Cl **136** *SC* **136.11.7** *P* **235** *L* **18** # i-60

RAN, ADEE — Intel Corporation

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

Package transmission line characteristic impedance is set at 90 Ohm. This is an increase from the default value in Annex 93A which is 78.2 Ohm.

The reason for the relatively low value 78.2 Ohm was that to typical packages (especially large ones with many lanes) have lower impedance to improve their matching to silicon and ball impedances, and to reduce the trace insertion loss. This is not expected to change; most practical packages will not have impedance close to 100 Ohm.

In practice, termination can be adjusted and board design can be optimized to match lower impedance package and improve performance (even if cables are 100 Ohm)

It is suggested to acknowledge the expected lower impedance of practical devices in the reference package and termination parameters: assume packages are 80 Ohm while termination and board are 90 Ohm (imperfect matching).

Also applies in 137.10 (Table 137-5).

SuggestedRemedy

In both Table 136-15, and Table 137-5, change the value of Zc to 80 Ohm and Rd to 45 Ohm.

In 136.11.7.1, add an exception to the parameter values from Table 92-12: Z_c is set to 90 Ohm.

Consider changing the reference impedance for channels from 100 Ohm to 85 Ohm (136.11.1 and 137.10, and COM tables).

Response *Response Status* **U**

REJECT.

The response to comment i-161 resulted in different changes than the ones in the suggested remedy.

Cl **138** *SC* **138.7.1** *P* **272** *L* **17** # i-119

Dawe, Piers J G — Mellanox Technologies

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

A TDECQ limit of 4.9 seems very high, given that the same fibres and transmitter and receiver front-ends that should not be worse can do 100GBASE-SR4 (PAM2, almost the same signalling rate) without the FFE.

SuggestedRemedy

This needs more study. We should be able to use information from 802.3bm.

Response *Response Status* **U**

REJECT.

No change to document suggested.
The issue caused by a TDECQ limit of 4.9 dB has not been clarified. There is precedence for this kind of transmitter quality metric to be higher in MMF specifications than in SMF specifications.

Cl **138** *SC* **138.7.1** *P* **273** *L* **22** # r01-70

Dawe, Piers J G — Mellanox Technologies

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

A TDECQ limit of 4.9 seems very high, given that the same fibres and transmitter, and receiver front-ends that should not be worse, can do 100GBASE-SR4 (PAM2, almost the same signalling rate) without the FFE. D.30 comment 119.
Also, it seems that the TDECQ spec limit can be "gamed" (D3.0 comment 116).

SuggestedRemedy

Compare a minimally compliant 100GBASE-SR4 transmitter and set the TDECQ limit accordingly. Provide a signal quality spec that cannot be "gamed".

Response *Response Status* **U**

REJECT.

No specific change to document suggested.

The issue that might be caused by a TDECQ limit of 4.9 dB has not been clarified. There is precedence for this kind of transmitter quality metric to be higher in MMF specifications than in SMF specifications.
To date no contribution has been made that demonstrates the problem, for example, a waveform that passes TDECQ but cannot be decoded by a reasonable receiver implementation.
Measured data has been presented to the task force supporting the current specifications.
See:
http://www.ieee802.org/3/cd/public/Jan18/king_3cd_02_0118.pdf
http://www.ieee802.org/3/cd/public/adhoc/archive/chang_011018_3cd_02_adhoc-v2.pdf

Cl **138** *SC* **138.8.5.1** *P* **276** *L* **38** # r01-73

Dawe, Piers J G — Mellanox Technologies

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

Further investigation of possible minimally compliant MMF signals and their associated TDECQ FFE settings indicates that 2 pre, 2 post (making the cursor the third tap) is never significantly better than 1 pre, 3 post (making it the second tap), for compliant signals. Further refining the TDECQ search rules will avoid inefficiency both in product receiver design, testing and operation, and in TDECQ testing.

SuggestedRemedy

Change "Tap 1, tap 2, or tap 3, has" to "Tap 1 or tap 2 has". There is a separate comment for SMF because the different TDECQ limit there could lead to a different conclusion.

