LEAD Fiber Optics
PRODUCT CATALOGUE

FIBER PATCH CORD

Fiber Patch cord

Fiber Patch Cord (Fiber Patch Cable or Fiber jumper) is an fiber cable that has fiber connectors installed on one or both ends. General use of these cable assemblies includes the interconnection of fiber cable systems and optics-to-electronic equipment.

Fiber pigtail and Fiber patch cord
If the fiber connectors are attached to only one end of a cable, it is known as a fiber pigtail, if the fiber connectors are attached to both ends. it is known as a fiber jumper or fiber patch cord.

Singlemode and Multimode
Single mode fiber patch cord uses 9/125um glass fiber, Multimode fiber patch cord uses 50/125um or 62.5/125um glass fiber. Single mode and multimode refer to the fiber cable types. Single mode Fiber Patch Cord is used in long distance data transmission. Multimode Fiber Patch Cord is use in short distance transmission. Typical single mode Fiber Patch Cord used yellow fiber cable; Typically multi mode Fiber Patch Cord used orange fiber cable.

Cable material and cable diameter
There are various kinds of Fiber cable material for different environment and applications, PVC, Riser, Plenum, OFNR, OFNP, LSZH, 10 Gig Aqua. Typical Fiber cable diameter can be 0.25mm, 0.9mm, 2.0mm, 3.0mm.

Simplex and Duplex
Simplex means this Fiber Patch Cord is with one cord, at each end is only one fiber connector. Duplex can be regarded as two Fiber Patch Cord put side by side. Duplex Fiber Patch Cord usually with Clip on the fiber Connector to combine it.

LFO provide a variety of custom Simplex, Duplex and Mini Zip, single mode (SM) and multi mode (MM) Fiber Patch Cords and Fiber pigtail assemblies that could be built to your specification. Our Fiber Patch Cord and Fiber Pigtail range offers choices of any length, connector types and either PVC or LSZH sheath, All of our cable assemblies are composed of our top quality **Ceramic Ferrules** and **Fiber Connector** Housings ensuring a stable performance at a high quality level.

Fiber Patch cord

Features

- Compliant with JIS C-5973, Bellcore
- Optical performance 100% factory test
- Precision ceramic ferrule with end-face geometry per IEC proposal
- Riser & LSZH cable option
- Low insertion loss
- Low back reflection

Applications

- Telecommunication
- CATV Networks
- Data Communication Networks
- Active device termination
- Instrumentation
- Local Area Network

Specifications

ITEM	VALUES
Insertion Loss	$\leqq$ 0.15 dB Typical (SM) $\leqq$ 0.2 dB Typical (MM) $\leqq$ 0.3 dB Typical　(MTRJ　MM)
Return Loss	$>$ 40dB (PC) $>$ 45dB (SPC) $>$ 50dB (UPC) $>$ 60dB(APC)
Temperature Range	$-$40°C ~ 75°C
Durability	$<$ 0.2 dB change after 500 matings

Fiber Patch cord   Ordering   information

PC   XX/XX   XX   X   X   XX.X(m)

Connector #1 #2

11-ST
21-FC/PC
22-FC/APC
23-FC/PC Duplex(with clip)
31-SC/PC
32-SC/APC
41-LC/PC
42-LC/APC
43-LC/PC Duplex(with clip)
51-MU/PC
53-MU/PC   Duplex
61- MUJ
71-MTRJ   Female
72-MTRJ   Male
81-MPO
91-FDDI
E2-E2000/APC
No-None
XX-Others, Please specify

Length

005-0.5m
010-1.0m
015-1.5m
025-2.5m
030-3.0m
100-10.0m
150-15.0m
XXX-Others, 3 digit number ,
    please specify in **m**

