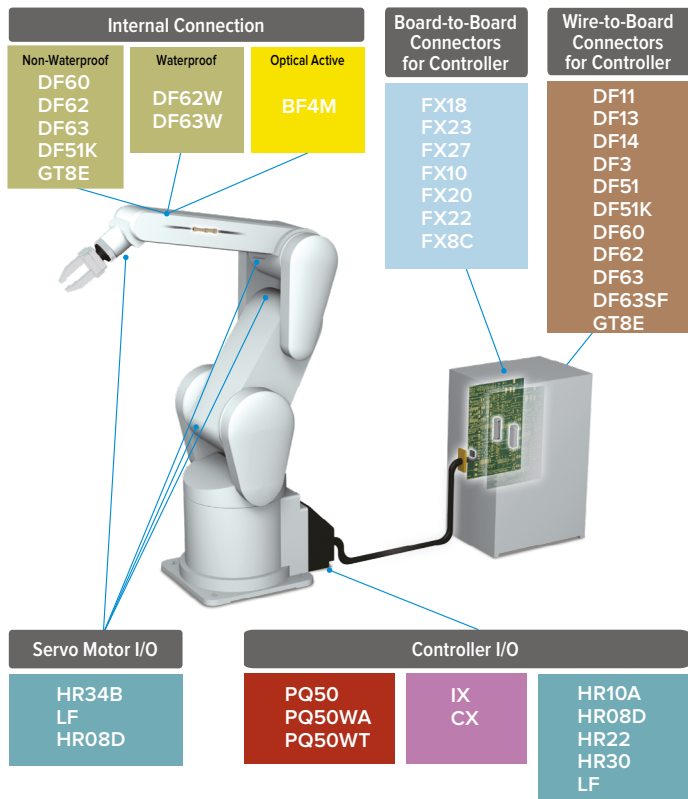
Servo Drive



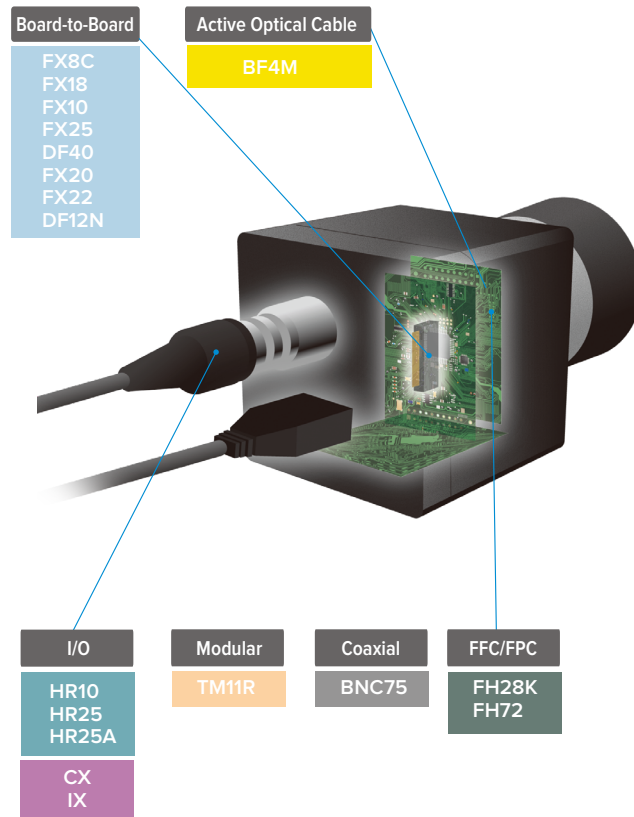
Servo Motor



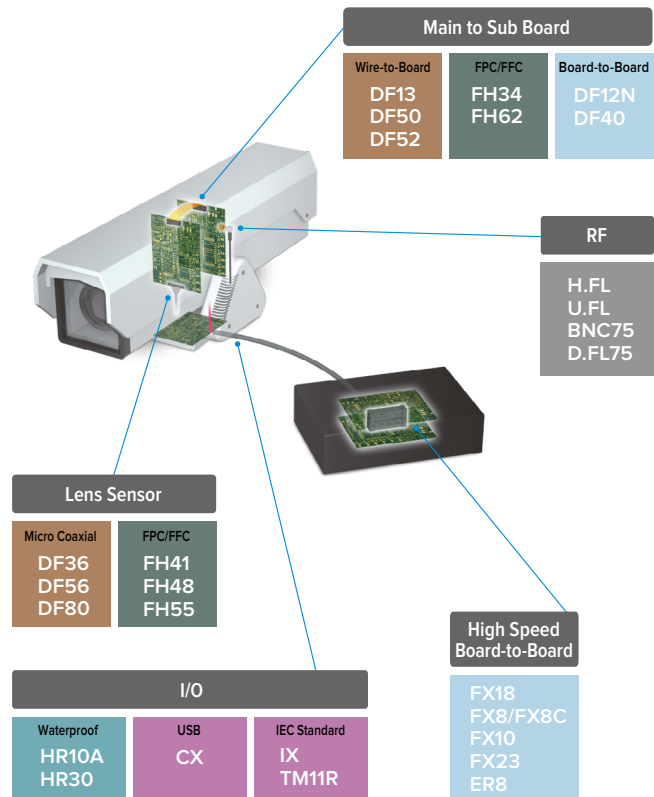
Industrial Robot



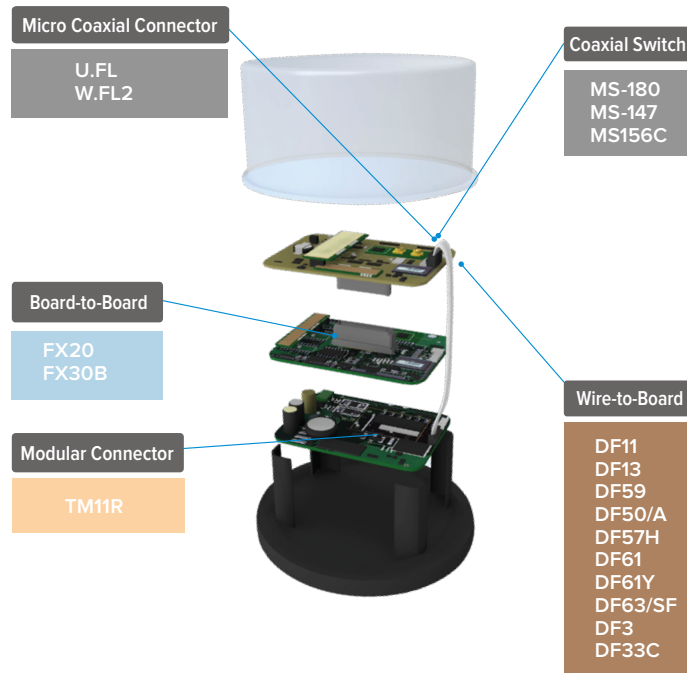
FA Camera



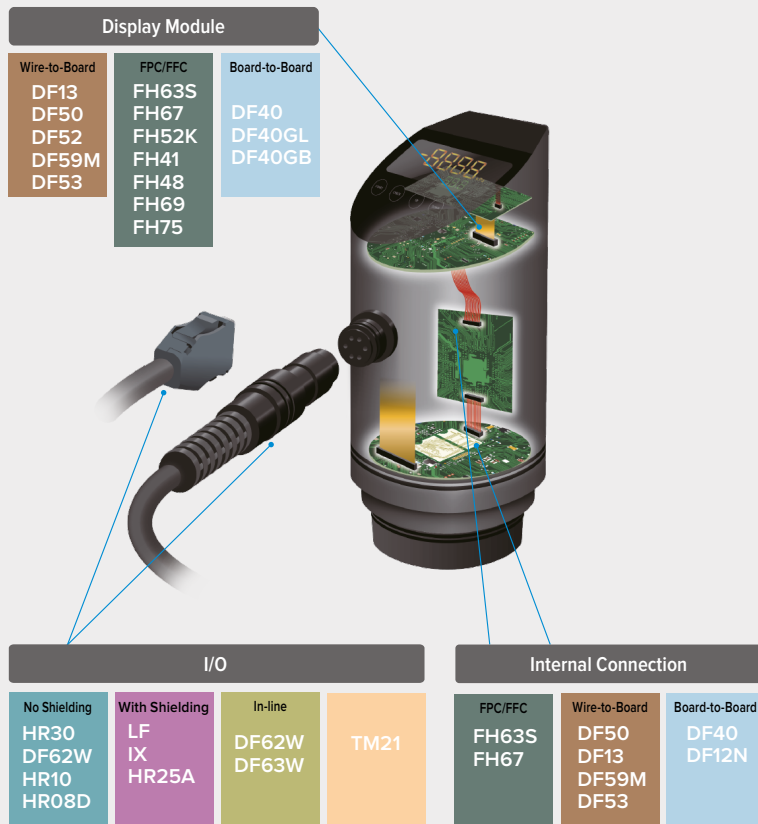
Security Camera



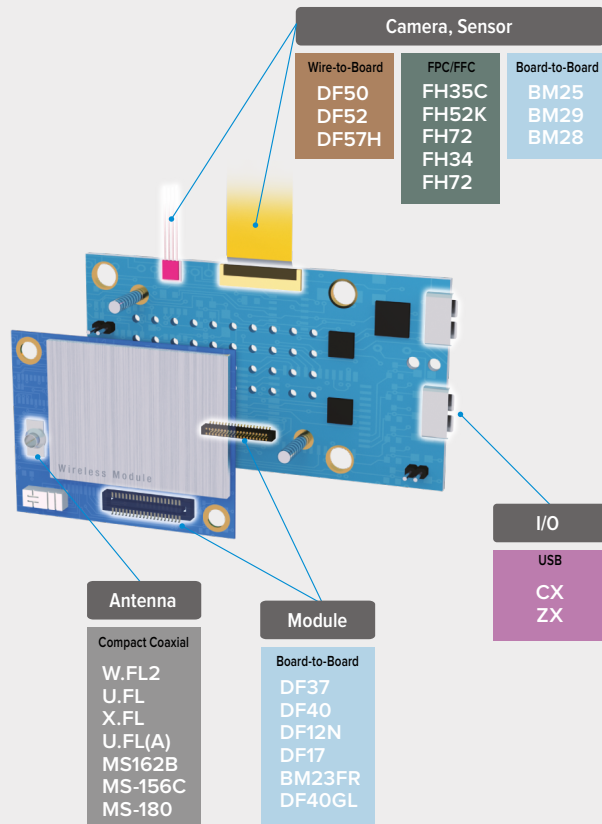
Smart Meter



