What are the characteristics of the new type of optical splitter



Overview

Optical Splitters: Split Ratios, Splitting Architectures & PON Network. This guide focuses on two critical aspects of optical splitters that define FTTH.

Key Takeaways

A new type of optical splitter functions as a passive device that divides or combines optical signals, enabling efficient distribution of light in fiber-optic networks without requiring power.

Core Function

The primary function of an optical splitter is to divide a single input optical signal into multiple output signals or, conversely, to combine multiple inputs into one output. This allows a single fiber in a network to serve multiple users or devices, which is essential in Passive Optical Networks (PON) and Fiber-to-the-Home (FTTH) deployments, reducing the need for separate fibers for each subscriber.

Working Principle

The new optical splitters operate passively, relying on the physics of light rather than electricity. Light traveling through a fiber can partially escape the core into the cladding. By bringing fibers close together or using integrated waveguide technology, the light is redistributed among multiple output fibers.

This process is characterized by: Split Ratio: Determines how the input power is divided among outputs (e.g., 1x4, 1x16, 1x32). Insertion Loss: The natural reduction in signal power due to splitting. Higher split ratios increase insertion loss.

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Uniformity: Ensures consistent output power across all ports.

Types and Advantages

Modern optical splitters include: Planar Lightwave Circuit (PLC) Splitters: Use integrated waveguides on a quartz substrate, offering low loss, wide wavelength range, and uniform light distribution. Ideal for large-scale networks with many outputs. Fused Biconic Tapered (FBT) Splitters: Created by fusing and tapering fibers together, suitable for smaller networks with fewer outputs.

Advantages of the new splitters include compact size, high reliability, bidirectional functionality, and the ability to operate in remote or hard-to-access locations without power.

Applications

These splitters are widely used in: FTTH and FTTX networks to connect multiple homes or offices to a single fiber. Optical network monitoring and distributed sensing systems. Telecommunication and data centers where efficient signal distribution is critical.

In summary, the new type of optical splitter enhances network efficiency by passively managing light signals, supporting multiple outputs, and maintaining signal quality across modern fiber-optic infrastructures.

Article Content

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Optical splitters are fundamental components in passive optical networks (PONs), enabling a single optical input to be distributed to multiple output ports with minimal signal loss.

Fiber-optic splitter

It is an optical fiber tandem device with many input and output terminals, especially applicable to a passive optical network (EPON, GPON, BPON, FTTX, FTTH etc.) to connect the main distribution

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Optical Splitters Demystified: The Silent Heroes Powering Your FTTH ...

explains how optical splitters enable FTTH, their types (FBT vs. PLC), key ratios, and how they integrate with LINK-PP optical modules for a seamless network.

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