Cl **00** *SC* **0** *P* *L* # 11

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(bucket)*

The format used for defining the various status counters for the PCS (175.2.5.3), PMA (176.7.4.1), and Inner FEC (177.5.4.1, 184.5.7) vary wildly from clause to clause.
Rewrite/reformat the counter definitions in the same style.

SuggestedRemedy

Reformat the counter definitions in 175.2.5.3, 176.7.4.1, 177.5.4.1, and 184.5.7 to be the same format. Use either 175.2.5.3 ro 177.5.4.1/184.5.7 as the template.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Reformat the counter definitions in 176.7.4.1, 177.5.4.1, and 184.5.7 to use the same format as 175.2.5.3.
Implement with editorial license.
[Editor's note: CC: 176, 177, 184]

Cl **00** *SC* **0** *P* **261** *L* **47** # 273

Ran, Adee — Cisco

Comment Type **TR** *Comment Status* **A** *Management interface*

"If the MDIO Interface is not implemented, provision of an equivalent mechanism to access the variables is recommended."
This sentence is repeated in multiple clauses and annexes (14 instances).

Access to the management variables is required ("shall") if MDIO is implemented, but otherwise it is only recommended to have them accessible.

MDIO is optional but access to the management variables should be a requirement even if it is not implemented.

SuggestedRemedy

Change "provision of… is recommended" to "shall be provided", with editorial license, in all instances

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In 175.8, 176.11, 177.10, 178.13, 179.14, 180.11, 181.11, 182.11, 184.9, 185.11, 186.7, 187.11, and 178B.15.
Change "If the MDIO Interface is not implemented, provision of an equivalent mechanism to access the variables is recommended."
To: "If the MDIO Interface is not implemented, an alternate mechanism to access management variables shall be provided."
Implement with editorial license.

Cl **00** *SC* **0** *P* **338** *L* **30** # 302

Ran, Adee — Cisco

Comment Type **T** *Comment Status* **R** *(withdrawn)*

The Skew and Skew Variation at SP2 are specified with the words "is limited to", while for all other measurement points it is specified with "shall be less than".
"is limited to" reads like an informative statement, but it is a normative requirement (it is not related to the fact that SP2 may not be accessible; the same is true for SP5).

This wording appears in multiple places in the draft (per PMD and data rate). Note that the same wording is used in multiple clauses of the base standard. If necessary, it can be dealt with in maintenance.

SuggestedRemedy

Change "is limited to" to "shall be less than" in all instances of Skew and Skew variation at SP2.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **1** *SC* **1.4.92a** *P* **53** *L* **10** # 269

Ran, Adee Cisco

Comment Type **E** *Comment Status* **R** *(withdrawn)*

The definition of 1.6TAUI-n includes "used for chip-to-chip or chip-to-module electrical interfaces" followed by "For chip-to-module interfaces and for chip-to-chip interfaces". This duplicity is not helpful.

Following the new descriptions introduced in the new AUI annexes, the clarity of this definition can be improved.

Similar concerns exist in the definitions of 200GAUI-n, 400GAUI-n, and 800GAUI-n.

SuggestedRemedy

Change the definition text to:
"A physical instantiation of the PMA service
interface over n lanes, enabling partitioning of a 1.6 Tb/s Physical Layer implementation across multiple devices. Specified separately for chip-to-chip and chip-to-module electrical interfaces. Two
widths of 1.6TAUI-n are defined: 16-lane (1.6TAUI-16 C2C and 1.6TAUI-16 C2M), and eight-lane
(1.6TAUI-8 C2C and 1.6TAUI-8 C2M)."

Apply corresponding changes in the definitions of 200GAUI-n, 400GAUI-n, and 800GAUI-n.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **45** *SC* **45.2.1** *P* **70** *L* **7** # 272

Ran, Adee Cisco

Comment Type **T** *Comment Status* **R** *(bucket)*

Inner FEC registers are contained in the PMA/PMD section but there is no reference to the inner FEC positioning in the stack, nor to the clauses where it is defined (177 and 184).

SuggestedRemedy

Add test describing the inner FEC MDIO positioning (in the same MMD as the PMD).

Response *Response Status* **C**

REJECT.
There is precedence for having FEC control and status registers in the PMA/PMD address space and the postioning of this FEC functionility is not called out in 45.2.1. There is no justification for making an exception for the inner FEC registers.

Cl **45** *SC* **45.2.1** *P* **70** *L* **7** # 271

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

The base text of 45.2.1 includes references to multiple PMA sublayers and how MMD addresses are allocated.
This text points to 83.1.4, 109.1.4, and 120.1.4, but does not include the corresponding references to the new PMAs: 173.1.4 (apparently missed by 802.3df) and 176.11.

SuggestedRemedy

Bring in the first paragraph of 45.1.2 and add references to 173.1.4 and 176.11.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Bring in the first paragraph of 45.2.1 from the base standard and add references to 173.1.4 and 176.1.5

Cl **45** *SC* **45.2.1.213a** *P* **92** *L* **13** # 6

Marris, Arthur Cadence Design Systems

Comment Type **T** *Comment Status* **A** *(bucket)*

Replace the 8 enable bits with a single reset bit in Table 45–177a

SuggestedRemedy

In Table 45–177a delete rows "Inner FEC enable lane 1" to "Inner FEC enable lane 7" and in the row for "1.2400.0" change "enable" to "reset"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #1.

Cl **45** *SC* **45.2.1.213a** *P* **92** *L* **14** # 91

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(bucket)*

Description column of fields in "Table 45-177a - Inner FEC control register bit definitions" is inconsistent with other MDIO registers.

SuggestedRemedy

Propose the following text for the description column of 1.2400.7 row:
1 = Enable Inner FEC on lane 7
0 = Disable Inner FEC on lane 7

Propose similar update to description column of 1.2400.0 through 1.2400.6 rows.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #1.

Cl **73** *SC* **73.6.2.5.3** *P* **122** *L* **46** # 92

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(bucket)*

The paragraph that begins "The variable an_rs_fec_int_negotiated_control indicates that RS-FEC-Int ..." is located in the incorrect sub-clause.

SuggestedRemedy

Propose to move the paragraph such that it is inserted after the second paragraph of 73.6.2.5.4 (consistent with editorial guidance found in 802.3ck-2022, Sub-Clause "73.6.5.3 FEC control variables").

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.6.4** *P* **125** *L* **25** # 93

Nicholl, Shawn AMD

Comment Type **E** *Comment Status* **A** *(bucket)*

Currently says "D[10:0] and D[47:16] contains the Unformatted Code Field ...", but should use the singular verb.

SuggestedRemedy

Propose "D[10:0] and D[47:16] contain the Unformatted Code Field"

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.8** *P* **128** *L* **21** # 94

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(bucket)*

Typo mr_lp_adv_extened_ability[32:1] in "Table 73-6-Backplane Ethernet Auto-Negotiation variable to MDIO register mapping"

SuggestedRemedy

Propose mr_lp_adv_extended_ability[32:1]

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.10.2** *P* **130** *L* **14** # 546

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **R** *(bucket)*

This is contrary to the standard order (slow to fast).

SuggestedRemedy

Put the new entry immediately below the 100G/lane one. As the base document is out of order and this project amendment cannot deliver a properly ordered table without cleaning it up, bring the other two link_fail_inhibit_timer rows into the draft and put them in the right order.

Response *Response Status* **C**

REJECT.
This would be best addressed at the revision project to create the updated base standard. Bringing in additional rows not relevant to 802.3dj scope would not be useful.

Cl **73A** *SC* **73A.1a** *P* **640** *L* **40** # 97

Nicholl, Shawn AMD

Comment Type **E** *Comment Status* **A** *(bucket)*

Currently says "... indicates additional abilities that were not accommodated in the link codeword Base Page ..." Present tense seems more appropriate.

SuggestedRemedy

Propose "... indicates additional abilities that are not accommodated in the link codeword Base Page ..."

Response *Response Status* **C**

ACCEPT.

Cl **116** *SC* **116.1.4** *P* **138** *L* **18** # 114

Slavick, Jeff Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Table 116-3b has a thick bar on the right side of clause 73 M

SuggestedRemedy

adddress the formatting issue

Response *Response Status* **C**

ACCEPT.

Cl **116** *SC* **116.3.3.4.1** *P* **150** *L* **12** # 152

Bruckman, Leon — Nvidia

Comment Type **E** *Comment Status* **A** *(bucket)*

Missing comma

SuggestedRemedy

To make consistent with the text in the previous section penumtimate paragph, add a comma before: but it is considered…
Or delete the coma in the previous section penumtimate paragph, wathever makes sense grammatically.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
On page 149 line 27 delete comma preceding " but it is considered".

