Cl **FM** *SC* **FM** *P* **13** *L* **54** # 54

Dudek, Mike — Marvell

Comment Type **ER** *Comment Status* **X**

The written page numbers are not matching the pdf page numbers. These comments are based on the pdf page number.

SuggestedRemedy

Fix the discrepancy.

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* **9** *L* **21** # 1

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **X**

For PMA/PMD type selection bits:

SuggestedRemedy

For PMA/PMD type selection:
Are 1 1 1 1 0 0 0 and 1 1 1 1 1 1 0 taken? By what? It would be neater if the P802.3db set were moved up or down 1 so each VRn and SRn pair differed by a single bit.
Please show the sub-rows before and after so we can see the context.
Please revise the rubric to mention 802.3cp, 802.3ct, P802.3cw and any others that use this register.
Preferably, please show all the changes that all active projects that are not already in the 802.3dc roll-up have made (802.3cp, 802.3ct, P802.3cw, any more). If all projects show each other's concurrent changes, any clashes will be more obvious.
In future, we may have 8-lane and maybe 16-lane variants of these PMD families. If this is expected, should we plan for a block of 8 or 10 PMDs, using the next (7th, bit 6) bit?

Proposed Response *Response Status* **O**

Cl **78** *SC* **78.1.4** *P* **13** *L* **13** # 18

Nicholl, Gary — Cisco

Comment Type **ER** *Comment Status* **X**

The editing instruction states "unchanged rows not shown" , however unchanged rows are shown in Table 78-1.

SuggestedRemedy

Change "(unchanged rows not shown)" to "(some unchanged rows not shown)".

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.1.1** *P* **16** *L* **3** # 22

Nicholl, Gary — Cisco

Comment Type **ER** *Comment Status* **X**

The editing instruction is incorrect. 802.3cu-2021 did not touch "Table 80-5". 802.3cu made a change to "Table 80-4a" , as inserted by 802.3cd-2018. The table table on line 6 is also incorrect, and it should be "Table 80-4a and not Table 80-5". There is already a "Table 80-5" in section 80.4.

SuggestedRemedy

Change the editing instruction to reference "Table 80-4a" and not "Table 80-5". Also change the table title on line 6 from "Table 80-5" to "Table 80-4a".

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.1.3** *P* **15** *L* **10** # 19

Nicholl, Gary — Cisco

Comment Type **ER** *Comment Status* **X**

There is a space between "and" and "in" that should be strike through.

SuggestedRemedy

Strike through space between "and" and "in" on line 10

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.1.3** *P* **15** *L* **11** # 20

Nicholl, Gary — Cisco

Comment Type **ER** *Comment Status* **X**

Use a non-breaking hyphen for "100GBASE-SR1"

SuggestedRemedy

Use a non-breaking hyphen for "100GBASE-SR1". Check , and fix as necessary, throughout the rest of the document.

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.1.4** *P* **15** *L* **18** # 21

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The editing instruction states "(unchanged rows not shown)" , however unchanged rows are shown in Table 80-1.

SuggestedRemedy

Change "(unchanged rows not shown)" to "(some unchanged rows not shown)".

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.4** *P* **16** *L* **51** # 23

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The editing instruction states "(unchanged rows not shown)" , however unchanged rows are shown in Table 80-5.

SuggestedRemedy

Change "(unchanged rows not shown)" to "(some unchanged rows not shown)".

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.2.7** *P* **18** *L* **10** # 24

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

Missing space in editing instruction between "2018' and "and".

SuggestedRemedy

Insert missing space between "2018' and "and".

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.2.7** *P* **18** *L* **13** # 25

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The space following "100GBASE-SR1," should also be underlined as it also needs to be inserted.

SuggestedRemedy

Underline the space following "100GBASE-SR1,"

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.3.3** *P* **18** *L* **24** # 26

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The space following "100GBASE-SR1," should also be underlined as it also needs to be inserted.

