

Creative Links to World Electronics

2016

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President
Kazunori Ishii

New Year Greetings

We wish you all a Happy New Year. Thank you very much for your patronage last year.

Last year, amid stable exchange rates and indications of improving Business Environment in North America, we have also witnessed continuing improvement in corporate earnings. Also, generally speaking, we have maintained a gradual upward momentum during the business recovery. However, it was also a year that brought great damage through natural disasters such as heavy rain, typhoons and eruptions.

While there is still a lingering feeling of uncertainty regarding the business environment surrounding the electronics industry, our company remains committed to rising to the challenge of developing products that meet the needs of our customers, not only by advancing past technology, but also adapting to changes in market conditions.

We would greatly appreciate your continued commitment, guidance and support in the coming year.

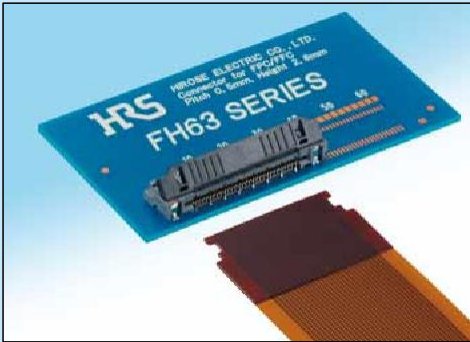
Kazunori Ishii, President

January, 2016

New FPC Connector (a proposal from HIROSE)

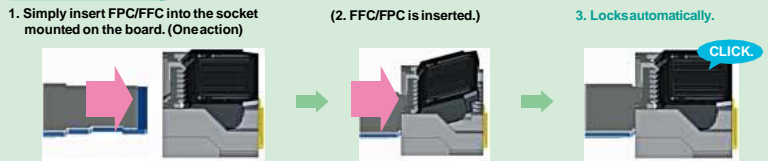
0.5mm Pitch, One Action Lock FPC/FFC Connectors

FH63 Series

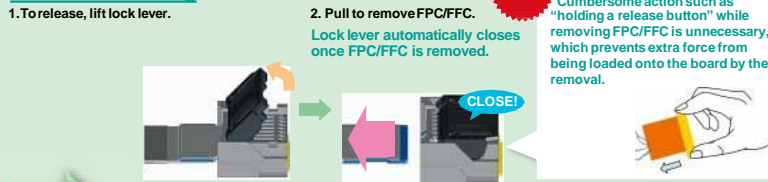


Rated Current	0.5A
Rated Voltage	AC/DC 50V
Operating Temperature Range	-55 ~ +105°C
Pitch	0.5mm
Height	2.8mm
Depth	5.15mm
FPC/FFC thickness at contact area	0.33±0.03mm

FPC/FFC Mating



FPC/FFC Unmating



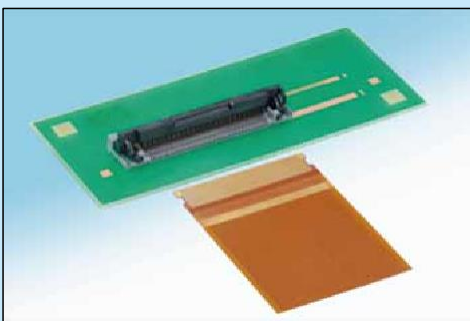
Point

- FPC/FFC can be easily inserted into the lock mounted on the board.
- FPC/FFC can be easily removed by the single hand.

1. Auto lock design enables one action lock.
2. Two points of contact and the wiping action prevent dust intrusion and produces high contact reliability.
3. Original lock structure to enable high FPC retention force.
4. Shield FFC support for EMI prevention.
5. Structure to prevent solder wicking and flux penetration.

0.5mm Pitch, Incomplete Mating Prevention FPC/FFC Connectors with Dual Beam Contact

FH50 Series



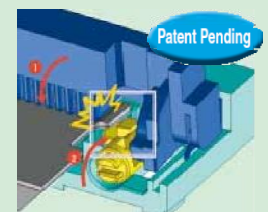
Rated Current	0.5A
Rated Voltage	AC/DC 50V
Operating Temperature Range	-55 ~ +85°C
Pitch	0.5mm
Height	3.7mm
Depth	8.3mm
FPC/FFC thickness at contact area	0.3±0.05mm

1. Hirose's unique cam function eliminates incomplete mating.
2. Secure FFC/FPC retention with raised side-catches.
3. Clear tactile feeling when FFC/FPC is inserted while temporarily held in place.
4. Independent 2-point spring contact eliminates contact failure by dust intrusion.
5. Clear tactile click is generated when the actuator is closed.
6. Robust and highly reliable actuator retention.
7. Industrial standard FFC/FPC thickness: 0.3±0.05mm

Incorrect FPC/FFC Insertion Prevention

◆ If FPC/FFC is not inserted to the end or inserted at an angle, the FPC/FFC lies over the side-catcher.

1. Closing actuator applies force to the cam, intending to raise the side-catcher.
2. However, the cam is blocked by the mis-placed FPC/FFC, and the actuator does not close.



Any operator recognizes his/her mis-operation.

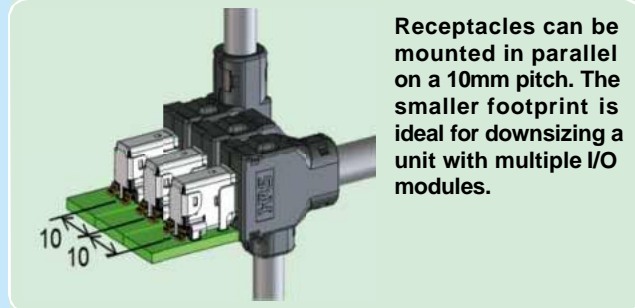
Assembly failures caused by FPC/FFC mis-insertion is dramatically reduced.

Compact and Rugged I/O Connectors with Positive Lock and 3 Gbps Data Transmission Capability for Industrial Application

IX Series



1. Snap-in connector with positive lock mechanism, provides a clear tactile click and ensures secure mating.
2. Shielding structure to prevent EMI/ESD.
3. High-speed data transmission capability up to 3 Gbps x 4-pair.
4. THR (Through-Hole Reflow) soldering capability.



Receptacles can be mounted in parallel on a 10mm pitch. The smaller footprint is ideal for downsizing a unit with multiple I/O modules.

Rated Current	0.5A (all pins) 1A (any 2 pins), 2A (pin No. 1 and No. 8 only)
Rated Voltage	AC 30V

The World's Highest Performance Optical Active Connector

BF4MC Series



BF4MC Optical Active Connector Features

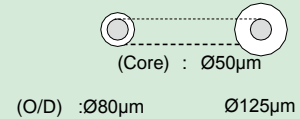
1. User-friendly optical link.
2. Effective Noise Suppression at High-speed.
3. Electrically Isolated High-Speed data Transmission.
4. Low power requirements : 120mW or less.

