

# LEAD Fiber Optics PRODUCT CATALOGUE

## FIBER OPTIC ATTENUATOR Fixed plug-in type

## Fixed plug in type Attenuator



Fixed plug in fiber attenuators (Fixed plug type or Male to Female Fixed fiber attenuator) use doped fiber to provide fixed level of optical attenuation. Typical attenuation values are between 3 and 20 dB. It is used in optical systems where the optical power from a source is too high for the test equipment in use. Fixed plug type fiber attenuator provides a connector plug (male) and an adapter socket (female) to connect between fiber patch cord and fiber adapter. Fixed plug type attenuator introduces an in-line fixed loss that will reduce the source power to an acceptable detection level. The attenuation level should be stable with temperature and wavelength for a stable reliable system.

Our Fixed plug type Fixed Attenuators and our **Fixed In-Line Fixed Attenuators** are devices that convert optical power into heat using specialty Metal Ion Doped Optical Fibers allowing the optical power to be attenuated to a desired level.

LFO provides a wide range of Fixed plug type single mode attenuator. They are used directly on the Fiber Optic Connectors and provide a fixed level of optical attenuation. Our Fixed plug type attenuator have low return loss and works at both 1310nm and 1550nm wavelength range. FC and SC fiber connector types with PC or APC polish are available, as well as ST and LC types of attenuators.

## Fixed plug in type Attenuator

### Features

- Environmentally stable
- Easy installation
- Custom designed specifications
- Low return Loss
- Readily panel mountable
- Compact

### Applications

- Telecommunication
- Local area network
- CATV
- Fiber optic sensors
- Testing instruments
- Fiber to the home
- Multi-Channel subscriber loop
- Optical transmission system



