

# Optical Attenuator

## *FOR FTTx, FTTh, FTTc*

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FC/UPC: Fiber connector /Ultra polished Physical Contact

SC/UPC: Subscription channel connector / Ultra polished/ Physical Contact.

LC/UPC: Lucent connector /Ultra polished Physical Contact.

FC/APC: Fiber connector /Ultra polished Physical Contact

SC/APC: Subscription channel connector / Ultra polished/ Physical Contact.

LC/APC: Lucent connector /Ultra polished Physical Contact.

## Optical Attenuator

This specification includes the generic attenuator specifications for single-mode optical fiber. For Metro LAN, passive optical network (PON) such as FTTx including Fiber To The Home (FTTH), Fiber To the Curb (FTTC), etc. built in the exchange, access node, building or equivalents, the attenuator shall be used.

### Features

1. Reduce the amplitude of light signal without harming the wave itself.
2. Generate all connector types
3. Excellent operation
4. Max. input power: 250mw
5. Plug key width: 2.1 mm
6. Adapter key width: 2.2mm

### Application

7. CATV Network
8. Connecting optical communication equipment
9. Telecom Network
10. ODF Transmission System
11. High speed, high capacity SDH Optical Fiber Transmission



FC

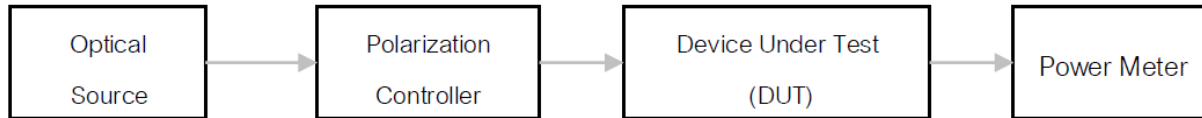


SC



LC

Polarization Dependent Loss,  $PDL \leq 0.5$  dB by using a fiber coupled polarization controller (PC) as shown in Figure 1 as per the GR-910 CORE.



Ratings	Operating Temperature Range	-40°C to +75°C	Storage Temperature Range	25°C to +°CSM
	Max. input power	250mW	Fiber type	SM

Item	Test Method	Specification
Return Loss	Measure at a point in the respective wavelength range of $1310 \pm 10$ nm and $1550 \pm 10$ (DSF)	$\geq 50$ dB
Insertion Loss		$\leq 0.2$ dB
Attenuation FC, SC		Body Nickel Plated
Attenuation LC		Body PBT Material with flame retardant UL94 V0
Ferrule gauge holding force	Zirconia gauge of $2.499 \pm 0.0005$ mm diameter	2.0N to 3.9N
Durability (cycle, mating/un-mating)	500 times	
Vibration	Frequency: 10 to 55Hz, single amplitude of 0.75mm. acceleration off $98.1$ m/s <sup>2</sup> , 3hrs in each of the 3 axis.	Meets attenuation/return loss requirements. No visible dislocation of the clamp or the cable.
Shock	Acceleration of $981$ m/s <sup>2</sup> , 6ms duration, sine half-wave, waveform, 3 cycles in each of the 3 axis.	
Composite Temperature Humidity Cyclic Test	Temperature: -10°C to 65°C, Humidity: 90% to 96% Timing: 240 hours (10 cycles)	
Dry Heat	500 hours at 85°C	
Cold	500 hours at -40°C	
Salt Mist		No significant corrosion