Cl **116** *SC* **116.4** *P* **150** *L* **52** # 24

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(bucket)*

Delay limits for the 200GBASE-R Inner FEC are TBD in Table 116-6 but are indeed defined in 177.7.

SuggestedRemedy

Update Table 116-6 with the delay numbers specified in 177.7.

Response *Response Status* **C**

ACCEPT.

Cl **116** *SC* **116.4** *P* **151** *L* **49** # 25

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(bucket)*

Delay limits for the 400GBASE-R Inner FEC are TBD in Table 116-7 but are indeed defined in 177.7.

SuggestedRemedy

Update Table 116-7 with the delay numbers specified in 177.7.

Response *Response Status* **C**

ACCEPT.

Cl **119** *SC* **119.3** *P* **162** *L* **33** # 14

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(bucket)*

Error bin counters are provided for 800GBASE-R and 1.6TBASE-R PCS but not for the 200GBASE-R or 400GBASE-R PCS. These counters are needed for accurate testing of a PHY receive path per 174A.7.

SuggestedRemedy

In Clause 119 add bin counters FEC_codeword_error_bin_i as defined in 172.3.6 stating that these counters are optional if the PCS is used in a PHY that includes 200 Gb/s per lane PMD.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In addition to bin counters FEC_codeword_error_bin_i as defined in 172.3.6, also add FEC_cw_counter as defined in 172.3.5. Since these counters are already optional in Clause 172, there is no need to restrict the optionality to " PHYs that includes 200 Gb/s per lane PMD"
Implement with editorial license.

Cl **120F** *SC* **120F.1** *P* **645** *L* **53** # 428

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *(bucket)*

The reference to 120F.4 should be a hot link as this is changed in 802.3dj

SuggestedRemedy

Make it so.

Response *Response Status* **C**

ACCEPT.

Cl **120F** *SC* **120F.1** *P* **646** *L* **9** # 429

Dudek, Mike — Marvell

Comment Type **ER** *Comment Status* **R** *(withdrawn)*

The reference to 135F.3.2.1 is not correct. That subsection is about Receiver Signalling rate.

SuggestedRemedy

Change the reference to 135F.5

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **169** *SC* **169.2.4** *P* **172** *L* **50** # 42

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

This clause should include a reference to the 800GBASE-ER1 PMA

SuggestedRemedy

Add a sentence: The 800GBASE-ER1 PMA is specified in clause 186.3

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **169** *SC* **169.4** *P* **178** *L* **22** # 43

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

Table 169-4 is missing rows for the 800GBASE-ER1 PCS and PMA

SuggestedRemedy

Add a row for the PMA. Depending on the disposition of other comments about ER1 architecture, add a row for the ER1 PCS or the ER1 FEC. The values for both in clause 186 are still TBD.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **169** *SC* **169.4** *P* **178** *L* **23** # 44

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

Clause 176 has delay constraints for 800G 32:4 and 4:4 PMAs, clause 177 has values for 800GBASE-R inner FEC, and clause 184 has values for the LR1 inner FEC

SuggestedRemedy

Replace the TBDs with the appropriate values from Table 176-7, Table 177-5, and from clause 184.7 for the LR1 inner FEC.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **169** *SC* **169.4** *P* **178** *L* **23** # 154

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(bucket)*

The values for 800GBASE-R Inner FEC and 800GBASE-LR1 are defined in the respective referenced sections.

SuggestedRemedy

Fill the TBDs in Table 169-4 for 800GBASE-R Inner FEC and 800GBASE-LR1 with the values in the referenced sections

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #44.

Cl **171** *SC* **171.7** *P* **200** *L* **41** # 418

Nicholl, Gary Cisco Systems

Comment Type **TR** *Comment Status* **A** *(bucket)*

Annex 176B does not show any MMD numbering.

SuggestedRemedy

Change the second sentence from:
"Annex 173A and Annex 176B show additional examples of 800GXS partitioning and MMD numbering"
to:
"Annex 173A shows additional examples of 800GXS partitioning and MMD numbering using the BM PMA. 176B.6.2 shows additional examples of 800GXS paritioning using both BM PMA and SM PMA".

Change the second sentnce of the second paragrpah from:
"Annex 176B shows additional examples of 1.6TXS partitioning and MMD numbering."
to:
"176B.7.2 shows additional examples of 1.6TXS partitioning"

Change the title of 171.7 from:
"800GXS and 1.6TXS partitioning example"
to:
"800GXS and 1.6TXS partitioning examples"

Make sure to underline any added text and to strikethrough any deleted text.

Response *Response Status* **C**

ACCEPT.

Cl **171** *SC* **171.9.5.5** *P* **216** *L* **22** # 95

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(bucket)*

Currently says "transmits what it receives from the 800GMII". However, this sub-clause pertains to 1.6TXS.

SuggestedRemedy

Propose "transmits what it receives from the 1.6TMII".

Response *Response Status* **C**

ACCEPT.

Cl **174** *SC* **174.3.2** *P* **235** *L* **20** # 87

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **R** *(bucket)*

In Figure 174-4 (1.6T Inter-sublayer interfaces with Inner FEC), there is no AUI. The Inner FEC will (almost) always be in an optical module below an AUI connection to a host. It would be better to show the Inner FEC below an AUI in this figure since the layer stack shown, while logically correct, will rarely, if ever, be used.

SuggestedRemedy

Add a "1.6T BASE-R 8:8 PMA" between the "1.6T BASE-R 16:8 PMA" on line 14 and the "1.6TBASE-R Inner FEC" on line 20 which creates an AUI interface between the two PMAs. And then add the necessary inter-layer signals on the AUI connection between the two PMAs.

Response *Response Status* **C**

REJECT.
The intent of this diagram (see figure title) is to show intersublayer interfaces not provide an exhaustive set of implementation configurations, which is provided instead in Annex 176B.

Cl **174A** *SC* **174A.4** *P* **662** *L* **3** # 161

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(bucket)*

Pre-FEC BER should be 2.21 × 10–4.

SuggestedRemedy

Change: " 2.21 × 10–14."
To: "2.21 × 10–4."

Response *Response Status* **C**

ACCEPT.

Cl **174A** *SC* **174A.5** *P* **668** *L* **14** # 469

Maki, Jeffery Juniper Networks

Comment Type **T** *Comment Status* **R** *(bucket)*

"Frame loss ratio for entire PHY" is wrong or at least has been unnecessarily truncated to one significant digit compared to other cases in the draft and in the published 802.3-2022 standard.

SuggestedRemedy

Change "Frame loss ratio for entire PHY" to 6.2x10^-11.

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #467.

Cl **174A** *SC* **174A.5** *P* **668** *L* **17** # 470

Maki, Jeffery Juniper Networks

Comment Type **T** *Comment Status* **R** *(bucket)*

"Frame loss ratio for entire PHY" is wrong or at least has been unnecessarily truncated to one significant digit. In turn, the "Codeword error ratio for entire PHY" is wrong.

SuggestedRemedy

Change "Codeword error ratio for entire PHY" to 1.50x10^-11.

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #467.

Cl **174A** *SC* **174A.5** *P* **668** *L* **19** # 471

Maki, Jeffery Juniper Networks

Comment Type **T** *Comment Status* **R** *(bucket)*

"Frame loss ratio for entire PHY" is wrong or at least has been unnecessarily truncated to one significant digit. In turn, the "BER for entire PHY (BERtotal)" is wrong.

SuggestedRemedy

Change "BER for entire PHY (BERtotal)" to 2.93x10^-4.

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #467.

Cl **174A** *SC* **174A.6.1.3** *P* **664** *L* **35** # 162

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(bucket)*

In Hm is not clear what is the meaning of "m"

SuggestedRemedy

Define the meaning of "m" in Hm or remove the "m"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
H_m is a set of measured histograms.
Change: "Hm(i)(k) is a set of 17-bin histograms"
To: "Hm(i)(k) is a set of measured 17-bin histograms"

Cl **174A** *SC* **174A.6.1.3** *P* **664** *L* **41** # 163

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **R** *(bucket)*

The polynomial for PRBS31Q is not defined

SuggestedRemedy

Define that the PRBS31Q is produced by the polynomial defined in Equation (49–2) and shown in Figure 49-9.

Response *Response Status* **C**

REJECT.
The PRBS31Q test pattern is defined in the either the PMA clause or the Inner FEC clause. This detail is beyond the scope of this annex. The proposed change does not improve clarity or accuracy of the draft.

Cl **174A** *SC* **174A.6.1.3** *P* **664** *L* **48** # 432

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *(bucket)*

Wrong equation reference

SuggestedRemedy

Change Equation 174A-3 to 174A-1

Response *Response Status* **C**

ACCEPT.

