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What Is An Optical Module?

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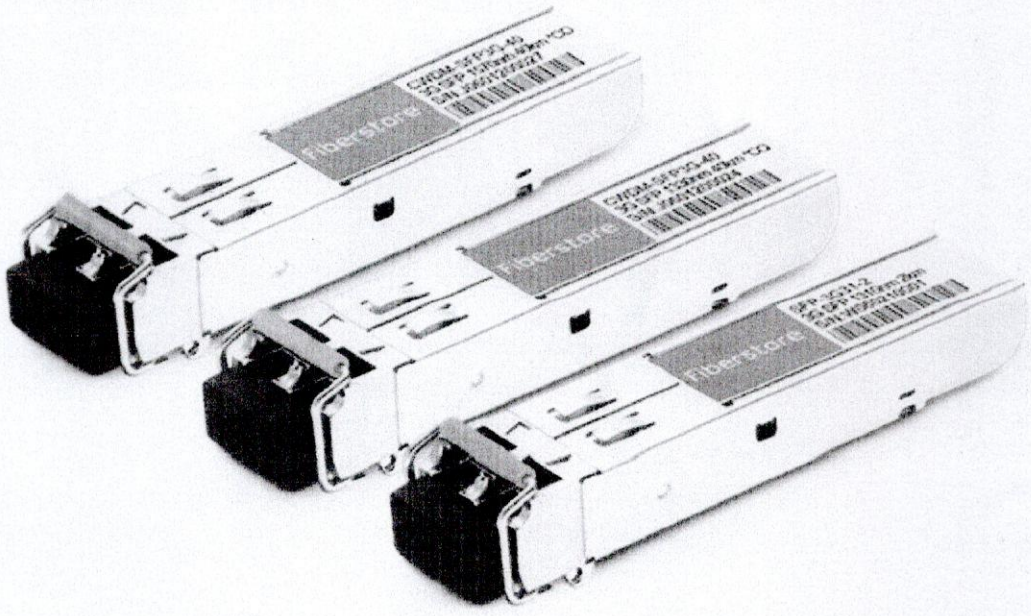
With the rapid development of Internet service and communication industry, optical communication is bound to become the most important strategic industry in 21th century. The elementary components of a basic optical communication consists of Ethernet switch, WDM passive device, optical module etc. Optical modules are the key building blocks for all network connectivity both inside and outside the data center. This article will focus on what optical module is and some related information about it.

What Is An Optical Module?

An optical module, also called fiber optic transceiver or optical transceiver, is a typically hot-pluggable device used in high-bandwidth data communications applications. Transceiver modules typically have an electrical interface on the side that connects to the inside of the system and an optical interface on the other side that connects to the various devices through a fiber optic cable. An optical module functions as a photoelectric converter which converts the electrical signal into light and vice versa. There are multiple transceiver module types available that can be used in telecommunications applications. The different specs and designs are widely used to meet the changing needs of designers.



How Many Types of Optical Modules?

of 10Gbit/s is designed in 2001. However, advances in technology led to more compact form factors for 10 Gigabit Ethernet applications. Soon after 2001, two related standards emerged: XPAK and X2. Later on, vendors generally changed to use XFP modules for longer distances, and SFP+ modules for high density. As escalating demand for higher speed and bandwidth, 25GbE optics like SFP28 Modules, 40GbE optics like QSFP/QSFP+ modules, and 100GbE optics like CFP transceiver and QSFP28 modules are being widely used. Know more specifications about these transceiver modules, you can read: Deep Analysis on Optical Transceiver Module.

Single Mode vs. Multimode Optical Modules: How Do You Choose?

Transceiver module usually come in either single mode or multimode modules. Chances are that you may make a choice between these two types transceiver module. But before that, there are a couple of factors you should consider. Single mode transceiver modules support longer reach data transmission and higher speed rates than multimode transceiver module. That's mainly because multimode modules have shorter wavelength(around 850nm) than single mode modules(around 1260nm-1650nm). But in datacom environments, both singlemode transceiver modules and multimode transceiver modules can accommodate speeds beyond 50G as of today. And due to the "fragility" of single mode fiber system, single mode modules usually cost more than multimode. But single mode fiber costs less than multimode fiber. With regard to how to save largest budget, read this article for cost comparison: Single-mode Cabling Cost vs. Multimode Cabling Cost. So if you are hovering over the two types, port speed, desired reach and interconnect topology and total cost should be considered as the main decision criteria.

Can Single Mode Optical Modules Connect to Multimode Optical Modules?

The short answer for this question is no. Single mode module is 1310nm laser-based, and multimode module is 850nm LED-based, therefore, single mode optical modules only work over single mode fiber and multimode optical modules only work over multimode fiber. Single mode module should be used with single mode module over single mode fibers, and multimode module should be used with multimode module over multimode fibers. We can't connect single mode module to multimode module. But for some optical modules that can work both over single mode and multimode fibers, such as 1310nm laser-based 1000BASE-LX/LH modules. If we want to use it over multimode fibers, we could use mode conditioning patch cable. Want to know more about mode conditioning patch cables, you can read this article Mode Conditioning Patch Cord Utilized in 1/10 Gigabit Ethernet Applications.