



Introduction

Purpose

- **To Introduce the DF57 series connector.**

Objective

- **To explain features and benefits.**

Content

- **14 pages**

Learning time

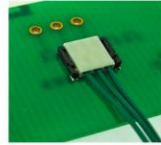
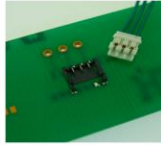
- **** minutes**

Welcome to the introduction of Hirose's new DF57 series of ultra low profile, wire to board connector systems. This presentation will provide an in-depth explanation of the DF57 series features and benefits



DF57 Series

1.2 mm Pitch, Low Profile “Swing Lock”
Wire to Board Connector for Power Supply



Features

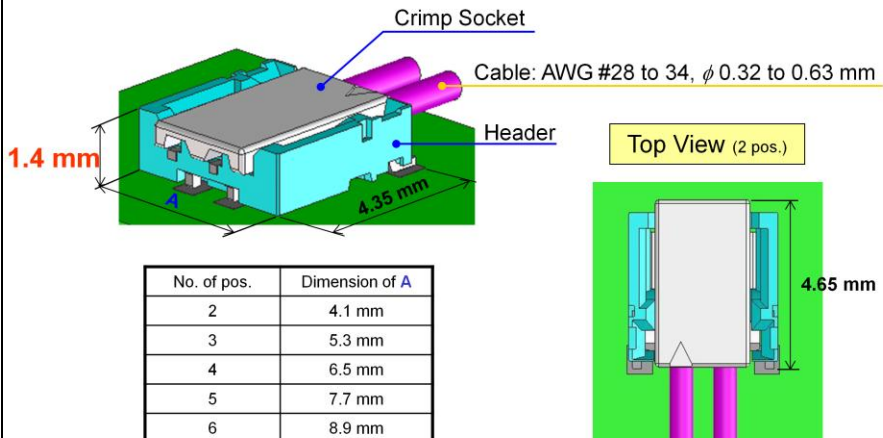
1. 1.2 mm pitch, 1.4 mm height
2. Space saving and Low Profile Design
3. Unique “Swing Lock” design (Positive and Friction lock)
4. High current capability (2.5 Amps)
5. Solder wicking prevention
6. High contact retention strength
7. RoHS compliant

Hirose’s DF57 Series is an ultra-low profile wire-to-board connector system suitable for applications requiring up to 2.5 amperes per line. Key features include: 1.2 millimeter contact pitch, and a height of just 1.4 millimeter when mated. The DF57 series is also designed for space saving on the PCB. The unique “Swing-lock” mating feature assures a more secure connection. The operating current is up to 2.5 amperes when using #28 gauge wire. The contacts of the PCB mount header are designed to prevent solder wicking in to the contact mating area. Contact retention strength is designed to prevent accidental pull-out of the wire and contact when under load. All materials conform to RoHS.



1.2 mm Pitch, Low Profile Connector

Dimensions (Example of 2 pos.)



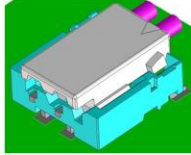
With a contact pitch of 1.2 millimeter, low profile design and efficient PCB real estate layout, the DF57 is suitable for tight packaging requirements. The DF57 is available in contact counts from 2 to 6 positions. Compatible stranded wire sizes are #28 to #34 AWG. Please refer to the Hirose datasheet for specific details of compatible wire types.



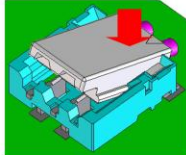
“Swing Lock” Hirose’s unique double lock design

Mating Operation

1. Position the socket above the header.



2. Insert the cable side first.



3. Press down at the lever side.

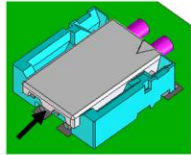


Clear tactile click!

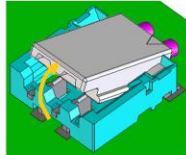
NOTE: Horizontal mating could damage the connector.

Unmating Operation

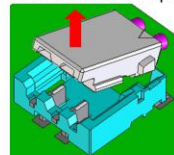
1. Hook the lever.