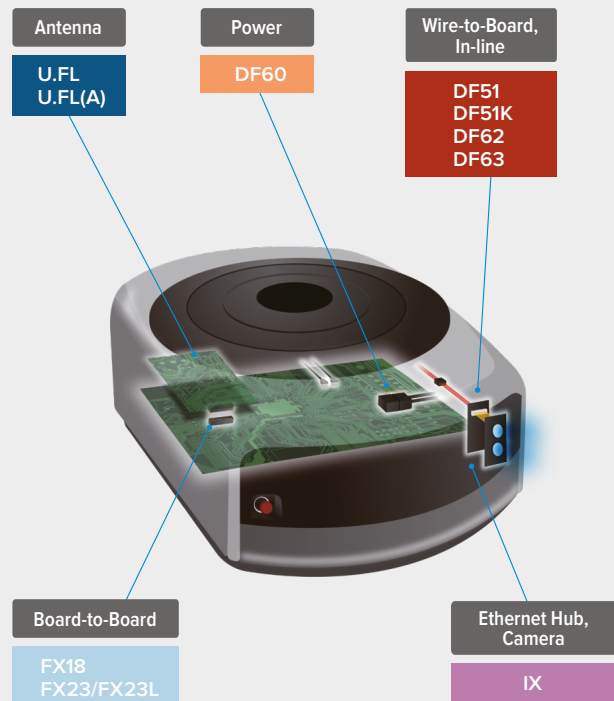
Industrial Sensor



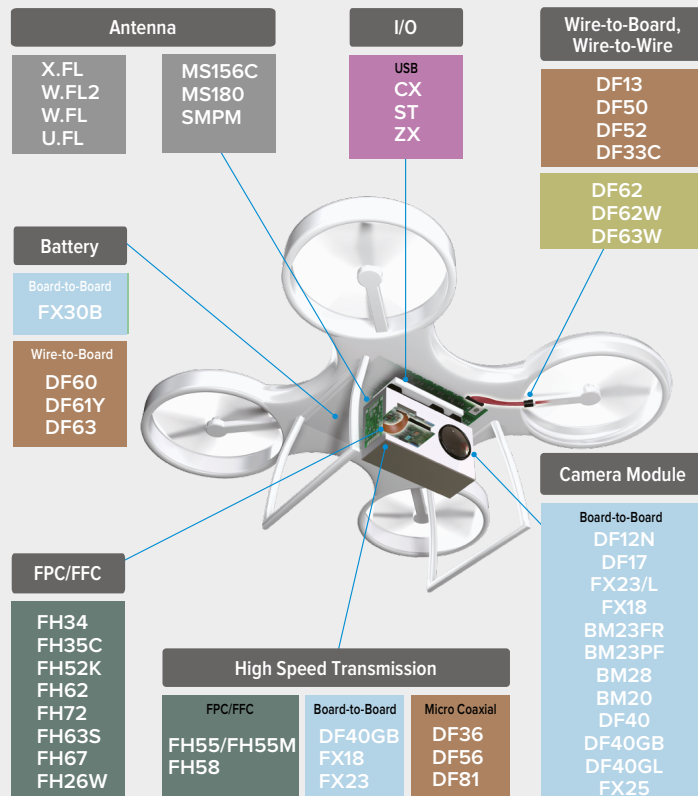
IoT Module



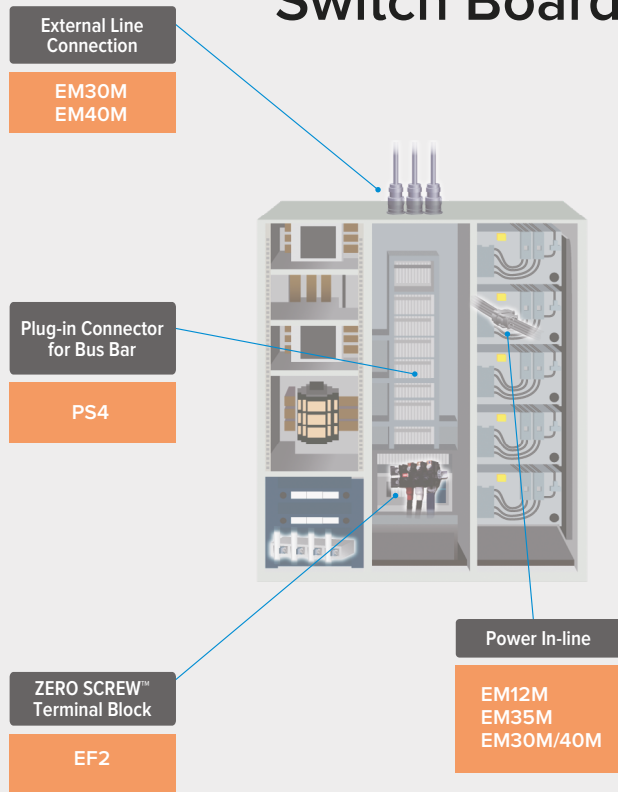
AGV



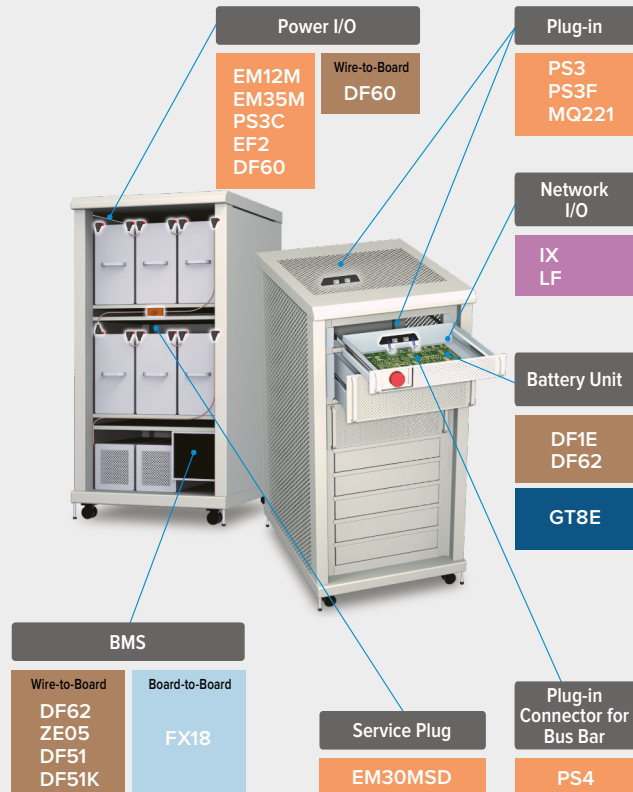
Drone



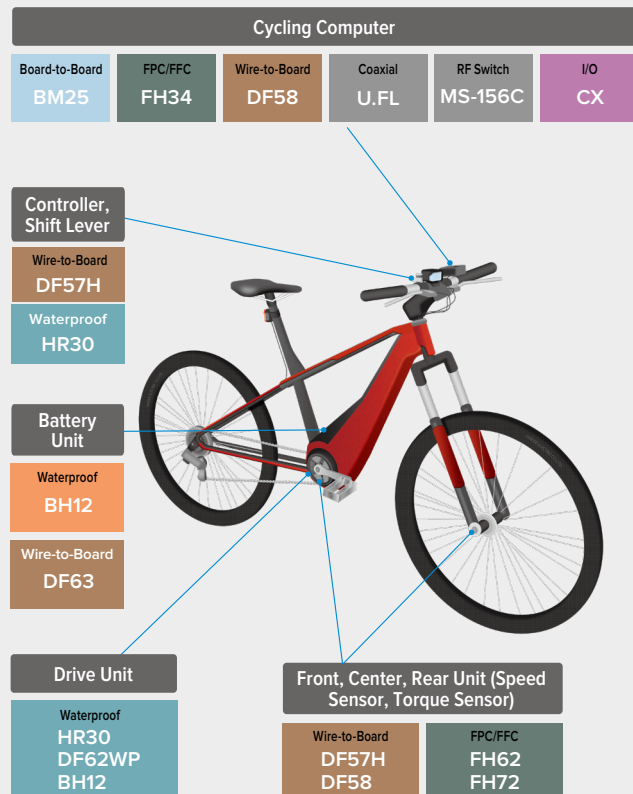
Power Distribution, Switch Board



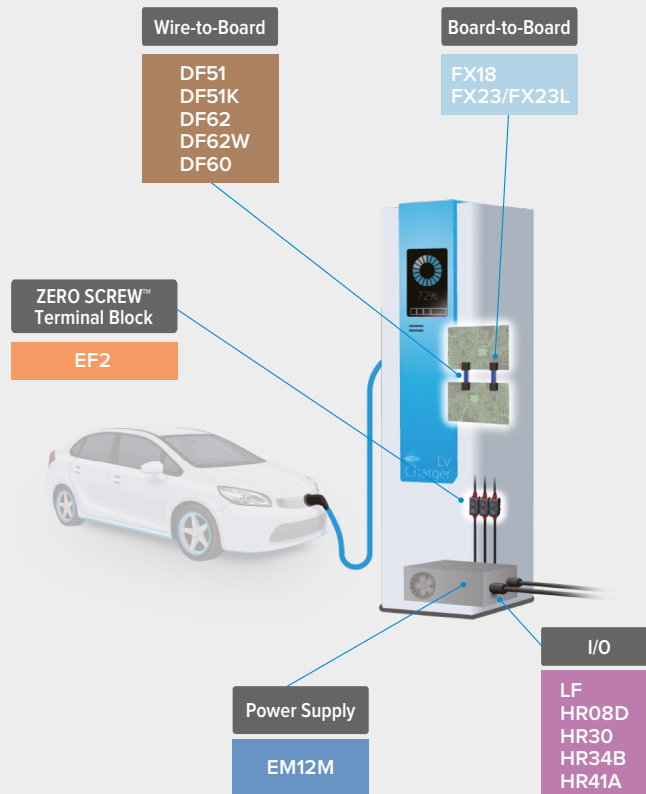
Battery Storage System



