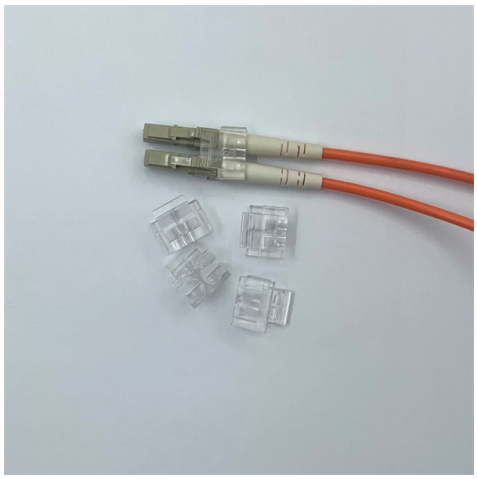
What are the standards for optical splitters



Overview

11. What Standards Apply to Fiber Optic Splitters?

These standards define optical performance, environmental reliability, and testing procedures. An In-Dept.

Key Takeaways

Optical splitters in PON networks are governed by ITU-T standards like G.984, with performance metrics including split ratios, insertion loss, return loss, and uniformity to ensure reliable signal distribution.Overview of Optical Splitters

Optical splitters are passive fiber-optic devices that divide a single optical signal into multiple outputs or combine multiple signals into one. They are essential in Passive Optical Networks (PONs), enabling a single Optical Line Terminal (OLT) to serve multiple Optical Network Terminals (ONTs) without requiring active electronics, reducing operational costs and complexity .

Split Ratios and Architectures

Splitters are characterized by split ratios, commonly powers of 2 (1x2, 1x4, 1x8, 1x16, 1x32, 1x64), though odd ratios like 1x3 or 1x5 are also used . The splitting architecture can be:

• Centralized splitting: Splitters are located at a central office or cabinet, allowing flexible customer-to-splitter assignments via jumpers .

• Distributed splitting: Splitters are deployed in the field (closures or pedestals), with fixed assignments that cannot be changed by jumper reconfiguration .

Types of Optical Splitters

• FBT (Fused Biconical Taper) Splitters: Cost-effective, suitable for small splits (1:2, 1:4), but less uniform for large splits .

• PLC (Planar Lightwave Circuit) Splitters: Provide highly uniform signal distribution, ideal for large splits (1:32, 1:64), and are insensitive to wavelength variations . PLC splitters are based on integrated waveguide technology on a quartz substrate, ensuring consistent performance across multiple channels .

Performance Metrics

Standards for optical splitters define key performance parameters:

• Insertion Loss (IL): Optical power lost when a signal passes through the splitter. Lower IL is better, as it allows higher optical power to reach end users .

• Return Loss (RL): Fraction of optical power reflected back to the source. Higher RL is preferred to protect OLT/ONT lasers and maintain signal stability .

• Uniformity: Variation in output power among splitter ports. High uniformity ensures consistent signal quality for all users .

• Polarization-Dependent Loss (PDL): Variation in loss due to polarization; lower PDL is desirable for stable performance .

Relevant Standards

• ITU-T G.984: Defines GPON specifications, including splitter performance, insertion loss limits, and deployment guidelines .

• Other PON standards: BPON, EPON, 10G EPON, and 10G GPON also employ optical splitters with similar performance requirements .

Summary

Optical splitters are standardized to ensure efficient, reliable, and scalable PON deployment. Key considerations include split ratio selection, centralized vs distributed architecture, splitter type (FBT or PLC), and performance metrics like IL, RL, and uniformity. Compliance with ITU-T standards such as G.984 ensures interoperability and consistent service quality across FTTH networks .

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These standards define optical performance, environmental reliability, and testing procedures.

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Fiber-optic splitter

Balanced (2xN) splitters consists of 2 input fibers and N output fibers which divide the power of the optical signal proportionally. They

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The GR-1209 standard details comprehensive optical performance criteria for a passive optical splitter. There are six main

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PASSIVE OPTICAL SPLITTER

A Passive Optical Network (PON) is a fiber optic technology utilizing point-to-multipoint topology and optical splitters to deliver data

CORNING OPTICAL COMMUNICATIONS GENERIC

[II.] Optical Performance Criteria Fiber optic splitter modules and the term "splitter" hereafter refer to and include a housing to protect

Optical Splitters are used in PON (Passive Optical Network

PON consists of an optical line terminal (OLT) at the service provider''s central office and optical network units (ONUs) near or at the

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The working principle of fiber splitters is relatively simple, and the signal distribution is achieved through the principle

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