Cable type

01-Simplex,bare fiber(250um)
02-Simplex,loose tube cable (0.9mm)
03-Simplex,PVC tight buffer cable (0.9mm)
04-Simplex,LSZH tight buffer cable (0.9mm)
05-Simplex,PVC cable(2.0mm)
06-Simplex,LSZH cable(2.0mm)
07-Simplex,PVC cable(2.4mm)
08-Simplex,LSZH cable(2.4mm)
09-Simplex,PVC cable(3.0mm)
10-Simplex,LSZH cable(3.0mm)
11-Duplex ,PVC cable(2.0mm)
12-Duplex,LSZH cable(2.0mm)
13-Duplex ,PVC cable(3.0mm)
14-Duplex,LSZH cable(3.0mm)
15-Duplex Minizip,PVC cable(1.8mm)
16-Duplex Minizip,LSZH cable(1.8mm)
17-Round cord,PVC calbe(3.0mm)
18-Round cord,LSZH calbe(3.0mm)
XX-Others, Please specify

Fiber type

1-9/125um(Single Mode)
2-50/125um(Multi Mode)
3-62.5/125um(Multi Mode)

Cable color

7-Yellow(SM)
8-Orange(MM)
X-Other Color

LFO Fiber Patch cord Series

ST Fiber Patch cord

The ST fiber patch cord uses a long 2.5mm diameter ceramic ferrule (or stainless alloy / plas tic ferrule). It mates with an interconnection adapter and is latched into place by twisting to engage a spring-loaded bayonet socket. It is the most popular connector for multimode fiber optic LAN applications.

FC Fiber Patch cord

The FC fiber patch cord uses a 2.5mm diameter ceramic ferrule (or stainless alloy ferrule). Designed with a threaded coupling for durable connections. It has been the most popular single mode connectors for many years. However it is now gradually being replaced by SC and LC connectors. It is specifically designed for telecommunication applications and provides non-optical disconnect performance.

SC Fiber Patch cord

The SC fiber patch cord is a non-optical disconnect connector with a 2.5mm pre-radiuses ceramic (or stainless alloy ferrule). It features a snap-in (push-pull) connection design for quick patching of cables into rack or wall mounts. It is widely used in single mode applications for its excellent performance. Two performance. Two simplex SC patch cords can be clipped together by a reusable duplex holding clip to create a duplex SC patch cord.

FDDI Fiber Patch cord

The FDDI fiber patch cord is a duplex connector designed by ANSI and is utillized in FDDI networks. FDDI connector utilizes two 2.5mm ferrules. The ferrules are sheltered from damage because of the fix shroud that has been constructed in the FDDI connector. FDDI connectors are generally used to connect to the equipment from a wall outlet, but the rest of the network will have ST or SC connectors.

LC Fiber Patch cord

The LC fiber patch cord uses a 1.25mm ceramic (zirconia) ferrule instead of the 2.5mm ferrule. It has a push-and-latch design providing pull-proof stability in system rack mounts. Externally LC patch cord resembles a standard RJ45 telephone jack. Internally they resemble a miniature version of the SC connector. Highly favored for single mode applications.

MU Fiber Patch cord

The LC fiber patch cord uses a 1.25mm ceramic (zirconia) ferrule. It has push-pull mechanism. They are called "mini SC" and are more popular in Japan. Applications include high-speed data communications, voice networks, telecommunications, and dense wavelength division multiplexing (DWDM). MU connectors are also used in multiple optical connections and as a self-retentive mechanism in backplane applications.

MTRJ Fiber Patch cord

The MT-RJ fiber patch cord is derived from MT ferrule design. It has a miniature two-fiber ferrule with two guide pins parallel to the fibers on the outside. The guide's pins align ferrules precisely when mating two MT-RJ connectors. MT-RJ connectors are designed with male-female polarity which means male MT-RJ connector has two guide pins and female MT-RJ connector has two holes instead. The MTRJ is designed for backbone and horizontal cabling systems, local area networks and telecommunication systems.

MPO Fiber Patch cord

The MTP and MPO are compatible ribbon fiber patch cord based on MT ferrule which allow quick and reliable connections for up to 12 fibers. Up to 12 fibers in a ribbon are stripped to 125um cladding and inserted into 250um spaced parallel grooves. MTP and MPO patch cord feature male and female connector design. Male connectors have two guide pins and female connectors do not. Both connector types need an adapter to mate a pair of male and female connectors.

