Cl **45** *SC* **45.2.3.87c.3** *P* **36** *L* **20** # 242

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **R** *Registers effect*

There is no reflection of what the current operating mode of OAM. 3.2348.1 only takes affect after a pmd_reset, so how do you tell if the current state of the enable bit represents the opereation state?

SuggestedRemedy

Add a new BASE-U OAM status field that reflects the current operating state of OAM mode.

Response *Response Status* **U**

REJECT.
According to 166.11 (with references to 115.9), BASE-U OAM channel is established when both link partners transmits PHD.CAP.OAM = 1, which indicates both partners have the optional ability of OAM channel and it is enabled. The status of the PHD operation is reported to any attached STA by the PHD lock status bit (3.2349.10) and the local and remote PHD reception status bits (3.2349.11 and 3.2349.12). Once the PHD bidirectional communication is indicated reliable, register BASE-U OAM enable (3.2348.1) and Remote BASE-U OAM ability (3.2349.3) can be used to determine the OAM is operative. If both registers value 1, then bidirectional OAM communication is operative.
The attached STA may change the register BASE-U OAM enable (3.2348.1) without PMA reset. In such a case, the read values of the register does not longer reflect current status of OAM channel. However, in this case, it is responsibility of the STA to maintain consistency of operations through write operations to the MDIO registers.

Cl **45** *SC* **45.2.3.87c.4** *P* **36** *L* **28** # 243

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **R** *Registers effect*

There is no reflection of what the current operating mode of EEE. 3.2348.0 only takes affect after a pmd_reset, so how do you tell if the current state of the enable bit represents the operation state?

SuggestedRemedy

Add a new BASE-U EEE status field that relfects the current operating state of EEE mode.

Response *Response Status* **U**

REJECT.
EEE capability is managed in MDIO with registers parallel to those used to manage BASE-U OAM. See response to comment #242.

Cl **166** *SC* **166.6.3.2** *P* **118** *L* **40** # 32

Murty, Ramana
Broadcom

Comment Type **TR** *Comment Status* **R**

The center wavelength range of 970 - 990 nm is too narrow. Virtually all data communication VCSELs operate in the 840 - 950 nm range. The automotive mission profile is not very different from conditions in which many datacom VCSELs operate. Expanding the VCSEL wavelength range enables more VCSEL suppliers.

SuggestedRemedy

Expand the center wavelength range to 840 - 990 nm in Tables 166-9 and 166-10.

Response *Response Status* **U**

REJECT.
Comment is out of scope for the recirculation balllot.
Despite this, the Task Force considered the comment and a motion to adopt the below response failed 19 Yes/9 No/9 Abstain. There is no consensus to make a change to the draft.
Proposed response:
Additionally, nominal center wavelength that has been adopted is 980 nm. Range of +/- 10 nm is consistent with other projects that use different nominal center wavelength, i.e. C/138 138.7.1, Table 138-8.
C/95 95.7.1, Table 95-6.
C/52 52.5.1, Table 52-7.

The TX and RX characteristics have been derived with margin considering real 980nm device samples operating in a range of backside temperature between -40ºC and +125ºC and bias current of up to 8 mA. It was demonstrated during the project that required wear-out reliability cannot be achieved with 850nm VCSEL devices using similar current densities. It was also demonstrated that in order to marginally meet the wear-out reliability requirements, the bias current should be reduced < 5 mA in high temperature, therefore reducing the speed and optical power and increasing the RIN of the VCSEL devices, hence making much more difficult the PHY implementation. On top of that, it was also demonstrated that 980nm devices are much less dependent with temperature, so they present a much more uniform threshold current between -40 and 125ºC. 850nm devices could be optimized for high temperature, but degrading (or making impossible) operation at low temperature and viceversa.

Technology for manufacturing 980nm VCSEL devices is widely available. It was developed during last decade for sensor devices. Producing reliable, high speed, low noise, and efficient VCSELs at 980nm is much easier than at 850nm. This will allow to expand the availability of manufacturers that can supply photonics for BASE-AU PHYs in automotive industry.

Several contributions about VCSEL have been presented in the TF:
https://www.ieee802.org/3/cz/public/may_2021/king_3cz_01a_0521.pdf
https://www.ieee802.org/3/cz/public/jul_2021/perezaranda_3cz_01_0721_wavelength.pdf

https://www.ieee802.org/3/cz/public/may_2021/perezaranda_3cz_01_0521_VCSEL_980nm.pdf

https://www.ieee802.org/3/cz/public/11_may_2021/perezaranda_3cz_01a_110521_50Gbps_850nm_demo.pdf

Random failures have been described in:
https://www.ieee802.org/3/cz/public/22_jun_2021/pankert_3cz_01_220621_random_failures.pdf