Cl **174A** *SC* **174A.6.1.4** *P* **665** *L* **24** # 165

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **R** *(bucket)*

Define the ranges of k and i

SuggestedRemedy

Change: "for all k and i."
To: "for k = 0 to 16 and i = 0 to p-1"

Response *Response Status* **C**

REJECT.
The lane index i and number of lanes p are defined in 174A.6.1.2. It is not necessary to repeat this elsewhere.

Cl **174A** *SC* **174A.7.1.3** *P* **667** *L* **1** # 129

Slavick, Jeff Broadcom

Comment Type **T** *Comment Status* **A** *(bucket)*

This section is not really "measuring" or comparing the hisograms to anything it's just acquiring the data. In 174A.6.1.3 we don't incluce the word measurement in the section title.

SuggestedRemedy

Remove the word "measurement" from the title of 174A.7.1.3

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The text literally says that these are measurements "An error histogram using PCS counters is measured using the following method:"
However, it makes sense to align the subclause titles in 174A.6.1.3 and 174A.7.1.3.
Change the title of 174A.6.1.3 to "PMA error histogram measurement"

Cl **174A** *SC* **174A.7.1.4** *P* **667** *L* **17** # 385

Healey, Adam — Broadcom Inc.

Comment Type **T** *Comment Status* **R** *(withdrawn)*

An "error mask" test method can also be defined for PCS-based measurements. This option can be used for lane-by-lane testing and would enable a quick assessment of whether or not the block error ratio requirement is met with reduced (or no additional) post-processing. As is the case for PMA-based measurements, failure to meet the error mask does not necessarily mean the block error ratio requirement is not met. It instead means that the method currently defined in 174A.7.1.4 would need to be used to confirm whether the block error ratio requirement is, or is not, met.

SuggestedRemedy

Consider adding a subclause for "Error mask test method using PCS-based measurements". The error mask is computed in the same way as defined in 174A.6.1.4 (using the value of BERadded appropriate for PCS-based measurments). The new subclause should also note that errors on unstressed lanes will be (incorrectly) attributed to the lane under test and should be minimized for the most accurate results.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **174A** *SC* **174A.7.1.4** *P* **667** *L* **26** # 168

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **A** *(bucket)*

Point e) is unclear

SuggestedRemedy

Change: "substituting Hms(k) for Hx(k) for Hms (i)(k) for Hy(k)"
To: "substituting Hms(k) for Hx(k) and Hms (i)(k) for Hy(k)"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **174A** *SC* **174A.7.1.4** *P* **667** *L* **35** # 106

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **TR** *Comment Status* **A** *(bucket)*

The last sentence of this subclause "The measured codeword error ratio is expected be less than 1.45 e-11." is misleading.

At the beginning, it states "The following method is used to calculate the block error ratio using FEC bin counters provided in the PCS."
Step h defines the block error ratio as Hms(16), not the code word error ratio.

CL174A.8 provides the definition of FEC codeword error ratio, which seems to be Hm(16).

It is unclear which error ratio shoule be less than 1.45e-11.

SuggestedRemedy

change to "the measured block error ratio is expected to be less….". Or state the relation between codeword error ratio and block error ratio in the subclause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "The measured codeword error ratio"
To "The measured block error ratio"

Cl **174A** *SC* **174A.9** *P* **668** *L* **16** # 433

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *(bucket)*

Footnote a should be applied to the xAUI-n C2C in the bottom row as well as the top.

SuggestedRemedy

Make this change in tables 174A-1 and 174A-2 Also in a74A-1 delete the extraneous "at" in the last sentence of footnote a where it says "to meet at the BER allocations .."

Response *Response Status* **C**

ACCEPT.

Cl **174A** *SC* **174A.9** *P* **668** *L* **29** # 468

Maki, Jeffery — Juniper Networks

Comment Type **T** *Comment Status* **R** *(bucket)*

"Frame loss ratio for entire PHY" is wrong or at least has been unnecessarily truncated to one significant digit. In turn, the "Codeword error ratio for entire PHY" is wrong and the "BER for entire PHY (BERtotal)" is wrong.

SuggestedRemedy

Change "Frame loss ratio for entire PHY" to 6.2x10^-11, "Codeword error ratio for entire PHY" to 1.50x10^-11, and change "BER for entire PHY (BERtotal)" to 2.93x10^-4.

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #467.

Cl **175** *SC* **175.2.4.6.1** *P* **247** *L* **1** # 181

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(bucket)*

The acronym AM (and plural AMs) is used a few times but never defined. Better to just spell it out.

SuggestedRemedy

Change "AM" to "alignment marker" is several places at page/line: 247/1, 248/12, 249/42, 249/51,249/54, 251/32 x2, 253/16 x2

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **175** *SC* **175.2.4.6.2** *P* **266** *L* **2** # 476

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Typo in variable name tx_acrambled_f1_i<256:0>.

SuggestedRemedy

Change tx_acrambled_f1_i<256:0> to be tx_scrambled_f1_i<256:0>.

Response *Response Status* **C**

ACCEPT.

Cl **175** *SC* **175.2.5.3** *P* **254** *L* **41** # 21

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(bucket)*

The following description is overly specific: "The following counters shall be implemented to aid a network operator in determining the link quality." It is also for PHY and LINK testing in general.

SuggestedRemedy

Change to "The following counters shall be implemented:"

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.1.3** *P* **270** *L* **32** # 16

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(bucket)*

The terms defined in this subclause are not ordered in a consistent way. Typically for definitions we order them alphanumerically according to the rules according to the guidelines here:
http://www.ieee802.org/3/WG_tools/editorial/requirements/words.html#sort

SuggestedRemedy

Reorder the terms alphanumerically according to the guidelines.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **176** *SC* **176.1.4** *P* **271** *L* **33** # 477

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **R** *(bucketp)*

Should modify "Delay alternating PCSLs by two RS-FEC codewords …" to be "Delay of alternating PCSLs by two RS-FEC codewords …"

SuggestedRemedy

Change:
"Delay alternating PCSLs by two RS-FEC codewords …"
To:
"Delay of alternating PCSLs by two RS-FEC codewords …".

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **176** *SC* **176.1.4** *P* **271** *L* **42** # 478

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Now that PMAL is a defined term, the parenthetical "(lanes)" on line 43 should be updated to "(PMALs)".

SuggestedRemedy

Replace "(lanes)"
with: (PMALs).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Since PMAL has been defined as lanes operating at 212.5Gb/s, it will be better to simply replace "... and data streams (lanes) operating at 212.5 Gb/s" with "and PMALs".
Implement the suggested remedy with editorial license.

Cl **176** *SC* **176.2** *P* **274** *L* **17** # 85

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

In the last sentence of the pargraph right before Table 176-5, the statement "[the parameter] is set to the value of the received SIGNAL_OK value" is ambigous. Which received SIGNAL_OK is to be used? There are two different SIGNAL_OK inputs.

The same kind of statement is made in the last sentence of the paragraph immediately before Table 176-6 on page 275, in subclause 176.3, line 29.

Both of these statements should be made more clear.

SuggestedRemedy

In 176.2, immediately prior to Table 176-5 change the sentence from:
"For the n:n PMAs, the SIGNAL_OK parameter at the client interface is set to the value of the received SIGNAL_OK value.
to:
"For the n:n PMAs, the SIGNAL_OK parameter at the client interface is set to the value of the received SIGNAL_OK parameter from the sublayer below the PMA (inst:IS_SIGNAL.indication(SIGNAL_OK))."

And in subclause 176.3, change the last sentence immediately prior to Table 176-6 from:
"For the n:n PMAs, the SIGNAL_OK parameter at the interface below the PMA is set to the value of the received SIGNAL_OK value."
to:
"For the n:n PMAs, the SIGNAL_OK parameter at the interface below the PMA is set to the value of the received SIGNAL_OK parameter from the sublayer above the PMA (PMA:IS_SIGNAL.request(SIGNAL_OK))."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **176** SC **176.3** P **275** L **6** # 479

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Verb tense is not correct.

SuggestedRemedy

Change: "…, the m:n PMAs sends n parallel symbol streams …"
to: "…, the m:n PMAs send n parallel symbol streams …".

And on line 11 of the same page 275,
Change: "…, the n:m PMAs sends m parallel symbol streams …"
to: "…, the n:m PMAs send m parallel symbol streams ..."

And on line 18 of the same page 275,
Change: "…, the n:n PMAs sends n parallel symbol streams …"
to: "…, the n:n PMAs send n parallel symbol streams ..."

Response *Response Status* **C**

ACCEPT.

Cl **176** SC **176.4** P **276** L **16** # 481

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Now that PMAL is a defined term, it can be used to replace term "212.5 Gb/s interface lanes".

SuggestedRemedy

Replace:
"Note that m equals the number of PCSLs and n equals the number 212.5 Gb/s interface lanes for each xBASE-R m:n PMA."
With:
"Note that m equals the number of PCSLs and n equals the number PMALs for each xBASE-R m:n PMA."

