

Wireless Connection

JAN.21.2002

Hirose Electric Co., LTD.
Marketing Division

Agenda

1. Wireless communication trend.

2. Coaxial connector.

- U.FL series

- W.FL series

3. Coaxial switch

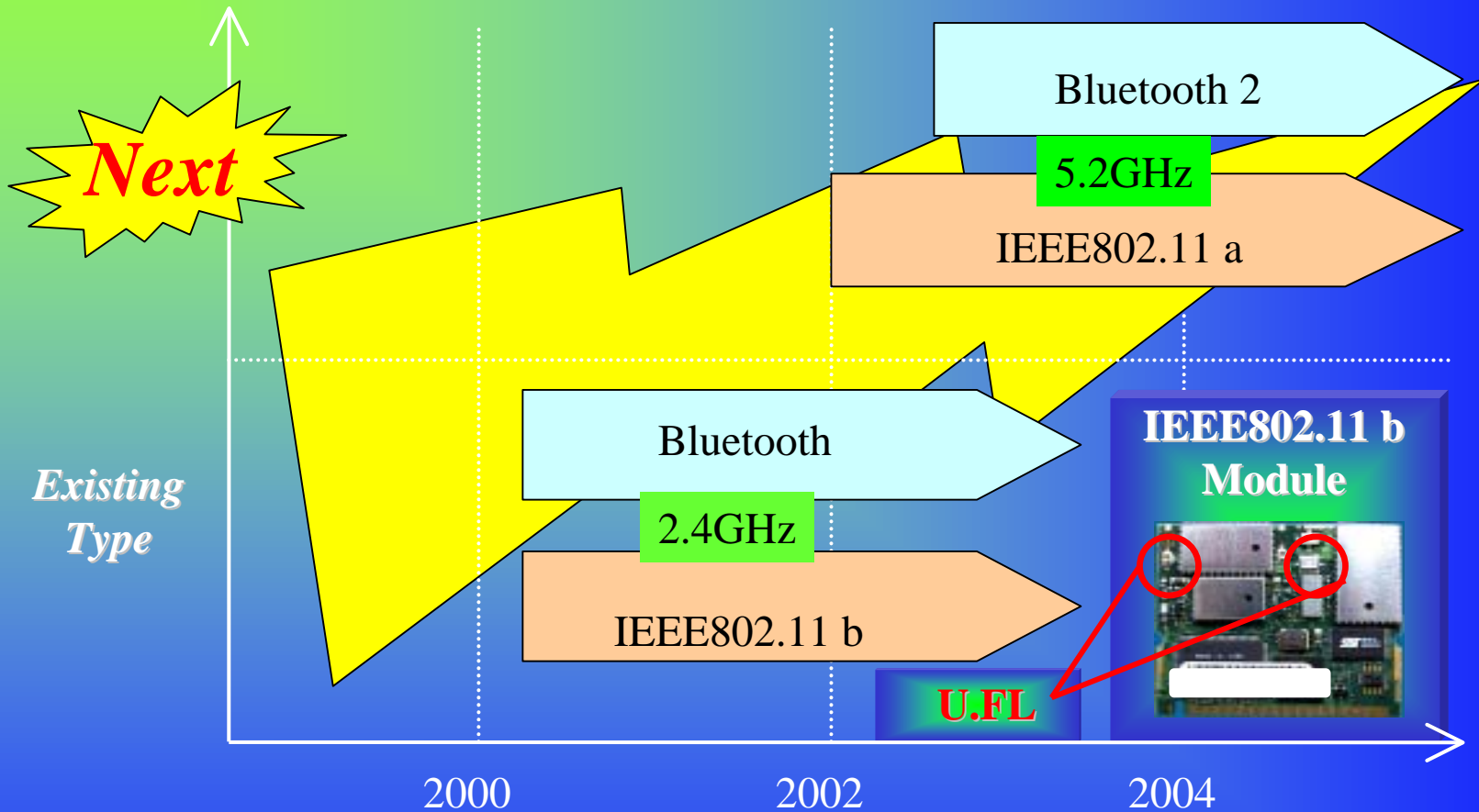
