

Article Overview

A single-chip optical splitter (PLC splitter) passively divides one input optical signal into multiple outputs, allowing you to connect multiple end devices without additional fibers.

Understanding the Single-Chip (PLC) Splitter

A Planar Lightwave Circuit (PLC) splitter is a passive optical device that splits a single input signal into multiple outputs using etched waveguides on a silica chip. It requires no power, is highly reliable, and provides uniform signal distribution across all output ports. Common split ratios include 1x4, 1x8, 1x16, 1x32, or higher, depending on the number of users or devices you need to serve. PLC splitters are widely used in FTTH and PON networks to distribute signals from an Optical Line Terminal (OLT) to multiple Optical Network Terminals (ONTs) at user locations.

Steps to Use a Single-Chip Optical Splitter

o Select the Appropriate Splitter

- o Determine the number of outputs required and choose a splitter with the matching split ratio (e.g., 1x8 for eight users).
- o Choose the connector type compatible with your network equipment, such as SC/APC, LC/UPC, or FC.

o Prepare the Fiber Connections

- o Ensure all fibers are clean and free of dust or debris.
- o Use proper fiber optic tools to strip, cleave, and polish fibers if connecting bare fibers.

o Connect the Input Fiber

- o Connect the upstream fiber from the OLT or central node to the input port of the splitter.
- o Ensure a secure connection to minimize insertion loss.

o Connect the Output Fibers

- o Connect each output port to the downstream devices (ONTs or other network nodes).
- o Label each output for easy identification and maintenance.

o Install the Splitter

- o Place the splitter in a distribution box, patch panel, or outdoor enclosure.
- o Ensure it is protected from moisture, dust, and physical stress. Many PLC splitters come in IP65-rated ABS or LGX boxes for outdoor use.

o Test the Network

- o Use an optical power meter or OTDR to verify signal strength and uniformity across all outputs.

How to use a single-chip optical splitter

- o Check for excessive insertion loss or uneven distribution, which may indicate a connection issue.

Deployment Considerations

- o Centralized vs. Cascaded Splitting: Centralized splitting places the splitter near the OLT, while cascaded splitting uses multiple splitters in series to reach more users .
- o Signal Loss: Each split reduces signal power; higher split ratios require careful planning to maintain adequate signal levels.
- o Bidirectional Use: PLC splitters can handle signals in both directions, supporting upstream and downstream communication in PON systems . By following these steps, a single-chip optical splitter can efficiently distribute optical signals to multiple endpoints, reducing fiber infrastructure costs while maintaining reliable network performance.

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Fiber optic splitters use either single-mode or multimode fibers, depending on the

What's an optical splitter? How does the fiber optic splitter work? How many fiber splitter types? How to choose the

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What is a Fiber Optic Splitter? Fiber optic splitter is a passive optical device used to distribute optical signals, which

An optical splitter is a device that is used to split a single optical signal into multiple signals. These devices are

An optical splitter is a device that divides light transmission in a network into multiple output ends. It plays a crucial

Optical splitter is an integrated waveguide optical power distribution device that serves to split optical signals. It is

This post provides a introduction to how does a fiber optic splitter work, and optical fiber splitter application in FTTH.

A coupler can be used as a splitter to couple out some portion of the light circulating in the resonator of fiber laser, for example.

How to use a single-chip optical splitter

Fiber Broadband Association Technology Committee February 2025 The choice of splitter architecture for a passive optical network

In optical communication networks, optical splitters play a crucial role in efficiently dividing and distributing signals. Proper placement

This guide focuses on two critical aspects of optical splitters that define FTTH performance: split ratios (how signals

But what exactly is it, and how does it ensure your internet, TV, and phone services run smoothly? This guide will

Fiber-optic splitters are required for fiber-optic interferometers, as used e.g. for optical coherence tomography. Splitters with many

By allowing a single PON Interface to be shared by multiple subscribers, optical splitters have played an essential role in passive

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