BF4MC Highlighted Specifications

1. Low profile design with 1.5mm mated height.
2. Applicable data rate : 0.05 to 6.25Gbps.
3. The world's smallest fiber bend radius, 10mm.

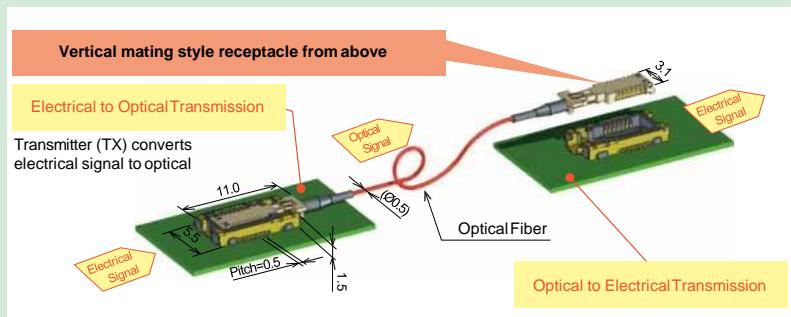
High Flex Optical Fiber

High flex fiber Conventional fiber



Product Type		BF4MC-6GTXRX	
Data rate		0.05Gbps ~ 6.25Gbps	
Power supply voltage (optional)	Transmitter [TX]	2.5 V or 3.3 V	
	Receiver	Single power supply	3.3V
Dual power supply		1.5 V / 2.5 V or 1.5 V / 3.3 V	
Power consumption	Single power supply	120 mW Max.	
	Dual power supply	80 mW Max.	

User-Friendly Optical Link !!



Advantages with optical system compared to electrical

- High Speed & Long Distance Transmission
- Immunity to electrical noise
- Electrically Isolated

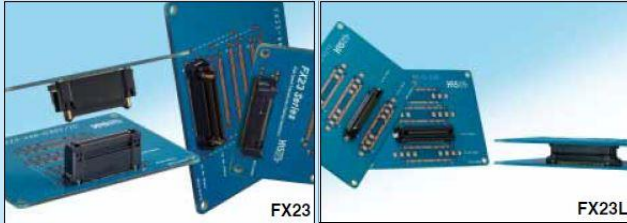
Advantages with BF4M compared to conventional optical connectors

- Light Weight Cable
- Low Power Consumption
- High Flex Optical Fiber
- Space Saving

Floating Connectors

8Gbps 0.5mm Pitch, Power/Signal Hybrid Connectors

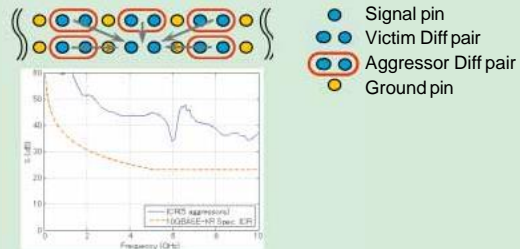
FX23/FX23L Series



Floating Range	X : ±0.6mm Y : ±0.6mm
Rated Current	Signal Contact : 0.5A Power Contact : 3A
Rated Voltage	AC50V

1. High speed transmission up to 8 Gbps.
2. 2 power pins are located on each side of the connector housings (3A/pin).
3. Wide range of varieties with
Signal Contact : 20,40,60,80,100,120pos.
Power Contact : 4pos
 - FX23 : Right angle and parallel connections between 15 to 30mm PCB distance are available.
 - FX23L : Low-profile parallel connection (Stacking Height : 8m, 10mm, 12mm)
4. Signal contact rated up to 0.5A/pin
5. ±1.2mm self-alignment structure for easy mating

• Insertion loss/ cross-talk ratio (ICR) for FEXT (h=15mm)



Insertion loss/cross-talk ratio (ICR) for FEXT using 5 sets of Aggressors has an adequate margin according to the specification of IEEE802.3ap.

0.5mm Pitch Board to Board Connectors

FX20 Series

Floating Range	X : ±0.6mm, ±0.8mm Y : ±0.6mm
Rated Current	0.5A
Rated Voltage	AC50V

- Satisfies Severe Automotive Requirements**
- ◆ Shock & Vibration (Meets specifications of automotive manufacturers)
 - ◆ Thermal Shock (from -40 to +85°C 1000 cycles)
 - ◆ Sulfur Dioxide
 - ◆ Heat Up to 105°C

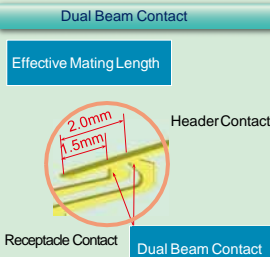
1. Self-cleaning function and vibration resistance with double contact.
2. Stacking type in 15, 20, 25, 30mm PCB distance and vertical mating type are available from 20 to 140 pos.
3. Current capacity: 0.5A / pin
4. ±1.2mm self-alignment structure for easy mating.
5. Contacts of both header and receptacle are enclosed in the housing for dust protection.

0.5mm Pitch Coplanar Mating Connectors

FX22 Series

Floating Range	X : ±0.6mm Z : ±0.6mm
Rated Current	0.7A
Rated Voltage	AC50V

1. Self-cleaning function and vibration resistance with double beam contact.
2. Coplanar connection available for 40 to 80pos.
3. Extremely low profile with 4.2mm height.
4. ±1.2mm self-alignment structure for easy mating.

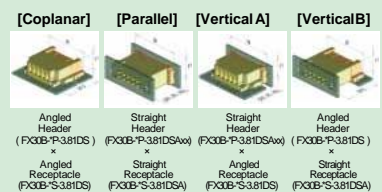


13~17A 3.81mm Pitch, Power Connectors

FX30B Series

Floating Range	X : ±0.3mm Y : ±0.3mm
Rated Current	13~17A/pin
Rated Voltage	UL/C-UL : 250V AC/DC TUV : 150V AC/DC Skipped pin VDE : UL/C-UL : 600V AC/DC TUV : 600V AC/DC

1. High contact reliability with independent 4-point contact.
 2. Excellent mating alignment with wide guide range.
 3. Wide range of varieties with 2 to 5 pos.
- Coplanar, Vertical and Parallel (Height = 20, 25, 30mm) mating styles.



Miniature waterproof Interface connectors

Supports TÜV and MIL spec.

HMS Series



1. A ground circuit is provided in the TÜV approved connectors.
2. Mated plug/receptacles and un-mated receptacles are IP68 compliant.

Water Resistant	IP68
Rated Current	46A/pin Max
Rated Voltage	AC 500V DC 700V Max
Wire Conductor Size	AWG#6 Max

Multi-Contact

RM-W Series



1. Cable exit in 360° directions for right angle plug.
2. When fully mated, the connector meets IP68 requirements (Single-body waterproof receptacles also meet IP68 requirements.)