- MS147 series

- MS156 Series

- MS151 Series

4. Adaptor

Wireless Communication Trend

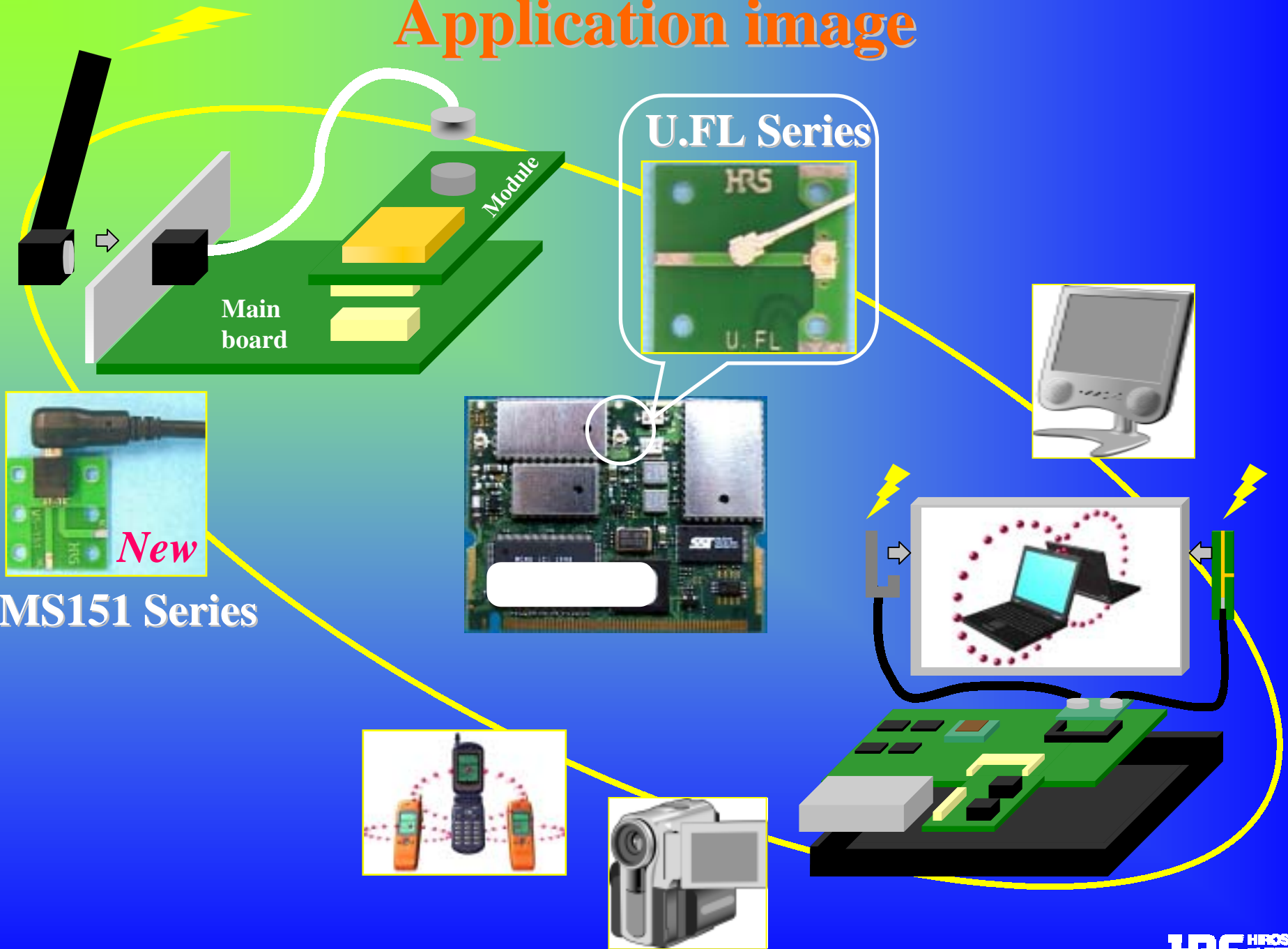


Low profile and high frequency connector will be required in near future.

