C/ 138	SC	138 1	P 28	/ 30	# 8	C/ 138	SC 138 7 1	P 36	/ 53	# 6
Dawe, Pie	rs	100.1	Mellanox	200	# 0	Dawe, Pier	s	Mellanox	200	# 0
Comment This ta 117F	<i>Type</i> able ca RS and	E n be prese 78Energ	<i>Comment Status</i> D ented more simply, as is alr y-Efficient Ethernet.	eady done for the	e first and last rows,	Comment T The tra The tra	<i>Type</i> TR Insition time sp Insition time sp	Comment Status D bec is not consistent for transmec is intended to protect the r	nit and SRS spe eceiver from unr	rcs. reasonably slow signals,
Suggested Combi 1172 1174 Into a 1172 and so identic	dRemed ine the 200GMI 400GMI single 200GMI 200GMI 5 on. No cal, and	dy rows: II Optional II Not appl row: II or 400GM otice that t I can be co	I Not applicable licable Optional MII Optional Optional he columns for 200GBASE ombined too.	SR4 and 400GE	3ASE-SR8 become	and its PMDs 802.3c ps for t 13.281 This is slide 1 numbe measu	without having d chose 34 ps he slowest MN 25 GHz) after ; inconsistent. 1 brown) show rs, so there is rement.	to use a common equalize to carry an extra burden for ju as the slowest after a slow ch IF signal after a fast channel, a slow channel - but still used The survey results for MMF (d that actual transition times are room to correct the spec and s	er IC across all t ist one or a few annel (SMF clau equivalent to 36 34 ps for the slo awe_3cd_01b_(e significantly fa still allow plenty	PMD types. Juses) but also used 34 is ps (observed in owest signal in SRS. D518 slide 8 green and ster than these of margin for
Proposed Response Response Status W PROPOSED REJECT. The current implementation retains the base format of Clause 138, which is helpful to the reader and follows the same format as Clause 86, also a clause with multiple PMDs with identical lane specifications. The proposed change makes it less obvious which MII applies to which PMD and does not represent an improvement to the draft				Also, it is more convenient to use the same bandwidth for transition time as for TDECQ. If someone prefers to use a different bandwidth, he can read the results across, similar to the second alternative in the remedy. Someone using emphasis to make a slow transmitter look faster will find that it makes the transition time shorter too. If his transmitter is slow enough to worry about the transition time spec, he won't have a problem with tightening the cursor tap strength limit.						
						Suggested Either: to 11.2 Or: In Tabl 400GB In 138. value s limit of stresse	Remedy in 138.8.7, Tra GHz and 26.5 e 138-8, Trans ASE-SR8, ma 8.10 Stressed ;pecified in Tab 34 ps to Table ed receiver sen	ansmitter transition time, for 40 625 GHz to 22.4 GHz (twice) (mit characteristics, add a second x 32 ps (not 34), and: receiver sensitivity, change "th ble 138-8" to "the transition time = 138-9, Receive characteristic sitivity test.	00GBASE-SR8, (same as 138.8. ond Transmitter he transition tim- le is no greater t s, in the section	change 13.28125 GHz .5, TDECQ). transition time row for e is no greater than the than 34 ps", or add a o for Conditions of
						Proposed P PROPO This co rejecte It is hig other F SR2, a	Response OSED REJEC ⁻ omment is simi d. Jhly desirable to MDs in Clause nd 200GBASE	Response Status W T. lar to comments #44 against D o keep the per lane specificati a 138 and changing the transit SR4 is out of scope for this p	D1.0 and #9 aga ons for 400GBA ion time for 50G roject.	inst D1.1, which were SE-SR8 identical to the BASE-SR, 100GBASE-