Similar updates can be made thoughout Clause 176 where there are referecnes to "212.5 Gb/s interface lanes" such as line 51 on page 292.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **176** SC **176.4.1** P **276** L **21** # 482

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Should add "PMAL" term when referring to the appropriate PMA interface lanes.

SuggestedRemedy

Replace:
"In the transmit (multiplexing) direction, the m:n PMAs perform a transmit function which multiplexes RS-FEC symbols from m PCSL input lanes received at the PMA service interface to n output lanes at the service interface below the PMA. In the receive (demultiplexing) direction, the m:n PMAs perform a receive function which demultiplexes RS-FEC symbols from n input lanes at the service interface below the PMA to m PCSL output lanes toward the PMA service interface."

With:
"In the transmit (multiplexing) direction, the m:n PMAs perform a transmit function which multiplexes RS-FEC symbols from m PCSL input lanes received at the PMA service interface to n PMAL output lanes at the service interface below the PMA. In the receive (demultiplexing) direction, the m:n PMAs perform a receive function which demultiplexes RS-FEC symbols from n PMAL input lanes at the service interface below the PMA to m PCSL output lanes toward the PMA service interface."

Similar updates can be made to 176.5.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In 176.4.1
Change:
"In the transmit (multiplexing) direction, the m:n PMAs perform a transmit function which multiplexes RS-FEC symbols from m PCSL input lanes received at the PMA service interface to n output lanes at the service interface below the PMA. In the receive (demultiplexing) direction, the m:n PMAs perform a receive function which demultiplexes RS-FEC symbols from n input lanes at the service interface below the PMA to m PCSL output lanes toward the PMA service interface."
To:
"In the transmit (multiplexing) direction, the m:n PMAs mutiplex RS-FEC symbols from m PCSLs at the PMA service interface to n PMALs at the service interface below the PMA. In the receive (demultiplexing) direction, the m:n PMAs demultiplex RS-FEC symbols from n PMALs at the service interface below the PMA to m PCSLs toward the PMA service interface."

In 176.5.1
Change:
"In the transmit (demultiplexing) direction, the n:m PMAs perform a transmit function which demultiplexes RS-FEC symbols from n input lanes at the PMA service interface to m PCSL output lanes at the service interface below the PMA. In the receive (multiplexing) direction, the n:m PMAs perform a receive function which multiplexes RS-FEC symbols from m

PCSL input lanes at the service interface below the PMA to n output lanes at the PMA service interface."
To:
"In the transmit (demultiplexing) direction, the n:m PMAs demultiplex RS-FEC symbols from n PMALs at the PMA service interface to m PCSLs at the service interface below the PMA. In the receive (multiplexing) direction, the n:m PMAs multiplex RS-FEC symbols from m PCSLs at the service interface below the PMA to n PMALs at the PMA service interface."

Implement the with editorial license.

Cl **176** *SC* **176.4.2.4.2** *P* **281** *L* **32** # 96

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(bucket)*

Currently says "… and for the 400GBASE-R 32:4 PMA, the odd lanes …"

SuggestedRemedy

Propose "… and for the 400GBASE-R 16:2 PMA, the odd lanes …"

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.4.4.2.1** *P* **289** *L* **25** # 483

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *(bucket)*

Definition of variable restart_lock_demux<y> states that it is set to true in the SYMBOL_LOCK_RESTART state, but is is actually set to true in two separate states in state diagram Figure 176-10.

SuggestedRemedy

Change: "Boolean variable that is set to true in the SYMBOL_LOCK_RESTART state to restart …"
To: "Boolean variable that is set to true in the SYMBOL_LOCK_RESTART and SLIP_CONTROL states to restart …"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **176** *SC* **176.4.4.2.3** *P* **290** *L* **4** # 484

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Numbers less than or equal to 10 (ten) should be written out.

SuggestedRemedy

Change: "Counts 3 alignment marker intervals."
To: "Counts three alignment marker intervals."

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.4.4.3** *P* **290** *L* **34** # 145

He, Xiang Huawei

Comment Type **T** *Comment Status* **A** *(bucket)*

The index y is not a PMAL but a PAML number.

SuggestedRemedy

Change "where y is the input PMAL" to "where y is the input PMAL number"

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.4.4.3** *P* **291** *L* **2** # 84

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

The initial condition (open arrow) to enter the LOSS_OF_ALIGNMNET state in Figure 176-9 is "reset + !all_locked_mux". (!signal_ok_mux) should be added to this condition

SuggestedRemedy

Change the open arrow condition to enter LOSS_OF_ALIGNMENT state from:
reset + !all_locked_mux
to:
reset + !signal_ok_mux + !all_locked_mux

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **176** *SC* **176.4.4.3** *P* **292** *L* **17** # 485

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

In Figure 176-10, the state transitions out of SLIP_CONTROL and SYMBOL_LOCK_RESTART do not have a condition.

SuggestedRemedy

Unconditional state transitions should be labelled "UCT".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In Fig 176-10, label the unconditional state transitions out of SLIP_CONTROL and SYMBOL_LOCK_RESTART with "UCT"

Cl **176** *SC* **176.5.4.1.5** *P* **319** *L* **48** # 20

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **R** *(withdrawn)*

The index "i" is typically used for the lane number. Since counters need to be defined per lane, this index "i" will cause some ambiguity in the management variables and MDIO register definitions. For similar bin counters defined in 174A.6 and 176.7.4.1 the index "k" is used for this purpose.

SuggestedRemedy

For the bin counters defined in 177.5.4.1.5 change the index "i" to "k". Also update Table 177-7 and definitions in Clause 45 appropriately.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **176** *SC* **176.8** *P* **199** *L* **9** # 22

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *PMA delay*

Delay limits for 200GBASE-R, 400GBASE-R, and 1.6TBASE-R PMAs are TBD and the one for 800GBASE-R PMAs may need to be refined.

SuggestedRemedy

Expect a contribution with proposals.
Update Table 116-6, Table 116-7, 169-4, and Table 174-4 with the adopted numbers.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #451.

Cl **176** *SC* **176.8** *P* **299** *L* **4** # 451

Shrikhande, Kapil Marvell

Comment Type **TR** *Comment Status* **A** *PMA delay*

In Table 176-7, complete the TBD delay values for the SM-PMAs.

SuggestedRemedy

A presentation will be provided for the TBD values in Table 176-7.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG.
https://www.ieee802.org/3/dj/public/25_01/shrikhande_3dj_01b_2501.pdf

Implement the proposals on slide 16 and 17 for all sublayers listed on slide 16, including changing CR/KR PMD delay values to 74.24 ns.

Implement with editorial license.

Cl **176** *SC* **176.8** *P* **299** *L* **6** # 223

de Koos, Andras Microchip Technology

Comment Type **T** *Comment Status* **A** *PMA delay*

Should the 4-codeword deskew (compensating for skew across an AUI) be included in the PMA delay constraint? I think not. This should be seen as the delay of the AUI itself, and should not be included in the PMA's delay constraint.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #451.

Cl **176** *SC* **176.8** *P* **299** *L* **6** # 225

de Koos, Andras Microchip Technology

Comment Type **T** *Comment Status* **A** *PMA delay*

The max delay values for the '1.6TBASE-R 8:16 PMA or 16:8 PMA' should be roughly equal to those of the 800GBASE-R 4:32 PMA or 32:4 PMA. It is true that the 1.6T PMA does not have the 'Delay odd PCSLs by one symbol' function (176.4.2.4.1), but the latency of one 10-bit symbol is negligible in the context of these delays.

SuggestedRemedy

For the '1.6TBASE-R 8:16 PMA or 16:8 PMA' delay constraints, use the same values as the '800GBASE-R 4:32 PMA or 32:4 PMA'

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #451.

Cl **176** *SC* **176.8** *P* **299** *L* **6** # 226

de Koos, Andras Microchip Technology

Comment Type **T** *Comment Status* **A** *PMA delay*

In the table, why is the value for a 4:4 PMA so large (2x the 4:32 / 32:4 PMA)? Wouldn't it just be a wire?
Is it because it could resonably be implemented with a 4:32 PMA in series with a 32:4 PMA?
Assuming the 4:4 PMA value is correct, the same rules can be used for the 1:1, 2:2 and 8:8 PMAs, i.e double the values of the 1:8, 2:16 , and 8:16 PMA, respectively.

SuggestedRemedy

For the '200GBASE-R 1:1 PMA' delay constraint values, double the delay constraint values of the '200GBASE-R 1:8 PMA or 8:1 PMA' delay constraints.
For the '400GBASE-R 2:2 PMA' delay constraint values, double thedelay constraint values of the '400GBASE-R 2:16 PMA or 16:2 PMA' delay constraints.
For the '1.6TBASE-R 8:8 PMA' delay constraint values, double the delay constraint values of the '1.6TBASE-R 8:16 PMA or 16:8 PMA' delay constraints.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #451.