Water Resistant	IP68
Rated Current	10A/pin Max
Rated Voltage	AC 600V DC 840V Max
Wire Conductor Size	AWG#12 Max

Water Resistant Circular Connector

JR-W Series



1. Reliable black chrome plating.
2. User-friendly 5-key mating interface.
3. Highly reliable cable clamp.

Water Resistant	IP68
Rated Current	30A/pin Max
Rated Voltage	AC 300V DC 420V Max
Wire Conductor Size	AWG#16 Max

IP67, RJ-45 Connector Hood

TM41W Series



1. Absorbs assembly tolerance up to ± 1 mm.
2. Dual-lock prevents mis-mating/unmating.
3. High cable clamp strength.

Water Resistant	IP67
Wire Conductor Size	$\varnothing 6.8 \pm 0.2$ mm

Water Resistant Small and light weight I/O Connector

PQW Series



1. Multiple-point contacts.
2. Light weight and robust shell with specially engineered plastic resin.

Water Resistant	IP65
Rated Current	12.5A/pin Max
Rated Voltage	AC/DC 300V Max
Wire Conductor Size	AWG#17~28

Water-Resistant Robust I/O Connector

PQWT Series



1. Flexible 6-unit & terminal combinations suitable for various applications.
2. Branch terminal allows distribution of electrical current.

Water Resistant	IP67
Rated Current	30A/pin Max
Rated Voltage	AC/DC 600V
Wire Conductor Size	AWG#10~28

Panel in-line Small Waterproof Connectors

GT18W Series



Meets Automotive Spec. in Europe and Asia

1. 2.5mm pitch miniature connector.
2. Positivelock.

Water Resistant	IP69K
Rated Current	3A
Rated Voltage	AC/DC 250V
Wire Conductor Size	AWG#20~24 AWG#20~22

Small type with Shielding

LF Series



1. Easy shielding connection.
2. Ease of operation and vibration resistant lock design.
3. TÜV and UL certified.

Water Resistant	IP68
Rated Current	10A/pin Max
Rated Voltage	AC 125V, DC 175V Max
Wire Conductor Size	AWG#16 Max

Small, Push-on Bayonet Lock Connectors

HR34B Series



1. User-friendly push-on bayonet lock.
2. Oil-resistant.
3. 4 pos. type is TÜV approved and water-resistant in unmated condition.

Water Resistant	IP68
Rated Current	5A/pin Max
Rated Voltage	AC/DC 400V Max
Wire Conductor Size	AWG#18 Max

Small, Push-on Bayonet Lock Connectors

HR08D Series

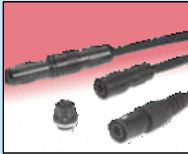


1. Vibration resistance design.
2. The right angle plug can be adjusted to mount in any of the 8 different directions (adjustable in 45° increments).
3. Receptacle is IP67 water resistant in unmated condition.

Water Resistant	IP68
Rated Current	3A/pin Max
Rated Voltage	AC 200V, DC 250V
Wire Conductor Size	AWG#18 Max

Small plastic push-pull lock connectors

HR30 Series



1. Light weight with a plastic shell.
2. Simplified shielding termination.
3. User-friendly push-pull lock.

Water Resistant	IP68
Rated Current	5A/pin Max
Rated Voltage	AC 100V, DC 140V Max
Wire Conductor Size	AWG#20 Max

Circular I/F connectors for FA

HR22 Series



1. Screw lock with anti-loosening feature.
2. Easy operation with back mount type receptacle.
3. Reinforced cable clamp and shielded plug is available.

Water Resistant	IP68
Rated Current	2A/pin Max
Rated Voltage	AC 100V, DC 140V
Wire Conductor Size	AWG#24 Max

Plastic Power Connectors

HR41/41A Series

1. Weather-resistant waterproof connector for outdoor use.
2. Higher lightning surge protection (15kV) and withstanding voltage.
3. Sequential contact structure for hot swap.



User-friendly bayonet lock with tactile lock and plug alignment indicator.



Snap-in mating with user-friendly push-on bayonet lock.

	HR41	HR41A
Water Resistant	IP68	IP68
Rated Current	20A Max.	10A Max.
Rated Voltage	AC/DC 600V	AC/DC 600V
Wire Conductor Size	AWG#10~18	AWG#16~20

High Current, Connectors for 125A

EV1 Series



1. Shielded structure.
2. Vibration resistant with multiple contact springs and screw lock.
3. Finger protection.

Water Resistant	IP68/IPX9K
Rated Current	125A/pin Max
Rated Voltage	AC 460V, DC 650V
Wire Conductor Size	20(16.78~26.66)sq

Waterproof Bayonet Lock Connector for Direct SFP Attachment

SW23 Series



1. Waterproof LC connectors for direct SFP attachment.
2. Excellent weather resistance with black chromium plating supports outdoor use. (Saltwater spray test: 1000 hours)
3. Bayonet lock allows easy mating / unmating.
4. Cable pull strength: 200N or more.

Water Resistant	IP67
Insertion loss	0.4dB Max
Return loss	40dB Min(SM) 22dB Min(GI)

Outdoor connectors with built-in SC/LC-duplex

SW20 Series



1. Outdoor connector with built-in SC/LC-duplex.
2. High performance and reliability with inner mating connector.
3. IP67 connector for harsh environmental use.

Water Resistant	IP67
Insertion loss	0.4dB Max
Return loss	40dB Min(SM) 22dB Min(GI)

Ultra small optical connectors with bayonet lock

MF10B Series

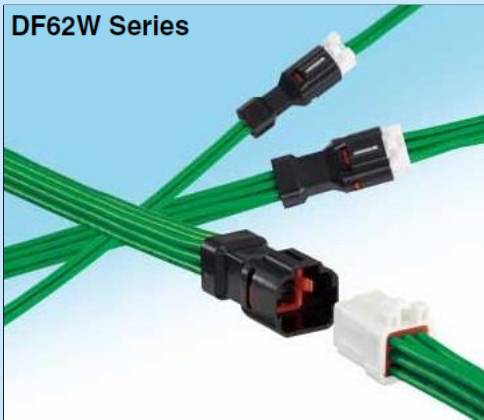


1. High reliability with secure mating structure.
2. Easy access to ferrule for cleaning.
3. Non-cleaning type also available (MFL10B Series).