C/ 138 SC 138.7.1

C/ 138 SC 138.8.5 P 38 L 44 # 1 Dawe, Piers Mellanox MellanoX	C/ 138 SC 138.8.5.1 P 38 L 45 # 4 Dawe, Piers Mellanox
Comment Type TR Comment Status D The 0.1 dB allocation for both modal noise and mode partition noise is too little. See dawe_3cm_adhoc_01_101118, castro_3cm_01_1118, pepeljugoski_1_1104 and castro_3cm_01_0119: we need 0.1 to 0.2 dB for MN (castro_3cm_01_0119 says 0.23 to 0.45 dB) as well as 0.1 dB for MPN. The total penalties should be kept below 4.6 dB, which is unreasonably high already. This should be done with a formula, as for 100GBASE- SR4, so as not to penalise good transmitters.	Comment Type TR Comment Status D Equalizing a signal after an 11.2 GHz BT4 filter with a 5-tap FFE needs at least one precursor unless the signal is carefully pre-distorted. If it is, and a fourth post-cursor is needed, the same transmitter seen after a fast channel, e.g. a short fibre, can be diffice receive (outside the TDECQ spec limit) because the 5-tap FFE can't correct the fourth cursor and the (now -ve) first precursor at the same time. In practice, it seems that TDECQ uses at least one precursor for real MMF transmitters.
Insert: For 400GBASE-SR8, Equation (138-1) is used in place of Equation (121-11).	There is an alternative remedy: defining MMF TDECQ with fast and slow channels, in same spirit as SMF with high and low dispersion.
R=sqrt(sigmaG ^A 2 + sigmaS ^A 2 - M ^A 2) (138-1) where M = 0.0065Pave In 138.8.10 Stressed receiver sensitivity, either refer to the new Eq. 138-1 (as above) and say that: the values of M in Equation (138-1) is set to zero or, leave this section referring to Eq. 121-11 but to avoid confusion, add: NOTEThe parameter M of Equation (138-1) is not used.	To ensure that the 400GBASE-SR8 transmitter is not gaming the spec like this: Change the fourth sentence in 138.8.5.1 as follows: change "Tap 1, tap 2, or tap 3, ha largest magnitude tap coefficient" to "For 50GBASE-SR, 100GBASE-SR2, and 200GBASE-SR4, tap 1, tap 2, or tap 3, has largest magnitude tap coefficient For 400GBASE-SR8, tap 2 or tap 3, has the larger magnitude tap coefficient"
Proposed Response Response Status W	Proposed Response Response Status W
This comment is similar to comments #39 against D1.0 and #4 against D1.1, which were rejected. It is highly desirable to keep the per lane specifications for 400GBASE-SR8 identical to the other PMDs in Clause 138 and changing the TDECQ definition for 50GBASE-SR, 100GBASE-SR2, and 200GBASE-SR4 is out of scope for this project. Insufficient evidence has been provided to show that the penalty is large enough to warrant a change to the link budget at this time. See the following for previous analysis:	PROPOSED REJECT. This comment is similar to comments #42 against D1.0 and #7 against D1.1, which we rejected. It is highly desirable to keep the per lane specifications for 400GBASE-SR8 identical t other PMDs and changing the constraint on which tap can have the largest magnitude 50GBASE-SR, 100GBASE-SR2, and 200GBASE-SR4 is out of scope for this project. Limiting to at most three post-cursors in the reference equalizer means that the transn

http://www.ieee802.org/3/aq/public/nov04/pepeljugoski_1_1104.pdf and http://www.ieee802.org/3/ad/public/Oct18/king_3cd_01_1018.pdf. The experimental results in

http://www.ieee802.org/3/cm/public/adhoc/sun 3cm adhoc 01 022819.pdf are consistent with the current budget.

ult to post-

s the

o the for nitted signal, when propagated through the TDECQ reference response, cannot have a significant amount of fourth post-cursor response at the receiver without suffering higher TDECQ penalty.

Insufficient evidence has been provided to justify a change.

C/ 138 SC 138.8.5.1

C/ 138	SC 138.8.5.1	P 38	L 45	# 3
Dawe, Piers		Mellanox		

Comment Type TR Comment Status D

All the PAM4 specs should allow the same range of over-emphasis so that a common equalizer IC can be used for all, without all SMF equalizers carrying a burden because of the MMF spec. 802.3cd chose a largest magnitude tap coefficient of at least 0.8 as a way of protecting the receiver from excessively peaky signals that abuse the receiver's dynamic range, resolution or sensitivity but don't benefit the transmitter implementer - however they did not implement it fully.

