

Center Wavelength Specification for Automotive Links

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Multi-Gigabit Automotive Ethernet over Plastic Optical Fiber

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Supporters

VCSEL

Vipul Bhatt

Coherent (formerly II-VI)

David Lewis

Lumentum

Nikolay Ledentsov

VI Systems

Ken Jackson

Sumitomo

German Feyh

Broadcom

Fiber

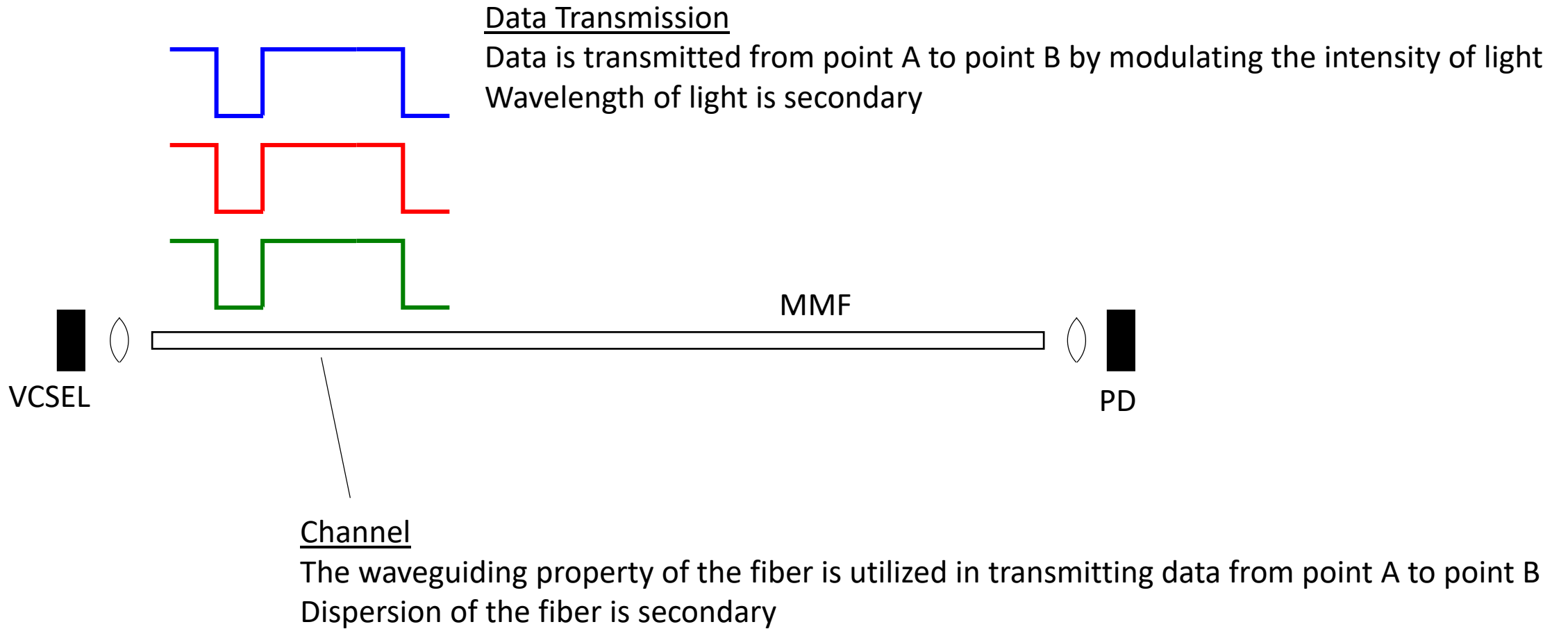
Mabud Choudhury

OFS

Discussion on center wavelength in 802.3cz was triggered by a comment R1-67 from David Law:

- There was majority support from individuals affiliated with a broad range of VCSEL suppliers and OEMs for a wide band (840 – 990 nm) for center wavelength. A wide band for wavelength was not adopted because the 75% threshold was not met.
- Following were discussed:
 1. Methodology of reliability calculations presented in [murty 3dh adhoc 01a 221019.pdf](#) was confirmed in my understanding
 2. Test conformance is between supplier and customer

Automotive Optical Link



Presentations on VCSELs of Different Wavelengths

These presentations show VCSELs of different wavelengths can meet the requirements of automotive links.