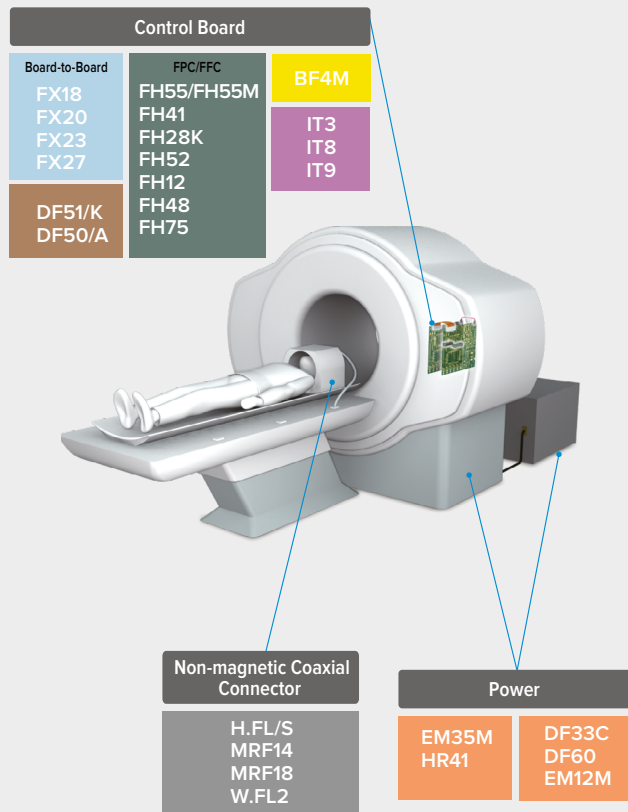
E-Bike



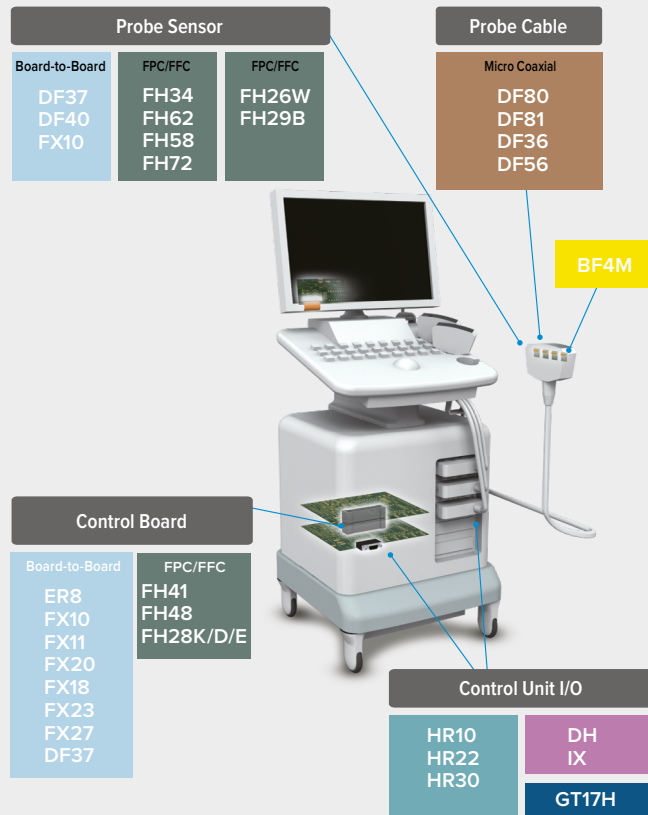
EV Charger



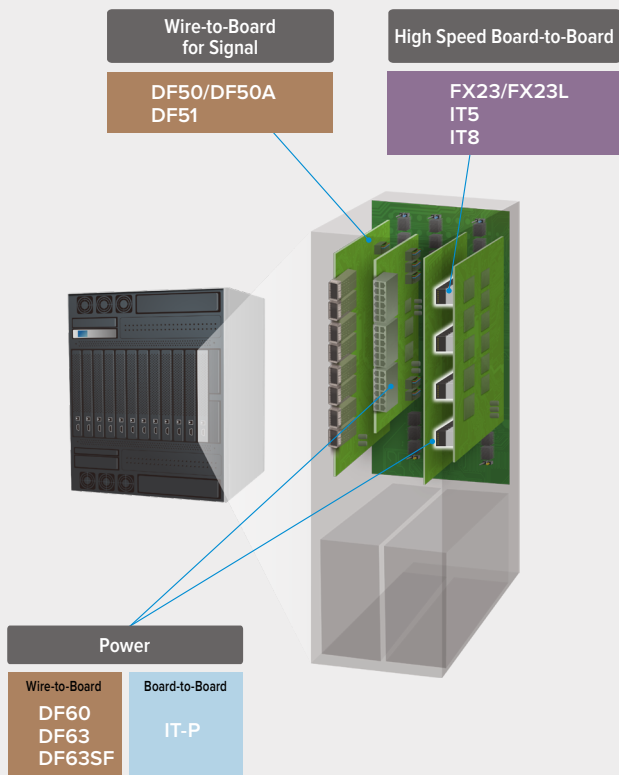
MRI, CT



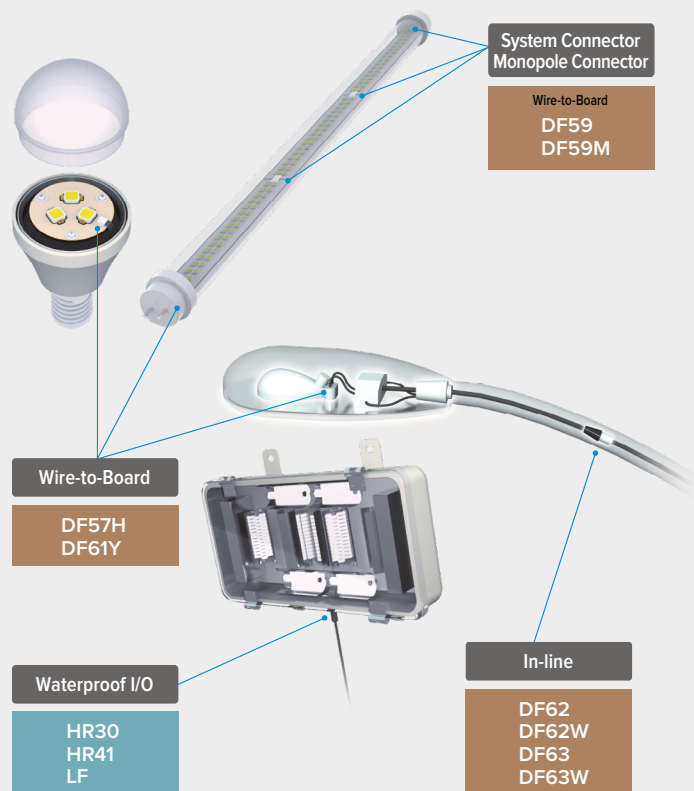
Ultrasound Equipment



Router



LED Lighting



Smart Home Devices



Smart Vacuum

DF13
DF65
DF53
DF50/A
DF52
DF57H
DF61/Y
DF65
DF58



Smart Camera

BM20
DF12N
DF17