While SMF TDECQ is measured for both extremes of channel, MMF TDECQ is measured for the slow channel only. We could measure MMF TDECQ for the fast channel too. If not, we can read across to the other case we don't measure, recognising that a signal after the slow measurement channel looks less emphasised than what the receiver has to tolerate after a fast channel.

The reference equalizer's largest magnitude tap coefficient (0.8 for a fast channel) should be set consistently (as from the same transmitter) for the slow channel. The survey results for MMF (green points, slide 8, dawe_3cd_01b_0518) are all to the right of +0.5 dB (or tap strength about 1.1). Anyone using emphasis to make a slow transmitter look faster will start well to the right (large tap strength) and will not be concerned by this limit. This proposal is consistent with the SMF specs and still allows a strongly over-emphasised transmitter.

SuggestedRemedy

Change the fourth sentence in 138.8.5.1 as follows: change "Tap 1, tap 2, or tap 3, has the largest magnitude tap coefficient, which is constrained to be at least 0.8." to

"...constrained to be at least 0.8 for 50GBASE-SR, 100GBASE-SR2, and 200GBASE-SR4, and at least 0.85 for 400GBASE-SR8".

Note another comment relates to the same sentence.

Proposed Response Response Status W

PROPOSED REJECT.

This comment is similar to comments #41 against D1.0 and #6 against D1.1, which were rejected.

It is highly desirable to keep the per lane specifications for 400GBASE-SR8 identical to the other PMDs and changing the constraint on the largest magnitude tap coefficient for 50GBASE-SR, 100GBASE-SR2, and 200GBASE-SR4 is out of scope for this project. In addition, VCSEL measurements to date have shown slightly higher TDECQ penalties than SMF transmitters due to low bandwidth, and the use of peaking can help to improve yield and reduce cost especially at process, temperature, and voltage corners. Increasing the minimum coefficient of the largest magnitude tap would reduce the flexibility for the transmitter design.

C/ 138 Swanson, St	SC 138.10.1 even	P 3 Cornii	9 ng Incorporate	L 44 ed	#	10	
Comment Ty Missing	<i>pe</i> E text.	Comment Status	D				
SuggestedRo Add text	SuggestedRemedy Add text after "Change note 'a' of Table 138–14 as follows:"						
Proposed Re PROPOS Insert "C	esponse SED ACCEPT II Only applies to 10	<i>Response Status</i> N PRINCIPLE. 00GBASE-SR2, 200	W)GBASE-SR4	, and 400)GBASE-SF	R8.".	
<i>Cl</i> 150 Swanson, St	SC 150.7 even	P 5 Cornii	3 ng Incorporate	L 39 ed	#	11	

Comment Type ER Comment Status D

Since our objective is to support 100m, the example used here should be based on 100m consistent with Clause 138.7 and not 150m.

SuggestedRemedy

Replace "A PMD that exceeds the operating range requirement while meeting all other optical specifications is considered compliant (e.g., a 400GBASE-SR4.2 PMD operating at 170 m meets the operating range requirement of 0.5 m to 150 m)." with Replace "A PMD that exceeds the operating range requirement while meeting all other optical specifications is considered compliant (e.g., a 400GBASE-SR4.2 PMD operating at 120 m meets the operating range requirement of 0.5 m to 100 m)."

Proposed Response Response Status W

PROPOSED REJECT.

The precedent for the type of statement beginning "A PMD that exceeds the operating range requirement while meeting all other optical specifications is considered compliant (e.g." is that the example provided after "e.g." is for the longest operating range. For example, in Clause 138, the example is based on the 100 m upper limit of the required operating range for OM4 and OM5, rather than the 70 m upper limit of the required operating range for OM3.