2. Pull up and friction lock is released.



3. Positive lock is released and removal completes.

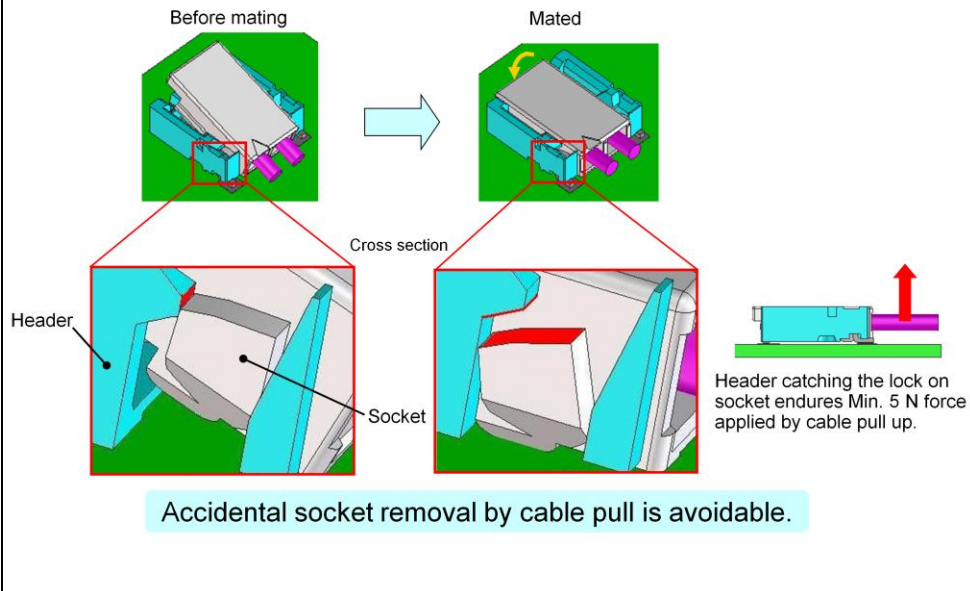


Two locks, a **positive lock** and **friction lock** are provided in this small connector.

The design of the “Swing Lock” mechanism in the DF57 assures that a secure connection is maintained when properly mated. Care should be taken to follow the mating and un-mating sequence to assure best performance and durability of the connectors as described here.



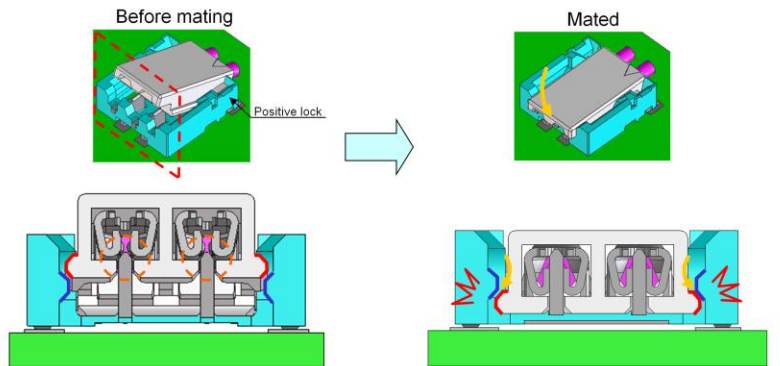
Positive Lock Structure



The unique locking structure actually strengthens as a tension load is placed in the direction of the wires. Accidental un-mating if the wires are pulled upward is resisted up to 5 Newtons, but will not result in significant damage to the connector if over ridden. The mating sequence is begun by first pressing the rear, wire end, of the connector into the slots of the header body.



Friction Lock Structure



-Full mating of the connector is achieved when the "Friction Lock" is engaged, at the contact area.

-Tactile and audible feed back indicator when mated.

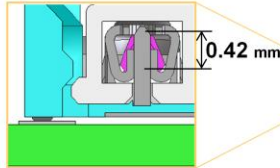
-Friction lock prevents the socket from floating after mated.