Cl **176** *SC* **176.8** *P* **299** *L* **6** # 222

de Koos, Andras Microchip Technology

Comment Type **T** *Comment Status* **A** *PMA delay*

For Table 176-6, the delay of the 1:8 and 8:1 (for 200GBASE-R) and 2:16 and 16:2 (for 400GBASE-R) PMAs is complicated because of the 2CW skew introduced. Must be careful to avoid double-accounting the delay due to this skew! The max delay constraint (which is for the *sum* of Rx and Tx) should thus be calculated as the max base delay plus the intentional skew, (not 2x the intentional skew). This way, the total constraint will count the skew's contribution only once.

SuggestedRemedy

For the 1:8, 8:1, PMAs use the base max delay value (same as the 800GBASE-R 4:32 PMA or 32:4 PMA, presumably?) plus the intentional skew.
Skew = 2 FEC CWs = 51.2ns for 200Gbps

200GBASE-R 1:8 PMA or 8:1 PMA :
Maximum (bit time): 36864 + 40960 = 77824
Maximum (pause_quanta): 72 + 80 = 152
Maximum (ns): 46.08 + 51.2 = 97.28

For the 2:16, 16:2, PMAs use the base max delay value (same as the 800GBASE-R 4:32 PMA or 32:4 PMA, presumably?) plus the intentional skew.
Skew = 2 FEC CWs = 25.6ns for 400Gbps

400GBASE-R 2:16 PMA or 16:2 PMA :
Maximum (bit time): 36864 + 20480 = 57334
Maximum (pause_quanta): 72 + 40 = 112
Maximum (ns): 46.08 + 25.6 = 71.68

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #451.

Cl **176** *SC* **176.8** *P* **299** *L* **21** # 224

de Koos, Andras — Microchip Technology

Comment Type **T** *Comment Status* **A** *PMA delay*

Whatever method is used to specify the max delay for the 1:8, 8:1, 2:16, 16:2 SM-PMAs in Table 176-6, a footnote to the table is required to explain the method. Otherwise, readers may get confused: looking at the delay through the Rx PMA in isolation, and the Tx PMA in isolation, one could conclude that they should each have a 2CW delay for the skew.

SuggestedRemedy

Add the following note after the table:
Note that since the delay constraint is respect to the sum of Rx and Tx delays, the intentional skew for the 1:8 and 8:1 PMAs (51.2ns) and for the 2:16 and 16:2 PMAs (25.6ns) contributes only ONCE.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #451.

Cl **176** *SC* **176.11** *P* **300** *L* **15** # 5

Marris, Arthur — Cadence Design Systems

Comment Type **T** *Comment Status* **A** *(bucket)*

Table 176–8 needs populating

SuggestedRemedy

Refer to "Table 45–3—PMA/PMD registers" in IEEE Std 802.3 for the correct MDIO register bit references

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **176B** *SC* **176B.3** *P* **683** *L* **12** # 378

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **E** *Comment Status* **A** *(bucket)*

This subclause is included to highlight the co-existence of bit and symbol muxing in an implementation, but the figure uses generic language fort he PMA sublayers that doesn't help.

SuggestedRemedy

Add "BM-" or "SM-" as appropriate to the PMA sublayer boxes in Fig 176B-4.`

Response *Response Status* **C**

ACCEPT.

Cl **176B** *SC* **176B.6.2** *P* **695** *L* **28** # 417

Nicholl, Gary — Cisco Systems

Comment Type **TR** *Comment Status* **A** *(bucket)*

Incorrect reference. Reference to "Figure 176B-2" should be "Fgure 176B-3"

SuggestedRemedy

Change "Figure 176B-2" to "Figure 176B-3".

Response *Response Status* **C**

ACCEPT.

Cl **176C** *SC* **176C.5.1** *P* **711** *L* **37** # 203

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(bucket)*

46.25 has orange highlight.

SuggestedRemedy

Remove highlight.

Response *Response Status* **C**

ACCEPT.

Cl **176C** *SC* **176C.5.1** *P* **711** *L* **37** # 559

Heck, Howard — TE Connectivity

Comment Type **E** *Comment Status* **A** *(bucket)*

The value for COM single-ended receiver transmitter termination resistance in Table 176C-6 is highlighted in orange. This value is consistent with those in 178 and 179.

SuggestedRemedy

Remove the orange highlighting.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.1** *P* **309** *L* **32** # 276

Ran, Adee — Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

"4-symbol" is used only here, elsewhere the term "symbol quartet" is used instead.

SuggestedRemedy

Change to "symbol quartet"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.1.1** *P* **310** *L* **29** # 120

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

The demultiplexing function refers to "service interface below the PMA" but this is above the Inner FEC.

SuggestedRemedy

Add "with the exception that it operates on the Inner FEC service interface input lanes"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.1.2** *P* **310** *L* **36** # 419

Nicholl, Gary — Cisco Systems

Comment Type **T** *Comment Status* **A** *(bucket)*

I think the sentence "The data
stream is not altered.", although accurate, is confusing/contradictory as the first sentence in the subclause states that "The alignment marker lock function is performed as defined in 176.4.3.3.", , and 176.4.3.3 by definition does alter the data stream.

I tihnk it would be better to update Figure 177-3 to show the symbol demultiplex and alignment marker lock functions for 200G/400G to be "off to the side" from the main data path, with the main data path drawn as a straight arrow from top to bottom of diagram (indicating that the main data path is passthrough and is not altered in any way).

SuggestedRemedy

Delete the sentence "The data path is not altered" on line 36.

Update the 200GBASE-R/400GBASE-R portion of Figure 177-3 as described in the comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Keep the "data stream is not altered", and update the diagram to show a straight arrow.
Otherwise implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.1.3** *P* **310** *L* **47** # 45

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

The wording here is a bit awkward - the intent is to define a much stricter maximum skew tolerance in the inner FEC than in 800GBASE-R PCS, but the text says "… Skew between PCSLs is removed as defined in 172.2.5.1, except that the 800GBASE-R deskew function shall support a maximum Skew of 25 ns between PCS lanes..."

SuggestedRemedy

Use language more like what 172.2.5.1 uses. Change the text to read "… Skew between PCSLs is removed as defined in 172.2.5.1, except that a maximum Skew of 25 ns is supported between PCS lanes..."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.1.3** *P* **310** *L* **52** # 46

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

The wording here is a bit awkward - the intent is to define a much stricter maximum skew tolerance in the inner FEC than in 800GBASE-R PCS, but the text says "… Skew between PCSLs is removed as defined in 172.2.5.1, except that the 1.6TBASE-R deskew function shall support a maximum Skew of 25 ns between PCS lanes..."

SuggestedRemedy

Use language more like what 175.2.5.1 uses. Change the text to read "… Skew between PCSLs is removed as defined in 175.2.5.1, except that a maximum Skew of 25 ns is supported between PCS lanes..."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.1.5** *P* **311** *L* **15** # 277

Ran, Adee Cisco

Comment Type **T** *Comment Status* **A** *(bucket)*

The reader may be curious why symbol multiplexing is not performed for 200GBASE-R and 400GBASE-R PHYs.

This is because the data on each PCS lane already includes 4-way RS-FEC interleaving performed by the PMA (as illustrated in Figure 176–6). But that may be difficult to understand if not stated explicitly.

SuggestedRemedy

Add an informative note at the end of 177.4.1.5:
"NOTE--In 200GBASE-R and 400GBASE-R PHYs, this operation is not required, since the output of the PMA below the PCS is already symbol multiplexed with 4-way interleaving (see Figure 176–6)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.2** *P* **311** *L* **18** # 146

He, Xiang Huawei

Comment Type **T** *Comment Status* **A** *(bucket)*

The term "PMA lane" is not accurate. Within the Inner FEC sublayer, it is an "Inner FEC lane".

SuggestedRemedy

Change "PMA lane" to "Inner FEC lane", to be consistent within the clause.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.2** *P* **311** *L* **24** # 278

Ran, Adee Cisco

Comment Type **T** *Comment Status* **R** *(withdrawn)*

The last delay line (labeled "Delay Line 2") is actually not a delay line.
The interleaver can be described as being composed of three data paths, of which the first two include delay lines (0 and 1) and the third does not.

SuggestedRemedy

Rephrase the text in this subclause and change Figure 177-4 per this comment, changing "Delay Line n" to "interleaver path n".

Implement any additional edits required by this change with editorial license.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **177** *SC* **177.4.2** *P* **311** *L* **25** # 34

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

The text here seems a bit repetetive. The four paragraphs that start at line 25 spell out the delays for each delay line for each rate in detail, and then at line 50 there is a more abstract specification of the same thing.