C/ 150 SC 150.7 IEEE P802.3cm D1.2 400 Gb/s over Multimode Fiber 3rd Task Force review comments

P 56	L 17	# 13	C/ 150	SC 150.7.1	P 54	L 30	# 5			
Corning Inco	rporated		Dawe, Pier	S	Mellanox					
ment Status D sertion loss values m of 3 dB/km.	ust change to re	flect the new cabled	Comment T The tra 400GB	<i>Type</i> TR Insition time sp ASE-SR4.2 ch	Comment Status D ec is not consistent for transm annel which needs faster trans	nit and SRS sp smitters. See	ecs, and too slow for this slides 6 and 7 of			
7." 8."			dawe_ The tra and it s PMDs 802.3c	3cm_01a_0119 insition time sp should be possi without having d chose 34 ps). ec is intended to protect the re ible to use a common equalize to carry an extra burden for th as the slowest after a slow ch	eceiver from ur er IC across all e bidi spec. annel (SMF cla	nreasonably slow signals, 50G/lane PAM4 optical auses). Here, we have 34			
onse Status W NCIPLE. nel insertion loss", r ional insertion loss a	eplace "1.8" with illowed", replace	"1.7" and replace "1.9" "0.2" with "0.3" and	ps for t 13.281 is incol 11 brov transm this sp Also, it someo	he slowest MM 25 GHz) after a nsistent. The s wn) show that a itters for 150 m ec and still allow is more conve ne prefers to us	IF signal after a fast channel, a slow channel - but 34 ps is u urvey results for MMF (dawe_ actual transition times are sign a have to be better than those w plenty of margin for measur nient to use the same bandwin se a different bandwidth, he ca	equivalent to 3 sed for the slo 3cd_01b_0518 ificantly faster for 100 m, so t ement. dth for transition an read the res	8 ps (observed in west signal in SRS. This 8 slide 8 green and slide than these numbers, and there is room to correct on time as for TDECQ. If sults across, similar to the			
P 56 Corning Inco	L 22 rporated	# 12	secono Someo transiti time sr	l alternative in t one using emph on time shorter oec, he won't ba	the remedy. asis to make a slow transmitt too. If his transmitter is slow ave a problem with tightening	er look faster v enough to wor the cursor tap	vill find that it makes the ry about the transition strength limit			
Comment Type ER Comment Status D					SuggestedRemedy					
on loss is calculated cal fiber attenuation plice loss given in 1 ig the maximum dist	using the maxim of 3.5 dB/km at 50.10.2.2.1." with ance specified in n for connection a	um distance specified 350 nm plus an "bThe channel Table 150–6 and and splice loss given in	Either: GHz to Or: Chang In 150. value s limit co stresse	in 150.8.7, Tra 18 GHz (twice e 34 ps to 30 p 8.10 Stressed specified in Tab puld of 34 ps to ed receiver sense	nsmitter transition time, chang) (same as 150.8.5, TDECQ) s, and: receiver sensitivity, change "th le 150-7" to "the transition tim Table 150-8, Receive charact sitivity test.	ge 13.28125 G ne transition tin e is no greater eristics, in the	Hz to 9 GHz and 26.5625 ne is no greater than the than 34 ps", or add a section for Conditions of			
			Proposed F	Response	Response Status W					
onse Status 🛛 W			PROP0 This cc rejecte VCSEL http://w http://w high as	OSED REJECT omment is simil d. _ measurement ww.ieee802.or ww.ieee802.or s 33 ps, with no	T. ar to comments #43 against E s shown in g/3/cd/public/May18/king_3cd g/3/cd/public/July18/king_3cd receiver problems seen, and	01.0 and #8 ag _03_0518.pdf _02a_0718.pd no evidence h	ainst D1.1, which were and f had transition times as			
	 <i>P</i> 56 Corning Inco ment Status D ertion loss values m of 3 dB/km. 7." 8." onse Status W VCIPLE. nel insertion loss", m ional insertion loss a <i>P</i> 56 Corning Inco <i>P</i> 56 Corning Inco <i>ment Status</i> D ation in footnote b is on loss is calculated ical fiber attenuation plice loss given in 15 ing the maximum dist nm plus an allocation onse Status W 	P 56 L 17 Corning Incorporated ment Status D ertion loss values must change to reful of 3 dB/km. 7." 8." onse Status VICIPLE. nel insertion loss", replace "1.8" with ional insertion loss allowed", replace P 56 L 22 Corning Incorporated ment Status D ation in footnote b is incorrectly stated on loss is calculated using the maximical fiber attenuation of 3.5 dB/km at 8 plice loss given in 150.10.2.2.1." with ing the maximum distance specified in nm plus an allocation for connection a onse Status W	P56L17#13Corning Incorporatedment StatusDertion loss values must change to reflect the new cabled if 3 dB/km.7."8."onse StatusWVCIPLE.nel insertion loss", replace "1.8" with "1.7" and replace "1.9" ional insertion loss allowed", replace "0.2" with "0.3" and $P56$ L22# 12 Corning Incorporatedment StatusDation in footnote b is incorrectly stated.on loss is calculated using the maximum distance