Water Resistant	IP67
Insertion loss	1.0dB Max
Return loss	40dB Min(SM) 22dB Min(GI)

Product lineup for Water-Resistant Discrete Wire In-line Connectors

DF62W Series

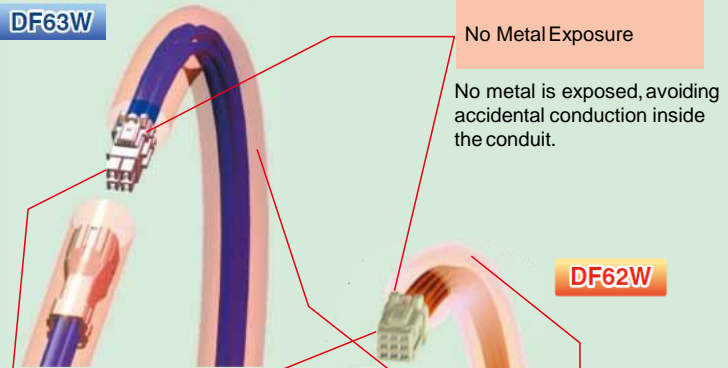


DF63W Series



	DF62W	DF63W
Water Resistant	IP67	IP67
Rated Current	AWG#22 : 3 A AWG#24 : 2 A AWG#26 : 1 A	AWG#16: 14A@2pos.; 12A@4pos. AWG#18: 11A@2pos.; 9A@4pos.
Rated Voltage	AC/DC 250V	AC/DC 630V
Applicable Wire	AWG#20~26	AWG#16~22
Jacket Outer Diameter	Ø1.4~1.6mm	DF63W : Ø2.8~3.2mm DF63WA : Ø1.7~2.4mm

DF63W



No Metal Exposure

No metal is exposed, avoiding accidental conduction inside the conduit.

DF62W

Multi-Row Pin Layout

Contacts are arranged in grid, providing a small diagonal diameter.

Smooth Contour

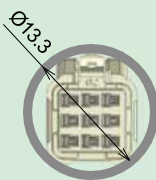
Rounded contour for smooth wiring inside a small space.

DF62W

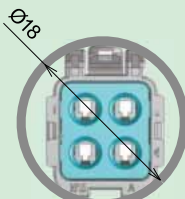
(9 Pos.)

DF63W

(4 Pos.)



Max. Diameter of connector: Ø13.3mm



Max. Diameter of connector: Ø18mm

DF62W



Contact is shaped to prevent possible seal damage during contact assembly.

DF63W



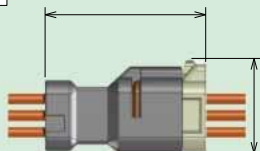
Simply insert the crimped contact into the empty cavity.

3pos. is also available

Design is Optimized for Connection Inside Small Spaces.

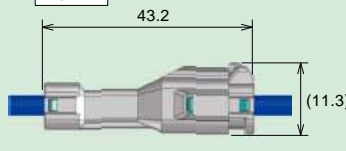
DF62W

9pos.

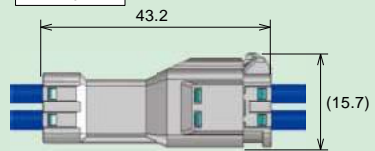


DF63W

2pos.



3*, 4pos.



3 Pos is available by removing No.4 Pin of 4 Pos type

2×2.2mm Pitch, Slim In-line Connectors for Wiring in Narrow Spaces

DF62 Series



Rated Current	AWG#22 : 4A (2 pos.)
	3A (3 to 13 pos.)
	2.5A (24 pos.)
Rated Voltage	AWG#24 : 2A
	AWG#26~30 : 1A
	AC/DC 250V

UL, CSA Recognized

Many Variations available
 ◆ In-Line, Panel mount type 2, 3, 4, 5, 6, 7, 13, 24pos.
 ◆ DIP type 13, 24pos.

The locking mechanism provides two lock completion indicators.

Visible lock inspection.

Optimized design for connection inside small confined space.

Multi-Row Pin Layout: Contacts are arranged in a grid, allowing for a smaller diagonal diameter.

No Metal Exposure: No metal is exposed, avoiding accidental conduction inside the conduit.

Smooth Contour: Rounded contour for smooth wiring inside small spaces.

High contact reliability and strong against vibration.

2-point contact

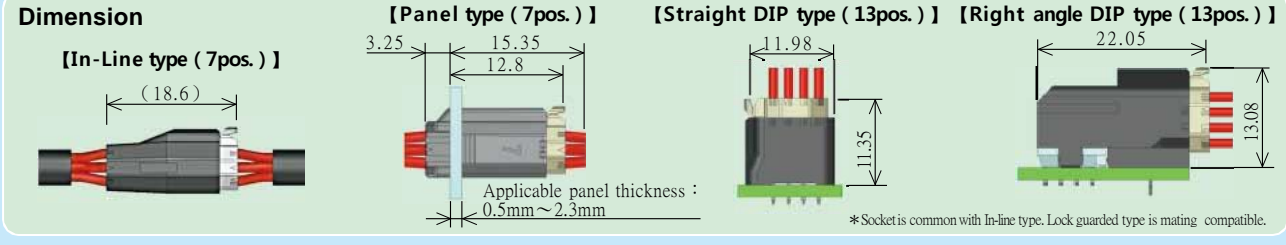
Reliable contact & lock features

Positive Lock Approx. 50N
 Lance Force Approx. 25N

Lock Strength Approx. 50N

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

The unique structure design protects the contact by preventing deformities during any of the following situations: the mating process, insertion of the contacts into a case, during harnessing or transportation.



Coaxial Connectors for Millimeter and Quasi-millimeter Band

Screw lock Coaxial Connectors : Compatible with "K connectors"

HK Series

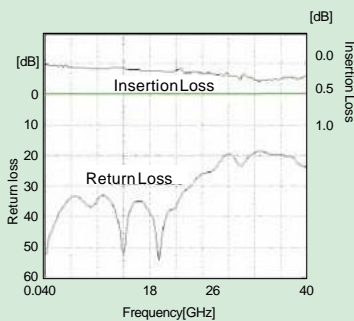


Frequency DC ~ 40GHz

Characteristic impedance 50Ω

1. Compatible with widely-used "K connector" / 2.92mm connector.
2. High frequency capability up to 40GHz.
3. Mates with SMA Connectors.
4. Screw locktype.

Typical Data



2.4mm Coaxial Connectors

H2.4 Series

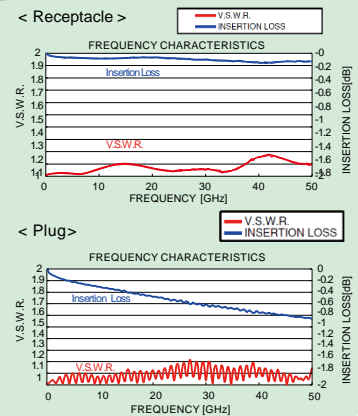


Frequency DC ~ 50GHz

Characteristic impedance 50Ω

1. 2.4mm coaxial connector meets-MIL-STD-348B Standards.
2. Screw mounting provides excellent high-frequency performance and consistent assembly quality.
3. Accepts flexible PCB thickness.
4. 0.085 inch semi-flexible cable applicable.

