Introduction

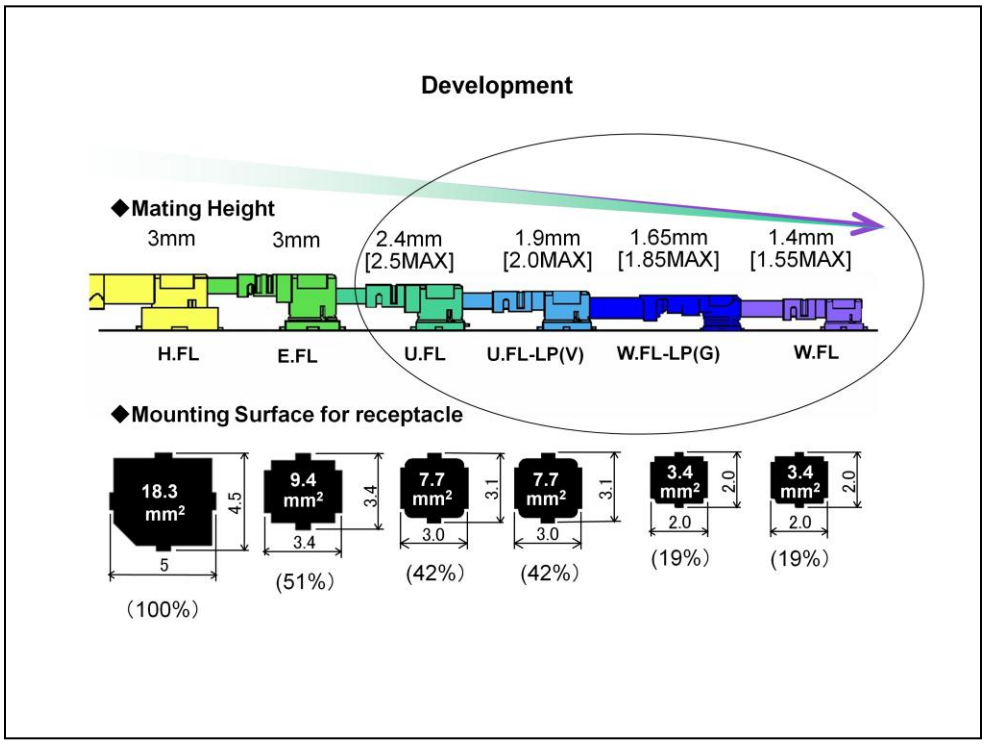
Purpose
* To introduce the variation of Micro coaxial connector series U.FL and W.FL

Objective
* To explain the variation of U.FL and W.FL series

Content
* 10 pages

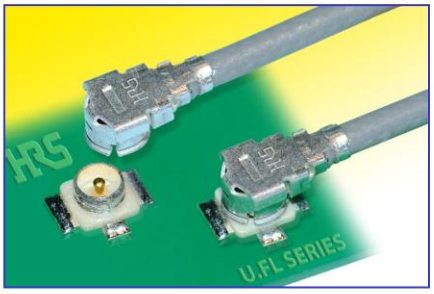
Learning Time
* 5 minutes

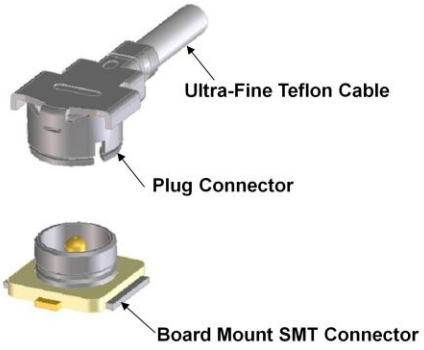
Welcome to the Hirose introduction to W.FL and U.FL Coaxial connector series Product Training Module (PTM). The intent of this training module is to introduce the U.FL and the W.FL series and to explain their differences