SuggestedRemedy

Underline the space following "100GBASE-SR1,"

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.3.3** *P* **18** *L* **31** # 27

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The space following "100GBASE-VR1," and the space following "100GBASE-SR1," should also be underlined as it also needs to be inserted.

SuggestedRemedy

Underline the space following "100GBASE-VR1," and the space following "100GBASE-SR1,"

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.3.3** *P* **18** *L* **38** # 28

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The space following "100GBASE-VR1," and the space following "100GBASE-SR1," should also be underlined as it also needs to be inserted.

SuggestedRemedy

Underline the space following "100GBASE-VR1," and the space following "100GBASE-SR1,"

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.3.3.1** *P* **18** *L* **46** # 29

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The space following "100GBASE-VR1," and the space following "100GBASE-SR1," should also be underlined as it also needs to be inserted.

SuggestedRemedy

Underline the space following "100GBASE-VR1," and the space following "100GBASE-SR1,"

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.6.2a** *P* **18** *L* **9** # 30

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The space following "100GBASE-VR1," and the space following "100GBASE-SR1," should also be underlined as it also needs to be inserted.

SuggestedRemedy

Underline the space following "100GBASE-VR1," and the space following "100GBASE-SR1," . Check and correct similar instances throughout the rest of the document.

Proposed Response *Response Status* **O**

Cl **116** *SC* **116.1.3** *P* **23** *L* **41** # 31

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The editing instruction states "(unchanged rows not shown)" , however unchanged rows are shown in Table 116-2.

SuggestedRemedy

Change "(unchanged rows not shown)" to "(some unchanged rows not shown)".

Proposed Response *Response Status* **O**

Cl **116** *SC* **116.1.4** *P* **24** *L* **24** # 32

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

There appears to be something wrong with the editing instruction and the table title that follows (Table 116-4). This table is actually Table 116-3 in 802.3-2018, 802.3cd-2018 and 802.3cn.

SuggestedRemedy

Change editing instruction and table title to "Table 116-3" and not "Table 116-4".

Proposed Response *Response Status* **O**

Cl **116** *SC* **116.1.4** *P* **25** *L* **14** # 33

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

There appears to be something wrong with the editing instruction and the table title that follows (Table 116-5). This table is actually Table 116-3 in 802.3-2018, 802.3cd-2018 and 802.3cn.

SuggestedRemedy

Change editing instruction and table title to "Table 116-4" and not "Table 116-5".

Proposed Response *Response Status* **O**

Cl **116** *SC* **116.1.4** *P* **25** *L* **36** # 34

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

The wrong row in the table is udnerlined.

SuggestedRemedy

Underline the row for 400GBASE-SR4 and remove the underlining on the row for 400GBASE-SR4.2.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.2** *P* **40** *L* **10** # 15

Lewis, David Lumentum

Comment Type **TR** *Comment Status* **X**

The center wavelength (range) for -VRn should allow for nominal wavelengths between 850 nm and 940 nm with tolerance around those wavelengths. This will increase market potential by enabling receivers to work with different transmitters operating at different wavelengths.

SuggestedRemedy

Change "TBD" to "844 to 948".

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.2** *P* **40** *L* **26** # 16

Lewis, David Lumentum

Comment Type **T** *Comment Status* **X**

The receiver characteristics for -VRn should match those for -SRn in order to support interoperability over -VR reaches.

SuggestedRemedy

Change SECQ value from TBD to match the value in the corresponding -SRn column.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.1** *P* **29** *L* **45** # 35

Nicholl, Gary Cisco

Comment Type **TR** *Comment Status* **X**

Table 167-2. 3db precedes 3ck in the amendment order according to the project timeline as indicated in the 802.3-2018 editorial database . 3ck does not exist as far as 3db is concerned, and so AUI interfaces being defined by 3ck (i.e 100GAUI-1 C2C and 100GAUI-1 C2M) should not be referenced.