Response *Response Status* **U**

REJECT.

A similar proposal was made against draft 3.0 (comments i-107 i-117 and i120) which was reviewed by the Task Force.

The agreed resolution was to limit the main tap to tap 1, tap 2, or tap 3.
http://www.ieee802.org/3/cd/public/Mar18/dawe_3cd_01a_0318.pdf was reviewed by the Task Force.
There was no consensus to make the proposed change.

The resolution to i-117 was:

ACCEPT IN PRINCIPLE.
Implement the changes proposed in
http://www.ieee802.org/3/cd/public/Jan18/king_3cd_03_0118.pdf with editorial license

Cl **139** *SC* **139.7.5.4** *P* **301** *L* **1** # r01-76

Dawe, Piers J G — Mellanox Technologies

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

Further investigation of possible minimally compliant SMF signals and their associated TDECQ FFE settings indicates that 2 pre, 2 post (making the cursor the third tap) is never significantly better than 1 pre, 3 post (making it the second tap), for compliant signals. Further refining the TDECQ search rules will avoid inefficiency both in product receiver design, testing and operation, and in TDECQ testing.

SuggestedRemedy

Change "Tap 1, tap 2, or tap 3, has" to "Tap 1 or tap 2 has". Do the same in 140.7.5.1 because the TDECQ limit is similar. There is a separate comment for MMF because the different TDECQ limit there could lead to a different conclusion.

Response *Response Status* **U**

REJECT.

See response to comment r01-73.

[Editor's note added after comment resolution completed:

For reference, the response to comment r01-73 is copied here:

REJECT.

A similar proposal was made against draft 3.0 (comments i-107 i-117 and i120) which was reviewed by the Task Force.

The agreed resolution was to limit the main tap to tap 1, tap 2, or tap 3.
http://www.ieee802.org/3/cd/public/Mar18/dawe_3cd_01a_0318.pdf was reviewed by the Task Force.
There was no consensus to make the proposed change.

The resolution to i-117 was:

ACCEPT IN PRINCIPLE.
Implement the changes proposed in
http://www.ieee802.org/3/cd/public/Jan18/king_3cd_03_0118.pdf with editorial license

]

Cl **136** *SC* **136.11.8** *P* **233** *L* **7** # r02-30

Ran, Adee
Intel Corporation

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

The COM parameters for clause 136 correspond to very well-matched channel terminations. The device single-ended termination resistance is 50 Ohm, the package model characteristic impedance is 95 Ohm, and the host board impedance (136.11.8.1) is 100 Ohm.

This creates a smooth channel with no reflections outside of the cable, except for the package capacitors (which are within the DFE reach).

In reality things will not be so nice. Actual devices and NICs will have reflections outside of the DFE reach (limited by ERL, not not zero). These reflections are not accounted for in the COM budget - leaving a deficit.

The effect of far-end reflections is not accounted for in the receiver interference tolerance test COM calibration. So receivers may perform well in the test but fail in real life scenarios.

I am planning a presentation with more details of the problem and proposed solutions.

SuggestedRemedy

Upcoming presentation.

Response *Response Status* **U**

REJECT.

There is no consensus to make a change.

Straw poll #11
In order to address the issues presented in
http://www.ieee802.org/3/cd/public/May18/ran_3cd_01a_0518 with respect to clause 136,
to create a guardband in COM, I would support:
1. Adjust the specifications for Tx and/or Rx
2. Adjust the specifications for the cable assembly
3. Adjust the specifications both for the Tx/Rx, and for the cable assembly
4. Make no changes
(Chicago rules)
1: 3, 2: 8, 3: 7, 4: 16

Straw poll #14
In order to address the issues presented in
http://www.ieee802.org/3/cd/public/May18/ran_3cd_01a_0518 with respect to clause 137,
to create a guardband in COM, I would support:
1. Adjust the specifications for the backplane channel
2. Make no changes
1: 2, 2: 19

