

Paraguay Displacement-Type Optical Attenuator



Overview

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Key Takeaways

A displacement-type optical attenuator reduces optical signal power by laterally displacing the fiber or optical path, typically as a fixed attenuator with high return loss. Working Principle

The Paraguay displacement-type optical attenuator operates by laterally displacing the optical fiber or light path to achieve a predetermined signal loss. This method controls the amount of light transmitted through the fiber by adjusting the alignment between the fiber ends or the optical path, creating a controlled gap or offset that reduces optical power without significantly affecting the signal waveform or beam profile. Unlike variable optical attenuators, this type is usually fixed, meaning the attenuation value is preset and cannot be adjusted after manufacturing.

Construction and Materials

These attenuators often use metal absorption films or reflective coatings applied directly to the fiber end face or a glass substrate. Common materials include aluminum (Al), titanium (Ti), chromium (Cr), or tungsten (W), sometimes protected with a thin layer of SiO₂ or MgF₂ to enhance durability. The device is typically welded or bonded, ensuring mechanical stability and high return loss, often exceeding 60 dB.

Applications

Displacement-type optical attenuators are widely used in fiber optic communications, laser systems, and optical testing setups. They are particularly useful for:

- Preventing receiver overload by reducing optical power before it reaches sensitive detectors.
- Simulating network conditions for stress testing and evaluating system performance.
- Integrating into fiber patch panels or inline connections where a fixed attenuation is required .

Key Characteristics

- Fixed attenuation: Predetermined loss, often specified in decibels (e.g., 5, 10, 15 dB).
- High return loss: Minimizes back reflections, typically >60 dB.
- Connector compatibility: Can be designed for FC, SC, or LC fiber connectors.
- Durability: Welded or bonded construction ensures long-term stability.
- Compact design: Suitable for inline or adapter-mounted configurations.

Summary

The Paraguay displacement-type optical attenuator is a reliable, fixed optical device that uses lateral displacement to reduce signal power. Its high return loss, robust construction, and precise attenuation make it ideal for fiber optic networks and laser applications where consistent signal control is critical .

Article Content

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Optical attenuator

An optical attenuator, or fiber optic attenuator, is a device used to reduce the power level of an optical signal, either in free space or

Attenuators

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Optical Attenuators: N7765C | Keysight

The N7765C high dynamic range optical attenuator is particularly suitable for optical amplifier test where wavelength flatness is key,

The Ultimate Guide to Fibre Optic Attenuators

What Are Fibre Optic Attenuators? Fibre optic attenuators, also called optical attenuators, are passive devices used to reduce the

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Fiber Attenuators

PM Version Available; 630 to 1550 nm; Fiber Type SM, MM, PM (PANDA); Connector Type FC/UPC, FC/APC, other; Attenuation 0.6

Optical Attenuators | Keysight

An optical attenuator is a device used to reduce the power of an optical signal in a controlled, repeatable way. In test setups, it's

AC Photonics Inc

Optical attenuators reduce the intensity of transmitted light uniformly across the spectrum. Applications include preventing too much

The Ultimate Guide to Fiber Optic Attenuators

Fiber optic attenuators play a crucial role in managing and controlling the power levels of optical signals in fiber optic

23 Optical Attenuator Manufacturers in 2026

23 Optical Attenuator Manufacturers in 2026 This section provides an overview for optical attenuators as well as their applications

Optical Attenuators

Optical attenuators are usually of two types: fixed attenuation or adjustable attenuation. Fixed attenuation value optical attenuator

Fiber Optic Attenuator

The attenuator is implanted into the flange to fix the light attenuation. The flange-type adjustable optical attenuator uses the principle

Optical Attenuators – Buyer's Guide & Suppliers

This buyer's guide for optical attenuators provides technical background, comparison of major types, selection criteria, and an

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Ranking of Displacement-Type Optical Attenuators

This white paper will shed light on the types, working principles, and applications of fibre optic attenuators, which will help you gain a

Optical Attenuators | Keysight

Select the optical attenuator you need to simulate real-world optical link conditions, calibrate power levels, or automate signal

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