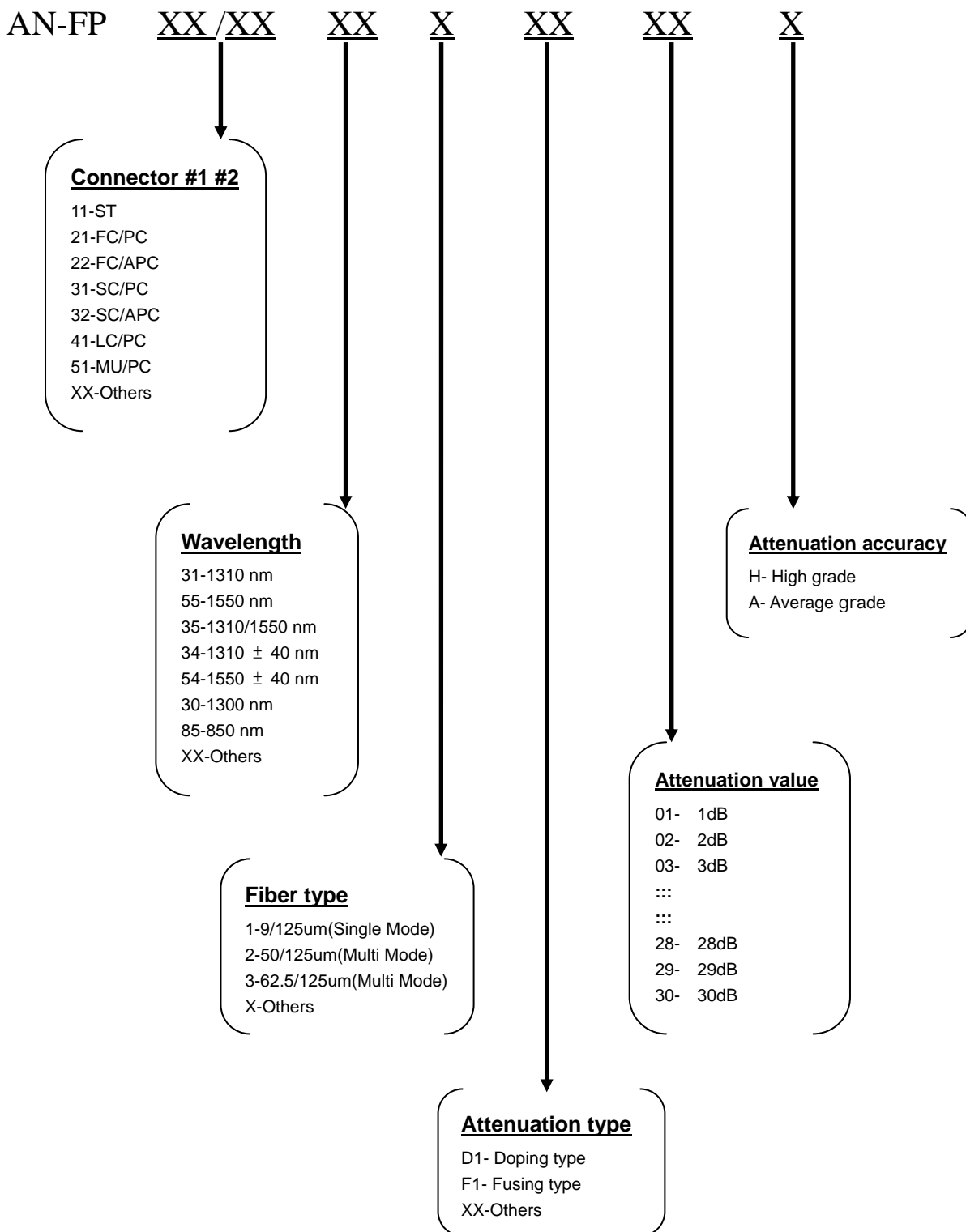
## Specifications

ITEM		Wideband Fixed Plug in type Attenuator (Doping type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm or 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.0	±1.5
	6~10dB	±1.5	±2.0
	11~15dB	±2.0	±2.5
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature		-40°C ~75°C	
Storage temperature		-50°C ~85°C	
Connector Type		ST,FC,FC/APC,SC,SC/APC,LC,MU	

Specifications			
ITEM		Dual window Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm and 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.5	±2.0
	6~10dB	±2.0	±2.5
	11~15dB	±2.5	±3.0
	16~20dB	±3.0	±3.5
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature		-40°C ~75°C	
Storage temperature		-50°C ~85°C	
Connector Type		ST,FC,FC/APC,SC,SC/APC,LC,MU	

Specifications			
ITEM		Standard Fixed Plug in Type Attenuator (Fusing Type)	
Mode Type		Multi Mode	
Operation Wavelength, nm		850 or 1310	
Bandwidth, nm		±10	
Attenuation, dB		1~20 or otherwise specified	
Attenuation Accuracy (typical, including connector)	1~5dB	±1.0	
	6~10dB	±1.5	
	11~20dB	±2.0	
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature		-40°C ~75°C	
Storage temperature		-50°C ~85°C	
Connector Type		ST,FC,SC	

**Fixed Plug in Fiber Optic Attenuator Ordering information**



## **LFO Fixed Plug in Fiber Optic Attenuator Series**



### **ST Plug in type Attenuator**

ST fiber optic attenuators use a 2.5mm diameter ceramic ferrule with PC end-face and a ceramic sleeve for precise alignment. It was designed to operate in the 1310 / 1550 nm windows for singlemode and 850 nm windows for multimode.



### **FC Plug in type Attenuator**

The FC fiber optic attenuators use a 2.5mm diameter ceramic ferrule with either PC or APC end-face and a ceramic sleeve for precise alignment. It was designed to operate in the 1310 / 1550 nm windows and 850 nm windows for multimode.



### **SC Plug in type Attenuator**

The SC fiber optic attenuators use a 2.5mm diameter ceramic ferrule with either PC or APC end-face and a ceramic sleeve for precise alignment. It was designed to operate in the 1310 / 1550 nm windows and 850 nm windows for multimode.