SuggestedRemedy

Delete rows for 120F and 120G from Table 167-1.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.1** *P* **30** *L* **20** # 36

Nicholl, Gary Cisco

Comment Type **TR** *Comment Status* **X**

Table 167-2. 3db precedes 3ck in the amendment order according to the project timeline as indicated in the 802.3-2018 editorial database . 3ck does not exist as far as 3db is concerned, and so AUI interfaces being defined by 3ck (i.e. 200GAUI-2 C2C, 200GAUI-2 C2M, 400GAUI-4 C2C and 400GAUI-4 C2M) should not be referenced.

SuggestedRemedy

Delete rows for 120F and 120G from Table 167-2.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.1** *P* **31** *L* **14** # 37

Nicholl, Gary Cisco

Comment Type **ER** *Comment Status* **X**

"100GBASE-R PCS" wraps onto two lines in Figure 167.1. Same for "200GBASE-R" and "400GBSAE-R"

SuggestedRemedy

Update diagram to fit "100GBASE-R PCS", "200GBASE-R PCS" and "400GBASE-R PCS" on a single line, For an example, see 802.3cd-2018, Figure 138-1.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.1** *P* **40** *L* **25** # 51

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

The 100G RX and CGMII are in clause 81 not 80 (as is shown correctly in table 80-5)

SuggestedRemedy

Change 80 to 81 two places.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.1** *P* **40** *L* **51** # 52

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

unfortunate line break in the middle of a word

SuggestedRemedy

put "behave" on one line.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.5.4** *P* **36** *L* **21** # 68

Ghiasi, Ali — Ghiasi Quantum/Marvell

Comment Type **TR** *Comment Status* **X**

The Greater-less than and less than match symbols show up nu and Omega with Preview but its fine if viewed with Acrobat DC

SuggestedRemedy

Please correct so document is platform independent

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.5.4** *P* **36** *L* **23** # 38

Nicholl, Gary — Cisco

Comment Type **ER** *Comment Status* **X**

"Table 167-7" in Table 167-5 should be a cross-reference

SuggestedRemedy

Change "Table 167-7" in Table 167-5 to a cross-reference.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.5.4** *P* **36** *L* **25** # 39

Nicholl, Gary — Cisco

Comment Type **TR** *Comment Status* **X**

The text is inconsistent with previous ammendments, e.g. clause 122 in 802.3-2018 and clause 151 in 802.3cu-2021.

SuggestedRemedy

Change:
"compliant 100GBASE-VR1, 200GBASE-VR2, 400GBASE-VR4, 100GBASE-SR1, 200GBASE-SR2, or 400GBASE-SR4 signal input"
to:
"compliant 100GBASE-R, 200GBASE-R, or 400GBASE-4 signal input"

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.5.4** *P* **47** *L* **23** # 53

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

The Average receive power each lane min is in Table 167-8 not Table 167-7 and should be a hot link.

SuggestedRemedy

Change to 167-8 and make it a hot link.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.5.7** *P* **48** *L* **7** # 55

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

Table 167-7 should be a hot link

SuggestedRemedy

fix it. Also on line 19

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **7** # 41

Nicholl, Gary — Cisco

Comment Type **ER** *Comment Status* **X**

The order of the parameters in Table 167-7 is not consistent with the order used in 802.3cu (see 802.3cu-2021 Table 151-7 as an example) or the parmeters listed in Table 167-11 and in sub-clause 167.8. There was a long discssion in 802.3cu on this topic, so probably best to correct it now (rather than waiting until working group ballot).

SuggestedRemedy

Reoder the parameters in Table 167-7 to be consistent with the order used in 802.3cu (see 802.3cu-2021 Table 151-7 as an example), and the order used in sub-clause 167.8 and Table 167-11.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **15** # 2

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **X**

We should consider a wavelength range that allows the best laser bandwidth.

SuggestedRemedy

Consider a wider range of wavelengths for VR than the draft range for SR. This doesn't necessarily mean that the SRS signal need be slower, as laser speed and fibre bandwidth will net off.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **15** # 13

Lewis, David — Lumentum

Comment Type **TR** *Comment Status* **X**

The center wavelength (range) for -VRn should allow for nominal wavelengths between 850 nm and 940 nm with tolerance around those wavelengths. This will increase market potential and leverage the high volume manufacturing infrastructure currently supplying 3D sensing applications.