SuggestedRemedy

Rewrite the first paragraphs to be algorithmic rather than per-rate:
"The first line (Delay Line 0) delays the data by 4x2xQ RS-FEC symbols, the second line (Delay Line 1) by 4x1xQ RS-FEC symbols, and the last line (Delay Line 2) adds no delay. The values of Q are shown in table 177-X."
Add a table with a column for the rate (200GBASE-R, 400GBASE-R, etc.) and a column for the value of Q.
Delete the sentence at lin 51 that starts with "The number Q differs for each..." and the bullet list that follows (this information is replaced by the table).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** SC **177.4.2** P **311** L **26** # 279

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

Commas are missing in the 4 paragraphs about delay lines, and periods are inconsistent.

SuggestedRemedy

In the first paragraph, add commas after "200GBASE-R" and before "and the last line". Similarly for the other 3 paragraphs.

Add a period at the end of the second and third paragraphs.

Response *Response Status* **C**

ACCEPT.

Cl **177** SC **177.4.2** P **311** L **42** # 115

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

The deskewed data is fed into the covolutioner.

SuggestedRemedy

Change " The input data from the FEC service interface lane is fed into" to: "The data from deskewed PMA lane is fed into"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** SC **177.4.2.5** P **311** L **10** # 489

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

The plural of PCSL ahouls be PCSLs, not PCSLS.

SuggestedRemedy

Change "PCSLS" to "PCSLs" (lowercase s).

Response *Response Status* **C**

ACCEPT.

Cl **177** SC **177.4.2.5** P **311** L **50** # 490

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

Incorrect cross-reference.

SuggestedRemedy

Change "Figure 177-5" to "Figure 177-4".

Response *Response Status* **C**

ACCEPT.

Cl **177** SC **177.4.4** P **312** L **34** # 280

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

The last sentence in 177.4.4 is "Within each RS-FEC symbol, bit 0 is transmitted first and bit 9 is transmitted last". The transmission order is relevant for the 120-bit block creation, not for the circular shift (circular shift would be the same regardless of the bit order within a symbol).

SuggestedRemedy

Move the quoted sentence to 177.4.3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** SC **177.4.5** P **313** L **24** # 281

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

Missing commas

SuggestedRemedy

Add a comma after "flows".
Add commas before and after "m<119:0>".

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.5** *P* **313** *L* **51** # 282

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

the integer i is a scalar, not a vector, so it should not be in boldface here (it is not bold in other instances)..

SuggestedRemedy

Remove the boldface format from i.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.5** *P* **313** *L* **51** # 283

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

"(s0,i, s1,i, s2,i, s3,i, s4,i, s5,i, s6,i) is the binary vector corresponding to the element α_i in the Galois Field GF(2^7) with primitive polynomial x^7 + x^3 + 1"

This reads as if the s bits are the binary representation of the 128 elements of the field - but per Equation 177-2 these are actually the binary coefficients in the linear combination of α_0 through α_6 that creates α_i. I suspect these are not the same.

SuggestedRemedy

Move the quoted sentence after the subsequent one (which states that the elements can be expressed as a linear combination), and change "binary vector corresponding to" to "binary coefficients of the linear combination that creates".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.5** *P* **314** *L* **1** # 284

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

The second sentence in the first paragraph spans 5 lines and includes 6 commas, 3 instances of "and", and 2 instances of "where". It is difficult to follow.
It also includes "first", but there seems to be no further steps.

SuggestedRemedy

Rewrite this sentence, preferably breaking it into more readable pieces.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.7** *P* **315** *L* **10** # 285

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

"The rate… is…"
The exact rate depends on the input rate which has some tolerance.
It would be helpful for the reader to write the ratio of the output rate and the input rate. This information should preferably be placed in the "summary of functions" in 117.1.3 as well.

SuggestedRemedy

Change "the rate" to "the nominal rate".
Add a statement about the ratio, here and in 177.1.3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.7.1** *P* **316** *L* **6** # 421

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *(bucket)*

The FAS descriptions in table 177-4 have the MSB transmitted first as other clauses do and as is shown with the vectors in Annex 177A. In other clauses the MSB is also transmitted first and is shown as the left most bit in diagrams. Figure 177-8 however might be interpreted as the FAS being transmitted in the other order.

SuggestedRemedy

Clarify Figure 177-8 to match the text and Annex

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.9** *P* **317** *L* **4** # 286

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

"These test patterns are used to test adjacent layer interfaces or to perform testing between an Inner FEC and external testing equipment"

Which adjacent layer interfaces? and what is "testing between"?

These generators are only in the output direction, so they can only be used to drive the PMD service interface (which is then used with external testing equipment).

SuggestedRemedy

Change to
"If implemented, these test patterns can be used to drive the PMD service interface for PMD testing purposes".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.9** *P* **317** *L* **5** # 287

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

It is not specified what happens when more than one generator is enabled on the same lane.
The definitions in clause 120 which are referenced include different control variables and MDIO mappings, and the case where two are enabled is only covered in 45.2.1.170.

Note that some of the patterns in clause 120 are not per-lane but here all patterns have enable bits per lane.

SuggestedRemedy

Add text in 177.4.9 stating that all generators are per-lane, that enabling any of the pattern generators on a lane affects only that lane, and that the behavior when more than one generator is enabled on the same lane is not specified.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5** *P* **317** *L* **27** # 123

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

Introductory sentence could be useful

SuggestedRemedy

Add the following to 177.5 "The following processes are performed independently on each PMD service interface input lane.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.1.1** *P* **317** *L* **43** # 491

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

The second and third sentences of the third paragraph of 177.5.1.1 is hard to understand. Also, this is the first use of "ILT" in this clause and it should be spelled out.

SuggestedRemedy

Suggest changing:
"If ILT function is enabled by the management variable mr_training_enable (see 178B.15), the precoding state on the link partner transmitter is requested using the ILT function. If ILT is disabled by the management variable mr_training_enable, the precoding state on the link partner transmitter is set by management."

to:
"If inter-sublayer link training (ILT) is enabled by the control variable mr_training_enable (see 178B.15), precoding of the received data is enabled at the link partner (transmitter) as requested by the receiver using ILT. If ILT is disabled, then the precoding of data at the transmitter is controlled by a management entity."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.2** *P* **318** *L* **4** # 501

Opsasnick, Eugene Broadcom

Comment Type **ER** *Comment Status* **A** *(bucket)*

Extra "to" and missing verb in second sentence of 177.5.2.

SuggestedRemedy

Change:
"The eight codewords inserted as pad (see 177.4.7) are used to frame to the data stream and then removed before the received data is processed."
to:
"The eight codewords inserted as pad (see 177.4.7) are used to frame the data stream and are then removed before the received data is processed further."

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.2** *P* **318** *L* **7** # 290

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

The initial ("blind") deinterleaving and synchronization is performed on bit pairs, since they cannot rely on the FEC decoder.
The source of the bit pairs is likely hard decoding of the input symbols into PAM4 and then into bits.
However, the same deinterleaving is later performed on the input symbols, which are more than bit pairs. This is currently not stated.

SuggestedRemedy

Add text stating that the alignment found by the initial synchronization based on the PAM4 hard decoding is used for deinterleaving of soft inputs into the Inner FEC decoding.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.2** *P* **318** *L* **7** # 289

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

"Blind 1:8 bit-pair deinterleaving (each pair of bits corresponding to a PAM4 symbol) is performed to eight Inner FEC flows"

It is unclear what "blind" refers to in this operation. "blind" is no defined in 802.3 and its occasional use is inconsistent.

Perhaps "initial" is more adequate here.

SuggestedRemedy

Change "blind" to "initial" in the quoted sentence and the one with the other instance of "blind" in this subclause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change the first sentence to:
"1:8 bit-pair deinterleaving (each pair of bits corresponding to a PAM4 symbol) is performed to eight Inner FEC flows. The initial position is not specified."

Cl **177** *SC* **177.5.2** *P* **318** *L* **19** # 116

Slavick, Jeff Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

The statement that you can identify flow 0 and how its done should be one paragraph

SuggestedRemedy

Combine paragraph 4 & 5 in 177.5.2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.4** *P* **319** *L* **10** # 291

Ran, Adee Cisco

Comment Type **E** *Comment Status* **A** *(bucket)*

"The Inner FEC decoder is a soft-decision decoder that requires a higher resolution than two bits for each received PAM4 symbols"

Wording can be improved.

SuggestedRemedy

Change to
"The Inner FEC decoding assumes soft-decision operation that requires a resolution of more than two bits for each received symbol".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.4** *P* **319** *L* **10** # 488

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Typo in tense of "PAM4 symbols".