### **LC Plug in type Attenuator**

The LC fiber optic attenuators use a 1.25mm diameter ceramic ferrule with either PC or APC end-face and a ceramic sleeve for precise alignment. It was designed to operate in the 1310 / 1550 nm windows and 850 nm windows for multimode.



### **MU Plug in type Attenuator**

The MU fiber optic attenuators use a 1.25mm diameter ceramic ferrule with PC end-face and a ceramic sleeve for precise alignment. It was designed to operate in the 1310 / 1550 nm windows.

## ST Fiber Optic Attenuator

### Features

- Environmentally stable
- Easy installation
- Custom designed specifications
- Low return Loss
- Readily panel mountable
- Compact

### Applications

- Telecommunication
- Local area network
- CATV
- Fiber optic sensors
- Testing instruments
- Fiber to the home
- Multi-Channel subscriber loop
- Optical transmission system



## Specifications

ITEM		Wideband Fixed Plug in Type Attenuator (Doping type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm or 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.0	±1.5
	6~10dB	±1.5	±2.0
	11~15dB	±2.0	±2.5
Back Reflection, dB	16~20dB	±2.0	±2.5
	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~ 75°C	
Storage temperature, °C		-50°C ~ 85°C	

## Specifications


ITEM		Dual window Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm and 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.5	±2.0
	6~10dB	±2.0	±2.5
	11~15dB	±2.5	±3.0
Back Reflection, dB	PC	≤-40	
	APC	≤-60	
Operation Temperature, °C		-40°C~75°C	
Storage temperature, °C		-50°C~85°C	

## Specifications

ITEM		Standard Fixed Plug in Type Attenuator (Fusing Type)	
Mode Type		Multi Mode	
Operation Wavelength, nm		850 or 1310	
Bandwidth, nm		±10	
Attenuation, dB		1~20 or otherwise specified	
Attenuation Accuracy (typical, including connector)	1~5dB	±1.0	
	6~10dB	±1.5	
	11~20dB	±2.0	
Back Reflection, dB	PC	≤-40	
	APC	≤-60	
Operation Temperature, °C		-40°C~75°C	
Storage temperature, °C		-50°C~85°C	



## FC Fiber Optic Attenuator

<p><b>Features</b></p> <ul style="list-style-type: none"> <li>● Environmentally stable</li> <li>● Easy installation</li> <li>● Custom designed specifications</li> <li>● Low return Loss</li> <li>● Readily panel mountable</li> <li>● Compact</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>● Telecommunication</li> <li>● Local area network</li> <li>● CATV</li> <li>● Fiber optic sensors</li> <li>● Testing instruments</li> <li>● Fiber to the home</li> <li>● Multi-Channel subscriber loop</li> <li>● Optical transmission system</li> </ul>	
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## Specifications

ITEM		Wideband Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm or 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.0	±1.5
	6~10dB	±1.5	±2.0
	11~15dB	±2.0	±2.5
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~75°C	
Storage temperature, °C		-50°C ~85°C	

## Specifications

ITEM		Dual window Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310 nm and 1550 nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.5	±2.0
	6~10dB	±2.0	±2.5
	11~15dB	±2.5	±3.0
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~75°C	
Storage temperature, °C		-50°C ~85°C	

## Specifications

ITEM		Standard Fixed Plug in Type Attenuator (Fusing Type)	
Mode Type		Multi Mode	
Operation Wavelength, nm		850 nm or 1310 nm	
Bandwidth, nm		±10	
Attenuation, dB		1~20 dB or otherwise specified	
Attenuation Accuracy (typical, including connector)	1~5dB	±1.0	
	6~10dB	±1.5	
	11~20dB	±2.0	
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~75°C	
Storage temperature, °C		-50°C ~85°C	

## SC Fiber Optic Attenuator

### Features

- Environmentally stable
- Easy installation
- Custom designed specifications
- Low return Loss
- Readily panel mountable
- Compact

