Which wavelength does a passive optical network use

Article Overview

Passive optical networks use specific wavelength pairs for upstream and downstream traffic, typically ranging from 1260 nm to 1600 nm depending on the PON standard.

Standard Wavelength Allocations

PONs use wavelength-division multiplexing (WDM) to allow bidirectional communication over a single fiber. Each PON standard has defined wavelength ranges for upstream (US) and downstream (DS) traffic:

• GPON: Downstream 1480–1500 nm, Upstream 1290–1330 nm, with 1550 nm reserved for optional RF video overlay services .
• EPON: Downstream 1480–1500 nm, Upstream 1290–1330 nm, similar to GPON .
• XGS-PON: Downstream 1575–1580 nm, Upstream 1260–1280 nm, with 1550 nm reserved for optional services .
• TWDM-PON: Downstream 1596–1602 nm, Upstream 1524–1544 nm, supporting multiple wavelength channels for higher capacity .
• 25G/50G PON: Upstream 1260–1310 nm, Downstream 1340–1360 nm (25G) and 1340–1344 nm (50G) depending on the specific channel .

How Wavelengths Enable PON Functionality

• Downstream traffic (from OLT to ONT/ONU) uses a higher wavelength, while upstream traffic (from ONT/ONU to OLT) uses a lower wavelength. This separation p...

Article Content

Nov 10, 2025

The FOA Reference For Fiber Optics

By utilizing different wavelengths, it is possible to have these newer, faster networks sharing the same passive optical network as the

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Passive Optical Networks: An Understanding

Introduction to Passive Optical Networks (PON) Passive Optical Networks (PON) represent a cornerstone in modern

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Passive Optical Networks: An Understanding

PONs primarily use two types of Wavelength Division Multiplexing (WDM): Coarse Wavelength Division Multiplexing

Feb 28, 2026

Recommendation ITU-T

This document outlines recommendations for wavelength allocation in gigabit-capable passive optical networks (G-PONs) to enable

May 14, 2026

What Is Passive Optical Networking (PON)?

XGS-PON: 1577-nanometer (nm) wavelength for downstream traffic and 1270-nm wavelength for upstream traffic. The 1550-nm

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Consolidated_Version_Passive Optical Networks

After three decades of dynamic research, Passive Optical Network (PON) has been considered as the most promising broadband

Nov 01, 2025

(PDF) Passive Optical Networks: Introduction

The paper provides an overview of Passive Optical Networks (PONs), which have emerged as a vital solution due to the increased

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Gigabit Passive Optical Networks (GPON) | Electronics Tutorial

Wavelength Allocation Scheme GPON uses wavelength-division multiplexing (WDM) with standardized wavelength bands: 1490 nm

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AON (Ethernet) vs. PON (Passive) Networks:Which is Better?

Compare AON (Active Ethernet) vs. PON (Passive Optical Networks) to discover which delivers better performance, scalability, and

Jun 15, 2026

Introduction to Passive Optical Network

Introduction to Passive Optical Network A passive optical network (PON) or Gigabit Passive Optical Network (GPON) is a point-to

Aug 16, 2025

Passive Optical Network Architecture

PON architecture, or Passive Optical Network architecture, is defined as a passive optical network deployed in a point-to-multipoint

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What is Passive Optical Network (PON) and GPON？How does It Work?

Passive Optical Network (PON) technology delivers high-speed, reliable, and cost-effective broadband access. Among

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Passive optical network

A passive optical network (PON) is a fiber-optic telecommunications network that uses only unpowered

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What is a Passive Optical Network (PON)? | Glossary

What is a passive optical network (PON)? A passive optical network (PON) uses fiber-optic

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The Definitive Guide to Passive Optical Network (PON): Architecture ...

Researchers at institutions like Nokia Bell Labs also found a way to transmit multiple colors, or wavelengths, of light

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Active vs Passive Optical Networks – AON and PON Explained

There are two basic paths to deploy high-speed FTTH networks: active optical network (AON) and passive optical

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Introduction to Passive Optical Network

One of the main characteristics of PON is the use of passive optical splitters in the fiber distribution network, enabling a single

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Passive Optical Network Guide

The data stream is separated by the passive optical network operations according to the laser wavelength (color). The

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Passive Optical Access Networks: State of the Art and Future ...

In the very last years, optical access networks are growing very rapidly, from both the network operators and the

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Passive Optical Networks

Passive optical networks (PONs) are a fiber-optic access technology that can be used for residential and business access, and also

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Gigabit Passive Optical Networks (GPON) | Electronics Tutorial

Downstream transmission: Broadcasts data at 1490 nm wavelength to all Optical Network Units (ONUs). Upstream reception:

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Passive optical network (PON) supported networking

Passive optical network (PON) research and technology have matured in recent years and firmly established PONs as

Mar 16, 2026

Passive Optical Network Tutorial

One wavelength is for downstream data transmission while another carries upstream data. These dedicated

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An introduction to Passive Optical Network (PON) technologies

Each flavor of PON uses a different wavelength pair (one in upstream, one in downstream) to transmit data. The wavelengths are

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An introduction to Passive Optical Network (PON) technologies

In a PON access network there are two end-points with active (powered) electronic transmission equipment, connected by passive

Nov 19, 2025

Passive Optical Networks: Cabling Considerations and

Networking gear such as that used for GPONs deploys long wavelengths (1490 nm, 1557

Apr 08, 2026

Passive Optical LAN: A Beginner''s Guide

Passive Optical LAN Definition A passive optical LAN, called POL or POLAN, is short for Passive Optical Local Area

Dec 08, 2025

What is PON? Passive Optical Networks Explained

Summary: What is PON and why should you care? A passive optical network (PON) is a shared, fiber optic access

Contact Us

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