SuggestedRemedy

Change "TBD" to "844 to 948".

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **26** # 66

Palkert, Tom — Macom

Comment Type **TR** *Comment Status* **X**

Need value for TBD for VR Overshoot

SuggestedRemedy

Replace TBD with 12%

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **26** # 14

Lewis, David — Lumentum

Comment Type **T** *Comment Status* **X**

The transmitter characteristics for -VRn should match those for -SRn in order to support interoperability over -VR reaches.

SuggestedRemedy

Change OMAouter minus TDECQ (min), TDECQ (max), and TECQ (max) values from TBD to match the values in the corresponding -SRn column.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **26** # 42

Nicholl, Gary — Cisco

Comment Type **TR** *Comment Status* **X**

Overshoot/Undershoot is a maximum.

SuggestedRemedy

Change "Overshoot/undershoot" to "Overshoot/undershoot (max)"

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **28** # 40

Nicholl, Gary — Cisco

Comment Type **ER** *Comment Status* **X**

Change the way OMA (min) requirements are captured in the “transmit characteristisc" table (Table 167-7, to be consistent with the change that was made by 802.3cu. For example see 802.3cu-2018 Table 151-7 and https://www.ieee802.org/3/cu/public/May20/nicholl_3cu_03_051920.pdf.

SuggestedRemedy

Make the following changes to Table 167-7:

- Change row "Outer Optical Modulation Amplitude (OMAouter), each lane (min)" to be consistent with the format used in 802.3cu-2021 and https://www.ieee802.org/3/cu/public/May20/nicholl_3cu_03_051920.pdf.

- Delete the row "Launch power in OMAouter minus TDECQ (min)"

- Delete footnote c.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **28** # 11

Tang, Yi — Cisco Systems, Inc.

Comment Type **T** *Comment Status* **X**

Currently, the minimum lanuch power in OMA is constrained by TDECQ, but independent of TECQ. This allows for a transimitter with a TECQ of 4.4dB operating at -3dBm OMA while a transmitter with a TDECQ of 4.4dB can only operating at 0dBm and above. To address the spec gap, OMA-TECQ shall be specified as well as OMA-TDECQ.

SuggestedRemedy

"Launch power in OMAouter minus TDECQ (min)"
shall be changed to
"Launch power in OMAouter minus T(D)ECQ (min)"

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **30** # 63

Palkert, Tom — Macom

Comment Type **TR** *Comment Status* **X**

Need value for TBD for TDECQ

SuggestedRemedy

Replace TBD for TDECQ with 3.4 dB

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **33** # 3

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **X**

As the channel is relatively slower than for any other optical PMDs so far, we should re-optimise the spec for this, encouraging good equalisable signals both after and before the fibre, not over-emphasised flaky ones. Overshoot/undershoot should be a useful protection eventually but it's still evolving, and the K limit can catch some bad transmitters that it misses - and K is a free by-product of TDECQ, K' is a free by-product of TECQ.
The K limit is similar to VEC in C2M: a screen for signals that are bad after equalisation.

SuggestedRemedy

Insert rows for K'=TECQ-10.log10(Ceq') and/or K=TDECQ-10.log10(Ceq), limit TBD between 3.4 and 4 dB. Consider if TDECQ max (and SECQ) should be increased (but see another comment recommending an improved reference equalizer).

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **41** # 69

Ghiasi, Ali — Ghiasi Quantum/Marvell

Comment Type **TR** *Comment Status* **X**

Encircled flux Greater-less than and less than match symbols show up nu and Omega with Preview but its fine if viewed with Acrobat DC

SuggestedRemedy

Please correct so document is platform independent

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **41** # 43

Nicholl, Gary Cisco

Comment Type **TR** *Comment Status* **X**

Should "Encircled Flux" be defined in sub-clause 167.8 ?