### Applications

- Telecommunication
- Local area network
- CATV
- Fiber optic sensors
- Testing instruments
- Fiber to the home
- Multi-Channel subscriber loop
- Optical transmission system



## Specifications

ITEM		Wideband Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm or 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.0	±1.5
	6~10dB	±1.5	±2.0
	11~15dB	±2.0	±2.5
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~ 75°C	
Storage temperature, °C		-50°C ~ 85°C	

## Specifications

ITEM		Dual window Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm and 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.5	±2.0
	6~10dB	±2.0	±2.5
	11~15dB	±2.5	±3.0
Back Reflection, dB	16~20dB	±3.0	±3.5
	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~ 75°C	
Storage temperature, °C		-50°C ~ 85°C	

## Specifications

ITEM		Standard Fixed Plug in Type Attenuator (Fusing Type)	
Mode Type		Multi Mode	
Operation Wavelength, nm		850 or 1310	
Bandwidth, nm		±10	
Attenuation, dB		1~20 or otherwise specified	
Attenuation Accuracy (typical, including connector)	1~5dB	±1.0	
	6~10dB	±1.5	
	11~20dB	±2.0	
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~ 75°C	
Storage temperature, °C		-50°C ~ 85°C	

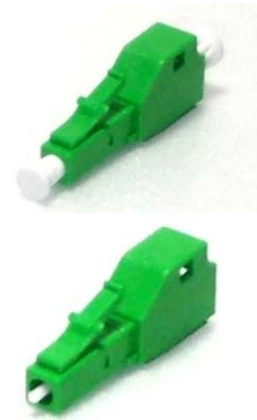
## LC Fiber Optic Attenuator

### Features

- Environmentally stable
- Easy installation
- Custom designed specifications
- Low return Loss
- Readily panel mountable
- Compact

### Applications

- Telecommunication
- Local area network
- CATV
- Fiber optic sensors
- Testing instruments
- Fiber to the home
- Multi-Channel subscriber loop
- Optical transmission system



## Specifications

ITEM		Wideband Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm or 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.0	±1.5
	6~10dB	±1.5	±2.0
	11~15dB	±2.0	±2.5
	16~20dB	±2.0	±2.5
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~75°C	
Storage temperature, °C		-50°C ~85°C	

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ITEM		Dual window Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm and 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
	1~5dB	±1.5	±2.0
	6~10dB	±2.0	±2.5
	11~15dB	±2.5	±3.0
	16~20dB	±3.0	±3.5
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~ 75°C	
Storage temperature, °C		-50°C ~ 85°C	
Connector Type		ST,FC,FC/APC,SC,SC/APC,LC,MU	

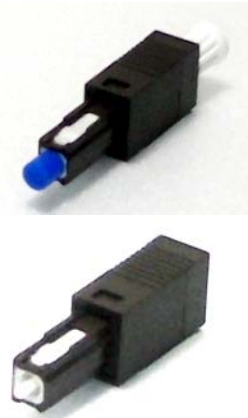
## MU Fiber Optic Attenuator

### Features

- Environmentally stable
- Easy installation
- Custom designed specifications
- Low return Loss
- Readily panel mountable
- Compact

### Applications

- Telecommunication
- Local area network
- CATV
- Fiber optic sensors
- Testing instruments
- Fiber to the home
- Multi-Channel subscriber loop
- Optical transmission system



## Specifications

ITEM		Wideband Fixed Plug in Type Attenuator (Doping Type)	
Mode Type		Single Mode	
Operation Wavelength, nm		1310nm or 1550nm	
Bandwidth, nm		±40	
Attenuation Accuracy (typical, including connector)	ITEM	H grade	A grade
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	6~10dB	±2.0	±2.5
	11~15dB	±2.5	±3.0
	16~20dB	±3.0	±3.5
Back Reflection, dB	PC	≤ -40	
	APC	≤ -60	
Operation Temperature, °C		-40°C ~ 75°C	
Storage temperature, °C		-50°C ~ 85°C	

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