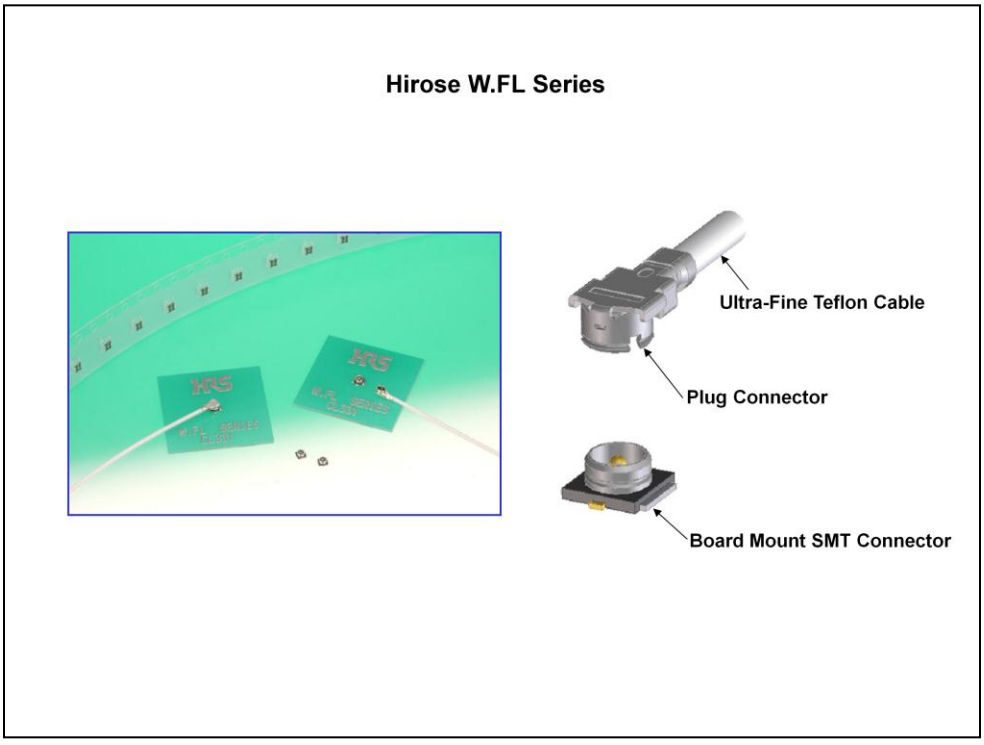
Hirose Electric developed the micro miniature coaxial connectors to meet the increasing demand for wireless devices. As these devices have become smaller, so has the size of the connectors offered, as shown in this diagram. This training will focus on the U.FL and the W.FL series of micro miniature coaxial connectors.

Hirose U.FL Series





The U.FL series has become a standard in the wireless industry. It provides an extremely small mounting area, only 7.7mm, and weighs in at 15.7 mg. The series offers high frequency performance from DC to 6GHz. It has a user friendly tactile lock feeling that ensures a reliable connection. The tape and reel packaging is standard for automated equipment and the series is series is RoHS compliant.

