

Nomenclature of 200Gbps optical PMDs over MMF link, for IEEE P802.3ds TF

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Introduction

- A series of objectives have been adopted to support optical PMD operating over
 - > n pairs of MMF with lengths up to at least 30m
 - > n pairs of MMF with lengths up to at least 50m
 - > Where n can be 1, 2,4,8 to support 200GE, 400GE, 800GE and 1.6TE MAC rate
- A timeline has been adopted for 802.3ds, targeting D1.0 coming out of March Plenary 2026
- Need to adopt names for the series of optical PMDs to satisfy the adopted objectives.
- This contribution brings nomenclature proposals for MMF optical PMDs, particularly supporting baseline proposals using 860nm wavelength
- This contribution also brings two possible nomenclature options for future PMDs using longer wavelengths.

Tracking back the MMF optics nomenclature

- **SR n PMDs**

- > Supporting multiple types of MMF: OM3, OM4, OM5
- > Various lengths at different signaling rate even for the same type of optical link
 - 10GBASE-SR, up to 400m
 - 40GBASE-SR4, 100GBASE-SR10, OM3 up to 100m, OM4 up to 150m
 - 100GBASE-SR4, OM3 up to 70m, OM4 up to 100m
 - 400GBASE-SR8, 400GBASE-SR16, up to 100m (OM4, OM5); 400GBASE-SR4.2, up to 100m(OM4), upto 150m(OM5)
 - 800GBASE-SR8, up to 100m (OM4, OM5), up to 60m (OM3)

- **VR n PMDs**

- > Introduced in 100Gb/s signaling rate
- > Supporting multiple types of MMF: OM3, OM4, OM5
- > Various lengths at different signaling rate even for the same type of optical link
 - 800GBASE-VR8, up to 50m (OM4, OM5), up to 30m (OM3)

- **Much earlier in the time**

- 1000BASE-SX(850) & 1000BASE-LX(1300), up to 550m
- 10GBASE-LX4 (1310 WDM) , up to 500m
- 10GBASE-LRM (1260~1355nm), OM3 up to 220m

Proposal Summary

- Propose to adopt the following nomenclatures for physical layer specifications that
 - > supports 200 Gb/s operation over n pairs of MMF with lengths up to at least 30m
 - > supports 200 Gb/s operation over n pairs of MMF with lengths up to at least 50m

Ethernet Rate	Assumed Signaling Rate	AUI	30m MMF OM4 @ 850nm	50m MMF OMyy @ TBD nm W/ enhanced EMB
			$n = 1, 2, 4, 8$	
200GE	212.5Gb/s	200GAUI-1 200GAUI-2	200GBASE-VR1	200GBASE-SR1
400GE		400GAUI-2 400GAUI-4	400GBASE-VR2	400GBASE-SR2
800GE		800GAUI-4 800GAUI-8	800GBASE-VR4	800GBASE-SR4
1.6TE		1.6TAUI-8	1.6TBASE-VR8	1.6TBASE-SR8

To differentiate the wavelength

- **Previously case of differentiating technical aspects**

- > 1000BASE-SX(850nm) & 1000BASE-LX(1300nm). Now in xR optics stands for BASE-R types of PMDs, therefore difficult to pick a letter that could easily tell it is for MMF 30m links.
- > 400GAUI4-S, 400GAUI4-L dictating two host electrical interface for short and long module output mode respectively

- **Options** for 200Gb/s optical PMDs using long wavelength (1060nm) over OM~~xx~~ types of fiber, supporting reach up to at least 30m

- > x00GBASE-VR~~n~~-L
- > x00GBASE-VRL~~n~~

- **For 802.3ds TF discussion**

Table 38–6—Operating range for 1000BASE-LX over each optical fiber type

Fiber type	Modal bandwidth @ 1300 nm (min. overfilled launch) (MHz · km)	Minimum range (m)
62.5 μm MMF	500	2 to 550
50 μm MMF	400	2 to 550
50 μm MMF	500	2 to 550
SMF	N/A	2 to 5000

Table 38–2—Operating range for 1000BASE-SX over each optical fiber type

Fiber type	Modal bandwidth @ 850 nm (min. overfilled launch) (MHz · km)	Minimum range (m)
62.5 μm MMF	160	2 to 220
62.5 μm MMF	200	2 to 275
50 μm MMF	400	2 to 500
50 μm MMF	500	2 to 550
SMF	N/A	Not supported