specified cal fiber attenuation of 3.5 dB/km at 850 nm plus an plice loss given in 150.10.2.2.1." with "bThe channel og the maximum distance specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table 150–6 and and plus an allocation for connection and splice loss given in to specified in Table	P56 L17 # 13 Cl 150 Corning Incorporated Dawe, Pier ment Status D Comment 3 ertion loss values must change to reflect the new cabled if 3 dB/km. The tra 7." The tra 8." Donse Status W GCIPLE. Status VU nel insertion loss", replace "1.8" with "1.7" and replace "1.9" The tra ional insertion loss allowed", replace "0.2" with "0.3" and Status Spectral P56 L22 # 12 Corning Incorporated Someo ment Status D Suggested ation in footnote b is incorrectly stated. Suggested cal fiber attenuation of 3.5 dB/km at 850 nm plus an plice loss given in 150.10.2.2.1." with "bThe channel inm plus an allocation for connection and splice loss given in Suggested onse Status W PROPer Proposed H PROPer This correctly thtp://withtp://w	P 56 L 17 # 13 Corning Incorporated The transition time sp ment Status D Comment Type TR ertion loss values must change to reflect the new cabled of 3 dB/km. Comment Type TR 7." The transition time sp 400GBASE-SR4.2 ch 8." comment Status W 302.3cd chose 34 ps vCIPLE. nel insertion loss", replace "1.8" with "1.7" and replace "1.9" The transition time sp ional insertion loss allowed", replace "0.2" with "0.3" and 302.3cd chose 34 ps P 56 L 22 # 12 Corning Incorporated transmitters for 150 m ment Status D second alternative in 1 Someone using empt transition time spotter time spec, he won'that attransition time spotter time spec specified in Table 150–6 and time to specified in Table 150–6 and time to specified in Table 150–6 and timit could of 34 ps to 30 p non 15	P56 L17 # 13 Corning Incorporated Cl 150 SC 150.7.1 P54 ment Status D D Dawe, Piers Mellanox retion loss values must change to reflect the new cabled if 3 dB/km. D The transition time spec is not consistent for transm 7." Otage 24, 2 channel which needs faster tran dawe_3cm_01a_0119. The transition time spec is intended to protect the n and it should be possible to use a common equalize PMDs without having to be solvest affer a slow ech spec is intended to protect the n and it should be possible to use a common equalize PMDs without having to be solvest affer a slow ech spec is net solvest fMF signal affer a fast channel, 13,28125 GHz) after a slow ech use a different bandwidth, he composited is incorrectly stated. P56 L 22 # 12 Corning Incorporated ment Status D D ation in footnote b is incorrectly stated. on loss is calculated using the maximum distance specified cal fiber attenuation of 3.5 dB/km at 850 nm plus an plice loss given in 150.10.2.2.1" with "5The channel ig the maximum distance specified in Table 150-6 and imm plus an allocation for connection and splice loss given in 150.8.10 Stressed receiver sensitivity, change "transite response" Response Response Status W Proposed Response Response Status W onse Status W PROPOSED REJECT. This comment is	P56 L17 # 13 Corning Incorporated Mellanox ment Status D Mellanox retion loss values must change to reflect the new cabled f3 dB/km. The transition time spec is not consistent for transmit and SRS sp 400GBASE-SR4.2 channel which needs faster transmitters. See dawe.3 cm. 01a.0119. 7." 8." The transition time spec is intended to protect the receiver from un and it should be possible to use a common equalizer I (2 across all PMDs without having to carry an extra burden for the bid spec. 8." Sonse Status W ICIPLE. The summary status after a last channel, equivalent to 3 13.28125 GHz) after a slow channel - but 34 ps is used for the ski one is inconsistent. The survey results for MRF (dawe_3d-01b_051) 11 brown) show that actual transmitter is of 150 m have to be better than those for 100 m, so this spec and still allow plenty of margin for measurement. Also, it is more convenient to use the same bandwidth, he can read the reside of the second alternative in the remedy. Someone using emphasis to make a slow transmitter is slow enough to wor tars its specified in 150.0.2.2.1." with "bThe channel gig the maximum distance specified in Table 150-6 and m plus an allocation for connection and splice loss given in 150.10.2.2.1." with "bThe channel gig the maximum distance specified in Table 150-6 and m plus an allocation for connection and splice loss given in 150.0.2.2.1." with "bThe channel gig the maximum distance specified in Table 150-6 and m plus an allocation for connection and splice loss given in 150.0.2.2.1." with "bThe channel gig the maximum distance specified in Table 150-6 and m plus			