IEEE802.11 WLAN Over View

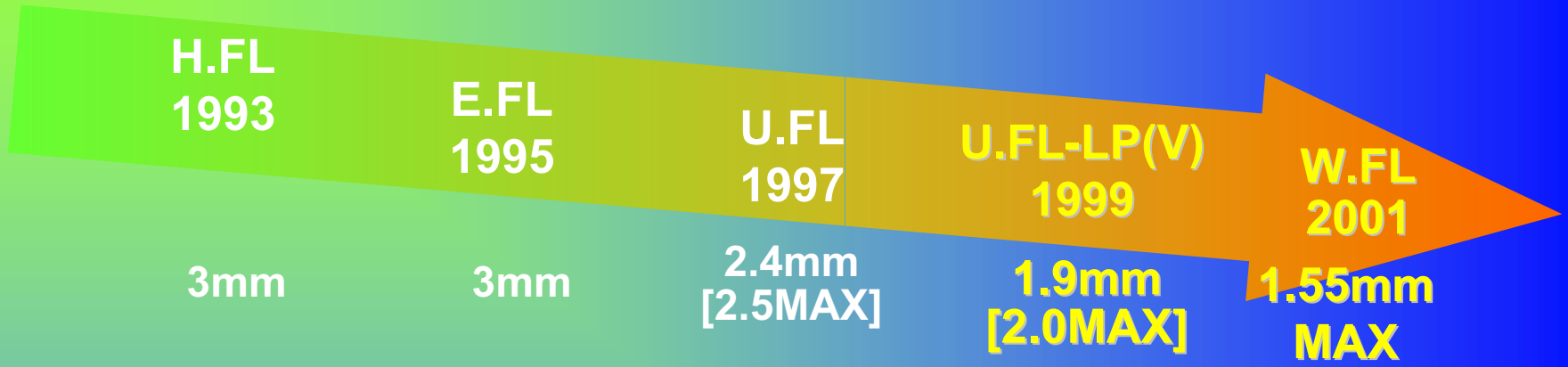
	802.11b	802.11a
Standard approved	Sept.1999	Sept.1999
Available bandwidth	83.5MHz	100MHz
Frequency of operation	2.40 – 2.4835GHz	5.15 – 5.25GHz
Number of non-overlapping channels	4	4 (Japan) 12 (US)
Data rate per channel	1, 2, 5.5, 11Mbps	6, 9, 12, 18, 24 36,48, 54Mbps
Modulation type	DSSS	OFDM

Application image

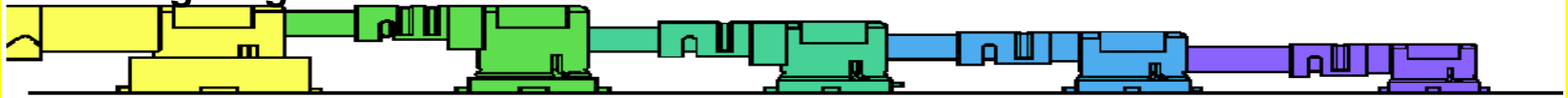


Coaxial Connector

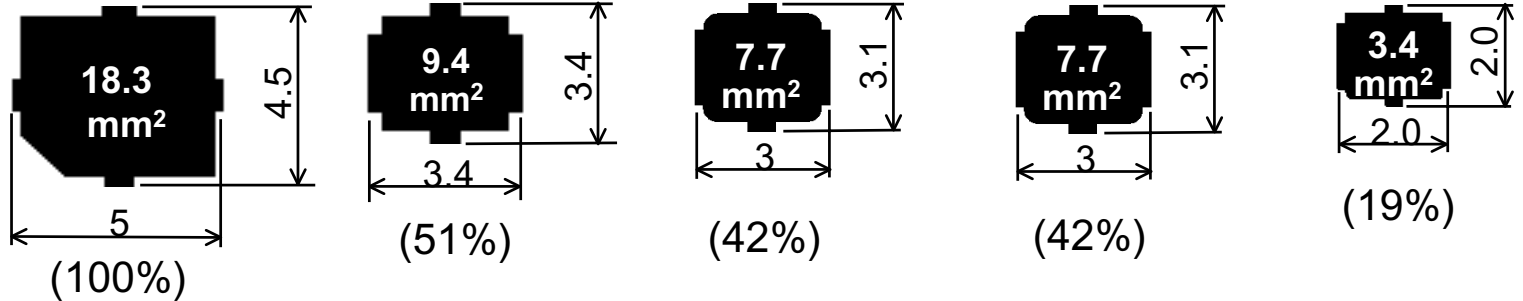
HRS Road Map of Small Coaxial Connector



1. Mating height



2. Mounting Surface for receptacle







Small Coaxial Connector

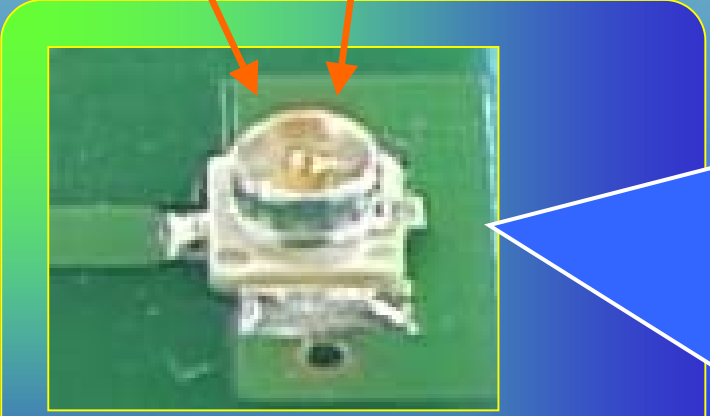
U.FL appreciable cable list

(Units = mm)