SuggestedRemedy

Add a defintion and measurement method (which can be a reference) for "encircled flux" in sub-clause 167.8

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.1** *P* **39** *L* **48** # 44

Nicholl, Gary Cisco

Comment Type **TR** *Comment Status* **X**

802.3cu added a Figure to illustrate "OMAouter each lane (max) and OMAouter each lane (min) versus TDECQ"

SuggestedRemedy

Add a figure (and associated text) following Table 167-7 to illustrate "OMAouter each lane (max) and OMAouter each lane (min) versus TDECQ" for the different PMDs. See 802.3cu-2021 Figure 151-3 as an example.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.2** *P* **40** *L* **19** # 10

Tang, Yi Cisco Systems, Inc.

Comment Type **TR** *Comment Status* **X**

Raise minimum SECQ from 1.4dB to 1.8dB to allow additional margin for RX. Supporting presentation "tang_3db_adhoc_01a_062421.pdf" was reviewed by task force on 06/24.

SuggestedRemedy

All changes proposed are listed in the supporting presentation "tang_3db_adhoc_01a_062421.pdf".

Page 40, 167.7.2 Table 167-8:
Average receiver power, each lane (min): -6.4dBm
Stressed receiver sensitivity (OMAouter), each lane (max): -2dBm
Receiver sensitivity (OMAouter), each lane (max): max(-4.6, SECQ - 6.4) dBm.
Remove Editors' note c

Page 39, 167.7.1 Table 167-7:
Average launch power, each lane (min): -4.6dBm
Outer Optical Modulation Amplitude (OMAouter), each lane (min): -2.6dBm
Remove Editors' note b
Change note c to "Even if the TDECQ < 1.8dB"

Page 45, 167.8.12, Equation 167-1:
RS = Max(-4.6, SECQ-6.4) (dBm)
Change Figure 167-4 accordingly to match modified equation 167-1

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.2** *P* **40** *L* **20** # 45

Nicholl, Gary Cisco

Comment Type **TR** *Comment Status* **X**

In 802.3cu we made "receiver sensitivity" normative and changed the way it is represented in the table (see 802.3cu-2021, Table 151-8 as an example).

SuggestedRemedy

Make the following changes to Table 167-8:

- Change the row "Receiver sensitivity (OMAouter), each lanee (max)" to use the same format adopted by 802.3cu-2021. See 802.3cu-2021, Tab;e 151-8 as an example.

- Delete footnote e

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.2** *P* **40** *L* **24** # 67

Palkert, Tom — Macom

Comment Type **TR** *Comment Status* **X**

Need value for TBD for SECQ for VR

SuggestedRemedy

Replace TBD with value of 3.4 dB

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.2** *P* **40** *L* **38** # 46

Nicholl, Gary — Cisco

Comment Type **TR** *Comment Status* **X**

802.3cu added a Figure to illustrate "Receiver sensitivity (OMAouter), each lane (max) versus TECQ" for the different PMDs. Note in defining receiver sensitivity 802.3cu switched to using TECQ rather than SECQ. I have submitted a separate comment against the 167.8.12 proposing to make the same change for 802.3db.

SuggestedRemedy

Add a figure (and associated text) following Table 167-8 to illustrate "Receiver sensitivity (OMAouter), each lane (max) versus TECQ" for the different PMDs. See 802.3cu-2021 Figure 151-4 as an example.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.2** *P* **40** *L* **40** # 70

Ghiasi, Ali — Ghiasi Quantum/Marvell

Comment Type **TR** *Comment Status* **X**

We have not seen compeling enough advantage with 940 nm VCSELs, not to mention these high speed VCSELs are very different designs than 940 nm VCSELs from 3D sensing, the 940 nm VCSELs require InGaAs detector and not backward compatible with 200GBASE-SR4.

SuggestedRemedy

Change TBD with center wavelength of 840-860 nm

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.2** *P* **51** *L* **33** # 56

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

With equalizing receivers it is possible to pass stressed receiver sensitivity while not being able to pass sensitivity and such a receiver would not be inter-operable with some Tx's and channel combinations. For this reason 802.3cu made the sensitivity specification normative

SuggestedRemedy

Delete footnote "e". Also on page 56 line 44 delete "is informative and" and delete "The normative requirement for receivers is stressed receiver sensitivity." line 1 page 57. on line 45 page 45 change "should" to "shall".