BM28
DF40
BM25
KN14



Smart Home

CX
ZX

MS-180
MS-190
U.FL



Smart Door

FH34
FH40
FH52
FH35C
FH58/M
FH72
FH63S
FH67
TF38
FH75

Smart Speaker

Between boards

FPC/FFC

FH34
FH63S
FH67
FH35C
FH62
FH58
FH72

Woofer, Speaker,
Microphone, Sensor

FH34
FH35C
FH72
TF38

Battery

Board-to-Board

BM25
BM50
DF40

Wire-to-Board

DF57H
DF61Y
DF52
DF65

Antenna

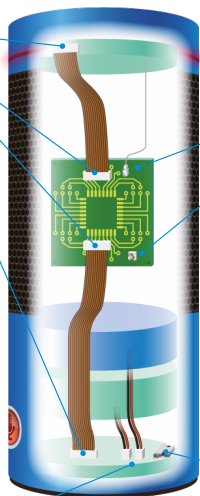
U.FL
U.FL(A)
W.FL2

RF Switch
MS-156C
MS-180

Board-to-Board
BM46

I/O

USB
CX
ZX



Notes



Lined area for notes, consisting of multiple horizontal lines.

Notes



Lined area for notes, consisting of multiple horizontal lines.

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Board-to-Board Connector Chart