850 nm

Mirko Hoser, “850 and 910 nm VCSELs for POF automotive links,” [Hoser 3dh 220824.pdf](#)

N. Ledentsov, Jr., “Technical feasibility and reliability of quantum-dot 850-nm VCSELs operating up to and above 25Gbaud with a high temperature stability beyond 150°C,” [ledentsovJr OMEGA 01 280420 VCSEL.pdf](#)

Laura Giovane, “850 nm 25G VCSEL reliability,” [giovane 3cz 01 080621.pdf](#)

Ramana Murty, “850 nm VCSEL for GI POF links,” [murty 3dh 01a 220713.pdf](#)

910 nm

Mirko Hoser, “850 and 910 nm VCSELs for POF automotive links,” [Hoser 3dh 220824.pdf](#)

Presentations on VCSELS of Different Wavelengths

940 nm

David Lewis, "Extending wavelength for -VR PMD," [lewis_3db_01_070121.pdf](#)

980 nm

Roger King, "VCSEL design for automotive datacom Experimental results for 980 nm versus 850 nm," [king_3cz_01a_0521.pdf](#)

Example of a Wide Band Specification

100G MM Link (Clause 167, 802.3db)

Table 167–7—Transmit characteristics

Description	100GBASE-VR1 200GBASE-VR2 400GBASE-VR4	100GBASE-SR1 200GBASE-SR2 400GBASE-SR4	Unit
Signaling rate, each lane (range)	53.125 ± 100 ppm		GBd
Modulation format	PAM4		—
Center wavelength (range)	842 to 948	844 to 863	nm

Table 167–8—Receive characteristics

Description	100GBASE-VR1 200GBASE-VR2 400GBASE-VR4	100GBASE-SR1 200GBASE-SR2 400GBASE-SR4	Unit
Signaling rate, each lane (range)	53.125 ± 100 ppm		GBd
Modulation format	PAM4		—
Center wavelength (range)	842 to 948		nm

Summary

A wide center wavelength band brings multiple VCSEL suppliers to automotive data link market.

The exact width of the wavelength band will depend on bandwidth guidance for GI POF.

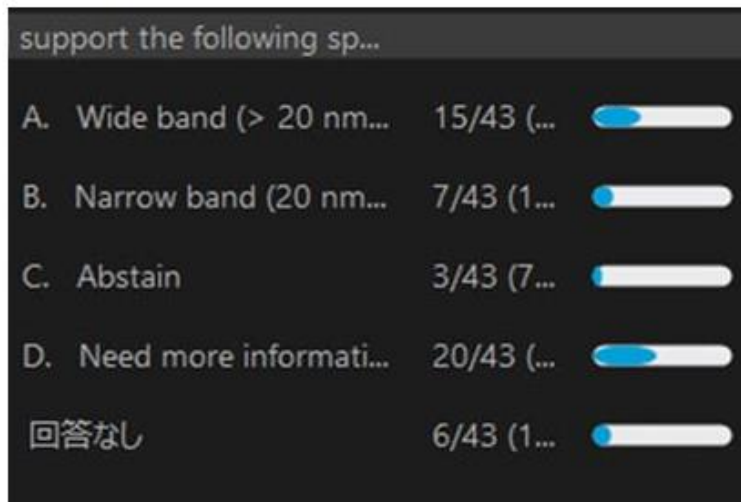
802.3dh has the opportunity to write a specification that benefits all participants (suppliers of electronic and optical components, fiber, and OEMs) in the automotive ecosystem.

Straw Poll

I support the following specification for “center wavelength” range:

1. Wide band (> 20 nm): Multiple nominal wavelengths, e.g., 840 – 920 nm
2. Narrow band (20 nm): Single nominal wavelength, e.g., 840 – 860 nm
3. Abstain
4. Need more information

[Chicago rules]



Results

1. 15

2. 7

3. 3

4. 20

No answer: 6

Total: 43 voters