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.3** *P* **41** *L* **16** # 17

Lewis, David — Lumentum

Comment Type **T** *Comment Status* **X**

Replace the TBDs for -VRn in Table 167-9 to include the same penalties as -SRn.

SuggestedRemedy

Change power budget (for max TDECQ) from TBD to 6.4 dB. Change allocation for penalties (for max TDECQ) from TBD to 4.6 dB. Change additional insertion loss allowed from TBD to 0.2 for OM3, and 0.1 for OM4 and OM5.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.3** *P* **41** *L* **27** # 47

Nicholl, Gary — Cisco

Comment Type **TR** *Comment Status* **X**

802.3cu added several figures following the illustrative link budget table to illustrate the "Transmitter OMAouter each lane versus TDECQ and receiver sensitivity (OMAouter) each lane versus TECQ" for each PMD.

SuggestedRemedy

Add figures (and associated text) following Table 167-9 to illustrate "Transmitter OMAouter each lane versus TDECQ and receiver sensitivity (OMAouter) each lane versus TECQ" for the different PMDs. See 802.3cu-2021 Figure 151-5 as an example.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.7.3** *P* **52** *L* **22** # 57

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

The minimum OMA given for VR in table 167-7 is -3dBm The OMA sensitivity for VR in table 167-8 is-5dBm Therefore the additional insertion loss allowed can be calculated. However providing additional insertion loss for VR may not be the best use of the optical budget.

SuggestedRemedy

Either put 0.2dB for 0M3 and 0.1dB for OM4 and OM5 for additional insertion loss allowed or put 0.1dB for OM3 and 0dB for OM4 and OM5 and make the minimum Tx specs 0.1dB lower for VR than for SR.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5** *P* **43** *L* **19** # 4

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **X**

The rules for threshold adjust should be improved because they make xECQ measurements inaccurate, because they rely on the OMAouter levels being found to an accuracy better than 1% of the OMA, and the measurement method we use for OMA isn't that good. Also we will need better xECQ technique if we move to MMSE optimization.

SuggestedRemedy

Proposal to follow.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5** *P* **43** *L* **21** # 72

Ghiasi, Ali — Ghiasi Quantum/Marvell

Comment Type **TR** *Comment Status* **X**

TDECQ precedure allow up to +/- 1% threshold adjustment given that VCSEL have larger waveform excursion where OMA (1/6, 1/2, 2/3) levels deviates from signal mean crossing this end up increasing TDECQ

SuggestedRemedy

Most CDR use statistical mean to set the slicer level and there is further adjustment capability as it has been suggested there is no issue to increase the TDECQ threshold adjustment from 1% to 2%

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5** *P* **43** *L* **27** # 8

Le Cheminant, Greg — Keysight Technologies

Comment Type **E** *Comment Status* **X**

The concept of using two filters for the TDECQ measurement could be better understood and clearer to implement by describing the function of each filter

SuggestedRemedy

Update the existing text for the first as follows: (Line 27)…….The first filter represents the system receiver and has a 3 dB bandwidth of approximately 26.5625 GHz…….(Line 29) The second filter represents the dispersion of the fiber and has a 3 dB bandwidth of approximately TBD GHz .....(Line 34) The first filter represents the system receiver and has a 3 dB bandwidth of approximately 26.5625 GHz .....(line 37) The second filter represents the dispersion of the fiber and has a 3 dB bandwidth of approximately 18 GHz with

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5** *P* **43** *L* **29** # 65

Palkert, Tom — Macom

Comment Type **TR** *Comment Status* **X**

Need value for the bandwidth of the 2nd filter for VR

SuggestedRemedy

Replace TBD with value of 22 GHz

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5** *P* **43** *L* **40** # 5

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **X**

Per D1.0 comment 30, "Add editors' note: The noise handling in the fiber emulation and the fiber response is under further study".