To complete the mating sequence of the connector, the friction lock must be engaged by rocking the connector down and forward. A clear tactile and audible feedback indicates a successful mating of the connector. The total locking mechanism assures a secure mating condition, minimizing float between the connector halves.



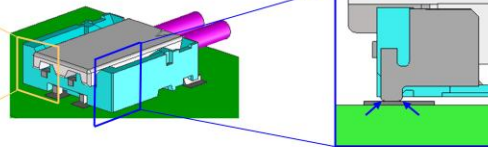
DF57 Features

Long effective mating length



-The contact features two-point contact terminal geometry to ensure high contact reliability.

Molded in contacts prevents solder wicking



- Insert molding of the header contacts eliminates any gap between the terminals and housing to prevent solder wicking.

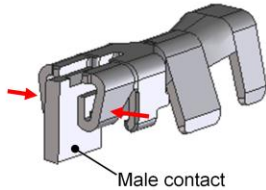
The design of the wire crimped contacts features two points of contact assuring good contact normal force maximizing electrical current capacity. By insert-molding the header contacts into the housing, air-gaps between the housing material and contacts are eliminated, thus preventing the potential for solder-wicking during the PCB solder reflow process.



DF57 Features

High current capability

Rated Current for 2 pos. with AWG #28 cable: 2.5 Amps



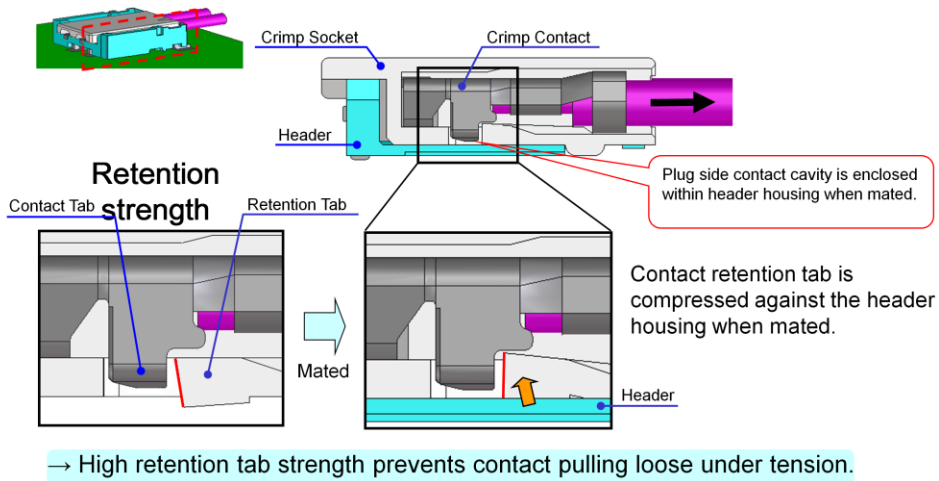
- Stable contact force decreases contact resistance, achieving high current capability
- Blade male contact is hard to deform
- Applicable cable: AWG #28, 30, 32, 34
Insulation max. diameter 0.63 mm to 0.32 mm

The design for the DF57 contact produces low contact resistance, strong current capacity and durable blade type male contact. Compatible wire sizes range from #28 to #34, with maximum insulation outside diameter from 0.63 millimeters to 0.32 millimeters. The maximum current rating of 2.5 amperes per pin is applicable to the 2 position; higher pin counts must be de-rated accordingly due to total temperature rise potential.



