

# Optical Module Model Parameter Comparison Table



## Overview

Explore the ultimate guide to optical modules. Learn types, functions, performance metrics & how to choose the right module for your fiber network.

## Key Takeaways



Optical modules can be compared across form factor, connector type, data rate, wavelength, transmitter/receiver characteristics, power budget, and monitoring capabilities. Key Parameters Comparison

| Parameter                      | Description                                          | Typical Values / Notes                                                                                                                     |
|--------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Form Factor                    | Physical size and shape of the module                | SFP, SFP+, SFP28, QSFP+, QSFP28, OSFP; determines switch/port compatibility                                                                |
| Connector Type                 | Interface to fiber cable                             | LC Duplex, SC Duplex, MPO/MTP; must match patch cables                                                                                     |
| Transmission Rate              | Maximum supported data rate                          | 1G, 10G, 25G, 40G, 100G, 400G; PON modules: 1.25G (EPON/GPON), 10G (10GEPON/XG-PON)                                                        |
| Wavelength                     | Light color used                                     | 850nm, 1310nm, 1550nm; affects fiber type (multimode/singlemode) and distance                                                              |
| Transmitter Type               | Laser technology                                     | VCSEL (multimode), DFB/EML (singlemode); affects cost, power, and distance                                                                 |
| Receiver Type                  | Photodetector technology                             | PIN photodiode, APD; impacts sensitivity                                                                                                   |
| Transmitter Power (Tx)         | Output optical power                                 | Measured in dBm; must be within receiver input range                                                                                       |
| Receiver Sensitivity           | Minimum detectable optical power                     | Measured in dBm; lower (more negative) indicates better sensitivity                                                                        |
| Power Budget                   | Difference between Tx power and receiver sensitivity | Must exceed total link loss (cable + connectors)                                                                                           |
| Receiver Saturation / Overload | Maximum optical power receiver can handle            | Avoids signal distortion                                                                                                                   |
| Extinction Ratio (ER)          | Ratio of '1' bit power to '0' bit power              | Higher ratio improves signal quality                                                                                                       |
| Modulation Format              | Data encoding method                                 | NRZ, PAM4; affects bandwidth efficiency                                                                                                    |
| Monitoring / Diagnostics       | Real-time monitoring of module parameters            | DDM/DOM: Tx/Rx power, temperature, supply voltage; essential for proactive maintenance                                                     |
| PON-Specific Parameters        | For GPON/EPON/XG-PON modules                         | Transmission power, reception power, reception sensitivity, overload optical power; standards: IEEE 802.3ah, 802.3av, ITU-T G. 984, G. 987 |

3ah, 802.3av, ITU-T G. 984, G. 987

**Environmental & Reliability** Operating conditions Temperature range, humidity, mechanical durability; affects lifespan  
**Notes on Module Selection** Compatibility: Ensure form factor and connector type match your network equipment. Performance: Choose modules with appropriate transmission rate, wavelength, and power budget for your link distance. Reliability: Consider environmental tolerance and receiver sensitivity to maintain stable operation.

### Cost-

**Effectiveness:** Balance features with budget; multimode VCSEL modules are generally lower cost than singlemode DFB/EML modules. **Monitoring:** DDM/DOM support is recommended for proactive network management.

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**N Modules:** Select based on upstream/downstream rates and standard compliance (EPON, GPON, XG-PON) for optical access networks. This table provides a structured overview to compare optical modules across multiple specifications, helping network engineers and planners make informed decisions for deployment.

## Article Content

### The Most Comprehensive Guide Of Optical Modules

Explore the ultimate guide to optical modules. Learn types, functions, performance metrics & how to choose the right module for your fiber network.

### SFP Optical Module Specifications: Standards & Performance

From electrical and optical parameters to environmental limits and diagnostic capabilities, we explain what each specification means in practice, how it affects real-world performance, and the

### Cisco Compatible Optical Modules Catalog

TECHNICAL SPECIFICATIONS ing table encapsulates the primary classifications an capabilities of the catalog. For detailed, model-specific parameters, please refer to the individual SKU datasheets.

### PON Module Parameters Guide: How to Choose the Best GPON

Discover key PON module parameters for selecting the best GPON and EPON modules. Understand their impact on network performance and make informed choices.

### 400G Optical Modules 2026 Guide: DR4 vs. FR4 vs. LR8 Lab

400G optical modules are high-speed transceivers using PAM4 modulation and multi-lane architectures to enable ultra-high bandwidth connectivity. They are essential for AI clusters,

### What Are the Key Parameters of Optical Modules

Understand the key parameters of optical modules, including transmission rate, distance, wavelength, and fiber compatibility, for better network performance.

### How to Understand the Performance Parameters of Optical Modules?

The optical module is a core component in optical fiber communication systems, and its performance parameters directly impact the transmission rate, stability, and reliability of the entire

### 100G Optical Module Mainstream Model Analysis-fiber -

Comparison chart of the technical parameters of four mainstream models of 100G QSFP28 dual-fiber optical modules : These four mainstream models of 100G QSFP28 dual-fiber

### Understanding Optical Modules: Working Principles, Structures, and ...

Explore the working principles, structures, and performance metrics of optical modules, essential components of optical fiber communication systems. Learn about key indicators such as

Cisco Transceiver Modules

Cisco Transceiver Modules - Learn product details such as features and benefits, as well as hardware and software specifications.

What Is an Optical Module and Its FAQs (V200)

What Is an Optical Module and Its FAQs (V200) Describes what an optical module is and FAQs, including the fundamentals, appearance and structure, key performance counters, common types,

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The Ultimate 10G Optical Module Guide: Compare LRM, SR, LR, ER,

In high-speed network construction, 10G optical modules are critical components for data centers, enterprise networks, and telecom infrastructures. However, with numerous models available—such

Optical Module Comparison: Understanding Performance Metrics and ...

In our blog titled "Optical Module Comparison: Understanding Performance Metrics and Applications," we take a closer look at what really matters when it comes to optical modules—like

240816 Fiberwdm

FIBERWDM, based on years of accumulation in the field of transmission, provides multi-specification optical module applications for data centers, enterprise networks, data communication

The Evolution of Optical Modules: Powering the Future

Enter optical modules, which leverage the power of light to transmit data efficiently over long distances, driving the next generation of technological

Microsoft PowerPoint

Metrology of Optical Systems Figures and Images for Instructors Module 1 Optical System Parameters and Performance Metrics Precision Optics Series 2018 University of Central Florida This text was

TI DLP® System Design: Optical Module Specifications

Developers can use Table 4-2 to accelerate communication with DLP Display projection optical module manufacturers. Optical module manufacturers list target and boundary specifications to effectively

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