Typical Data



Push-on lock coaxial connectors

SMP Series

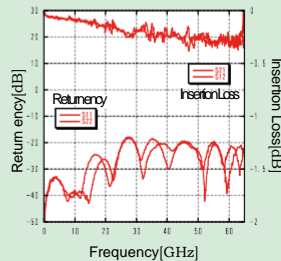


Frequency DC ~ 18GHz

Characteristic impedance 50Ω

1. Conforms to MIL Standard.
2. Push-on locktype.
3. 0.085 inch semi-flexible cable

Typical Data



Screw Lock Coaxial Connectors: Compatible with "V connectors"

HV Series

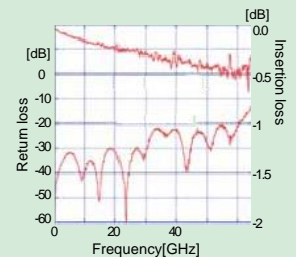


Frequency DC ~ 65GHz

Characteristic impedance 50Ω

1. Low V.S.W.R. : High impedance matching with accuracy of microfabrication and assembly.
2. Resistance to thermal stress, achieving high reliability.
3. Connector opening is compatible with V connector / 1.85mm connector.
4. Screw lock.



Typical Data



Non-magnetic, Coaxial Connectors, coaxial Lighting Arrester

Non-magnetic, High Durability Connectors

MRF14
Sries

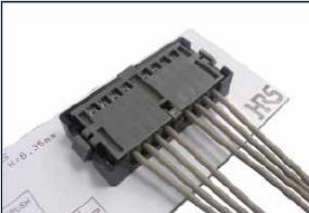
Coaxial Type		Frequency	DC~1GHz
Signal Type		Characteristic impedance	50Ω

1. High durability, 60,000 mating cycles.
2. Low insertion / withdrawal force.
3. Customizable housing design.

Low insertion / withdrawal force	Coaxial Type	Signal Type
Insertion Force	1.5 N max./pin	0.3 N (Nominal)/pin
Withdrawal Force	0.15 N min./pin	0.02 N min./pin

Vertical Mating, Non-Magnetic 8-channel Coaxial Connectors


MRF18
Sries

	Frequency	DC~2GHz
	Characteristic impedance	50Ω

1. Small Size and Light Weight.
2. High lock strength and cable pull resistance.
3. Easy cable termination, soldering both center and outer conductors.
4. Flow mounting or manual soldering for PCB mounting.
5. Applicable cable ranges from ϕ 1.13 to 1.8 mm.

Non-magnetic, Micro-Coaxial Connectors (SMT low-profile)

HFL/S
Sries

	Frequency	DC~2GHz
	Characteristic impedance	50Ω


Supports 50μ fluorine micro cables

Single shielded ϕ 1.37mm finished diameter fluorine micro coaxial cable is applicable.

1. Low profile: 3.0mm
2. High frequency Performance (V.S.W.R.): 1.3MAX [DC to 2GHz].
3. User Friendly: Click tactile click when fully mated.

Lightning Arrester Up to 12.5GHz N-PJ Connectors Type

CP
Sries

	Frequency	DC~12.5GHz
	Characteristic impedance	50Ω

Protects internal circuits from electrical surges.

Protects against lightning surges coming through the antenna cables.

Specification

- Gas tube type
- V.S.W.R.
 - 1.3 max (DC~6GHz)
 - 1.4 max (6~12.5GHz)
- Insertion Loss
 - 0.3dB max (DC~6GHz)
 - 0.5dB max (6~12.5GHz)
- Lightning Surge Test
 - IEC61000-4-5Ed.2 level4

Connector lineup for Smart City Concept

Single Pos. Snap-in Lock Power Connectors

EM12 Series



Safety design with finger protection.

Rated Current	90A Max
Rated Voltage	AC/DC 600V
Wire Conductor Size	<ul style="list-style-type: none"> ◆ Receptacle 70A : 14 (10.52~16.78) sq 90A : 22 (16.78~26.66) sq 38 (26.66~42.42) sq ◆ Plug 22 (16.78~26.66) sq

50A Power Supply Connectors

EM35M Series



Three-phase power source + ground.

Rated Current	50A Max
Rated Voltage	AC/DC 500V
Wire Conductor Size	<ul style="list-style-type: none"> 8.44~8.92sq : 50A 5.26~5.57sq : 30A

Quick Assembly In-Line Power Connectors

EF1 Series



Quick and secure snap-in lock, no retightening of screw.

Rated Current	130A Max
Rated Voltage	AC/DC 600V
Wire Conductor Size	38 (26.66~42.42) sq

Manual Service Disconnect

EM30MSD Series



Physically interrupts the electric circuit and protects operators from high voltage shock accidents.

Water Resistant	IP67	
	Power Contact	Signal Contact
Rated Current	200A	1A
Rated Voltage	AC/DC 1500V	AC/DC 250V
Wire Conductor Size	200A : 100sq Min (Supports Crimp M8 Crimp terminal)	

Three-phase power source and one-ground connector up to 100A.

EM52M Series



1. Crimp termination with commercially available crimp tool
2. Sequentially mate ground contact
3. Finger protection : IP2X
4. User-friendly push-on bayonet lock

Water Resistant	IP67
Rated Current	100A (AWG#2, 38sq) 80A (AWG#4, 22sq)
Rated Voltage	AC 600V, DC 750V
Wire Conductor Size	38 (26.66~42.42) sq 22 (16.78~26.66) sq

Waterproof, In-line power connectors

DF63W Series



Water Resistant	IP67
Rated Current	14A Max
Rated Voltage	AC/DC 630V
Pitch	3.96mm
Wire Conductor Size	AWG#16~22
Jacket dia.	DF63W : Ø2.8~3.2 DF63WA : Ø1.7~2.4

Pitch, Small, Power Supply Connectors

DF33C Series



Rated Current	5A Max
Rated Voltage	AC/DC 500V
Pitch	3.3mm
Wire Conductor Size	AWG#20~22
Jacket dia.	Ø1.5~1.9

High Current, Connectors for 125A

EV1 Series



1. Shielded structure.
2. Vibration resistant with multiple contact springs and screw lock.
3. Finger protection.

Water Resistant	IP68/IPX9K
Rated Current	125A/pin Max
Rated Voltage	AC 460V DC 650V
Wire Conductor Size	20(16.78~26.66)sq

300A Plug-In Connectors for Storage Battery Applications

PS2 Series



1. Floating screw allows ± 2.5 mm floating mate.
2. Its unique plug-in design provides enhanced safety features,

reduced production costs related to its installation and the maintenance of high current units.

	Power Contact	Signal Contact
Rated Current	100/200/300A	5A
Rated Voltage	AC 1000V	AC300V(100,200A) AC 600V(300A)
Wire Conductor Size	300A : 150sq 200A : 80sq 100A : 38sq	AWG#16~18 AWG#18~28 AWG#18~28

150A Plug-In Connectors for Storage Battery Applications

PS3 Series



1. Slim design achieved by employing unique blade contact allows application to standard 1U rack.
2. Floating screw allows ± 2 mm floating mate.