C/ 150 SC 150.7.1

C/ 150	SC 150.8.5	P 58	L 22	# 7	
Dawe, Piers		Mellanox			

Comment Type TR Comment Status D

The 0.1 dB allocation for both modal noise and mode partition noise is too little. See dawe_3cm_adhoc_01_101118, castro_3cm_01_1118, pepeljugoski_1_1104 and castro_3cm_01_0119: we need 0.1 to 0.2 dB for MN (castro_3cm_01_0119 says 0.23 to 0.45 dB) as well as 0.2 to 0.4 dB for MPN. The total penalties should be kept below 4.6 dB, which is unreasonably high already. This should be done with a formula, as for 100GBASE-SR4, so as not to penalise good transmitters.

This remedy keeps the 150 m reach for OM5, although the 100 m transmitters have to be slightly better than needed for 100 m on OM4.

SuggestedRemedy

Insert:

Equation (150-1) is used in place of Equation (121-11).

R=sqrt(sigmaG² + sigmaS² - M²) (150-1)

where M = 0.0065Pave

In 150.8.10 Stressed receiver sensitivity, either refer to the new Eq. 150-1 (as above) and say that:

the value of M in Equation (150-1) is set to zero

or, leave this section referring to Eq. 121-11 but to avoid confusion, add:

NOTE--The parameter M of Equation (150-1) is not used.

Reduce the limits for TDECQ and TDECQ-10log10(Ceq), from 4.5 dB to 4.3 dB (0.2 dB lower than the SECQ values, allowing for 0.3 dB MPN penalty with associated Pcross, including the 0.1 dB already in the draft budget).

In the budget table 150-9, the power budget doesn't change, the allocation for penalties for 70 m and 100 m decrease from 4.6 to 4.5 dB and the additional insertion losses for 70 m and 100 m increase by 0.1 dB to 0.3, 0.2 dB.

Proposed Response Response Status W

PROPOSED REJECT.

This comment is similar to comments #45 against D1.0 and #10 against D1.1, which were rejected.

Insufficient evidence has been provided to show that the penalty is large enough to warrant a change to the link budget at this time. See the following for previous analysis:

http://www.ieee802.org/3/aq/public/nov04/pepeljugoski_1_1104.pdf and

http://www.ieee802.org/3/cd/public/Oct18/king 3cd 01 1018.pdf

The experimental results in

http://www.ieee802.org/3/cm/public/adhoc/sun_3cm_adhoc_01_022819.pdf are consistent with the current budget.