Cl **138** *SC* **138.7.1** *P* **270** *L* **22** # r02-40

Dawe, Piers J G
Mellanox Technologies

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

A TDECQ limit of 4.9 dB still has not been justified, given that the same fibres and transmitter, and receiver front-ends that should not be worse, can do 100GBASE-SR4 (PAM2, almost the same signalling rate) without the FFE. king_3cd_02_0118 showed 1 to 2.5 with representative drive. The high limit in the draft would require a better equalizer (e.g. more precise tap settings) than needed for the MMF PMDs. D.30 comment 119, D3.1 comment 70.

SuggestedRemedy

Consider what actual PAM4 MMF transmitters do, and compare a minimally compliant 100GBASE-SR4 transmitter, and set the TDECQ limit accordingly, e.g. 3.8 dB.

Response *Response Status* **U**

REJECT.

No specific changes to the draft proposed.

See also response to comment r02-39.

[
Editor's note added after comment resolution completed.
For reference, the response to r02-39 is:
"REJECT.
No specific change to the draft proposed.
This is a duplicate of comment r01-69 against draft 3.1.
There is no support to consider one of the options from the remedy.
Measured data has been presented to the task force supporting the current specifications.
See: http://www.ieee802.org/3/cd/public/Jan18/king_3cd_02_0118.pdf
http://www.ieee802.org/3/cd/public/adhoc/archive/chang_011018_3cd_01_adhoc-v2.pdf
http://www.ieee802.org/3/cd/public/May18/king_3cd_03_0518.pdf"
]

Cl **138** *SC* **138.8.5.1** *P* **273** *L* **41** # r02-48

Dawe, Piers J G — Mellanox Technologies

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

For some equalizer architectures, precursors are much more expensive than post-cursors (sun_3cd_042518_adhoc).
D3.1 comment 73.

SuggestedRemedy

When we have decided what range of MMF signals are useful and allowed, continue the improvement made in king_3cd_03_0118: change "Tap 1, tap 2, or tap 3, has" to "Tap 1 or tap 2 has".
There is a separate comment for SMF because the different TDECQ limit there could lead to a different conclusion.

Response *Response Status* **U**

REJECT.

Allowing just one pre-cursor in the reference EQ means the transmitted signal, when propagated through a worst case channel, cannot have a significant amount of pre-cursor response at the receiver without suffering higher TDECQ penalty.

An electrical channel typically can guarantee that, however the chromatic and modal dispersion effects of the optical channel in combination with laser performance may require the extra tap. No evidence has been provided to show otherwise.

Cl **139** *SC* **139.7.5.4** *P* **298** *L* **5** # r02-53

Dawe, Piers J G — Mellanox Technologies

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

For some equalizer architectures, precursors are much more expensive than post-cursors (sun_3cd_042518_adhoc). Further investigation of possible minimally compliant SMF signals and their associated TDECQ FFE settings indicates that 2 pre, 2 post (making the cursor the third tap) is never significantly better than 1 pre, 3 post (making it the second tap), for compliant signals. See dawe_3cd_01a_0318. Further refining the TDECQ search rules will avoid inefficiency both in product receiver design, testing and operation, and in TDECQ testing. D3.1 comment 76.

SuggestedRemedy

Continue the improvement made in king_3cd_03_0118: change "Tap 1, tap 2, or tap 3, has" to "Tap 1 or tap 2 has". Do the same in 140.7.5.1 because the TDECQ limit is similar. There is a separate comment for MMF because the different TDECQ limit there could lead to a different conclusion.

Response *Response Status* **U**

REJECT.

Allowing just one pre-cursor in the reference EQ means the transmitted signal, when propagated through a worst case channel, cannot have a significant amount of pre-cursor response at the receiver without suffering higher TDECQ penalty.

An electrical channel typically can guarantee that, however the dispersion effects of the optical channel in combination with chirp may require the extra tap. No evidence has been provided to show otherwise.