	Power Contact	Signal Contact
Rated Current	150A Max	1A
Rated Voltage	AC/DC 1000V	AC/DC 250V
Wire Conductor Size	14~50sq	AWG#20~22

50A Internal Power Supply

DF60 Series



Rated Current	50A Max
Rated Voltage	AC/DC 1000V (UL : 600V)
Pitch	10.16mm
Wire Conductor Size	AWG#8~12
Jacket dia.	$\varnothing 4 \sim 7.8$

Hybrid/Signal - 100A Power Supply, Front Access Plug-in Connector

PS3F Series



1. "Front Access" on system rack side allows cable assembly from mating side.
2. Front access is best suited to systems without rear space for maintenance.
3. Finger protection meeting IP2X requirements contributes to operators' safety.

	Power Contact	Signal Contact
Rated Current	100A	1A
Rated Voltage	AC/DC 1000V	AC/DC 250V
Wire Conductor Size	22sq	AWG#20~22

15A Internal Power Supply

DF63 Series



Rated Current	15A Max
Rated Voltage	AC/DC 630V
Pitch	3.96mm
Wire Conductor Size	AWG#16~22
Jacket dia.	$\varnothing 1.5 \sim 3.2$

30A Internal Power Supply

DF22 Series



Rated Current	30A Max
Rated Voltage	AC/DC 1000V (UL : 600V)
Pitch	7.92mm
Wire Conductor Size	AWG#10~16
Jacket dia.	$\varnothing 2.4 \sim 4.9$

150A, High Current Single Pos. Cable Connector for Storage Battery

PS3C Series




1. 180° reversal mate allows flexible cabling.
2. Right angle plug saves space for cable wiring.
3. Safety design with IP2X finger protection.

Rated Current	150A
Rated Voltage	AC/DC 1000V
Wire Conductor Size	14~50sq


Wearable era has come!

USB Type-C Connector **CX Series**



Rated Current	Power Contact: 5A Max Signal Contact: 0.25A/pin
Rated Voltage	AC 20V
Pitch	0.5mm
Height	Mating portion 0.8mm Mounting portion 1.3mm
Wire Conductor Size	This connector uses a solder type termination, which allows use of flexible cable types.


Micro USB3.0 Connectors **ZX360 Series**



High speed transmission capability up to 5 Gbps.
Mating compatibility with Micro USB2.0.


Rated Current	1.8A Max
Rated Voltage	AC 30V
Wire Conductor Size	AWG#28
Jacket dia.	Ø3.3, Ø4.8mm

Space Saving Interface Connectors **ST Series**




Rated Current	0.5A
Rated Voltage	AC 100V
Pitch	0.5mm
Height	3mm
Depth	7.5mm
Wire Conductor Size	This connector uses a solder type termination, which allows use of flexible cable types.

Ultra-low Profile Interface **LX Series**




Rated Current	0.5A
Rated Voltage	AC 50V
Pitch	0.5mm
Height	2.0mm
Depth	6.5mm
Wire Conductor Size	AWG#30, UL 20276 equivalent
Jacket dia.	Ø4.0, Ø4.5, Ø5.0mm

High Durability Robust Interface **3800 Series**




Rated Current	1.5A Max
Rated Voltage	AC 125V
Pitch	0.5mm
Height	5mm
Depth	7.5mm
Wire Conductor Size	AWG#28
Jacket dia.	Ø60. mm Max

High Durability I/F Connector **3500 Series**



Rated Current	1A Max
Rated Voltage	AC 125V
Pitch	0.8mm
Height	5.3mm
Depth	9.2mm
Wire Conductor Size	AWG#28, UL20276
Jacket dia.	10pos. : Ø5mm, 16pos. : Ø5.9mm


High Performance, Microminiature Circular Connectors **SR38 Series**



- Simple lock type
- Shielded design

Rated Current	0.5A
Rated Voltage	AC 30V, DC 42V
Plug outer Diameter	5.3×5.9mm
Receptacle outer Diameter	Ø5
Depth	5.4mm
Wire Conductor Size	AWG#30 Max
Jacket dia.	Ø3.5mm

Ultra-small Coaxial Connector (Low Profile) **X.FL Series**




- Height
:0.94mm(1mm Max)
Ø0.5,Ø0.64,Ø0.81 cable
:1.2mm(1.3mm Max)
Ø1.13 cable

Plug Receptacle for Board-to-Board is also available.

Height: 1mm


Frequency (V.S.W.R.)	1.3 Max. [DC to 3GHz] 1.4 Max. [3 GHz to 6 GHz]
Characteristic impedance	50Ω

Low Profile up to 2.5A **DF57H Series**




Rated Current	2.5A Max AC/DC
Rated Voltage	100V Max
Pitch	1.2mm
Height	DF57H: 1.4mm, DF57AH: 1.6mm
Depth	4.65mm AWG#26
Applicable Cable	~34
Jacket dia.	0.32~0.88mm dia.

Small and High Current, W-to-B **DF61Y Series**




Rated Current	4A Max
Rated Voltage	AC/DC 350V
Pitch	2.2mm
Height	2.0mm
Depth	7.35mm
Wire Conductor Size	AWG#24~28
Jacket dia.	Ø0.88~1.11mm dia.

Small, Low Profile up to 4A **DF65 Series**



Rated Current	4A Max
Rated Voltage	AC/DC 50V
Pitch	1.7mm
Height	1.8mm
Depth	6.3mm
Applicable Cable	AWG#24~28
Jacket dia.	0.88~1.11mm dia.

Small & Robust Wire to Board **DF52 Series**



Rated Current	2.5A Max
Rated Voltage	AC/DC 100V
Pitch	0.8mm
Height	1.75mm
Depth	4.1mm
Applicable Cable	AWG#28~32
Jacket dia.	0.5~0.6mm dia.

