

## Article Overview

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:

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

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

- o 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 .
- o 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 .
- o Uniformity: Variation in output power among splitter ports. High uniformity ensures consistent signal

quality for all users .

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

## Relevant Standards

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

Fiber optic splitters enable a signal on an optical fiber to be distributed among two or more fibers. Since splitters contain no

1.1 A range of application This specification applies to the optical splitter for FTTH communication network construction that meet the

Check the tariff classification for Optical Splitters. New regulation A new regulation was published on 23 July 2024

Optical splitters, including FBT (Fused Biconical Taper) couplers and PLC (Planar Lightwave Circuit) splitters, are

CommScope offers a portfolio of bare and connectorized splitters/couplers in a wide range of styles and

The FBA Technology Committee subgroup discussed the concept of centralized and distributed splitting in depth, and we were

As the most core passive optical device in the construction of fiber to the home (FTTH), optical splitters are used to

This tariff notice implements EU Regulation 2024/1998 (effective 12 August 2024) establishing the correct Combined Nomenclature

Fiber-optic splitter A fiber-optic splitter, also known as a beam splitter, is based on a quartz substrate of an integrated waveguide

In your letter dated April 27,2005 you requested a tariff classification ruling. The multimode fiber optic couplers/splitters

This difference occurs because fiber optic splitters have a certain bandwidth, meaning the splitting ratio remains

Optical components that create two beams by splitting incident light are beamsplitters. Read more about the different types of

Master optical splitter selection for FTTH & GPON networks. Compare PLC vs FBT, analyze insertion loss charts, and

Choosing the right optical splitter can be confusing with so many options available. This guide will simplify the process

Optical splitters are the silent workhorses of GPON networks. They enable mass FTTH deployment, reduce

There are laws, regulations, and standards that require engineering controls and risk communication to aid in the

Web: <https://bssoda.pl>