E2000 Fiber Patch cord

The E2000 fiber patch cord uses a 1.25mm ceramic (zirconia) ferrule. E2000's are small form factor connectors with a moulded plastic body similar to that of an LC. The E2000 also exhibits a push-pull latching mechanism, and integrates a protective cap over the ferrule, which acts as a dust shield and shields users from laser emissions. The protective cap is loaded with an integrated spring to ensure proper closing of the cap. Like other small form factor connectors, the E-2000 connector is suited for high-density applications.

ST Fiber Patch cord

Features

- Compliance with IEC, JIS, Telcordia
- Twist-lock bayonet coupling mechanism which ensures quick, highly repeatable, low-loss connections
- Simplex, duplex, and multi-fiber assemblies in standard and custom configurations
- Singlemode and Multimode
- PC finish

Applications

- Premise installations
- Telecommunication networks
- Metro networks
- Local Area Networks (LANs)
- Data processing networks
- Instrumentation

Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	Multi Mode
Insertion Loss(dB)	$<$ 0.2	$<$ 0.3
Return Loss(dB)	$>$ 40	-
Durability:500matings(dB)	$<$ 0.2	$<$ 0.2
Operation temperature(°C)	-40°C ~ 85°C	-40°C ~ 85°C
Ferrule Type	Standard	Standard
Body Material	Zinc die-casting	
Cable Type	0.9 / 2.0 / 2.4 / 3.0 / Zip Cable	
Boot Type	Variety of Color , Design available	

Specifications (Adapter)

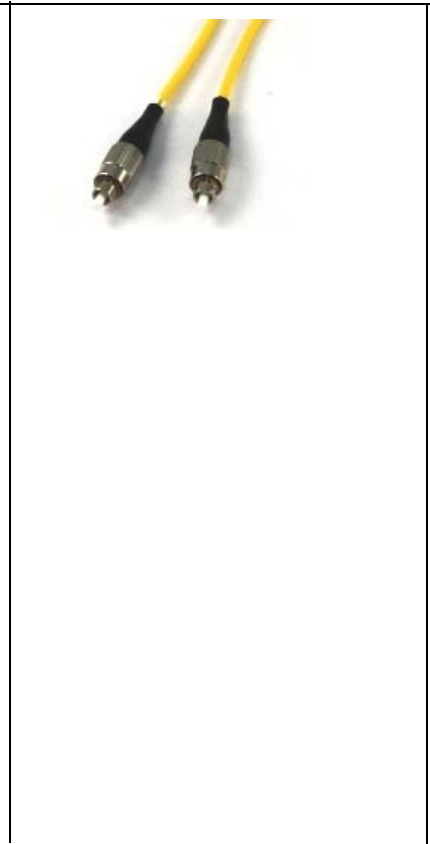| ITEM	SM / PC	Multi Mode
Sleeve	Ceramic/ Phosphor bronze	Phosphor bronze
Body Material	Zinc die-casting	

FC Fiber Patch cord

Features

- Compliance with IEC, JIS, Telcordia
- Threaded, key-oriented coupling mechanism which allows repeatable, low-loss connections
- Simplex, duplex, and multi-fiber assemblies available in standard and custom configurations
- Singlemode and Multimode
- PC or APC finish

Applications

- CATV
- Metro Applications
- Active device termination
- Test equipment
- Wide Area Networks (WANs)
- Telecommunication networks
- Local Area Networks (LANs)
- Data processing networks
- Premise installations

Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	SM / APC	Multi Mode
Insertion Loss(dB)	＜ 0.2	＜0.2	＜0.3
Return Loss(dB)	＞ 40	＞ 60	-
Durability:500matings(dB)	＜ 0.2	＜ 0.2	＜ 0.2
Ferrule Type	Standard	Step / Conical	Standard
Body Material	Nickel plated brass		
Cable	0.9 / 2.0 / 2.4 / 3.0 / Zip Cable		
Boot Type	Variety of Color , Design available		

Specifications (Adapter)

ITEM	SM / PC	SM / APC	Multi Mode
Sleeve	Ceramic/ Phosphor bronze	Ceramic	Phosphor bronze
Body Material	Nickel plated brass		
Body Type	Square Type / Round Type		

