

Wide Band Multimode Fiber (OM5)

Just the Technical Facts



What's new in standards?

Telecommunications Industry Association (TIA) initiated a work group in October 2014 to develop guidance for a wide band multimode fiber (WB MMF) 50/125 μm fiber standard to support short wavelength division multiplexing (SWDM) transmission. The TIA-492AAAE Standard was published in June 2016. The IEC WB MMF standard is anticipated to be completed by early 2017.

What is WB MMF?

WB MMF is a version of the OM4 fiber with additional bandwidth characterization at 953 nm.

What is different about WB MMF?

The WB MMF optical and mechanical attributes are compliant with OM4 50/125 μm specifications and include the additional specifications of effective modal bandwidth and attenuation at 953 nm. WB MMF is intended for operation using vertical-cavity surface-emitting laser (VCSEL) transceivers across the 846 to 953 nm wavelength range.

Does WB MMF have a name in the standards?

ISO/IEC JTC 1/SC 25 has approved the OM5 designation for inclusion into the ISO/IEC 11801-1 document that is expected by mid-2017. TIA is expected to harmonize with the ISO/IEC 11801-1 document and implement OM5 usage in 2017.

What is SWDM?

SWDM is a proprietary wavelength division multiplexing (WDM) technology that uses four wavelengths across the 850 to 940 nm range. SWDM transceivers were designed to use 2-fiber connectivity into the transceiver with OM3/OM4. SWDM VCSEL transceivers are expected in 2016 and 2017.

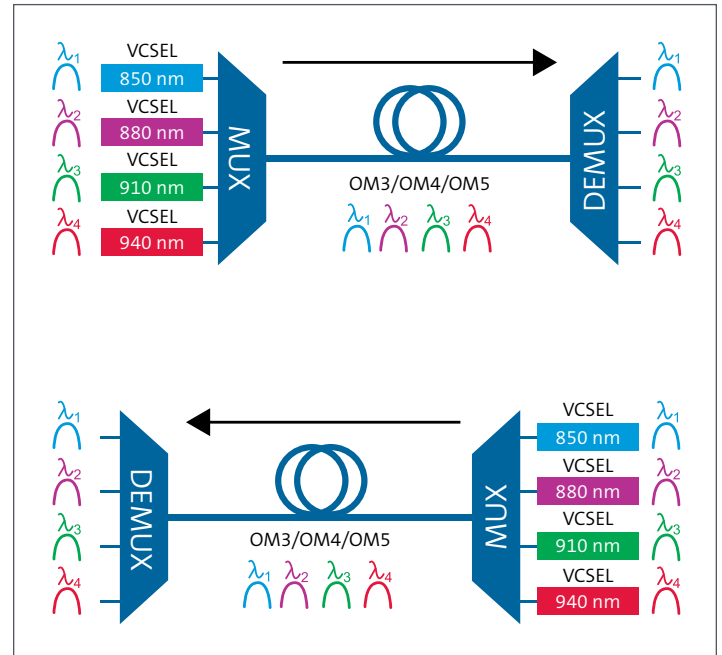


Figure 1: 100GbE (4x25GbE/Wavelength 2-Fiber SWDM)

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Can SWDM be used over OM5?

Yes. SWDM transceivers are compatible with OM3/OM4/OM5 optical connectivity solutions.

What are the expected SWDM data rates and distances?

The 40/100GbE expected operation distances are given in the table below.

	OM3	OM4	OM5
40G SWDM	240 m	350 m	440 m
100G SWDM	75 m	100 m	150 m

Table 1: Expected Operation Distances for OM3/OM4/OM5

Did Corning participate in the TIA WB MMF working group?

Yes. Corning was a very active participant.

Did transceiver manufacturers participate in the WB MMF working group?

Yes. Finisar®, Foxconn® Interconnect Technology (FIT), and Lumentum participated.

What are the specified OM5 effective modal bandwidth (EMB) values?

$EMB \geq 4700 \text{ MHz}\cdot\text{km}$ at 850 nm

$EMB \geq 2470 \text{ MHz}\cdot\text{km}$ at 953 nm

How do OM3/OM4 EMB values compare to OM5?

EMB is specified only at 850 nm for OM3/OM4 at 2000/4700 MHz·km, respectively. OM5 EMB values are specified at both 850 and 953 nm.

Why is the OM5 EMB lower at 953 nm compared to 850 nm?