**IEEE802.11
Mini-PCI Module**

Part No.	Appearance	Shield	Cable diameter	height
U.FL-LP-040		Single	φ 0.81	2.5max
U.FL-LP(V)-040		Single	φ 0.81	2.0max
U.FL-LP-066		Single	φ 1.13	2.5max
U.FL-LP-066		Double	φ 1.32	2.5max






U.FL-R-SMT
De facto Standard

Small Coaxial Connector

Normal cable attenuation

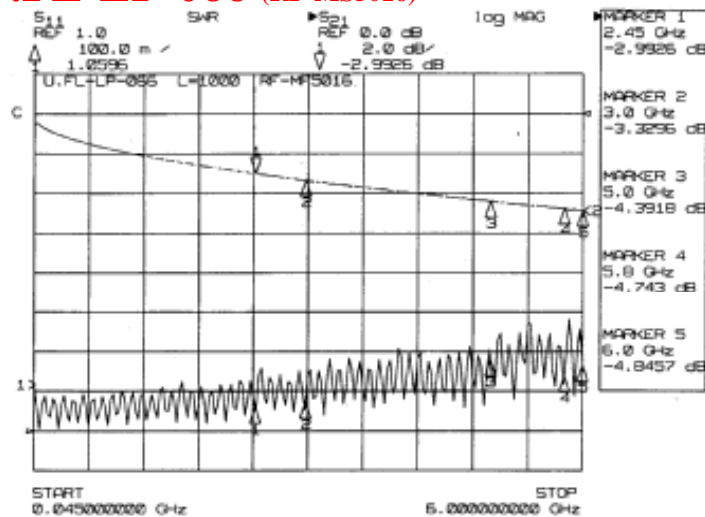
(dB/m)

	U.FL-LP-040 U.FL-LP(V)-040 φ 0.81(RF-MF5010)	U.FL-LP-066	
		φ 1.13(RF-MF5016)	φ 1.32(A12B0733)
1GHz	3.53	2.06	1.9
2GHz	5.17	2.97	3.0
3GHz	6.45	3.69	3.8
4GHz	7.55	4.31	4.5
5GHz	8.53	4.87	5.1
6GHz	9.42	5.38	5.6
Appearance			

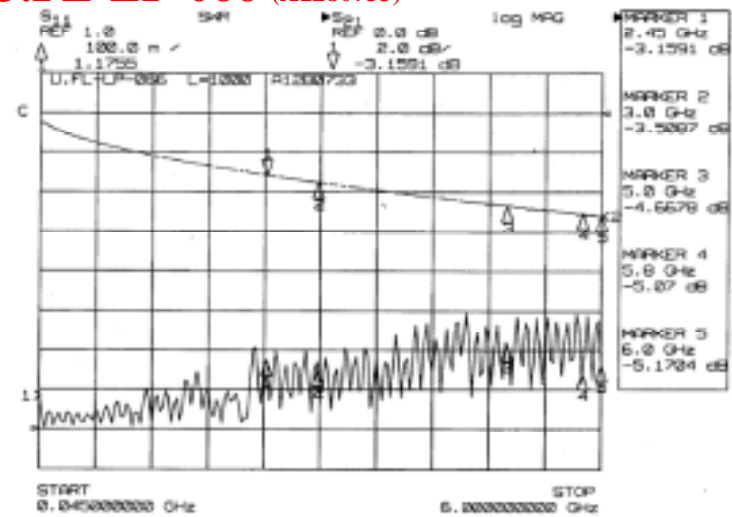
Small Coaxial Connector

U.FL series both end assembly typical data (L=1,000mm)

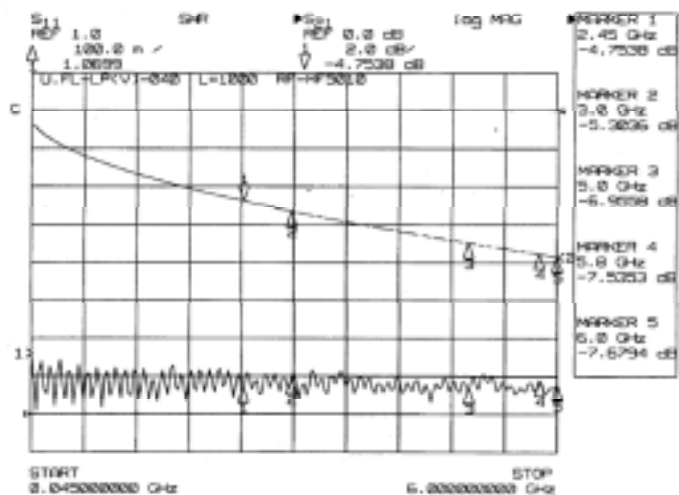
U.FL-LP-066 (RF-MS5016)