SC Fiber Patch cord

Features

- Compliance with IEC, JIS, Telcordia
- Push-pull, key-oriented coupling mechanism which allows highly repeatable, low-loss connections
- Simplex, duplex, and multi-fiber assemblies available in standard and custom configurations
- Singlemode and Multimode
- PC or APC finish
- UL94V-O compatible resin housing and optional UL94V-O compatible resin boot is available

Applications

- CATV,   Metro
- Active device termination
- Test equipment
- Telecommunication networks
- Local Area Networks (LANs)
- Data processing networks
- Premise installations
- Wide Area Networks (WANs)

Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	SM / APC	Multi Mode
Insertion Loss(dB)	＜ 0.2	＜ 0.2	＜ 0.3
Return Loss(dB)	＞ 40	＞ 60	-
Durability:500matings(dB)	＜ 0.2	＜ 0.2	＜ 0.2
Ferrule Type	Standard	Step / Conical	Standard
Cable	0.9 / 2.0 / 2.4 / 3.0 / Zip Cable		
Boot Type	Variety of Color , Design available		

Specifications (Adapter)

ITEM	SM / PC	SM / APC	Multi Mode
Sleeve	Ceramic/ Phosphor bronze	Ceramic	Phosphor bronze
Body Material	Plastic		
Housing Color	Blue	Green	Beige
Housing Type	Simplex / Duplex		

FDDI Fiber Patch cord

Features

- ANSI FDDI compliant singlemode and multimode versions
- Push-pull installation and removal
- Quick installation with Snap-together housing
- Compatible with all FDDI-compliant connectors and active equipment
- Lowest profile in the industry
- Connector housing quickly and securely snaps together, no screws
- Color coded keying for service identification
- Various brand name connectors are available upon request

Applications

- Duplex fiber optic system
- Building wiring
- FDDI backbone network

Specifications (Patch cord / Pigtail / Connector)

ITEM	Multi Mode
Insertion Loss(dB)	＜ 0.2
Return Loss(dB)	-
Durability:500matings(dB)	＜ 0.2
Cable Type	Duplex round /Zip Cable
Boot Type	Duplex round cable/ Zip cable

Specifications (Adapter)

ITEM	Multi Mode
Body Material	Plastic
Housing Color	Beige

LC Fiber Patch cord

Features

- Compliance with IEC, Telcordia
- RJ-45 style housing with push-pull coupling mechanism which allows easy disengagement in dense spaces
- Small Form Factor - half the size of standard connectors
- Simplex and duplex assemblies available in standard and custom configurations
- Singlemode and Multimode
- PC Finish

Applications

- Gigabit Ethernet
- Video
- Active Device Termination
- Premise Installations
- Telecommunication Networks
- Multimedia

Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	SM / APC	Multi Mode
Insertion Loss(dB)	$<$ 0.2	$<$ 0.2	$<$ 0.3
Return Loss(dB)	$>$ 40	$>$ 60	-
Durability:500matings(dB)	$<$ 0.2	$<$ 0.2	$<$ 0.2
Ferrule Type	Standard	Step / Conical	Standard
Cable	0.9 / 2.0 / Zip Cable		
Boot Type	Variety of Color , Design available		

Specifications (Adapter)

ITEM	SM / PC	SM / APC	Multi Mode
Sleeve	Ceramic	Ceramic	Phosphor bronze
Body Material	Plastic		
Housing Color	Blue	Green	Beige
Housing Type	Simplex / Duplex		

MU Fiber Patch cord

Features

- Compliance with IEC, JIS, Telcordia
- Miniature single-position plug with push-pull coupling mechanism which are used for high density, low profile interconnect applications and back panel connector applications
- Design based on SC connector technology
- Simplex and duplex assemblies available in standard and custom configurations
- Singlemode and Multimode
- PC finish

Applications

- CATV
- Video
- Active Device Termination
- Premise Installations
- Telecommunication Networks
- Local Area Networks (LANs)
- Data processing networks
- Wide Area Networks (WANs)

Specifications (Patch cord / Pigtail / Connector)

