WHAT IS OM5 FIBER AND WHAT ARE THE ADVANTAGES OVER OM3/OM4?

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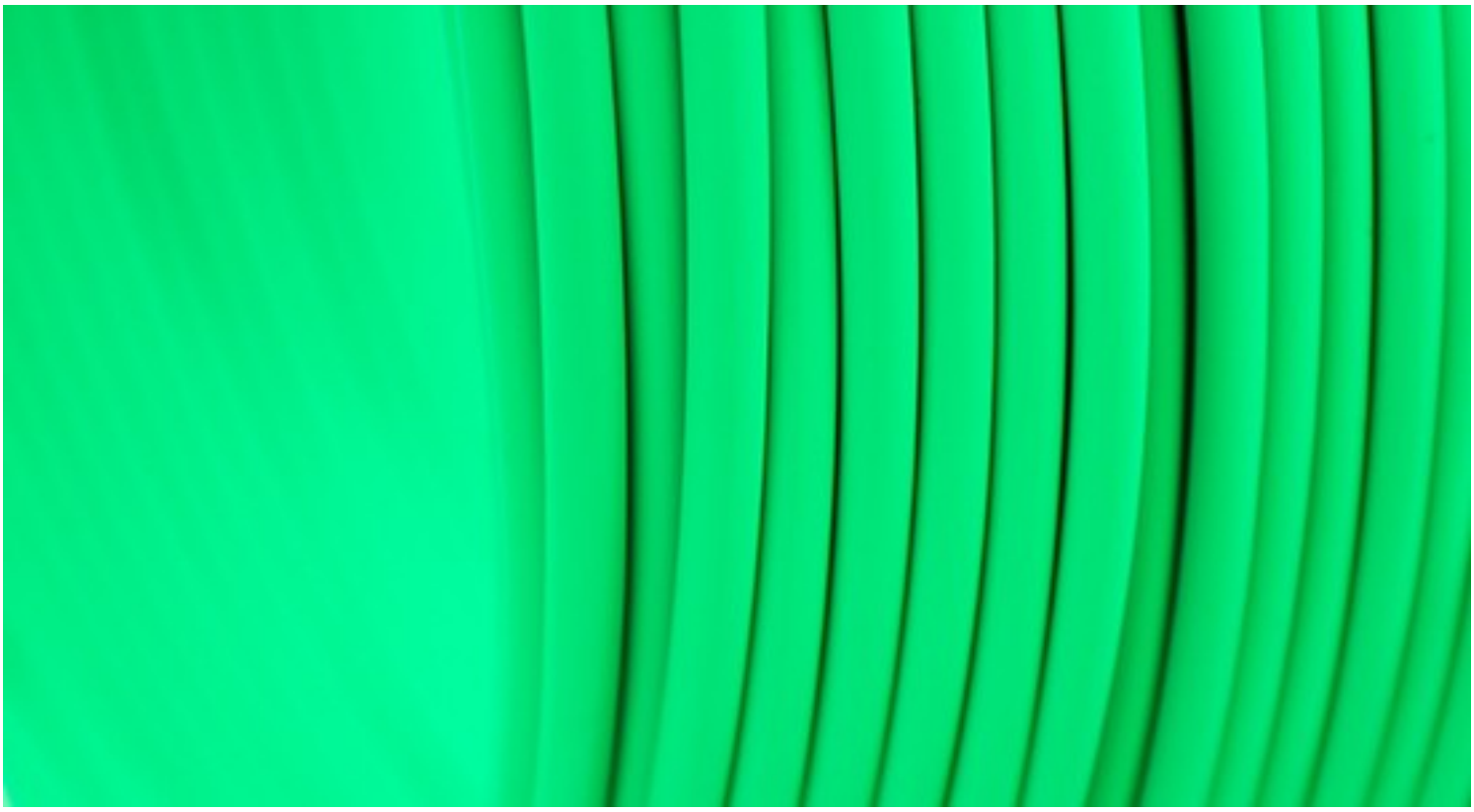

Categories: Data Center, Fiber Optic

OM5 is a multimode fiber cable designed for high bandwidth and short to medium range applications. Is the first approved as WBMMF (Wide Band Multimode Fiber) designed to specifically handle high-speed data center applications.

It was created to support shortwave wavelength division multiplexing (SWDM) applications that reduce parallel fiber count by transmitting multiple VCSEL wavelenghts in the 850-950nm range.

Comparison OM5 fiber with others optical fiber

OM5 fiber is backward compatible with OM3 and OM4 fiber cabling. The attenuation has been reduced and the bandwidth requirement of 953nm wavelenght has been increased.

The limits to be met for cabled optical fiber transmission performance are specified in the following table:

OPTICAL FIBER MAXIMUM ATTENUATION (dB/km)

	OM3 AND OM4 MULTIMODE		OM5 MULTIMODE	
Wavelength	850nm	1300nm	850nm	1300nm
Attenuation	3,5	1,5	3,0	1,5

Multimode optical fiber modal bandwidth:

		MINUMUM MODAL BANDWIDTH (MHz X km)				
		OVERFILLIED LAUNCH BANDWIDTH			EFFECTIVE MODAL BANDWITH	
Wavelength		850 nm	953 nm	1300 nm	850 nm	953 nm
Category	Nominal core diameter µm					
OM3	50	1500	N/A	500	2000	N/A
OM4	50	3500	N/A	500	4700	N/A
OM5	50	3500	1850	500	4700	2470

Operational distances supported by optical fibre applications for multimode optical fiber:

		OPERATIONAL DISTANCES (m)		
CATEGORY	NOMINAL CORE DIAMETER (µm)	10GBASE-SR4	40GBASE-SR4	10GBASE-SR10
OM3	50	1500	N/A	500
OM4	50	3500	N/A	500
OM5	50	3500	1850	500

In multimode IEEE applications, the maximum transmission distance supported by OM4 and OM5 is the same.

According to SWDM4 MSA technical specifications, the expected maximum operational distances are specified in the following table:

		OPERATIONAL DISTANCES (m)	
CATEGORY	NOMINAL CORE DIAMETER (μm)	40G-SWDM4	100G-SWDM4
OM3	50	240	75
OM4	50	350	100
OM5	50	440	150

According to a testing with 40G-SWDM4 transceivers, it shows that 40G-SWDM4 could reach 400 meters over OM4 fiber, while over OM5 cable, the module can achieve link length up to 500 meters. If a datacenter is using non-IEEE-compliant 100G-SWDM4 transceivers, it proven that OM5 can support only more 50 meters than OM4.

The optical fiber and cable subcommitee, TR-42.12, approved lime green as the OM5 official jacket color cable.

Conclusion

Wideband multimode fiber is a reliable medium to expand your data center or enhance network capacity. With the capability of managing multiple wavelengths, it effectively reduces the number of fibers and enhances total channel capacity, proven to be a cost-effective solution for increasing network bandwidth.