Top Contact, Back Flip

FH53 Series



Rated Current	0.2A
Rated Voltage	AC/DC 30V
Pitch	0.2mm
Height	0.65mm
Depth	3.2mm
FPC thickness at contact area	0.12±0.02mm

Top and Bottom Contact, Back Flip

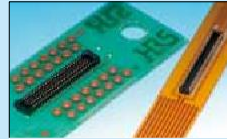
FH58 Series



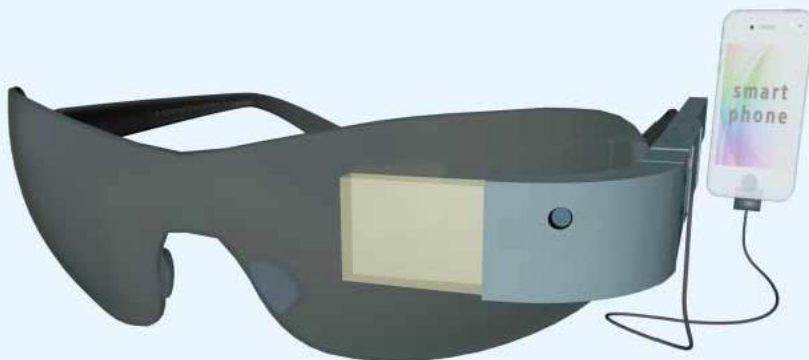
Rated Current	0.2A
Rated Voltage	AC/DC 30V
Pitch	0.2mm
Height	0.9mm
Depth	3.1mm
FPC thickness at contact area	0.2±0.02mm

FPC to Board Connectors

BM20 Series

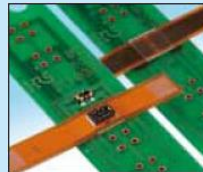


Rated Current	0.3A
Rated Voltage	AC/DC 30V
Pitch	0.4mm
Stacking Height	0.6mm, 0.8mm
Secure mating with	0.15mm
Occupied Mounting Area (40pos.)	10.48×2.3mm



Compact connectors, Small pin-count up to 4A

BM22 Series



Rated Current	Power Contact : 4A Signal Contact : 0.3A
Rated Voltage	AC/DC 50V
Stacking Height	0.9mm
Mounting Area (4pos.)	4.24×2.64mm



Robust Low Profile, Narrow Pitch Connector

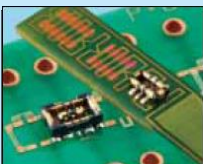
BM23 Series



Rated Current	0.3A
Rated Voltage	AC/DC 30V
Pitch	0.35mm
Height	0.6mm, 0.8mm
Depth	1.98mm
Occupied Mounting Area (40pos.)	9.5×1.98mm

Small, High Current, FPC-to-B

BM29 Series



Rated Current	Power Contact : 3A Signal Contact : 0.3A
Rated Voltage	AC/DC 30V
Pitch	0.35mm
Stacking Height	0.6mm
Mounting Area (2pos.)	2.44×1.5mm

Small Connector up to 10A

BM25 Series

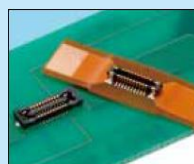


Contact Resistance:
Power : 5mΩ Max.
Signal : 30mΩ Max.

Rated Current	Power Contact : 10A Signal Contact : 0.3A
Rated Voltage	AC/DC 30V
Pitch	0.4mm
Stacking Height	0.7mm
Occupied Mounting Area (4pos.)	5.0×2.6mm

Signal and Power Hybrid up to 5A

BM24 Series



Rated Current	Power Contact : 5A Signal Contact : 0.25A
Rated Voltage	AC/DC 30V
Pitch	0.35mm
Height	0.8mm
Mounting Area (40pos.)	2.3mm×10.5mm

Automotive Connectors

Automotive Shielded Connectors

GT32 Series



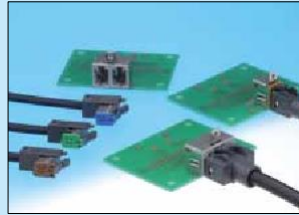
Supports USB3.0, HDMI 1.4 Signal Transmission

Rated Current	1A
Rated Voltage	AC 30V
Operating Temperature Range	-30~+105°C

1. High speed transmission capable up to 5Gbps, Enhanced EMI prevention.
2. Reliable positive locking with clear tactile click.
3. Unique 2-point contact design on crimp contact.
4. Reflow soldering is optional.

Automotive Shielded Connectors

GT17/HN Series

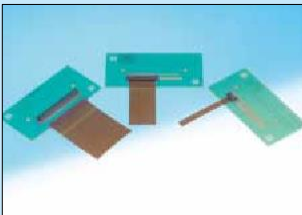


1. High speed transmission capability up to 1 Gbps.
2. Highly reliable lock structure prevents accidental plug release.

Rated Current	1A
Rated Voltage	AC 250V
Operating Temperature Range	-30~+105°C

Robust FPC/FFC Connectors

FH52 Series



Rated Current	0.5A
Rated Voltage	AC/DC 50V
Operating Temperature Range	FH52: -40~+105°C FH52T: -40~+125°C
Pitch	0.5mm
Height	2mm
Depth	5.7mm
FPC/FFC thickness at contact area	0.3±0.05

10*Gbps, FPC Connectors

FH55/55M Series



	FH55	FH55M
Rated Current	0.5A	0.4A
Rated Voltage	AC/DC 50V	AC/DC 40V
Operating Temperature Range	-55~+85°C	
Pitch	0.5mm	0.4mm
Height	1.5mm	
Depth	4.2mm	
FPC thickness at contact area	0.3±0.03	



Instruments/gauges

GT17 FH52 FH48
GT32 FH50 FH55
GT15 FH41



Automotive Navigation System

GT17 FX23 : (Refer to page 5)
GT32 FX30B : (Refer to page 5)
FH52 FX20 : (Refer to page 5)
FH41
FH48
FH55



Small In-line Panel Mount Waterproof Connector

GT18W Series

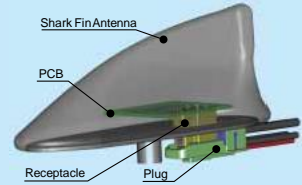
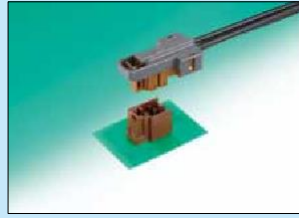


1. 2.5mm pitch miniature connector.
2. Positive lock.

Water Resistant	IP69K
Rated Current	3A
Rated Voltage	AC/DC 250V
Operating Temperature Range	-40~+105°C

Small, Multi-Terminal, Wire to Board Connector

GT36 Series



Rated Current	1A
Rated Voltage	DC 50V
Operating Temperature Range	-40~+105°C

1. One-step connection of multiple coaxial cables to PCB on roof antenna module.
2. Small size and simple mating operation.
3. Excellent frequency performance up to 3 GHz.
4. Improved operation and ensured quality with clear tactile click to lock.
5. Retainer secures terminal insertion and helps with vibration resistance.
6. Reflow soldering is optional.



Small Internal Wiring Connector

GT8E Series



Clear tactile click with positive lock.

