Cl **138** *SC* **138.7.1** *P* **262** *L* **17** # 20147

Dawe, Piers — Mellanox

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

This PMD needs more study, and knowing what TDECQ is feasible is probably the key.

SuggestedRemedy

While in WG ballot, show evidence of technical feasibility for the numbers in the spec: eyes, receiver waterfall plots, TDECQ measurements and so on. Adjust the draft as appropriate. TR because this could take a few meeting cycles.

Response *Response Status* **U**

REJECT.

[Editor's note: This D2.0 comment was unsatisfied.]

[Editors note: This comment is a repeat of comment 42 against draft 1.3]

No specific changes to the draft suggested.

Task force participants are encouraged to prepare consensus presentations with proposals for specific changes to the draft if necessary.

Cl **138** *SC* **138.7.1** *P* **270** *L* **10** # 21038

Dawe, Piers — Mellanox

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

It seems that it is possible to make a bad transmitter (e.g. with a noisy or distorted signal), use emphasis to get it to pass the TDECQ test, yet leave a realistic, compliant receiver with an unreasonable challenge, such as high peak power, high crest factor, or a need to remove emphasis from the signal, contrary to what equalizers are primarily intended to do. With some of the changed low-bandwidth TDECQ being used to equalize the reference receiver's own bandwidth, this issue becomes more apparent. Note the receiver is tested for a very slow signal only, not for any of these abusive signals. This is an issue for all the PAM4 optical PMDs, although it may be worse for MMF because of the high TDECQ limit.

SuggestedRemedy

1. To screen for noisy or distorted signals with heavy emphasis
Define TDECQrms = 10*log10(A_RMS/(s*3*Qt*R)) where A_RMS is the standard deviation of the measured signal after the 13.28125 GHz filter response, Qt and R are as already in Eq 212-12. s is the standard deviation of a fast clean signal with OMA=2 and without emphasis, observed through the 13.28125 GHz filter response (around 0.7 - can be calculated when the filter bandwidth is stable). Set limit for TDECQrms according to what level of dirty-but-emphasised signal we decide is acceptable, add max TDECQrms row to the table. Alternatively, if the same relative limit is acceptable for all PAM4 optical PMDs, the limit could be in the TDECQ procedure 121.8.5.3 as proposed in bs comment(s). Similarly in clauses 139, 140.
2. To protect the TIA input, consider a peak power spec as in Clause 86.
3. To protect the TIA and any AGC and TIA from unreasonable signals, consider a crest factor spec.
4. To protect the equalizer from having to support unnecessary settings, require that the cursor is one of the first three taps.
5. To protect the receiver from having to "invert" heavily over-emphasised signals, set a minimum cursor weight.

Response *Response Status* **U**

REJECT.

[Editor's note: This D2.1 comment was unsatisfied.]

This comment is related to unsatisfied comments i-140 and r02-35 against 802.3bs draft 3.2.

The resolution to P802.3bs comment r02-35 was:
"REJECT
Insufficient evidence of the claimed problem and that the proposed remedy fixes the problem. The commenter is invited to provide a contribution that demonstrates the problem (a waveform that passes TDECQ but cannot be decoded by a reasonable receiver implementation) and that the proposed additional requirement prevents this issue from occurring."

Insufficient evidence was provided of the claimed problem and that the suggested remedy

fixes the problem. A contribution is invited that demonstrates the problem (a waveform that passes TDECQ but cannot be decoded by a reasonable receiver implementation) and that the proposed additional requirements prevent this issue from occurring.

Cl **139** *SC* **139.6.1** *P* **291** *L* **36** # 21040

Dawe, Piers Mellanox

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

The discussion around D2.0 comment 152 implied that there is receiver margin to spare in 50GBASE-FR.

SuggestedRemedy

reduce all the optical power levels for 50GBASE-FR (except Rx damage) by 1 dB.
Bring more evidence for what optical power levels and TDECQ limits are right, including TDECQ measurements with SSPRQ, and correlation to actual receiver performance.
Review the TDECQ limit.

Response *Response Status* **U**

REJECT.

[Editor's note: This D2.1 comment was unsatisfied.]

This comment is a follow up comment to comment #152 to D2.0.

The current values are based on the adoption of a baseline proposal in http://www.ieee802.org/3/cd/public/May16/cole_3cd_01_0516.pdf during the May 2016 meeting in Whistler by a motion with the following results. Y: 54 N: 0 A: 25.

It is known that there are margins in both transmitter and receiver specifications when the baseline proposal was adopted.

No analysis has been provided that changing the current values by 1 dB would enable lower cost solutions and/or better performance.

Cl **140** *SC* **140.6.1** *P* **314** *L* **33** # 21042

Dawe, Piers Mellanox

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

D2.0 comment 128: PAM4 optics is still new and raw, we are still debugging the specification methodology, and we have seen too little experimental information showing technical and economic feasibility. As measurements with the new TDECQ method and with new receiver designs become available, it may be that optical power levels can be reduced and the spec as in this draft would be uneconomic.

SuggestedRemedy

Reduce all the optical power levels for 100GBASE-DR by 0.5 dB.
Bring more evidence for what optical power levels and TDECQ limits are right; in particular, TDECQ measurements with SSPRQ, and correlation to actual receiver performance.
Review the TDECQ limit.

Response *Response Status* **U**

REJECT.

[Editor's note: This D2.1 comment was unsatisfied.]

No analysis has been provided that changing the current values by 0.5 dB would enable lower cost solutions and/or better performance.

Furthermore the existing values for 100GBASE-DR are intentionally consistent with the values for one lane in 400GBASE-DR4 in P802.3bs.

A presentation (dawe_3bs_03_0917) containing similar proposals pertaining to 400GBASE-DR4 in P802.3bs D3.3 was not accepted.