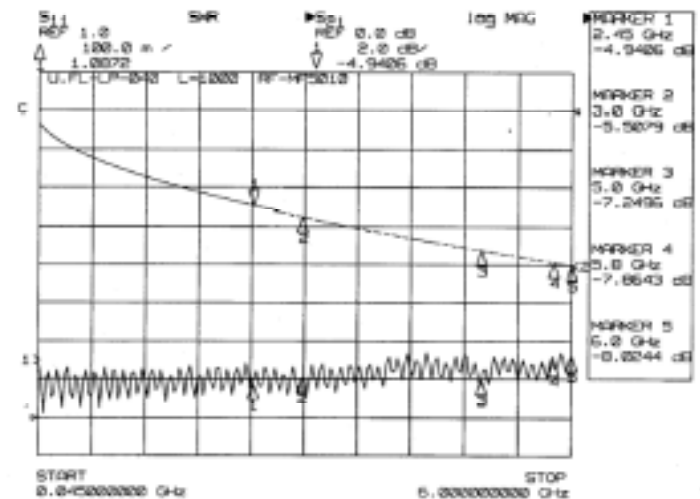
U.FL-LP-066 (A1280733)



U.FL-LP(V)-040 (RF-MF5010)





U.FL-LP-040 (RF-MF5010)



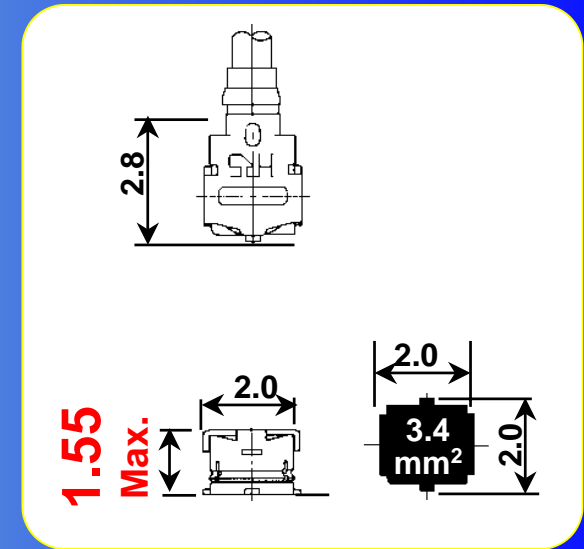
U.FL Series Low Insertion Loss Type

New

	Appearance	Applicable cable	Cable diameter	Plug Part No.	Height (mm)
Conventional type		MF-5016	Φ 1.13	U.FL-LP-066	2.4
Advanced type		New cable	Φ 1.4	U.FL-LP-XXX	2.4

The Smallest Coaxial Connector

W.FL Series



◆ Features

1. The World Smallest Coaxial Connector*

Small mounting surface: 3.4mm² (for receptacle)

Low mating height: 1.55mm Max.

*data as of Nov., 2001




2. High Frequency Performance: VSWR: 1.3 Max. [Up to 3GHz]

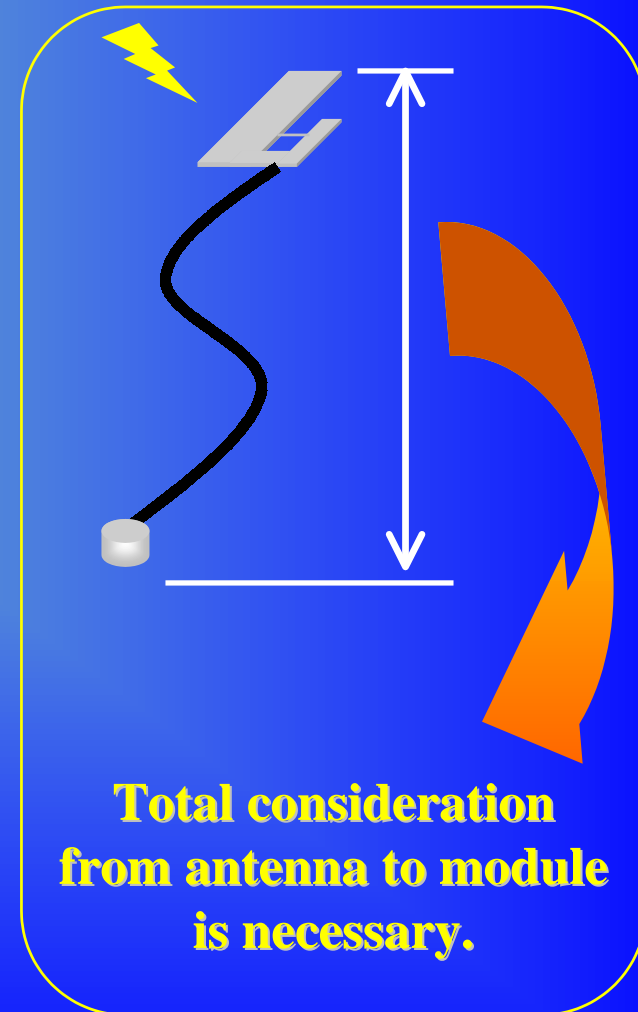
3. Extra Fine Cable: ϕ 0.8mm external diameter