Attenuation Value	Attenuation Tolerance (AT)	Return Loss	Ref.
1dB	±0.75dB	≥50dB	AT: IEC61300-3-5 RT: IEC61300-3-6 Method 1
2dB	±0.75dB	≥50dB	AT: IEC61300-3-5 RT: IEC61300-3-6 Method 1
3dB	±0.75dB	≥50dB	AT: IEC61300-3-5 RT: IEC61300-3-6 Method 1
4dB	±0.75dB	≥50dB	AT: IEC61300-3-5 RT: IEC61300-3-6 Method 1
5dB	±0.75dB	≥50dB	AT: IEC61300-3-5 RT: IEC61300-3-6 Method 1
10dB	±1.50dB	≥50dB	AT: IEC61300-3-5 RT: IEC61300-3-6 Method 1
15dB	±2.25dB	≥50dB	AT: IEC61300-3-5 RT: IEC61300-3-6 Method 1
20dB	±3.00dB	≥50dB	AT: IEC61300-3-5 RT: IEC61300-3-6 Method 1

Test Item	Conditions	Requirements	Ref.
Appearance	Examine the product with the naked view	No deformation, crack, scratch, flaw, stain, looseness, and blur.	
Endurance	Mating and re-mating 500 times	Return Loss ≥50dB Change in Attenuation ≤ 0.5 dB for 1, 2, 3, 4, 5 dB Attenuator ≤ 1.0 dB for 10 dB Attenuator ≤ 1.5 dB for 15 dB Attenuator ≤ 2.0 dB for 20 dB Attenuator	Endurance: IEC 61200-2-2 RL: IEC 61300-3-6 Method 1 Change in attenuation: IEC 61300-3-3

<p>Strength of coupling mechanism</p>	<p>Force: 40 N Rate: 0-full load in 15 sec Point of application: 300 mm Duration: 1 minute</p>	<p>Return loss (RL) <math>\geq</math> 50 dB Change in Attenuation <math>\leq</math> 0.5 dB for 1, 2, 3, 4, 5 dB Attenuator <math>\leq</math> 1.0 dB for 10 dB Attenuator <math>\leq</math> 1.5 dB for 15 dB Attenuator <math>\leq</math> 2.0 dB for 20 dB Attenuator</p>	<p>Strength of coupling mechanism: IEC 61300-2-6 RL: IEC 61300-3-6 Method 1 Change in attenuation: IEC 61300-3-3</p>
<p>Vibration</p>	<p>Sweep range: 10-500 Hz at 1 octave/minute Crossover frequency: 41 Hz - below 41 Hz Amplitude 0.75 mm - above 41 Hz: 50 m/s<sup>2</sup> (~5g) Axes: 3 mutual perpendicular Duration: 10 cycles/axis</p>	<p>Return loss (RL) <math>\geq</math> 50 dB Change in Attenuation <math>\leq</math> 0.5 dB for 1, 2, 3, 4, 5 dB Attenuator <math>\leq</math> 1.0 dB for 10 dB Attenuator <math>\leq</math> 1.5 dB for 15 dB Attenuator <math>\leq</math> 2.0 dB for 20 dB Attenuator</p>	<p>Vibration: IEC 61300-2-1 RL: IEC 61300-3-6 Method 1 Change in attenuation: IEC 61300-3-3</p>
<p>Temperature cycling with condensation (Z/AD)</p>	<p>Precondition: 24 hrs. at 55° C and max 20% RH Cycle A: Lowest temperature: (+25±2) °C Highest temperature: (+65±2) °C Relative humidity: (93±3) % RH Duration time: 24 hrs. Cycle B: Lowest temperature: (+10±2) °C Highest temperature: (+65±2) °C Relative humidity: (93±3) % RH Duration time: 24 hrs. Total cycles: 10 cycles, alternating cycle B and A</p>	<p>Return loss (RL) <math>\geq</math> 50 dB Change in Attenuation <math>\leq</math> 0.5 dB for 1, 2, 3, 4, 5 dB Attenuator <math>\leq</math> 1.0 dB for 10 dB Attenuator <math>\leq</math> 1.5 dB for 15 dB Attenuator <math>\leq</math> 2.0 dB for 20 dB Attenuator</p>	<p>Temperature cycling with condensation (Z/AD): IEC 61300-2-1 RL: IEC 61300-3-6  Method 1 Change in Attenuation : IEC 61300-3-3</p>