Stack Height [mm]	Series	No. of contacts	Pitch [mm]	Male	Female
-	DF59S/SN	1	-	SMT	SMT
-	FX22	40, 50, 60, 80	0.5	SMT	SMT
0.6	BM20	10, 16, 20, 24, 30, 34, 40, 50, 60	0.4	SMT	SMT
0.6	BM23FR	6, 8, 10, 12, 16, 20, 24, 30, 34, 40, 50	0.35	SMT	SMT
0.6	BM28	6, 10, 16, 18, 20, 24, 30, 34, 36, 40, 44, 46, 50, 58, 60	0.35	SMT	SMT
0.6	BM29	2, 4, 6, 24	0.35	SMT	SMT
0.6	BM46	12	0.35	SMT	SMT
0.7	BM25	4	0.4	SMT	SMT
0.7	KN14	2	1.0	SMT	SMT
0.8	BM23FR	10, 18, 60	0.35	SMT	SMT
0.8	BM23PF	10, 14, 20, 24, 30, 40, 42, 44, 46, 50, 54, 64	0.35	SMT	SMT
0.8	BM20	10, 16, 20, 24, 30, 34, 40, 50	0.4	SMT	SMT
0.98	DF37	10, 16, 20, 24, 30, 34, 40, 44, 50, 60, 70	0.4	SMT	SMT
1.5	DF37	24, 30, 34, 40, 50, 60, 70	0.4	SMT	SMT
1.5	DF40	10, 12, 20, 24, 30, 34, 40, 50, 60, 70, 80, 90, 100, 120	0.4	SMT	SMT
1.5	DF40GB	10, 30, 48	0.4	SMT	SMT
1.5	DF40GL	44	0.4	SMT	SMT
1.5	DF40GT	10	0.4	SMT	SMT
2.0	DF40	12, 20, 24, 30, 40, 44, 50, 60, 70, 80	0.4	SMT	SMT
2.0	FX11/FX11L	68, 72, 92, 116, 140, 60/6, 80/8, 100/10, 120/12	0.5	SMT	SMT
2.5	DF40	10, 20, 30, 40, 50, 60	0.4	SMT	SMT
2.5	FX11/FX11L	80, 100, 60/6, 80/8, 100/10, 120/12	0.5	SMT	SMT
3.0	DF40	30, 40, 44, 50, 60, 70, 80, 90, 100	0.4	SMT	SMT
3.0	DF12N	10, 14, 20, 30, 32, 36, 40, 50, 60, 80	0.5	SMT	SMT
3.0	FX8/FX8C	40, 60, 80, 90, 100, 120, 140	0.6	SMT	SMT
3.0	DF40GB	48, 70	0.4	SMT	SMT
3.0	FX11/FX11L	80, 100, 60/6, 80/8, 100/10, 120/12	0.5	SMT	SMT
3.5	DF12N	20, 30, 36, 40, 50, 60	0.5	SMT	SMT

Stack Height [mm]	Series	No. of contacts	Pitch [mm]	Male	Female
3.5	DF40	20, 30, 40, 50, 60, 80	0.4	SMT	SMT
4.0	FX10	96, 120, 144, 168, 80/8, 100/10, 120/12, 140/14	0.5	SMT	SMT
4.0	DF40	40, 50, 60, 80, 90	0.4	SMT	SMT
4.0	DF12N	20, 30, 32, 36, 40, 50, 60	0.5	SMT	SMT
4.0	DF17	26, 30, 60, 70, 80	0.5	SMT	SMT
4.0	FX8/FX8C	60, 80, 90, 100, 120, 140	0.6	SMT	SMT
4.3	DF9	9, 11, 13, 15, 17, 19, 21, 23, 25, 31, 41, 51	1.0	SMT	SMT
5.0	DF12N	20, 30, 36, 40, 50, 60	0.5	SMT	SMT
5.0	DF17	20, 30, 40, 50, 60, 70, 80	0.5	SMT	SMT
5.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT
5.0	FX10	96, 120, 144, 168, 80/8, 100/10, 120/12, 140/14, 200/20	0.5	SMT	SMT
5.1	A3 B/C	4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 30, 32, 44, 48, 50	2.0	THT/SMT	THT/SMT
5.5	DF17	26, 80	0.5	SMT	SMT
6.0	A3 B/C	4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 30, 32, 36, 44, 50	2.0	THT/SMT	THT/SMT
6.0	DF17	20, 30, 40, 50, 60, 70, 80	0.5	SMT	SMT
6.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT
6.0 - 13.0	FX10	120, 144, 168	0.5	SMT	SMT
6.5	DF17	80	0.5	SMT	SMT
6.8	DF3	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	2.0	THT/SMT	THT/SMT
7.0	ER8	10, 20, 30, 40, 50, 60, 70, 80, 100, 120	0.8	SMT	SMT
7.0	DF17	20, 30, 40, 50, 60, 70, 80	0.5	SMT	SMT
7.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT
7.0	FX25	80, 110	0.4	SMT	SMT
7.5	DF3	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	2.0	THT/SMT	THT/SMT
7.55	DF11	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32	2.0	THT/SMT	THT/SMT
7.8	DF11	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32	2.0	THT/SMT	THT/SMT
8.0	DF17	20, 30, 40, 50, 60, 70, 80	0.5	SMT	SMT
8.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT

Board-to-Board Connector Chart

Stack Height [mm]	Series	No. of contacts	Pitch [mm]	Male	Female	Stack Height [mm]	Series	No. of contacts	Pitch [mm]	Male	Female
8.0-13.0	FX10	120, 144, 168	0.5	SMT	SMT	22.0	FX27	40, 60, 80, 100, 120	0.8	SMT	SMT
8.0	FX23L	20, 40, 60, 80, 100, 120	0.5	SMT	SMT	23.0	FX26	20, 30, 40, 50, 60	1	SMT	SMT
8.2	DF11	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32	2.0	THT/SMT	THT/SMT	25.0	FX20	20, 40, 60, 80, 100, 120, 140	0.5	SMT	SMT
8.45	DF11	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32	2.0	THT/SMT	THT/SMT	25.0	FX23	20, 40, 60, 80, 100, 120	0.5	SMT	SMT
9.0	ER8	10, 20, 30, 40, 50, 60, 70, 80, 100, 120	0.8	SMT	SMT	25.0	FX18	40, 60, 80, 100, 120, 140	0.8	SMT	SMT
9.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT	25.0	FX30B	2, 3, 4, 5	3.81, 7.62	THT	THT
10.0	ER8	10, 20, 30, 40, 50, 60, 70, 80, 100, 120	0.8	SMT	SMT	25.0	FX26	20, 30, 40, 50, 60	1	SMT	SMT
10.0	FX23L	20, 40, 60, 80, 100, 120	0.5	SMT	SMT	30.0	FX20	20, 40, 60, 80, 100, 120, 140	0.5	SMT	SMT
10.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT	30.0	FX23	20, 40, 60, 80, 100, 120	0.5	SMT	SMT
10.0	FX18	40, 60, 80, 100, 120, 140	0.8	SMT	SMT	30.0	FX18	40, 60, 80, 100, 120, 140	0.8	SMT	SMT
10.0-66.0	IT-P	2	10.8, 12	THT	THT	30.0	FX30B	2, 3, 4, 5	3.81, 7.62	THT	THT
11.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT	35.0	FX18	40, 60, 80, 100, 120, 140	0.8	SMT	SMT
12.0	ER8	10, 20, 30, 40, 50, 60, 70, 80, 100, 120	0.8	SMT	SMT	40.0	FX18	40, 60, 80, 100, 120, 140	0.8	SMT	SMT
12.0	FX23L	20, 40, 60, 80, 100, 120	0.5	SMT	SMT	45.0	FX18	40, 60, 80, 100, 120, 140	0.8	SMT	SMT
12.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT						
12.04	A1	4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 26, 30, 34, 36, 40, 50, 60, 64	2.54	THT	THT						
14.0	FX8/FX8C	60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT						
14.8	HIF6A	20, 26, 32, 34, 40, 50, 52, 60, 68, 80, 100	1.27	THT	THT						
15.0	FX20	20, 40, 60, 80, 100, 120, 140	0.5	SMT	SMT						
15.0	FX23	20, 40, 60, 80, 100, 120	0.5	SMT	SMT						
15.0	FX18	40, 60, 80, 100, 120, 140	0.8	SMT	SMT						
15.0	FX26	20, 30, 40, 50, 60	1	SMT	SMT						
16.0	FX8/FX8C	40, 60, 80, 90, 100, 120, 140, 160, 180, 200, 240, 280	0.6	SMT	SMT						
18.0	FX26	20, 30, 40, 50, 60	1	SMT	SMT						
20.0	FX20	20, 40, 60, 80, 100, 120, 140	0.5	SMT	SMT						
20.0	FX30B	2, 3	3.81, 7.62	THT	THT						
20.0	FX26	20, 30, 40, 50, 60	1	SMT	SMT						
20.0	FX23	20, 40, 60, 80, 100, 120	0.5	SMT	SMT						