4. User Friendly: Click feeling when fully mated

For reference

Antenna

	Appearance	Features
Chip die Antenna		Secure and stable antenna characteristics are achieved. However tall in height and high in cost.
Grounded reversed F Antenna		Small, high performance and cost effective. Custom design is necessary on each application.
PCB Antenna		Tend to be large in size. No special relationship with case ground. Independent antenna design is possible.
Sleeve Antenna		Can co-exist with special circuit. Special designing is required and unit prices are high.

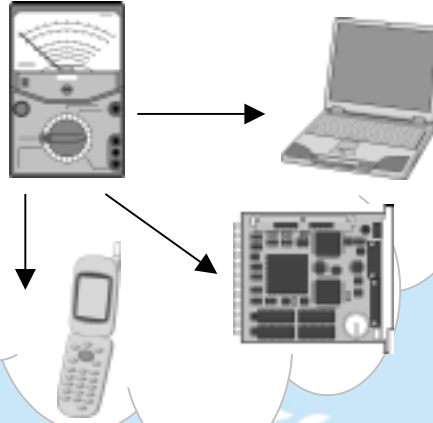


Coaxial Switch

Why Coaxial switch necessary?

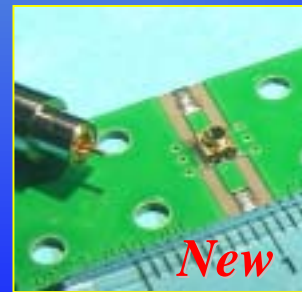
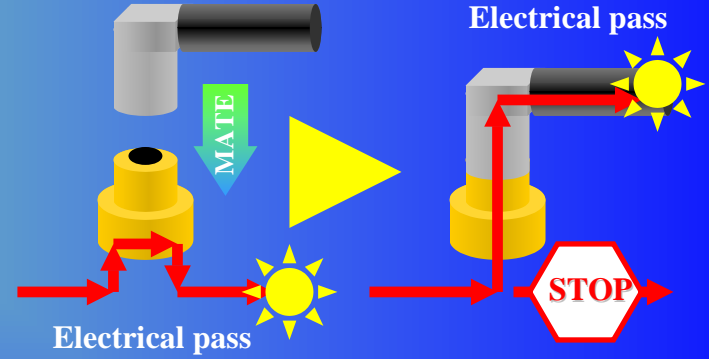
RF performance needs to be checked in the assembly line.

RF check!



Coaxial Switch

How to use Coaxial Switch?