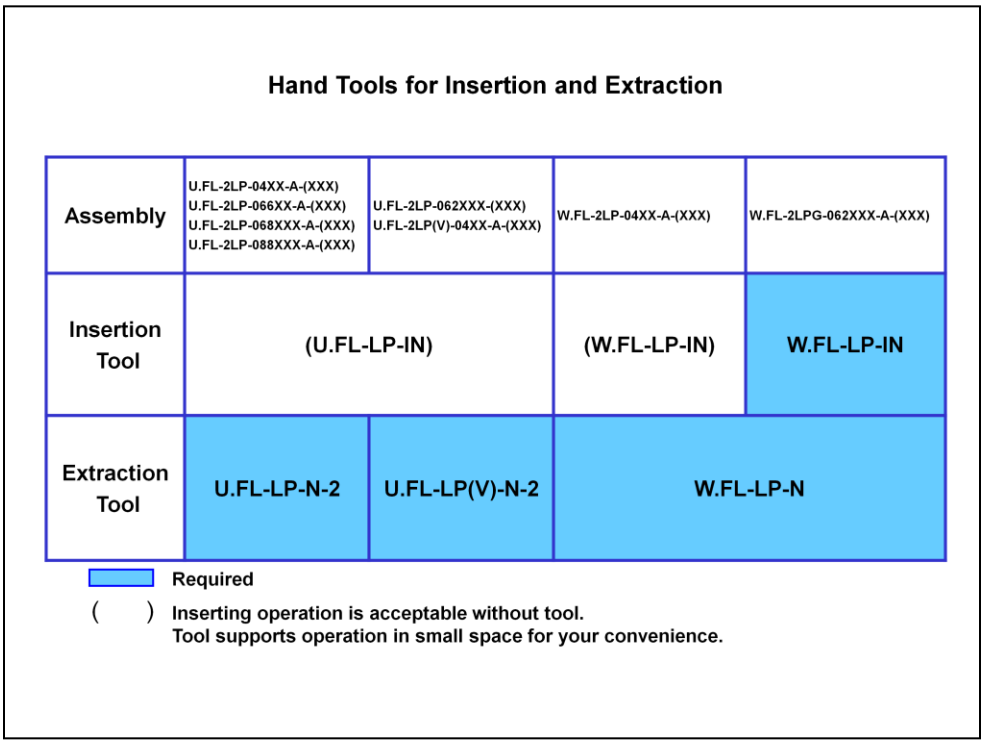


The Hirose W.FL connector reduces board space even more with a mounting area is only 3.4mm square and a weight of 2.6 mg. It is rated for transmission frequencies from DC to 6GHz. This series is also RoHS compliant and is supplied in tape and reel packaging for automated equipment.

Variation Chart

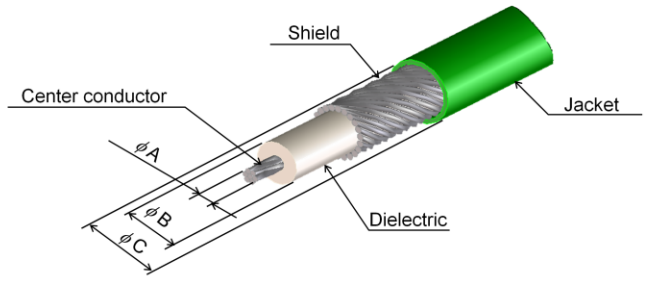
Series	W.FL		U.FL		
Mating Height / Cable Dia.	1.55mm Max	1.85mm Max	2.00mm Max	2.40mm Max	2.50mm Max
0.81mm	Special Order W.FL-2LP-04XX-A-(XXX)	-	Special Order U.FL-2LP(V)-04XX-A-(XXX)	-	Available U.FL-2LP-04XX-A-(XXX)
1.00mm	-	Available W.FL-2LPG-062XXX-A-(XXX)	-	Special Order U.FL-2LP-062XXX-A-(XXX)	-
1.13mm	-	-	-	-	Available U.FL-2LP-068XXX-A-(XXX)
1.32mm	-	-	-	-	Available U.FL-2LP-066XX-A-(XXX)
1.37mm	-	-	-	Available U.FL-2LP-088XXX-A-(XXX)	-

This table shows the mating height and cable diameter for the U.FL and W.FL series. The overall mated height depends on the cable diameters which can vary from 2.00mm to 2.50mm for the U.FL series and from 1.55mm to 1.85mm for the W.FL series.



Due to the small size of these products, it is imperative that recommended insertion and extraction tools are used. This will ensure a “straight line” range of motion. Improper extraction can subject the plug and receptacle to uneven twisting or wrenching motions which can result in damage to the connectors.