Cl **001** *SC* **1** *P* **1** *L* **1** # r03-6

Rannow, R K — IEEE/SELF

Comment Type **GR** *Comment Status* **R**

Various uses of undefined, and non-standard acronyms.

SuggestedRemedy

Response *Response Status* **U**

REJECT.

This comment does not apply to the substantive changes between IEEE P802.3cd D3.2 and D3.3 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. (out of scope)

The commenter has not indicated which of the acronyms are undefined or non-standard. Nor has the commenter provided a suggested remedy.

Cl **136** *SC* **136.9.3.4** *P* **226** *L* **16** # r03-18

Dudek, Michael — Cavium

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

The existing Transmitter Specifications allow transmitters to pass specification and provide significantly worse performance than the Transmitter used to test cables. This creates an inter-operability problem. A presentation will be made.

SuggestedRemedy

Add +3 to Equation 136-6

Response *Response Status* **U**

REJECT.

Note that a presentation on this topic was presented at an ad hoc meeting.
http://www.ieee802.org/3/cd/public/adhoc/archive/dudek_062718_3cd_adhoc.pdf

The presentation
http://www.ieee802.org/3/cd/public/July18/dudek_3cd_01a_0718.pdf
was reviewed and discussed.

Straw Poll #1:
I support applying the change in the suggested remedy:
Yes: 4
No: 16

Straw Poll #2
I support the suggested remedy with the addition of an exception in 136A.2 that the TP0a ERL recommendation is 18 dB.
Yes: 2
No: 11

There is no consensus to make the suggested change.

Cl **138** *SC* **138.8.10** *P* **275** *L* **45** # r03-24

Dawe, Piers J G — Mellanox Technologies

Comment Type **TR** *Comment Status* **R** *RIN limit*

In practice, the receiver may experience noise from modal noise and mode partition noise as well as from RIN. Although there is a small allocation for these in the budget, it would be as well to allow the SRS to use the anticipated amount of noise from all causes, not just from RIN.

SuggestedRemedy

Change "should be no greater than the RIN12OMA (max) specified for the transmit characteristics in Table 138-8" (which means -128 dB/Hz) to "-127 dB/Hz" or "-126 dB/Hz" as appropriate.

Response *Response Status* **U**

REJECT.

No evidence provided that there is a problem with the draft and that the proposed remedy fixes the claimed problem.

Cl **138** *SC* **138.7.2** *P* **271** *L* **9** # r03-25

Dawe, Piers J G
Mellanox Technologies

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

In D1.0, OMA-TDECQ was -5 dBm TBC, and the unstressed sensitivity was -7 dBm. Now, OMA-TDECQ is -5.9 and the implied unstressed sensitivity is about -7.3, equivalent to 50GBASE-LR and 1.5 dB harder for the receiver than 50GBASE-FR. The definition of TDECQ has changed a few times, which I think explains why the budget has gone up from 6 dB TBC to 6.5 dB. Min OMA at max TDECQ was -1 dBm TBC in D1.0, -1 in D3.2, is now -1.4. It looks like OMA-TDECQ should have been increased to -5.5 as the apparent TDECQ was reduced. king_3cd_01_0518 had proposed -5.7 dBm.

SuggestedRemedy

I think these changes restore the intent of D1.0, which was based on a TDECQ from about 0 to 4, to go with the present TDECQ which goes from about 0.5 to 4.5:
Increase OMA-TDECQ from -5.9 to -5.5 dBm. Increase SRS OMA from -3.4 back to -3 dBm (as in D1.0 and D3.2). Increase the other receiver sensitivity, equation 138-1, from max(-6.5, SECQ - 7.9) to max(-6.1, SECQ - 7.5).

Response *Response Status* **U**

REJECT.

The values in draft 3.3 reflect the discussion and decisions of the task force of TDECQ OMA-TDECQ and receiver sensitivity values which took place during comment resolution during the 802.3cd meeting in May 2018.

For reference see comment r02-9.