C/ 150	SC 150.8.5.1	P 58	L 28	#	9
Dawe, Piers		Mellanox			<u>-</u>

Comment Type **TR** Comment Status **D**

Equalizing a signal after a 9 GHz BT4 filter with a 5-tap FFE needs at least one precursor unless the signal is carefully pre-distorted. If it is, and a fourth post-cursor is needed, the same transmitter seen after a fast channel, e.g. a short fibre, can be difficult to receive (outside the TDECQ spec limit) because the 5-tap FFE can't correct the fourth post-cursor and the (now -ve) first precursor at the same time.

In practice, it seems that TDECQ uses at least one precursor for real MMF transmitters. There is an alternative remedy: defining MMF TDECQ with fast and slow channels, in the same spirit as SMF with high and low dispersion.

SuggestedRemedy

To ensure that the transmitter is good enough for the intended range of channel bandwidths, change "Tap 1, tap 2, or tap 3, has" to "Tap 2 or tap 3 has".

Proposed Response Response Status W

PROPOSED REJECT.

This comment is similar to comments #48 against D1.0 and #14 against D1.1, which were rejected.

Limiting to at most three post-cursors in the reference equalizer means that the transmitted signal, when propagated through the TDECQ reference response, cannot have a significant amount of fourth post-cursor response at the receiver without suffering higher TDECQ penalty.

Insufficient evidence has been provided to justify a change.

C/ 150 SC 150.8.5.1

IEEE P802.3cm D1.2 400 Gb/s over Multimode Fiber 3rd Task Force review comments

C/ 150	SC 150.8.5.1	P 58	L 29	#	2
Dawe, Piers		Mellanox			

Comment Type TR Comment Status D

All the PAM4 specs should allow the same range of over-emphasis so that a common equalizer IC can be used for all, without all their equalizers carrying a burden because of the bidi spec. 802.3cd chose a largest magnitude tap coefficient of at least 0.8 as a way of protecting the receiver from excessively peaky signals that abuse the receiver's dynamic range, resolution or sensitivity but don't benefit the transmitter implementer. While SMF TDECQ is measured for both extremes of channel. MMF TDECQ is measured for the slow channel only. We could measure MMF TDECQ for the fast channel too. If not. we can read across, recognising that a signal after the slow measurement channel looks less emphasised than what the receiver has to tolerate after a fast channel. The reference equalizer's largest magnitude tap coefficient (0.8 for a fast channel) should be set consistently (as from the same transmitter) for the slow channel. The survey results for MMF (green points, slide 8, dawe 3cd 01b 0518) are all to the right of +0.5 dB (or tap strength about 1.1); with the slower filter for 400GBASE-SR4.2 they will be further to the right (bigger again). Anyone using emphasis to make a slow transmitter look faster will start well to the right (large tap strength) and will not be concerned by this limit. This proposal is consistent with the SMF specs and still allows a strongly over-emphasised transmitter.

SuggestedRemedy

In "the largest magnitude tap coefficient, which is constrained to be at least 0.8", change 0.8 to 0.9.

Proposed Response Response Status W

PROPOSED REJECT.

This comment is similar to comments #40 against D1.0 and #5 against D1.1, which were rejected.

VCSEL measurements to date have shown slightly higher TDECQ penalties than SMF transmitters due to low bandwidth, and the use of peaking can help to improve yield and reduce cost, especially at process, temperature, and voltage corners. Increasing the minimum coefficient of the largest magnitude tap would reduce the flexibility for the transmitter design.

C/ 150	SC 150.10.1	P 63	L 33
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Swanson, Steven

Corning Incorporated

Comment Type T Comment Status D

In Table 150-13, the channel insertion loss values must change to reflect the new cabled optical fiber attenuation value of 3 dB/km.

SuggestedRemedy

or OM3, replace "1.8" with "1.7."

For OM4, replace "1.9" with "1.8."

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Proposed Response Response Status W
PROPOSED ACCEPT.
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TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn SORT ORDER: Clause, Subclause, page, line

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C/ 150 SC 150.10.1 Page 6 of 6 07/03/2019 14:47:56