IEEE P802.3db D3.0 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force Initial Sponsor ballot unresolved comments

Cl **167** *SC* **167.7.1** *P* **52** *L* **29** # I-36

Dawe, Piers J G
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Comment Type **TR** *Comment Status* **R**

In VR, the difference between TP2 and TP3 in VR is small so an unfortunately set-up VR transmitter can be in the top left corner of the TDECQ map while still meeting the TDECQ and overshoot specs. With the extra taps and threshold adjust range in this clause's TDECQ it would be well equalised, so there won't be so much padding, conservatism and need for measurement margin vs. TDECQ and TECQ as in earlier clauses, so signals near the nominal spec limits are a concern.

This bad signal has high K' and high but legal overshoot, a bad combination for receivers. Yet the point of a separate VR spec was to allow slower transmitters than are needed for SR, so VR transmitters should not be in this corner.

This is worse at TP2 than after a minimum-bandwidth optical channel at TP3.
The K' limit is similar to VEC in C2M and EVM in coherent: a screen for signals that are bad after equalisation. As it is a free by-product of the TECQ measurement, we can add it to exclude these untypical signals that don't benefit transmitter makers but are bad for receivers.

SuggestedRemedy

For VR, insert a row for K'=TECQ-10.log10(Ceq'), limit 4.4 dB, same as the TECQ limit. K' and Ceq' are the two parts of TECQ as K and Ceq are the two parts of TDECQ.

Response *Response Status* **U**

REJECT.

Reviewed the presentation
https://www.ieee802.org/3/db/public/May22/dawe_3db_01_051922.pdf.

The proposal for adding a specification for K'(max) did not have any support.

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Cl **167** *SC* **167.8.6** *P* **60** *L* **33** # R1-11

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

Unsatisfied D3.0 comment I-36 points out that the draft spec does not adequately screen for bad transmitters.
The high TDECQ limit and lack of a protective K limit allows a transmitter with a BER error floor in the T(D)ECQ receiver as bad as 1e-4 (before the small additional penalties that aren't included in TDECQ). This is inadequate for a robust link. While a real receiver could improve on this, it is not required to, and even if it does, an error floor problem remains.

In the proposed remedy, a follow-up calculation from the T(D)ECQ measurement checks that a reference receiver with 1 dB better sensitivity than nominal will have a BER better than 1.5e-4, and the error floor is below 5.6e-5. These are still very weak numbers, and the additional penalties will make things a little worse when they occur. For reference, the target BER is 2.4e-4, the target SER of 4.8e-4, and -4.4 dBm -1 dB /6 /Qt = 0.0141 mW

It is very easy to pass this spec by avoiding the combination of minimum OMA-T(D)ECQ and very high K. SR TECQ is expected to do this automatically.

SuggestedRemedy

Require that for the optimized T(D)ECQ tap weights, with R (the noise that could be added by a receiver) set at 0.0141 mW RMS, the larger of SER_L and SER_R is lower than 3e-4. Apply to both TDECQ and TECQ, to both VR and SR.

Response *Response Status* **U**

REJECT.

50G and 100G PAM4 optical links have defined a link penalty, TDECQ, to measure the ability to make an error free link (pre-FEC BER < 2.4E-4). This comment requests adding another link test (OMA - TDECQ) for the situation where receiver sensitivity is better than worst case.

The problem addressed by the comment has not been demonstrated. There was no support for the proposed remedy.

Adding an additional link test requires (a) supporting experimental measurements, and (b) a more extensive investigation.