SuggestedRemedy

Change: "… for each received PAM4 symbols."
To: "… for each received PAM4 symbol."

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.4** *P* **319** *L* **11** # 293

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

"The decoder evaluates the incoming codeword and determines the most likely codeword value"

Then input to the decoder is not a codeword (a codeword is a member of a set of 128-bit vectors). The input is a vector of "soft" samples that corresponds to a transmitted codeword.

SuggestedRemedy

Change to "The decoder evaluates the incoming block of 64 rx_symbol inputs and determines the most likely codeword value".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.4** *P* **319** *L* **11** # 292

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

The assumed correction capability of the decoder is not stated.
Also, it is not stated what happens when a codeword is uncorrectable. I assume the decoder does not mark the data as error in any way (since it is an inner code) but it is not stated. The error patterns that appear in this case are not described.

Compare to the RS-FEC decoder specification in 91.5.3.3 (where there are normative specifications for correction capability and uncorrectable error marking).

This is important information for testing, monitoring and analyzing the performance of an implementation.

The suggested remedy is based on slide 9 of
https://www.ieee802.org/3/df/public/22_05/22_0517/bliss_3df_01a_220517.pdf.

SuggestedRemedy

Add some test e.g.
"The decoder is expected to correct all codewords in which hard decision would result in up to one bit error and most codewords with up to three bit errors. Codewords that are not decoded correctly will contain at least four bit errors"
Or modifications of the above if necessary.

If there is no consensus for additional text (either the one above or otherwise), add an editor's note inviting contributions in this area.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.4..1.5** *P* **319** *L* **52** # 118

Slavick, Jeff Broadcom

Comment Type **T** *Comment Status* **A** *(bucket)*

We're specifyng the behavior of bin 3, so starting with "Note' could be a bit misleading

SuggestedRemedy

Change the last sentence to read "Error bin 3 incrments when three or more bits are corrected in an Inner FEC codeword."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.4.1.1** *P* **319** *L* **21** # 294

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

"The output of the Inner FEC decoder will recognize the miscorrected codewords as corrected codewords."

The output is not a separate entity, it is a block of 120 bits that has no information about the type of codeword it came from. The counter is internal to the decoder.

SuggestedRemedy

Change to
"The Inner FEC decoder will treat any miscorrected codeword as a corrected codeword."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change to:
"The Inner FEC decoder interprets miscorrected codewords as corrected codewords."
Implement with editorial license.

Cl **177** *SC* **177.5.4.1.1** *P* **319** *L* **24** # 117

Slavick, Jeff Broadcom

Comment Type **T** *Comment Status* **A** *(bucket)*

There is a reference to clause 45 here, I think we want that all to be in the tables

SuggestedRemedy

Delete the "(see 45.2.1.213h)"
In 177.5.4.1 add the following senetence "Mapping of the counters to management variables is specified in 177.10"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.4.1.4** *P* **319** *L* **45** # 108

Mi, Guangcan Huawei Technologies Co., Ltd

Comment Type **ER** *Comment Status* **A** *(bucket)*

inner FEC bin counters can be used to roughly measure pre-Inner FEC BER. Pre-FEC BER is implicit.

SuggestedRemedy

change to "pre-Inner-FEC BER"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.5.4.1.5** *P* **319** *L* **48** # 13

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *(bucket)*

The index "i" is typically used for the lane number. Since counters need to be defined per lane, this index "i" will cause some ambiguity in the management variables and MDIO register definitions. For similar bin counters defined in 174A.6 and 176.7.4.1 the index "k" is used for this purpose.

SuggestedRemedy

For the bin counters defined in 177.5.4.1.5 change the index "i" to "k". Also update Table 177-7 and definitions in Clause 45 appropriately.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.4.1.5** *P* **319** *L* **49** # 395

Shrikhande, Kapil Marvell

Comment Type **T** *Comment Status* **A** *(bucket)*

The definition of the inner fec codeword error bin counters in 177.5.4.1.5 could be edited to better align to the FEC codeword error bin counter in 175.2.5.3.

SuggestedRemedy

Align bin counter definition format in 177.5.4.1.5 to the bin counter in 175.2.5.3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #11.

Cl **177** *SC* **177.5.7** *P* **320** *L* **15** # 122

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

We're restoring to the data stream to its original order, but it could have errors in the so we can't state it's the orignial data from the SM-PMA and that'd be the far end SM-PMA not the local one.

SuggestedRemedy

Change "to restore the original data received from the BASE-R SM-PMA." to be "to restore the order of the data received to be compatible with the BASE-R SM-PMA."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.6.2.1** *P* **320** *L* **33** # 493

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

The word AND should be lowercase.

SuggestedRemedy

Change: "… for all eight flows AND the Inner FEC …"
to: "… for all eight flows and the Inner FEC …"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.2.1** *P* **320** *L* **34** # 296

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

The definition of all_synced does not (strictly) cover the case where sync_flow<x> is true for all eight flows but the Inner FEC flow 0 is not identified.
Also, "and" here has no special meaning and should not be capitalized.

SuggestedRemedy

Change "set to false when sync_flow<x> is false for any x" to "set to false otherwise".
Change "AND" to "and".

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.2.1** *P* **320** *L* **43** # 492

Opsasnick, Eugene Broadcom

Comment Type **ER** *Comment Status* **A** *(bucket)*

The word boolean should be capitalized.

SuggestedRemedy

Replace "boolean" with "Boolean" in the definition of these variables:
fas_valid
Inner_FEC_sync_status
slip_done
test_cw
test_fas

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.2.1** *P* **320** *L* **53** # 88

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *reset variable*

FEC_reset is referred to in the definition of the "reset" variable, but FEC_reset is not defined except through a cross-reference to 45.2.1.1.1. The MDIO control variable table (Table 177-6) should instead be used for the cross reference to CL 45 registers).

SuggestedRemedy

Remove the cross-reference text "(see 45.2.1.1.1)" from the definition of reset in 177.6.2.1.

Add the definition of "FEC_reset" to the list of variables in 177.6.2.1 as: "Boolean variable that is true when set by a management entity and is false otherwise".

Add FEC_reset to the MDIO control variables table (Table 177-6) in subclause 177.10 with cross-references to 177.6.2.1 and 45.2.1.1 and the MDIO register bit number, 1.0.15.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editorial slides with topic "Reset variables" in the following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_01/brown_3dj_03a_2501.pdf

Implement the proposed changes in slides 10 to 18 in brown_3dj_03a_2501, except that in Annex 178B align with the resets defined for PMA and PMD, rather than as proposed on slide 17.

Implement with editorial license.

Cl **177** *SC* **177.6.2.1** *P* **321** *L* **2** # 498

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *(bucket)*

The definition of the variable restart_inner_fec_sync states it is set by a process, but it can now be set by two separate processes.

SuggestedRemedy

Replace: "A Boolean variable that is set by the Inner FEC synchronization process …"

with: "A Boolean variable that is set by the Inner FEC synchronization process or the Inner FEC pad detection process …"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.2.1** *P* **321** *L* **13** # 497

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

The definition of sync_flow<x> should be made more clear. What does it mean to be "in a flow of Inner FEC"? Also, a range of values should be given as "A to B" instead of "A:B".

SuggestedRemedy

Suggest changing the definition of sync_flow<x> from:
"A Boolean variable that is set to true when the receiver has found the correct boundary of codewords in a flow of Inner FEC, where x = 0:7"

to:
"A Boolean variable that is set to true after the inner FEC codeword boundary is found for an inner FEC flow, where x=0 to 7 and represents an inner FEC flow ID before identifing the actual inner FEC flow numbering."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.6.2.3** *P* **321** *L* **45** # 502

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

The definion of "fas_cnt" is "Counts the interval of Inner FEC codewords between two adjacent pads." What is the interval value? How many codewords?

SuggestedRemedy

Add a number to to explicitly state the number of codewrds that need to be counted or else add a cross-reference to the subclause with this information.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Add a cross-reference to the subclause, and implement this change with editorial license.

Cl **177** *SC* **177.6.3** *P* **321** *L* **53** # 499

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

Should add a statement that the 8 self-sync processes operate independantly of each other and spell out the word synchronization. Should also state that 8 such processes are required on each input lane.

SuggestedRemedy

Change:
"The Inner FEC sublayer shall implement eight self-sync processes as shown in Figure 177–10 to identify the boundaries of the Inner FEC codewords."

to:
"The Inner FEC sublayer shall implement eight self-synchronization processes as shown in Figure 177–10 for each input lane in the receive direction. Each synchronization process operates independantly on an Inner FEC flow to identify the boundaries of the Inner FEC codewords."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.6.3** *P* **321** *L* **54** # 500

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

Should add a statement that a PAD detection process is required for each input lane.