The comment does not provide sufficient evidence that the suggested remedy would improve the draft.

The following presentation was reviewed and discussed by the task force:
http://www.ieee802.org/3/cd/public/July18/dawe_3cd_02_0718.pdf

Based on straw poll #9 there is no consensus to make the proposed changes.

For reference the result of straw poll #9 is provided here:

Straw Poll #9
I would support implementing the changes proposed in the suggested remedy for comment r03-25.
Yes: 3
No: 12

[Editor's note added after comment resolution completed.
For reference, the response to comment r02-9 is provided here:
ACCEPT IN PRINCIPLE.
The Task Force reviewed the updated proposal in
http://www.ieee802.org/3/cd/public/May18/king_3cd_01_0518.pdf.
In Table 138-8 change value for "Transmitter and dispersion eye closure (TDECQ), each lane (max)" from 4.9 dB to 4.5 dB and change the parameter name to "Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane (max)".
In Table 138-9:
Change value for "Stressed receiver sensitivity (OMAouter), each lane (max)" from -3 to -3.4 dBm.
Change value for "Stressed eye closure (SECQ), lane under test" from 4.9 dB to 4.5 dB.
Change note d to read "Receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 4.5 dB."
In Table 138-10:
Change value for "Power budget (for max TDECQ)" from 6.9 dB to 6.5 dB.
Change value for "Allocation for penalties (for max TDECQ)" from 5 dB to 4.6 dB.
In 138.8.7 change "Receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 4.9 dB" to "Receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 4.5 dB"
Change the title for subclause 138.8.5 from "Transmitter and dispersion eye closure - quaternary (TDECQ)" to "Transmitter and dispersion eye closure for PAM4 (TDECQ)"
In Table 139-6 change value for "Transmitter and dispersion eye closure for PAM4 (TDECQ) (max)" from 3.2 dB to 2.8 dB for 50GBASE-FR and from 3.4 dB to 3 dB for 50GBASE-LR.
In Table 139-7:
Change value for "Stressed receiver sensitivity (OMAouter) (max)" from -5.1 to -5.5 dBm for 50GBASE-FR and from -6.4 dBm to -6.8 dBm for 50GBASE-LR.
Change value for "Stressed eye closure for PAM4 (SECQ)" from 3.2 dB to 2.8 dB for 50GBASE-FR and from 3.4 dB to 3 dB for 50GBASE-LR.
Change note c to read "Receiver sensitivity (OMAouter) (max) is informative and is defined for a transmitter with a value of SECQ up to 2.8 dB for 50GBASE-FR and 3 dB for 50GBASE-LR."
In Table 139-8:
Change value for "Power budget (for max TDECQ)" from 7.6 dB to 7.2 dB for 50GBASE-FR and from 10.3 dB to 9.9 dB for 50GBASE-LR.
Change value for "Allocation for penalties (for max TDECQ)" from 3.6 dB to 3.2 dB for 50GBASE-FR and from 4 dB to 3.6 dB for 50GBASE-LR.
In 139.7.8 change "For 50GBASE-FR, receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 3.2 dB" to "For 50GBASE-FR, receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 2.8 dB" and change "For 50GBASE-LR, receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 3.4 dB" to "For 50GBASE-LR, receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 3 dB".
In Table 140-6 change value for "Transmitter and dispersion eye closure for PAM4 (TDECQ) (max)" from 3.4 dB to 3 dB.
In Table 140-7:
Change value for "Stressed receiver sensitivity (OMAouter) (max)" from -1.9 to -2.3 dBm.
Change value for "Stressed eye closure for PAM4 (SECQ)" from 3.4 dB to 3 dB.
Change note c to read "Receiver sensitivity (OMAouter) (max) is informative and is defined for a transmitter with a value of SECQ up to 3 dB."
In Table 140-8:
Change value for "Power budget (for max TDECQ)" from 6.5 dB to 6.1 dB for ER >= 5 dB and from 6.8 dB to 6.4 dB for ER < 5 dB.
Change value for "Allocation for penalties (for max TDECQ)" to "6.1 minus max channel