Cable



Cable Dia.	cable Type	ΦA Inner Conductor	ΦB Dielectric Diameter	Outer Conductor	ΦC Jacket Diameter	Nominal Impedance
0.81mm	04	7/0.05 (AWG36)	Dia. 0.40mm	Single Shielded	Dia. 0.81mm	50 ohms
1.00mm	062	7/0.071 (AWG33)	Dia. 0.62mm	Single Shielded	Dia. 1mm	50 ohms
1.13mm	068	7/0.08 (AWG32)	Dia. 0.68mm	Single Shielded	Dia. 1.13mm	50 ohms
1.32mm	066	7/0.08 (AWG32	Dia. 0.66mm	Double Shielded	Dia. 1.32mm	50 ohms
1.37mm	088	7/0.102 (AWG30)	Dia. 0.88mm	Single Shielded	Dia. 1.37mm	50 ohms

Note: Actual design of shield construction differs from above figure.

This chart shows the critical dimensions of the cables used for the U.FL and W.FL connectors. Cable sizes are determined by the performance requirements needed by the assembly or device. Each plug is specifically designed for a particular cable and is not interchangeable.

Specification for U.FL

Material and Finish

COMPONENT	MATERIAL	FINISH & REMARKS
Shell	Phosphor bronze	Silver plated
Insulator	PBT polymer (Plug side) LCP (Receptacle side)	Black, UL94V-0 Beige,UL94V-0
Male Contact	Brass	Gold plated
Female Contact	Phosphor bronze	Gold plated

Performance Characteristics

Contact Resistance		20 mΩ (Inner), 10 mΩ (Outer) at 10 mA DC	
Withstanding Voltage		200 V AC r.m.s for 1 minute	
Insulation Resistance		500 MΩ min. at 100 V DC	
Durability		30 cycles	
Characteristic Impedance		50 Ω	
V.S.W.R.	Part No.	Up to 3GHz	Up to 6GHz
	U.FL-2LP-04XX-A-(XXX)	1.3 MAX	1.35 MAX
	U.FL-2LP(V)-04XX-A-(XXX)	1.3 MAX	1.3 MAX
	U.FL-2LP-062XXX-A-(XXX)	1.3 MAX	1.3 MAX
	U.FL-2LP-066XX-A-(XXX)	1.3 MAX	1.5 MAX
	U.FL-2LP-068XXX-A-(XXX)	1.3 MAX	1.4 MAX
	U.FL-2LP-088XXX-A-(XXX)	1.3 MAX	1.4 MAX

This product satisfies RoHS requirements.

General material and finish specifications of the U.FL are shown here. The most important performance characteristics are a durability rating of 30 mating cycles, an impedance of 50 ohms, and a frequency range from DC to 6GHz.