The best system performance is achieved by a combination of low chromatic dispersion and high EMB. For typical optical fiber, the ideal zero dispersion wavelength occurs at 1310 nm. Because 953 nm is closer to 1310 nm than 850 nm, the chromatic dispersion is lower and consequently the EMB requirement is lower to achieve the same system performance.

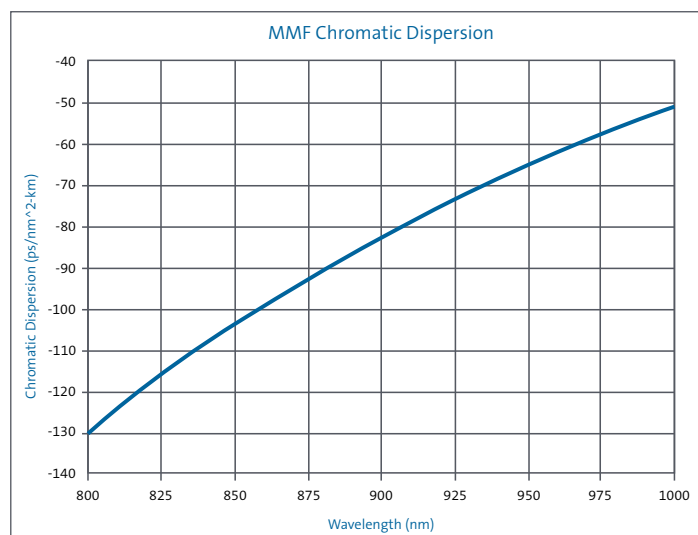


Figure 2: Typical MMF Chromatic Dispersion as a Function of Wavelength

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Is OM5 specified in optical transmission standards such as Ethernet and Fibre Channel?

There are no transmission standards that specify OM5 or SWDM. Transmission standards typically include only one multimode fiber variant that is selected based on economic, commercial, and technical criteria. Parallel transmission is the default multimode fiber variant for data rates $\geq 40\text{G}$.

When will Corning's connectivity products be available with OM5?

EDGE™ and EDGE8™ solutions are now available with OM5.

What cable jacket color will be used for OM5?

TIA has not specified a cable jacket color to date. Corning will use an aqua jacket color with OM5 identification print markings on the jacket unless TIA specifies another color.

Does this new technology require a new polarity method for the duplex fiber connectivity?

No. Traditional Corning universal polarity connectivity solutions can be used. End users are expected to deploy solutions with Base-8 or Base-12 MTP® backbone cables and MTP-to-LC modules or harnesses to breakout into 2-fiber LC interconnects.

Will field channel loss measurements be required at both 850 and 953 nm?

No. Compliant 850 nm field channel loss measurements can be used to demonstrate 953 nm channel loss conformance.

Can BiDi transceivers be used with OM5?

Yes. Corning Optical Communications' EDGE and EDGE8 solutions with OM4 and OM5 have the same 40G BiDi 200 m distance capability.

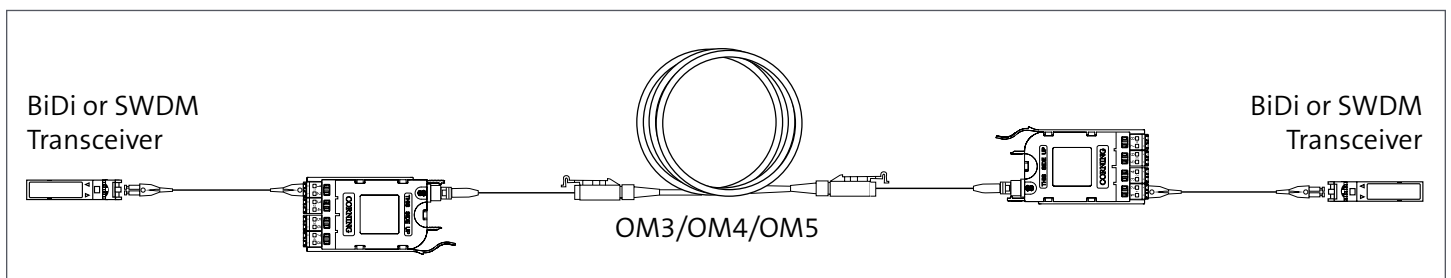


Figure 3: EDGE8 MTP Trunk and EDGE8 Universal Polarity Module with 2-Fiber Interconnects for BiDi or SWDM Transceivers

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Notes:

The Corning logo consists of a solid blue square. Inside the square, the word "CORNING" is written in a white, serif, all-caps font, centered horizontally and vertically.

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