insertion loss per Table 140-12" for ER >= 5 dB and
to "6.4 minus max channel insertion loss per Table 140-12" for ER < 5 dB.
In 140.7.8 change "a value of SECQ up to 3.4 dB" to "a value of SECQ up to 3 dB".
In 138.8.5, 139.7.5.3 and 140.7.5 change "Pth1, Pth2, and Pth3 are varied from their nominal values by up to ±1% of OMAouter in order to optimize TDECQ." to "Pth1, Pth2, and Pth3 are varied from their nominal values by up to ±1% of OMAouter in order to optimize TDECQ. The same three thresholds are used for both the left and the right histogram."
With editorial license.
]

Cl **138** *SC* **138.7.1** *P* **270** *L* **22** # r03-27

Dawe, Piers J G — Mellanox Technologies

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

A TDECQ limit of 4.5 dB still has not been justified, given that the same fibres and transmitter, and receiver front-ends that should not be worse, can do 100GBASE-SR4 (PAM2, almost the same signalling rate) without the FFE. king_3cd_02_0118 showed 1 to 2.5 dB with representative drive, and king_3cd_03_0518 shows better than 3.7 dB. chang_011018_3cd_01_adhoc-v2 showed 2.1 to 3.1 dB, the lower end with threshold adjust, although much of this was with PRBS15.
The high limit in the draft would require a better equalizer (e.g. more precise tap settings) than needed for the SMF PMDs. D.30 comment 119, D3.1 comment 70, D3.2 comment 40

SuggestedRemedy

Consider what actual PAM4 MMF transmitters do (more evidence like king_3cd_03_0518), and compare a minimally compliant 100GBASE-SR4 transmitter, and set the TDECQ limit accordingly, e.g. 4.0 dB.

Response *Response Status* **U**

REJECT.

PAM4 transmitters for MMF with measured TDECQ values up to 4.0 dB have been shown, in king_3cd_03_0518 and in dawe_3cd_01b_0518 (slide 9), which supports the P802.3cd draft 3.3 TDECQ limit of 4.5 dB taking account of product variability with larger sample sizes.

The same reference receiver is used for clause 138, 139, and 140. The higher TDECQ for 138 reflects the higher transmitter and link penalties for MMF, not a different reference equalizer.

The current TDECQ limit was arrived at as a compromise between transmitter and receiver capabilities.

[Editor's note added after comment resolution completed.

For reference, the URL for the cited presentations are provided here:
http://www.ieee802.org/3/cd/public/May18/king_3cd_03_0518.pdf
http://www.ieee802.org/3/cd/public/May18/dawe_3cd_01b_0518.pdf

]

Cl **138** *SC* **138.8.5.1** *P* **274** *L* **1** # r03-31

Dawe, Piers J G — Mellanox Technologies

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

TDECQ for MMF is measured through a specially low bandwidth, so for the same extreme transmitter emphasis, the reference equalizer's largest magnitude tap coefficient is larger (0.87 vs. 0.8 in dawe_3cd_01b_0518) than for SMF. Further, the survey results for MMF (green points, slide 3, dawe_3cd_01b_0518) are all to the right of +0.5 dB. So the spec can be made more realistic, which makes building the SRS tester easier as well as removing unnecessary design space from the receiver.

SuggestedRemedy

(Just for Clause 138) in "the largest magnitude tap coefficient, which is constrained to be at least 0.8", change 0.8 to 1.

Response *Response Status* **U**

REJECT.

TDECQ for MMF is measured through a receiver bandwidth which is lower that for SMF because it includes the channel response. TDECQ for SMF PMDs is measured through a worst case chromatic dispersion fibre which accounts for much, if not all, of the difference.

While VCSEL measurements to date have shown slightly higher TDECQ penalties than SMF transmitters due to low bandwidth, this does not reflect low temperature performance or future transmitter and VCSEL driver developments which would have better margins to the TDECQ limit and better yield/lower cost. Increasing the minimum coefficient of the largest magnitude tap will reduce the flexibility for the transmitter design.