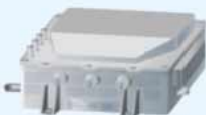
Rated Current	1A
Rated Voltage	AC 250V
Operating Temperature Range	-40~+105°C

Antenna

GT5 GT36
GT16 GT21
GT13 GT19

Inverter / Motor

GT25 GT18W
GT8E



Headlight (LED)

GT25
GT8E



025 tab size connectors for Interface

GT25 Series



1. SMT and multi-pole connector.
2. Small mounting area provides flexibility for PCB.

Rated Current	3A
Rated Voltage	AC 250V
Operating Temperature Range	-40~+105°C

Automotive Connectors

Automotive Antenna Connectors

GT5 Series



1. Cost saving termination by highly efficient and reliable one step crimp termination.
2. Excellent High Frequency Characteristics. (V.S.W.R. 1.5 Max. up to 2GHz)

Rated Current	1A
Rated Voltage	AC 250V
Operating Temperature Range	-30~+105°C

Automotive Antenna Connectors

GT21 Series



1. Downsized design saves space
2. Excellent high frequency performance.
3. V.S.W.R. DC to 2.5 GHz: 1.5 Max.

Rated Current	1A
Rated Voltage	AC 250V
Operating Temperature Range	-30~+105°C

Automotive Antenna Connectors

GT13 Series

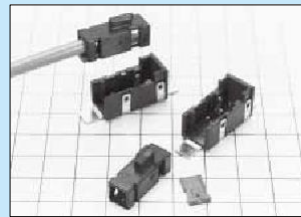


1. Cost saving termination by highly efficient and reliable one step crimp termination.
2. Excellent High Frequency Characteristics. (V.S.W.R. 1.5 Max. up to 1GHz)

Rated Current	1A
Rated Voltage	AC 250V
Operating Temperature Range	-30~+105°C

Automotive Window-mounted Antenna Connectors

GT19 Series



Cost saving termination by highly efficient and reliable one step crimp termination.

Rated Current	1A
Rated Voltage	AC 250V
Operating Temperature Range	-30~+105°C

Automotive Antenna Connectors

GT16 Series



Excellent High Frequency Characteristics. (V.S.W.R. 1.5 Max. up to 6GHz).
*Water resistant type is also available as GT16GW.

Rated Current	1A
Rated Voltage	AC 250V
Operating Temperature Range	GT16C: -30~+105°C GT16: -40~+85°C

High Speed Transmission FFC Connectors

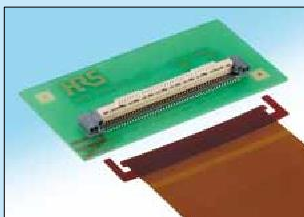
FH41/48 Series



Current rating	0.5A
Rated Voltage	AC/DC 50V
Operating Temperature Range	-40~+105°C
Pitch	0.5mm
Height (FH41 / FH48)	2.5mm / 6.18mm
Depth (FH41 / FH48)	6.2mm / 4.7mm
FFC thickness at contact area	0.3±0.05mm

Contact Protection Against Dust, Front Flip FPC Connector

FH49F Series



Current rating	0.3A
Rated Voltage	AC/DC 50V
Operating Temperature Range	-55~+105°C
Pitch	0.4mm
Height	4mm
Depth	7.83mm
FPC thickness at contact area	0.3±0.03mm

- Easy locking operation by inserting FPC and locking.
- Satisfies severe automotive requirements.

Dust Resistant 2-Point Contact, FPC/FFC Connector

FH52T Series



Current rating	0.5A
Rated Voltage	AC/DC 50V
Operating Temperature Range	-40~+105°C
Pitch	0.5mm
Height	2mm
Depth	5.7mm
FPC/FFC thickness at contact area	0.3±0.05mm

2-point contact with two independent contact springs to prevent contact failure due to dust intrusion.

Supports Vibration Tests for Railway Applications

IEC61373
(JIS E 4031)
Category1
ClassB

Interface Connectors for Railway Applications

TJA Series



Rated Current	4A/pin Max
Rated Voltage	AC 30V DC 130V
Wire Conductor Size	AWG#16~18 AWG#20~22
Wire Conductor Size	0.75~1.25sq 0.3~0.5sq

1. Small size fits into 3U4HP rack size.
2. Easy and reliable lock with snap-in design and unlock disabling slide button.
3. Selectable cable exit direction: Upper/lower quarter angles.
4. Screw fastening to panel and PCB avoids direct stress to solder joints during insertion/withdrawal.

LAN Connectors for Railway and Industrial Applications

TJL Series

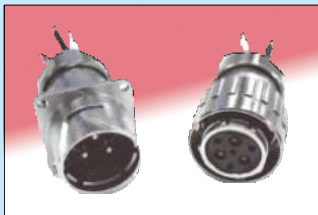


Rated Current	4A/pin Max
Rated Voltage	AC 100V DC 100V
Wire Conductor Size	AWG#18 AWG#22
Wire Conductor Size	0.75sq 0.3sq

1. Robust LAN signal connector available with 4 pos. in 1-port and 8 pos. in 2-port for railway and industrial applications.
2. Small size fits into 3U4HP rack size.
3. Snap-in lock and 3 keying options provide for easy use when using multiple connections. This improves operation for wiring and maintenance.

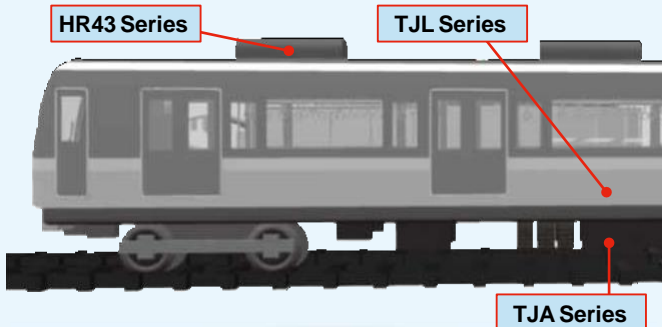
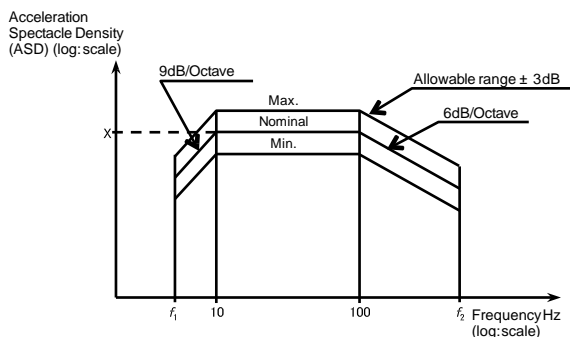
Bayonet Lock Water Resistant 3-pos. Connectors(IP67)

HR43 Series



Water Resistant	IP67
Rated Current	20A
Rated Voltage	AC 600V
Wire Conductor Size	Ø3.5 max. dia.
Wire Conductor Size	1.6~2.6sq

Passed rigorous vibration testing railway applications.



IEC61373(JIS E 4031) Category2

GT8E Series P.17 PS3C Series P.13
EM30MSD Series P.12 FX23L Series P.4

1. Independent design for sealing wire against water intrusion minimizes the connector length.
2. Crimp termination.
3. Aluminum alloy on metal shell provides a light-weight design as well as robustness.

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