MS156 Series



MS147 Series

Feb. 21

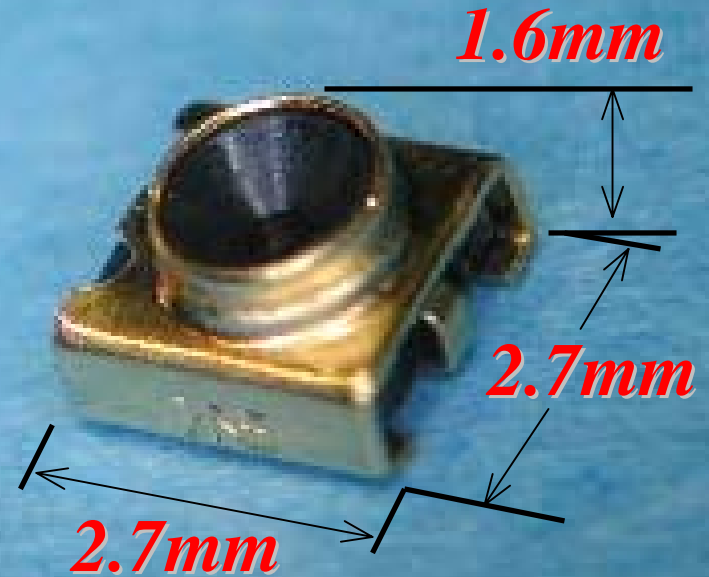
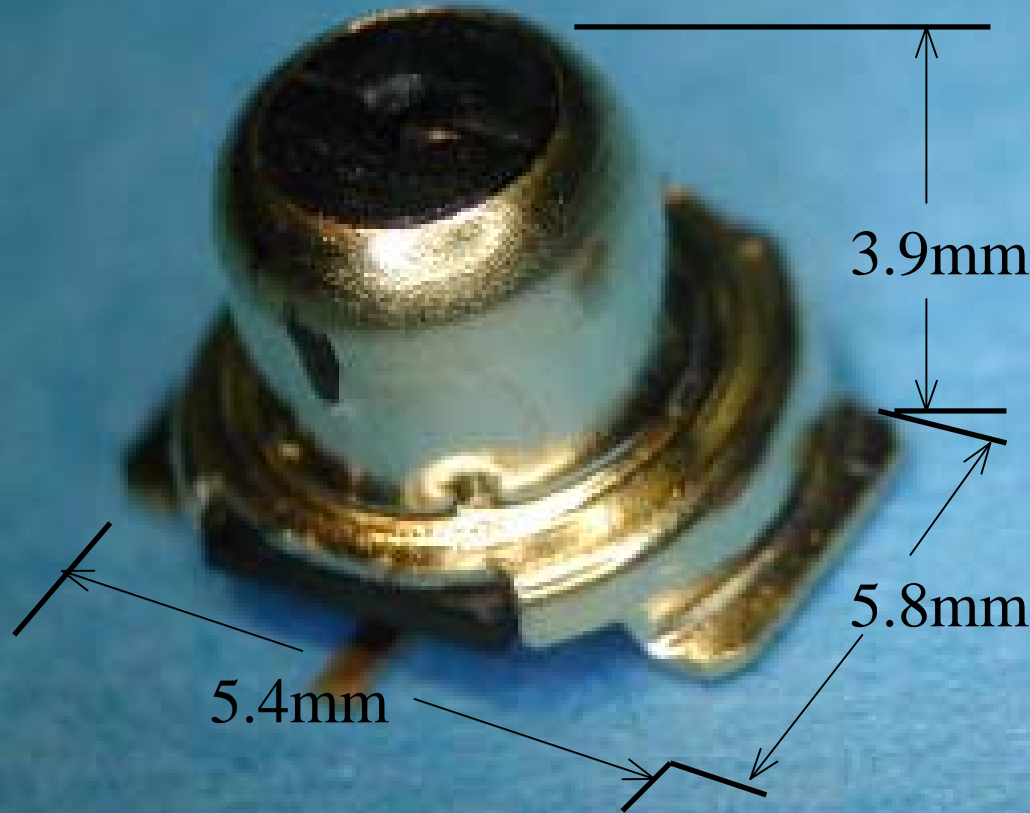
Small Coaxial Switch

MS-147 series

MS-156 series

New

Ultra Low profile and space saving.



**MS-156 is smallest coaxial switch
in the world*!**

*as of Dec. 2001

Small Coaxial Switch

		MS-147		MS-156	
		Unmated	Mated (with plug)	Unmated	Mated (with plug)
Frequency range		DC - 6GHz		DC - 6GHz	
Rated power		4W		2W	
Insertion loss	DC-2GHz	0.15dB or less	0.20dB max.	0.15dB or less	0.15dB or less
	2-2.5GHz	0.20dB or less	0.30dB max.	0.15dB or less	0.30dB or less
	2.5-3GHz	0.20dB or less	0.40dB max.	0.15dB or less	0.40dB or less
	3-6GHz	0.40dB or less	0.80dB max.	0.25dB or less	1.00dB or less
Isolation	DC-1GHz	25dB or more		20dB or more(DC-2GHz)	
	1-3GHz	20dB or more		15dB or more(2GHz-4GHz)	
	3-6GHz	14dB or more		10dB or more(4GHz-6GHz)	
V.S.W.R	DC-2GHz	1.2 or less	1.25 max.	1.2 or less	1.2 or less
	2-2.5GHz	1.2 or less	1.3 max.	1.4 or less	1.4 or less
	2.5-3GHz	1.2 or less	1.4 max.	1.4 or less	1.4 or less
	3-6GHz	1.5 or less	1.9 or less	1.4 or less	1.7 or less
Mechanical operation		12,000 mating cycles		100 mating cycles	