FFC/FPC Connector Chart

Pitch [mm]	Series	Pin Counts	Height [mm]	Depth [mm]	FFC/FPC	Contact	Flip
0.2, 0.25	FH58/M	7, 21, 31, 35, 41, 51	0.9	3.1	FPC	Top/Bottom	Back
0.25	FH62	13, 17, 21, 31, 35, 39, 41, 55, 61	1.1	4.0	FPC	Top	One Action
0.25	FH64MA	5, 7, 11, 15, 17, 19, 25	0.5	3.15	FPC	Top	Back
0.3	FH26W	13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 45, 51, 57, 61, 71	1.0	3.2	FPC	Bottom	Front
0.3	FH35C	9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 45, 49, 51, 55, 61	0.9	3.2	FPC	Top/Bottom	Back
0.3	FH72	11, 15, 21, 31	0.9	3.5	FPC	Top	One Action
0.4, 0.5	FH55/M	10, 22, 31, 40	1.5	4.2	FPC	Bottom	Front
0.5, 1.0	FH52	6, 8, 10, 11, 12, 15, 18, 20, 22, 24, 25, 26, 28, 30, 32, 40, 42, 45, 50, 60	2.0	5.7	FPC/FFC	Bottom	Front
0.5, 1.0	FH52E	6, 8, 10, 15, 18, 20, 22, 24, 26, 30, 40, 45, 50, 60, 64, 68	2.0	5.7	FPC/FFC	Bottom	Front
0.5	FH52K	6, 8, 10, 12, 15, 18, 20, 22, 24, 25, 26, 30, 32, 34, 40, 45, 50, 60, 68, 80	2.0	5.7	FPC/FFC	Bottom	Front
0.5	FH52T	10, 24, 32, 50	2.0	5.7	FPC/FFC	Bottom	Front
0.5	FH28K	10, 15, 20, 28, 30, 40, 45, 50, 55, 60, 64, 68, 74, 80	2.55	6.5	FPC/FFC	Bottom	Front
0.5	FH34	4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 30, 32, 34, 40, 45, 50	1.0	3.8	FPC/FFC	Top/Bottom	Back
0.5	FH40	10, 20, 24, 30, 40, 45, 50, 60, 64, 80	5.8	3.55	FPC	Bottom	Front
0.5	FH41	15, 20, 28, 30, 31, 40, 50, 60, 68	2.5	6.2	Shielded FFC	Bottom	Front
0.5	FH48	20, 21, 30, 31, 40, 50, 68	6.18	4.7	Shielded FFC	Vertical	Front
0.5	FH63S	10, 20, 30, 40, 50	2.8	5.15	FPC/FFC / Shielded FFC	Bottom	Back
0.5	FH65	8, 10, 12, 15, 34	1.2	3.57	FPC/FFC	Bottom	Front
0.5	FH67	10, 20, 30, 40, 50	5.2	3.57	FPC/FFC / Shielded FFC	Vertical	One Action
0.5	FH69	60	2.3	2.3	FPC/FFC	Top/Bottom	Back
0.5	FH75	40, 60	2.0	5.7	FPC/FFC	Bottom	Front
0.5	TF38	16, 18, 20, 22, 24, 26, 30, 32, 36, 38, 40, 45, 50, 60	5.2	4.96	FPC/FFC	Vertical	Vertical

AWG Conductor Size Table

*errors and omissions excepted

AWG	MCM [kcmil]	Diameter SOLID [mm]	Diameter STRANDED [mm]	Area [mm ²]
0000 (4/0)	212	11.684	13.50	107.2
000 (3/0)	168	10.404	12.02	85.03
00 (2/0)	133	9.266	10.70	67.42
0 (1/0)	106	8.250	9.53	53.49
1	84	7.348	8.487	42.41
2	66	6.544	7.558	33.63
3	53	5.827	6.731	26.66
4	42	5.189	5.994	21.15
5	33	4.621	5.338	16.77
6	26	4.115	4.753	13.3
7	21	3.665	4.233	10.55
8	17	3.264	3.770	8.368
9	13	2.906	3.357	6.632
10	10	2.588	2.989	5.262
11		2.305	2.662	4.172
12		2.053	2.371	3.309
13		1.828	2.111	2.625
14		1.628	1.880	2.081
15		1.450	1.674	1.650