Specification for W.FL

Material and Finish

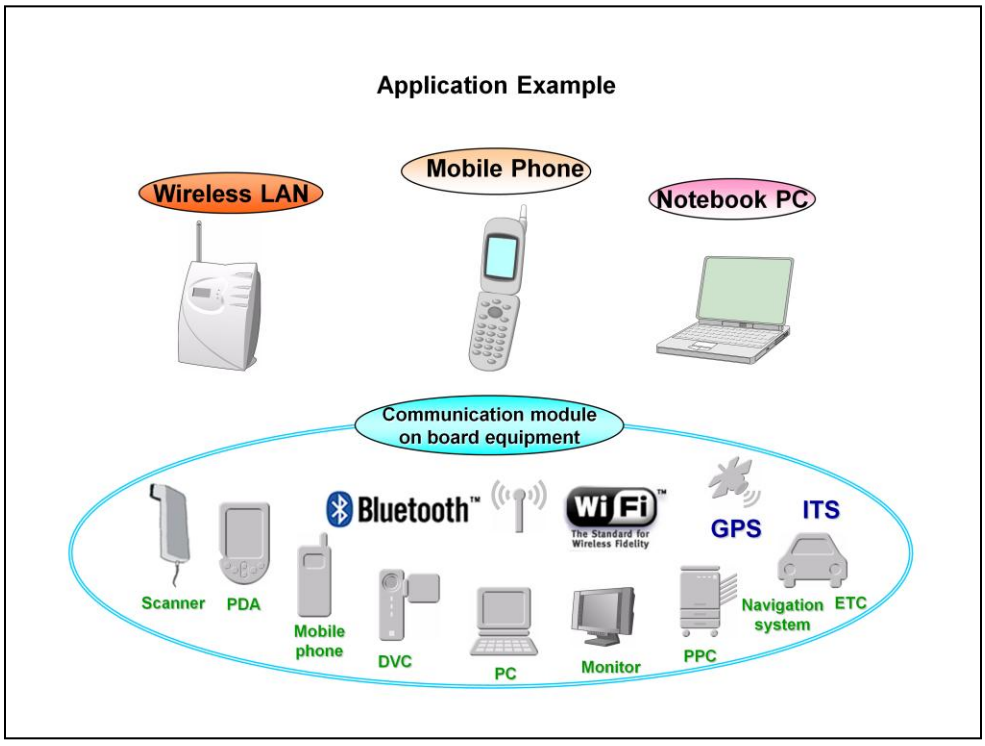
COMPONENT	MATERIAL	FINISH & REMARKS
Shell	Phosphor bronze	Silver plated
Insulator	PBT polymer (Plug side) LCP (Receptacle side)	Black, UL94V-0
Male Contact	Brass	Gold plated
Female Contact	Phosphor bronze	Gold plated

Performance Characteristics

Contact Resistance		20 mΩ (Inner), 10 mΩ (Outer) at 10 mA DC	
Withstanding Voltage		200 V AC r.m.s for 1 minute	
Insulation Resistance		500 MΩ min. at 100 V DC	
Durability		20 cycles	
Characteristic Impedance		50 Ω	
V.S.W.R.	Part No.	Up to 3GHz	Up to 6GHz
	W.FL-2LP-04XX-A-(XXX)	1.3 MAX	1.35 MAX
	W.FL-2LPG-062XXX-A-(XXX)	1.3MAX	1.4 MAX

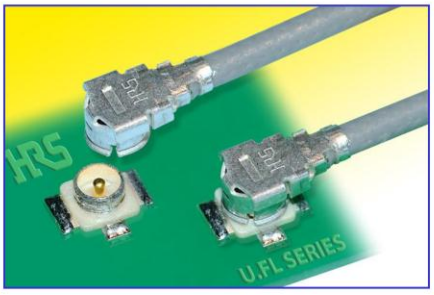
This product satisfies RoHS requirements.

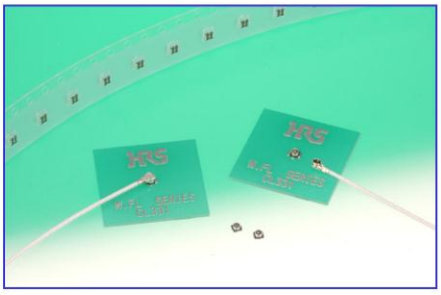
The specifications for the W.FL are shown here. The most important performance characteristics are a durability rating of 20 mating cycles, an impedance of 50 ohms, and a frequency range from DC to 6GHz.



The U.FL and W.FL have a broad range of applications such as mobile phones, GPS devices, wireless LAN's, notebook computers, data terminals, digital still and video cameras, and other small handheld devices that can transmit and /or receive data wirelessley.

Module Summary





- Ultra small coaxial connector
- High frequency performance
- "Click" tactile feel when mated
- Extremely reliable
- Industry standard

In summary, Hirose's U.FL and W.FL have become the wireless industries "de-facto" standard because of their high performance and small size. Both series also feature a "click" tactile feel when connected, and frequency ranges from DC to 6GHz.