Interface Connector with RF Switch

MS151 Series

MS-151-C(LP)



MS-151

◆ Performance Specifications

Operating Temperature Range	MS-151	-40 to + 85°C	
	MS-151-C(LP)	-30 to + 70°C	
Power	MS-151 MS-151-C(LP)	4W	
Frequency Range		DC to 3GHz	
V.S.W.R.	DC to 1GHz	Normally closed	Normally open
	1GHz to 2GHz	1.2 Max.	
	2GHz to 3GHz	1.4 Max.	
Insertion Loss	DC to 1GHz	0.2dB Max.	0.3 dB Max
	1GHz to 2GHz	0.4dB Max.	0.5dB Max.
	2GHz to 3GHz	0.6dB Max.	1.0dB Max.
Isolation	DC to 1GHz	-	20dB Min.
	1GHz to 2GHz	-	18dB Min.
	2GHz to 3GHz	-	12dB Min.

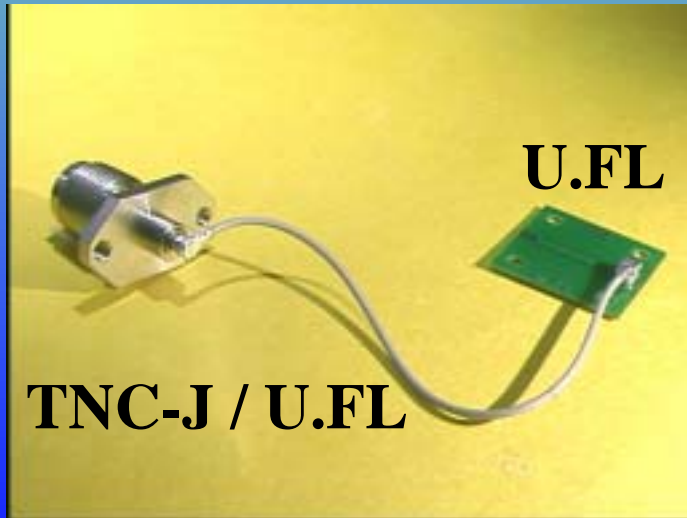
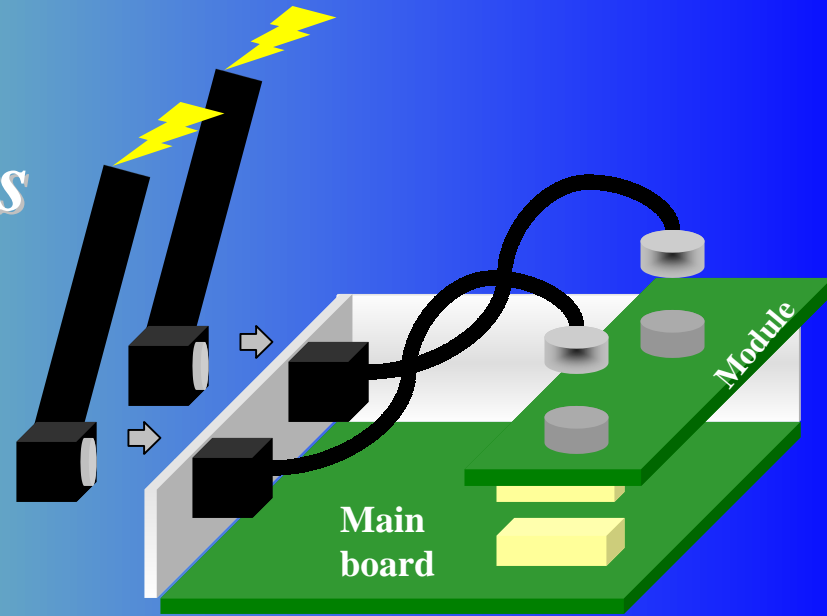
◆ Features

1. Re-direction of transmission to external antenna when inserting the plug.
2. Tactile sensation when fully mated
3. Plug can be mated with cable at any angle within 360° circle
4. Overmolded plug with convenient grip and built-in strain relief
5. High durability: 5,000 mating / unmating cycles

Adaptor

Cable assemblies

Hirose prepare some adapters for your LAN application and antenna connection.



TNC – U.FL
SMA – U.FL
MMCX – U.FL

Cable assemblies are available.

If you have any problems or requests
with Wireless connection,
please contact Hirose.

<http://www.HiroseEurope.com>