SuggestedRemedy

Does the draft need to say more about this?

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5** *P* **54** *L* **15** # 58

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

The test patterns to be used for the test are in table 167-11 not 167-10

SuggestedRemedy

Change the reference to table 167-11

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5** *P* **54** *L* **25** # 61

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **X**

The comination of the O/e convertor and oscilloscope doesn't consist of two filters.

SuggestedRemedy

Replace "the combination of the O/E converter and the oscilloscope used to measure the optical waverform consists of two cascaded filters" with
"the frequency response of the combination of the O/E converter and the oscilloscope used to measure the optical waveform is that of two cascaded filters". Also on line 34. Also on page 55 line 28 if a separate comment I've made is not accepted.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5.1** *P* **43** *L* **50** # 64

Palkert, Tom — Macom

Comment Type **TR** *Comment Status* **X**

Need value for Ref equalizer tap length TBD

SuggestedRemedy

Replace TBD with value of 9

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5.1** *P* **43** *L* **50** # 71

Ghiasi, Ali — Ghiasi Quantum/Marvell

Comment Type **ER** *Comment Status* **X**

The debate between 5T vs 9T FFE need to consider VCSEL BW, improvement in packaging, compatability between VR and SR, and potentially lower cost and power

SuggestedRemedy

Given that VCSELs BW and packaging are improving and compatability between VR and SR transmitters are essential, a 5T FFE satisfies the above and longer term will have lower cost and power. Replace TBD tap with 5, Tap 1, tap 2, or tap 3, has the largest magnitude tap coefficient, which is constrained to be at least 0.8.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5.1** *P* **44** *L* **1** # 6

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **X**

As both the transmitter and the channel are slow as compared with SMF, we have a 9-tap FFE in the draft. But that isn't the best way to address a slow signal. Using this sub-optimum reference receiver forces us to choose high xECQ which burdens real receivers with very nasty signals that may be nasty for even a very smart receiver. A reference equalizer slightly more like the 120G C2M one (which is intended for even slower channels) would be better.
Also, with 9 taps and 3 cursor positions, we have 3, 8-dimensional optimizations, which is time-consuming.

SuggestedRemedy

Change from FFE to CTLE, FFE, 1-tap DFE. Simple CTLE with single pole-zero pair as these channels are not as slow as 120G C2M. Remove unnecessary FFE taps that duplicate the CTLE function and/or if feasible, reduce the number of cursor positions.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.5.1** *P* **44** *L* **4** # 7

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **X**

We have 9 taps rather than the usual 5 because the channel is relatively slower than for other optical PMDs. So the last few taps should be correcting the tail of the response and should be quite small: actually much smaller than these proposed limits, but we can tighten them later as we learn more.

SuggestedRemedy

Impose limits on the absolute values of tap coefficients 7, 8 and 9: 0.4 0.3 0.2 for now. Also for the last taps for VR, depending how long that reference equalizer is.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.6** *P* **44** *L* **28** # 9

Le Cheminant, Greg — Keysight Technologies

Comment Type **E** *Comment Status* **X**

If the comment submitted for 167.8.5 is implemented, 167.8.6 can be simplified using the proposed text change

SuggestedRemedy

replace the main paragraph of 167.8.6 with: The TECQ of each lane is measured using the methods specified for TDECQ in 167.8.5 except the second filter representing the dispersion of the fiber is not used.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.6** *P* **55** *L* **28** # 59

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

It would be possible to make this section significantly clearer for the implementer

SuggestedRemedy

Replace "The TECQ of each lane is measured using the methods specified for TDECQ in 167.8.5 except the combination of the O/E converter and the oscilloscope used to measure the optical waveform has a 3 dB bandwidth of approximately 26.5625 GHz with a fourth-order Bessel-Thomson response to at least 1.3 × 53.125 GHz. At frequencies above 1.3 × 53.125 GHz, the response should not exceed □24 dB. Compensation may be made for any deviation from an ideal fourth-order Bessel-Thomson" with either
"The TECQ of each lane is measured using the methods specified for TDECQ in 167.8.5 except that instead of using the two cascaded filters just the first is used." or
"The TECQ of each lane is measured using the methods specified for TDECQ in 167.8.5 except that the second filter is omitted of the two cascaded filters"