Improved Contact Retention Design

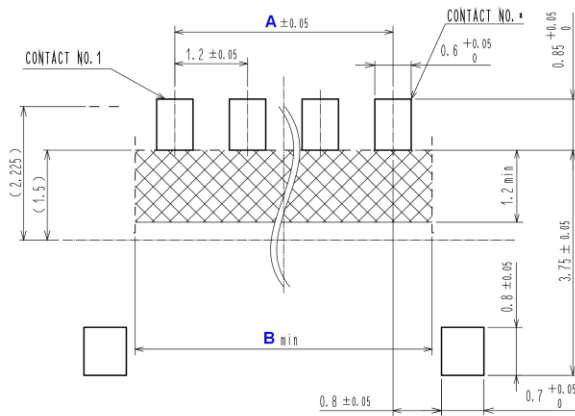
Double secured contact retention tab



The improved contact retention design of the DF57 creates a double secured retention tab when the connectors are mated. When mated, the housing side contact retention tab is compressed against the header bottom further securing the contact and protecting the contact cavity from particulate intrusion. This effectively prevents the contacts from being pulled loose under tension in all but the most extreme cases.




Recommended PCB Layout



◆Dimensions of A and B

No. of pos.	A	B
2	1.2	2.5
3	2.4	3.7
4	3.6	4.9
5	4.8	6.1
6	6.0	7.3

NOTES  : No conductive trace

Shown here is the basic PCB land pattern and dimensions for the DF57 Series.



Application Example

Mobile Phone



Modules

- LED module
- Touch panel
- Small sized battery
- Small sized motor
- Buzzer/Vibrator etc.

Notebook PC, Tablet PC, USB Modem



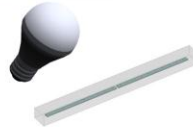
Industrial Robot



LCD TV



LED Lighting



Digital Camera



Due to the ultra-low profile design, the DF57 is a good consideration where tight packaging is a must. Applications include connections for battery power, speaker, buzzer or vibrator-motor connections, illumination devices and touch panel overlay connections. The small size makes the DF57 a good candidate for replacement of flexible printed circuits where higher current or other considerations may make stranded wire a more desirable choice.



Specifications

Material and Finish

COMPONENT		MATERIAL	FINISH / REMARKS
Housing	Header	LCP	UL94V-0, Black
	Socket	PBT	UL94V-0, White
Header Contact		Brass	Tin-plated over Nickel under plating
Crimp Contact		Phosphor bronze	Tin-plated
Metal Fitting		Brass	Tin-plated over Nickel under plating

Performance Characteristics

Rated Current		AWG#28	AWG#30	AWG#32	AWG#34
		2 pos.	2.5 Amps	1.5 Amps	1.0 Amps
3 pos.	2.0 Amps				
	4, 5 and 6 pos.	1.5 Amps	1.0 Amps	0.8 Amps	0.5 Amps
Rated Voltage	2 to 6 pos.	50 V AC / DC			
	2 pos. (Middle pin of 3 pos. is removed)	100 V AC / DC			
Operating Temperature	- 35 °C to + 85 °C*				
Contact Resistance	10 m Ω MAX. at 20 mV, 1 mA				
Insulation Resistance	100 M Ω MIN. (100 V DC)				
Withstanding Voltage	500 V AC for 1 minute				
Applicable Cable	AWG #28 to 34, φ 0.32 to 0.63 mm				
Durability	30 cycles (Insertion / Withdrawal)				

Varieties

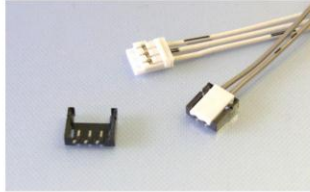
2, 3, 4, 5 and 6 pos.

*Up to 105 °C is acceptable for LED lighting applications. Consult Hirose about details.

The performance and materials specifications are shown here. Included are the de-rated operating current for each pin count and wire size.



Module Summary



- Space Saving and Low Profile Design
- High-Density mounting capable
- “Swing lock” provides positive and friction locks.
- High contact pull-out resistance.
- High current capability (2.5 Amps)
- Solder wicking prevention
- RoHS compliant

In summary; the new DF57 Series, Wire-to-Board connector system from Hirose is an ultra-low profile design, which makes efficient use of printed circuit board real estate. The unique “Swing Lock” mechanism produces a very reliable connection that resists unwanted pull-out or un-mating. With an operating electrical current of up to 2.5 amperes per pin, the DF57 provides best-in-class current density for its size. The header design integrates solder wicking prevention. All materials are RoHS compliant.