ITEM	Single Mode	Multi Mode
Insertion Loss(dB)	$<$ 0.2	$<$ 0.3
Return Loss(dB)	$>$ 40	-
Durability:500matings(dB)	$<$ 0.2	$<$ 0.2
Ferrule Type	Standard	Standard
Cable	0.9 / 2.0 / Zip Cable	
Boot Type	Blue, Variety of Color , Design available	

Specifications (Adapter)

ITEM	Single Mode	Multi Mode
Sleeve	Ceramic	Phosphor bronze
Body Material	Plastic	
Housing Color	Brown	
Housing Type	Simplex / Duplex	

MTRJ Fiber Patch cord

Features

- Compliance with IEC, JIS, Telcordia
- MT style ferrule with RJ-45 style housing with push-pull coupling mechanism which allows easy disengagement in dense spaces
- One ferrule accommodates two fibers
- Small Form Factor - Half the size of duplex SC and ST connectors
- Duplex assemblies available in standard and custom configurations
- Singlemode and Multimode

Applications

- Asynchronous Transmission Mode (ATM)
- Gigabit Ethernet
- CATV, Video and Multimedia
- Active Device/Transceiver Interface
- Premise Installations
- Telecommunication Networks
- Industrial
- Military
- Parallel optical interconnect between PC Cards and patch panels
- Interconnection for O/E modules
- Optical Switch interframe connections

Specifications (Patch cord / Pigtail / Connector)

ITEM	Single Mode	Multi Mode
Insertion Loss(dB)	＜ 0.7	＜ 0.7
Return Loss(dB)	＞ 26	-
Durability:500matings(dB)	＜ 0.3	＜ 0.3
Cable Type	Simplex round cable / Zip Cable	
Boot Type	Blue, Simplex round cable/Zip cable	

Specifications (Adapter)

ITEM	Single Mode	Multi Mode
Body Material	Plastic	
Housing Color	Black	

MPO Fiber Patch cord

Features

- Compliance with IEC, JIS, Telcordia
- Push-on / Pull-off latching connector
- Available Singlemode (angled) and Multimode (flat) performance
- High fiber density (24 fibers for Multimode)
- Fiber in single connector: 4, 8, 12
- High reflection loss with APC
- Precision molded polymer component

Applications

- Parallel optical interconnect between PC cards and patch panles
- Interconnection for O/E modules
- Optical Switch inter frame connections
- Gigabit Ethernet
- CATV
- Video
- Active Device / Transceiver Interface
- Premise Installations
- Telecommunication Networks
- Multimedia

Specifications (Patch cord / Pigtail / Connector)

ITEM	Low Loss /SM	SM	Multi Mode
Insertion Loss(dB)	$<$ 0.35	0.75	$<$ 0.5
Return Loss(dB)	$\geqq$ 50	$\geqq$ 50	-
Cable Type	4,8,12,24 Bare fiber ribbon / Ruggedized ribbon		
Boot Type	Variety of Color , Design available		

Specifications (Patch cord / Pigtail / Connector)

ITEM	Low Loss /SM	SM	Multi Mode
Body Material	Plastic		
Housing Color	Black		

E2000 Fiber Patch cord

Features

- The ferrule is protected by integrated sprig-loaded shutter
- The connector housing protects the ferrule all
  round against dust, dirt and scratches
- No different expansion coefficients due to Ceramic ferrule
- Singlemode and Multimode
- PC Finish and APC finish

Applications

- Telecommunication
- CATV
- LAN(including FITH,FTTH and FTTD)

Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	SM / APC	Multi Mode
Insertion Loss(dB)	＜ 0.2	＜ 0.2	＜ 0.3
Return Loss(dB)	＞ 40	＞ 60	-
Durability:500matings(dB)	＜ 0.2	＜ 0.2	＜ 0.2
Ferrule Type	Standard	Step / Conical	Standard
Cable	0.9 / 2.0 / 2.4 / 3.0		
Boot Type	Variety of Color , Design available		

Specifications (Adapter)

ITEM	SM / PC	SM / APC	Multi Mode
Sleeve	Ceramic	Ceramic	Phosphor bronze
Body Material	Plastic		
Housing Color	Blue	Green	Beige
Housing Type	Simplex		