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.6** *P* **55** *L* **33** # 60

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

Section 167.8.5.1 specifies the reference equalizer including which taps have the largest magnitude and what that value is. Rows 33 to 37 are contradicting that information. Also as the same receiver is used to receive the signal from both short fibers and long fibers there should not be a difference in the reference receiver for TECQ and TDECQ

SuggestedRemedy

Delete rows 33 to 37. If appropriate adjust the parameters in section 167.8.5.1

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.12** *P* **45** *L* **42** # 48

Nicholl, Gary — Cisco

Comment Type **TR** *Comment Status* **X**

In 802.3cu we made "receiver sensitivty" a normative parameter and defined it based on TECQ rather than SECQ. We should make the same change 802.3db.

SuggestedRemedy

Update section 167.8.12 to make "receiver sensitivity" a normative paramter and defined based on TECQ rather than SECQ. Propose using the text of 802.3cu-2021, sub-clause 151.8.12 as a template.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.13** *P* **46** *L* **28** # 49

Nicholl, Gary — Cisco

Comment Type **TR** *Comment Status* **X**

The first paragraph makes references to "121.8.10.1", "121.8.10.3" and "121.8.5.2" in 802.3-2018. These references do not exisit in this specification. Perhaps the correct references should be "121.8.9.1", "121.8.9.3" and "121.8.9.2" in keeping with 802.3cd-2018, sub-clause 138.8.10 ?

SuggestedRemedy

Change "121.8.10.1" to "121.8.9.1"

Change "121.8.10.3" to "121.8.9.3"

Change "121.8.5.2" to "121.8.9.2"

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.8.13** *P* **46** *L* **46** # 50

Nicholl, Gary — Cisco

Comment Type **TR** *Comment Status* **X**

Need to add another exception to the list to make it clear that the values of over/under-shoot and transmitter power excursion of the stressed receiver conformance test signal are within the limits specified in Table 167-7.

SuggestedRemedy

Add an additional exception to the list to state that the the values of over/under-shoot and transmitter power excursion of the stressed receiver conformance test signal are within the limits specified in Table 167-7. See 802.3cu-2021, sub-clause 151.8.13 as an example.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.10** *P* **59** *L* **33** # 62

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

Should be 200GBASE-VR2 on line 33 and 400GBASE-VR4 on line 34

SuggestedRemedy

Change them.

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.10.1** *P* **49** *L* **28** # 12

Tang, Yi — Cisco Systems, Inc.

Comment Type **T** *Comment Status* **X**

The wavelength range in footnote "c" of table 167-13 is not in line with the center wavelength range defined in table 167-7-Transimit characteristics for the SRx variants.

SuggestedRemedy

remove wavelength range from footnote "c" of table 167-13

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.10.2.2.1** *P* **50** *L* **11** # 73

Ghiasi, Ali — Ghiasi Quantum/Marvell

Comment Type **TR** *Comment Status* **X**

The Greater-less than and less than match symbols show up nu and Omega with Preview but its fine if viewed with Acrobat DC

SuggestedRemedy

Please correct so document is platform independent

Proposed Response *Response Status* **O**

Cl **167** *SC* **167.10.3.3** *P* **52** *L* **17** # 74

Ghiasi, Ali
Ghiasi Quantum/Marvell

Comment Type **TR** *Comment Status* **X**

Most customers have spoken in support of angled MPO connector due to performance issue which can be difficult to meet with PC MPO, introducing option B PC finish MPO MDI unlikley to have broad market potential and will fragment the market. There is also concern with plugging type A into Type B or vis versa.

SuggestedRemedy

Remove option B, but define the cable plant where both PC and APC are supported.

Proposed Response *Response Status* **O**