AWG	MCM [kcmil]	Diameter SOLID [mm]	Diameter STRANDED [mm]	Area [mm ²]
16		1.291	1.491	1.309
17		1.150	1.328	1.037
18		1.024	1.182	0.8226
19		0.9116	1.053	0.6529
20		0.8118	0.938	0.5174
21		0.7229	0.835	0.4105
22		0.6438	0.744	0.3256
23		0.5733	0.662	0.2581
24		0.5106	0.590	0.2047
25		0.4547	0.525	0.1623
26		0.4094	0.468	0.1288
27		0.3606	0.416	0.1021
28		0.3211	0.371	0.08097
29		0.2859	0.330	0.06425
30		0.2546	0.294	0.05097
31		0.2268	0.262	0.04039
32		0.2019	0.233	0.03203
33		0.1798	0.208	0.02540
34		0.1601	0.185	0.02014
35		0.1426	0.165	0.01597
36		0.1270	0.147	0.01267
37		0.1131	0.131	0.01005
38		0.1007	0.116	0.007968
39		0.08969	0.104	0.006319
40		0.07937		0.005012
41		0.07113		0.003973
42		0.06334		0.003151
43		0.05541		0.002499
44		0.05023		0.001982
45		0.04730		0.001572
46		0.03984		0.001246
47		0.03547		0.0009884
48		0.03159		0.0007838
49		0.02813		0.0006216
50		0.02505		0.0004929

Serie	Page	DF52	74	FH63S	17, 47	HR31	62	RP34L	55
		DF53	74	FH64MA	44	HR34B	33	SMP	37
1.85mm	36	DF56	82	FH65	18, 47	HR41	34, 63	SMPM	37
2.4mm	36	DF57H (Swing lock)	75	FH67	18, 48	HR41A	34, 62	ST	52
2.92mm	36	DF58	75	FH69	18, 48	HRM (SMA)	37	T1	54
A1	27	DF59 (Swing lock)	77	FH72	45	HRM(G) (SMA)	37	TF38	48
A1/A2	79	DF59M	74	FH75	18, 48	HT601	60	TJA	55
A3 B/C, A4B	76	DF59S/SN	27	FX10 EMC Protected	28, 50	HVH-280 (waterproof)	9	TJ*L	55
A3 B/C	27	DF60	20, 63, 72, 80, 86	FX11/FX11L EMC Protected	28	HVH-280 (non waterproof)	9	TM11 Angled cover	58
BF4M	88	DF61 (Swing lock)	78	FX15	83	IT-P	27	TM11AP	58
BH12	35, 65	DF61Y (ViSe lock)	78	FX16	83	IT3	51	TM11APA/TM11PA	58
BM20	22	DF62	78	FX18	25, 50, 68	IT5	51	TM11R	58, 69
BM23FR	22	DF62B	84	FX20	14, 23	IT8	51	TM11R-5M2-88	59
BM23PF	30	DF62C	70, 84	FX22	24	IT9	51	TM21 cover	59
BM25	31	DF62P	85	FX23	14, 24, 50, 68	ix industrial	51, 54, 69	TM21DP	59
BM28	30	DF62W	85	FX23L	14, 24	JR	34, 72	TM21R/TM22R	59
BM29	30	DF63	62, 71, 79, 85	FX25	23	JR-W	35	TM31P	59
BM46	22	DF63SF	62, 80	FX26	14, 25	KN14	25	TM36P	60
BM50	30	DF63W	85	FX27	25	KP10 - Micro SIM socket	56	U.FL	12, 40
BNC75	38	DF65	76	FX2B	76	KP13 - Micro SIM socket	56	U.FL(A)	40
C.FL	40	DF80	82	FX30B	27, 63, 71	KP15B - Combo SIM socket	56	W.FL2	41
CX60 USB Type-C	53	DF81	82	FXB/FX8C	24	KP15TL	56	X.FL	41
CX70M USB Type-C	53	DF9	26	GT13	10	LF	33, 55, 70	X.FL Board-to-Board	41
CX80B1 USB Type-C	53	D.FL75	38	GT16C/F	10	LX	52	ZH05	6
CX90B1 USB Type-C	53	DH	52, 68	GT16G	10	MMCX	37	ZE05	6
CX90M-16P	54	DM3	57	GT17	7	MQ172	55	ZE064W	6
CX90MWD2 USB Type-C	54	EF2	63	GT17H	7	MQ221	20	ZX Micro USB 2.0	52
DF11	26, 77, 84	EM12M	20	GT17HN	7	MRF14	43	ZX62W Micro USB 2.0	53
DF12N	15, 23	EM30M	35, 64	GT19	11	MRF18	43		
DF13	75	EM30MSD	21, 64	GT21	11	MRF20	38		
DF14	76	EM35M	63	GT25H2	7	MS-147	42		
DF17	15, 23	EM40M	35, 65	GT32	8	MS-156C	42		
DF19	74	EM52M	35, 64	GT32F	8	MS-162B	42		
DF1B	78	ER8	25, 50	GT36	11	MS-180	42		
DF1B/DF1E	85	EV1	64	GT36A	11	N	36		
DF1E	79	EV2	65	GT36S	11	PQ50	71		
DF20	75	FH26W	44	GT43	12	PQ50S	70		
DF3	26, 77, 84	FH28K	16, 45	GT50	6	PQ50W	71		
DF33C	70, 79	FH34	17, 45	GT5	10	PQ50WA	71		
DF36	82	FH35C	16, 45	GT8E	7	PQ50WT	72		
DF37	22	FH40	17, 46	H.FL	40	PS3	21		
DF40	23	FH41	17, 46	H.FL/S	43	PS3C	21		
DF40GB EMC Protected	28	FH48	17, 46	HIF3M*W IDC termination	79	PS3F	20		
DF40GL EMC Protected	28	FH52	46	HIF6A	26	PS4	21, 65		
DF40GT	15	FH52E	47	HR08D	33	QR/P4	66		
DF40T	15	FH52K	16, 47	HR10	32	QR/P6	66		
DF5	80	FH52T	47	HR10A/G	32	QR/P8	66		
DF50/DF50A	68, 75	FH55/M	16, 45	HR22	32, 69	RM	33		
DF51	9, 69, 77	FH58/M	44	HR25/HR25A	32	RM-V	34		
DF51K	69, 77	FH62	44	HR30	33				

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