

OM5: Wide-Band Multimode Fiber (WBMMF) >

Continuously increasing demand for high data rates and bandwidth has led to the innovation of a new generation multi-mode fiber, OM5. The TIA-492-AAAE and IEC-60793-2-10 A1a.4b standard OM5 complements the short-wavelength division multiplexing (SWDM) technology by enabling transmission of at least 4 low-cost wavelengths for longer distances, reducing the fiber count for high-speed applications.

BUSINESS CHALLENGE

The increasing need for faster data speed in data centers requires more fibers in parallel but increasing fiber count is practical only up to a point - and after that it poses cable management and space challenges.

Currently, data centers are looking for high-density cabling networks for optimization and in a 40GBase-SR4 layout, fiber optic transmission uses MTP connectors and 4 fiber channels (a total of 8 fibers), which is not a preferred choice. Also, 1U rack mount enclosures can support only up to 24 MTP adapters, limiting channels per 1U to 24.

An increase in cable density necessitates bandwidth expansion, as OM3 and OM4 bandwidths are not enough for current and future data center requirements. Apart from space issues, a high fiber count also increases the costs. The limited transmission distance capabilities of the OM3 and OM4 and the fallible process of matching polarity between male and female end faces of the MTP are also challenges in data center optimization.



Increasing data speed in data centers poses cable management and space challenges

Today, across the world, around 90 million internet transactions are conducted per minute, and all of these are processed through a network of worldwide data centers. These data centers contain thousands of servers supported by a network of switches and routers, requiring high-speed data transmission. Currently, data speed of 100G is able to fulfill the demand but looking at the growth in networks, new standards are being developed for 400G and higher, and the data centers need to look for an upgrade option to meet future requirements.

SOLUTION

The OM5 fiber features an extended bandwidth range of 850 to 950nm that enables it to provide optimal support to SWDM applications by enhancing its capability to transmit at least 4 low-cost wavelengths for longer distance, reducing parallel fiber count by a factor of 4.

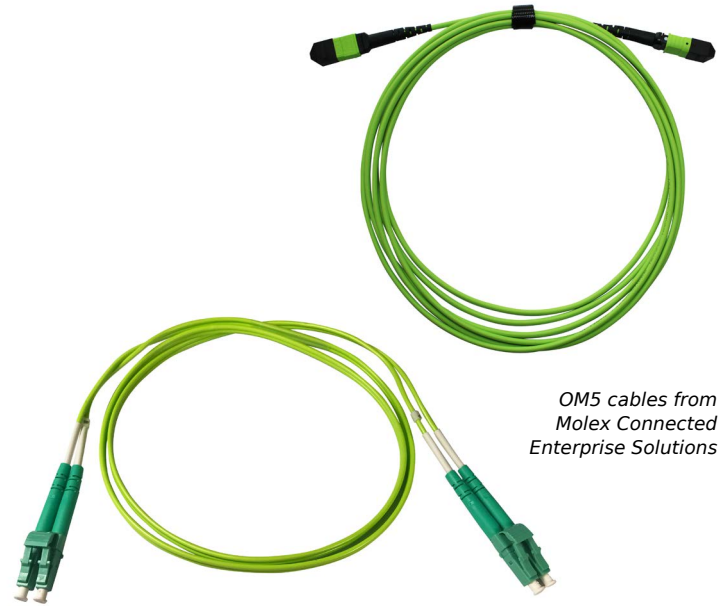
With OM5, 40G and 100G transmission can be carried out using only 2 fibers instead of 8, offering significant cost savings and up to 75% space savings. For example, using a Molex HD GII enclosure in a 1U space with

OM5, 192 fibers (i.e. 96 40G/100G fiber channels) can be supported (by using LC duplex connector) compared with 24 channels with OM4.

OM5 supports longer transmission distances. Using a SWDM transceiver, it can support 40G transmission up to 440m and 100G transmission up to 400m. It also provides a logical migration path to support 400G in the future while being compatible with OM3 and OM4 cabling, featuring the same structure (50/125 μ m) and supporting all legacy applications (at least of OM4).

KEY BENEFITS

- Extended bandwidth allows transmission of 40G and 100G over a single pair of fibers, reducing the fiber count for high speeds by 75%, offering significant space and cost savings.
- Supports at least 4 low-cost wavelengths in the 850 to 950nm range.
- Provides optimal support to SWDM applications, with a longer transmission distance and the ability to migrate up to 400Gbps.
- Backward compatibility with OM3 and OM4 makes it easy to upgrade data center network infrastructure for OM5



OM5 cables from Molex Connected Enterprise Solutions

Fiber Type	40G Transceivers				100G Transceivers				
	40GBASE-SR4	eSR4	BiDi	SWDM	100GBASE-SR4	eSR4	BiDi	SWDM	eSWDM
OM3	100m	300m	100m	240m	70m	200m	70m	75m	200m
OM4	150m	400m	150m	350m	100m	300m	100m	100m	300m
OM5	150m	400m	200m	440m	100m	150m	150m	150m	400m

OM5 can be a more user-friendly solution, with simplified cable installation, troubleshooting, cleaning and overall maintenance.

The duplex connector allows installers and engineers to adjust polarity in the field by themselves. Molex Connected Enterprise Solutions offers a complete OM5 solution, including the fiber cable, cable assembly, patch cord pigtail, adapter, splicing cassette and ModLink cassette.

More information:

OM5 molexc.com/solutions-overview/om5

Data Center Solutions: molexc.com/solutions-overview/data-center