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



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Optical modules can be compared across form factor, connector type, data rate, wavelength, transmitter/receiver characteristics, power budget, and monitoring capabilities. Key Parameters ComparisonParameterDescriptionTypical Values / NotesForm FactorPhysical size and shape of the moduleSFP, SFP+, SFP28, QSFP+, QSFP28, OSFP; determines switch/port compatibility Connector TypeInterface to fiber cableLC Duplex, SC Duplex, MPO/MTP; must match patch cables Transmission RateMaximum supported data rate1G, 10G, 25G, 40G, 100G, 400G; PON modules: 1. 25G (EPON/GPON), 10G (10GEPON/XG-PON) WavelengthLight color used850nm, 1310nm, 1550nm; affects fiber type (multimode/singlemode) and distance Transmitter TypeLaser technologyVCSEL (multimode), DFB/EML (singlemode); affects cost, power, and distance Receiver TypePhotodetector technologyPIN photodiode, APD; impacts sensitivity Transmitter Power (Tx)Output optical powerMeasured in dBm; must be within receiver input range Receiver SensitivityMinimum detectable optical powerMeasured in dBm; lower (more negative) indicates better sensitivity Power BudgetDifference between Tx power and receiver sensitivityMust exceed total link loss (cable + connectors) Receiver Saturation / OverloadMaximum optical power receiver can handleAvoids signal distortion Extinction Ratio (ER)Ratio of '1' bit power to '0' bit powerHigher ratio improves signal quality Modulation FormatData encoding methodNRZ, PAM4; affects bandwidth efficiency Monitoring / DiagnosticsReal-time monitoring of module parametersDDM/DOM: Tx/Rx power, temperature, supply voltage; essential for proactive maintenance PON-Specific ParametersFor GPON/EPON/XG-PON modulesTransmission power, reception power, reception sensitivity, overload optical power; standards: IEEE 802.

3ah, 802. 3av, ITU-T G. 984, G.

987 Environmental & ReliabilityOperating conditionsTemperature range, humidity, mechanical durability; affects lifespan Notes on Module SelectionCompatibility: 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.

PO

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.

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Optical Module Comparison: Understanding Performance Metrics and ...

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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

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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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