There is no consensus to implement the proposed changes.

Cl **138** *SC* **138.8.5.1** *P* **273** *L* **45** # r03-32

Dawe, Piers J G — Mellanox Technologies

Comment Type **TR** *Comment Status* **R** *precursor, MMF*

For some equalizer architectures, precursors are much more expensive than post-cursors (sun_3cd_042518_adhoc).
D3.1 comment 73, D3.2 comments 7, 8, 48, 53.

SuggestedRemedy

When we have decided what range of MMF signals are useful and allowed, review the value of the second precursor considering chromatic and modal dispersion. If it's small, continue the improvement made in king_3cd_03_0118: change "Tap 1, tap 2, or tap 3, has" to "Tap 1 or tap 2 has".
There is a separate comment for SMF because the different TDECQ limit and dispersion there could lead to a different conclusion.

Response *Response Status* **U**

REJECT.

Repeat of previous comments r02-48 and r02-53. During comment resolution on D3.2 a similar proposal was rejected for 50G PAM4 based PMDs.

The response to r02-48 is shown here for reference:
"REJECT
Allowing just one pre-cursor in the reference EQ means the transmitted signal, when propagated through a worst case channel, cannot have a significant amount of pre-cursor response at the receiver without suffering higher TDECQ penalty.
An electrical channel typically can guarantee that, however the chromatic and modal dispersion effects of the optical channel in combination with laser performance may require the extra tap. "

There was no related presentation for MMF PMDs, however there was a presentation on this topic for 50G SMF PMDs.
See: http://www.ieee802.org/3/cd/public/July18/sun_3cd_01b_0718.pdf

Based on straw poll #8 there is no consensus to make the proposed change.

For reference the result of straw poll #8 is provided here:

Straw Poll #8
For 50GBASE-SR, 100GBASE-SR2, and 200GBASE-SR4, I support constraining the largest magnitude tap coefficient to Tap 1 or tap 2.
Yes: 1
No: 16

Cl **139** *SC* **139.7.5.4** *P* **299** *L* **5** # r03-37

Dawe, Piers J G
Mellanox Technologies

Comment Type **TR** *Comment Status* **R** *precursor, SMF*

For some equalizer architectures, precursors are much more expensive than post-cursors (sun_3cd_042518_adhoc). Further investigation of possible minimally compliant SMF signals and their associated TDECQ FFE settings indicates that 2 pre, 2 post (making the cursor the third tap) is never significantly better than 1 pre, 3 post (making it the second tap), for compliant signals (but not yet including chromatic dispersion). See dawe_3cd_01a_0318. Further refining the TDECQ search rules will avoid inefficiency both in product receiver design, testing and operation, and in TDECQ testing. D3.1 comment 76, D3.2 comment 53.

SuggestedRemedy

Review the value of the second precursor considering chromatic dispersion. If it's small, continue the improvement made in king_3cd_03_0118: change "Tap 1, tap 2, or tap 3, has" to "Tap 1 or tap 2 has", like 100GBASE-DR. Increase the max TDECQ a little if appropriate.
There is a separate comment for MMF because the different TDECQ limit there could lead to a different conclusion.

Response *Response Status* **U**

REJECT.

No evidence has been shown that there is a problem with the current draft. The remedy is not specific.

The following related presentation was reviewed and discussed.
Http://www.ieee802.org/3/cd/public/July18/sun_3cd_01b_0718.pdf

Based on straw polls 6 and 7 there is no consensus to make the proposed changes.

For reference the results to straw polls are shown here:

Straw Poll #6.
For 50GBASE-FR, I support constraining the largest magnitude tap coefficient to Tap 1 or tap 2.
Yes: 4
No: 19

Straw Poll #7
For 50GBASE-LR, I support constraining the largest magnitude tap coefficient to Tap 1 or tap 2.
Yes: 0
No: 19