SuggestedRemedy

Change:
"Pad detection process follows the process shown in Figure 177–10."

to:
"An inner FEC Pad detection process as illustrated in the state diagram in Figure 177–10 shall be implemented for each input lane in the receive direction."

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.3** *P* **322** *L* **4** # 507

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

In figure 176-10, a space is needed between the logical-OR (+) operator and variable name.

SuggestedRemedy

Replace "+restart_inner_fec_sync" with "+ restart_inner_fec_sync".

And make the same change in Figure 177-11 on page 323, line 4.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.3** *P* **322** *L* **10** # 504

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

In figure 176-10, the condition to transition out of stte INNER_FEC_SYNC_INIT is incorrect.

SuggestedRemedy

Change the condition from:"all_synced" to "UCT"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.3** *P* **322** *L* **12** # 505

Opsasnick, Eugene Broadcom

Comment Type **ER** *Comment Status* **A** *(bucket)*

In figure 176-10, in CW_CHECK_3 state, the extra space between variable names and increment operator ++ should be removed.

SuggestedRemedy

Replace "cw_cnt ++" with "cw_cnt++"
and
replace "bad_cw_cnt ++" with "bad_cw_cnt++"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.3** *P* **322** *L* **21** # 506

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

In figure 176-10, the new state UNSYNC could use a better name.

SuggestedRemedy

Rename state "UNSYNC" to be "RESTART_SYNC"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.3** *P* **322** *L* **22** # 119

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

In Fig 177-10 the exit from INNER_FEC_SYNC can't be all_sync because that's false when any sync_flow is false and in that state we set it false and need to go through the sync process to set it to true.

SuggestedRemedy

Create new variable "none_synced" -- A Boolean variable that is set to true when sync_flow<x> is false for all eight flows and is set to false when sync_flow<x> is true for any x.

In Fig. 177-10 replace the all_sync criteria from INNER_FEC_SYNC_INIT to GET_BLOCK to be UCT

In Fig 177-11 replace the restart_inner_fec_sync criteria for entering FAS_LOCK_INIT with none_synced

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #504.

Cl **177** *SC* **177.6.3** *P* **323** *L* **9** # 509

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

In figure 177-11, there is an incomplete change to FAS_LOCK_INIT state from D1.2 comment #389.

SuggestedRemedy

In FAS_LOCK_INIT state, add:
"fas_lock <= false"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.3** *P* **323** *L* **13** # 510

Opsasnick, Eugene Broadcom

Comment Type **ER** *Comment Status* **A** *(bucket)*

In figure 177-11, in BAD_FAS state, the extra space between variable names and increment operator ++ should be removed.

SuggestedRemedy

Replace "bad_fas_cnt ++" with "bad_fas_cnt++"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.10** *P* **325** *L* **9** # 147

He, Xiang Huawei

Comment Type **T** *Comment Status* **A** *(bucket)*

"Inner FEC enable lane x" variables are not defined or backed by any proposal, and should be removed in the next draft.

SuggestedRemedy

Remove rows "Inner FEC enable lane 0" through "Inner FEC enable lane 7" in Table 177-6.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #1.

Cl **177** *SC* **177.10** *P* **325** *L* **29** # 1

Marris, Arthur Cadence Design Systems

Comment Type **TR** *Comment Status* **A** *(bucket)*

Change the "enable" control variables to a single "reset" variablef

SuggestedRemedy

In Table 177–6 rename "Inner FEC enable lane 0" to "Inner FEC reset"
Make the variable reference be to 177.6.2.1 (where Inner FEC reset is defined)
Delete rows for "Inner FEC enable lane 1" to "Inner FEC enable lane 7"
Delete editor's note below Table 177-6
In Table 45–177a delete rows "Inner FEC enable lane 1" to "Inner FEC enable lane 7" and in the row for "1.2400.0" change "enable" to "reset"
On page 320 line 53 for the reset variable change the cross reference from "45.2.1.1.1" to "45.2.1.213a"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.10** *P* **326** *L* **9** # 17

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *(bucket)*

In Table 177-6 the enable bits are never defined in this clause nor are they necessary.

SuggestedRemedy

Remove the enable bits from Table 177-6 and delete the editor's note below.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #1.

Cl **177** *SC* **177.10.** *P* **325** *L* **9** # 298

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

Table 177-6 includes control variables for per-lane inner FEC enable. As stated in the editor's note, these variables are not defined.

There idea of disabling the FEC and the behaviors of the encoder and decoder in this state have never been discussed.

If the intent is to have a way to power down the FEC logic, then the adjacent PMD's output enable and signal detect functions can be used. However, this would not be observable and need not be specified in a standard.

SuggestedRemedy

Delete the "Inner FEC enable" control variables in table 177-6 and the corresponding MDIO registers in clause 45.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #1.

Cl **177** *SC* **177.10.** *P* **325** *L* **39** # 299

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

The status variable name "pmal_locked_demux" is not mentioned in the referenced 177.4.1.2. It is defined in 176.4.4.2.1.
Also, it is a per-lane variable.

SuggestedRemedy

Either change the cross-reference to clause 176, or add text in 177.4.1.2 that the inner FEC has separate status variables for this function (only in the transmit direction? Or both?)
Add "lane 0 through 7".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change the cross reference to clause 176, and implement with editorial license.

Cl **178** *SC* **178.7.1** *P* **338** *L* **42** # 28

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *(bucket)*

The skew numbers from previous generations should be fine.

SuggestedRemedy

Delete the editor's note.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.7.2** *P* **339** *L* **12** # 29

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *(bucket)*

Skew constraints for 1.6TBASE-R based on 800GBASE-R should be fine.

SuggestedRemedy

Delete the editor's note.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.10.1** *P* **350** *L* **38** # 558

Heck, Howard TE Connectivity

Comment Type **E** *Comment Status* **A** *(bucket)*

The value for COM single-ended receiver termination resistance is highlighted in orange.This value is consistent with those in 179 and 176C.

SuggestedRemedy

Remove the orange highlighting.

Response *Response Status* **C**

ACCEPT.

Cl **178A** *SC* **178A** *P* **757** *L* **26** # 360

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Add quantization noise.

SuggestedRemedy

Add a new sub-section "178A.1.7.6 Quantization Noise". Please refer to slides 2-4 of the supporting document for the proposed sub-section content and text.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.7** *P* **754** *L* **32** # 364

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, "sampler" should be replaced with "quantizer".

SuggestedRemedy

Change "sampler" to "quantizer".

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.7** *P* **754** *L* **50** # 361

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, Figure 178A-7 should show addition of the quantization noise after the sampler.

SuggestedRemedy

Add quantization noise to the figure. Please refer to slide 5 of the supporting document for the proposed change.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.7** *P* **755** *L* **2** # 362

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, Table 178A-9 should include quantization noise parameters.

SuggestedRemedy

Add two quantization noise parameters to the table. Please refer to slide 6 of the supporting document for the proposed change.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.7** *P* **755** *L* **15** # 365

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, "sampler" should be replaced with "quantizer".

SuggestedRemedy

Change "sampler" to "quantizer".

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.7** *P* **755** *L* **19** # 363

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, Equation (178A-14) should include quantization noise PSD.

SuggestedRemedy

Add quantization noise PSD to the equation and its description to the descriptions. Please refer to slide 7 of the supporting document for the proposed change.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.8.1** *P* **757** *L* **18** # 367

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, quantization noise should be added before sampler output is applied to the feed-forward filter in Figure 178A-9.

SuggestedRemedy

Add quantization noise to the figure. Please refer to slide 8 of the supporting document for the proposed change.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.8.1** *P* **757** *L* **43** # 366

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, "sampler" should be replaced with "quantizer".

SuggestedRemedy

Change "sampler" to "quantizer".

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.8.1** *P* **758** *L* **33** # 534

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket)*

If Nb is the number of feedback taps, Nf is the number of feedforward taps. Obvs. Although OIF use it for something else. 10GBASE-LRM uses EqNf and EqNb. 802.3ck has:
DFE maximum span including floating taps N_f (but it doesn't have receiver FFE taps so the contradiction doesn't apply) and
Number of DFE floating tap banks N_bg.

SuggestedRemedy

Change Number of (FFE) taps per floating tap group, from Nf to N_fg

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
For consistency with the notation used in Annex 93A, change "Number of floating tap groups" from N_{g} to N_{wg} and change "Number of taps per floating tap group" from N_{f} to N_{wf}. The change from "b" to "w" in the subscripts indicates that this floating tap structure is in the feed-forward filter defined in Annex 178A, whose tap coefficients are denoted as w(i), and not in the feedback filter as defined in Annex 93A.
Implement with editorial license.
[Editor's note: CC: 178, 179, 176C, 176D.]

Cl **178A** *SC* **178A.1.9** *P* **761** *L* **10** # 368

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, Equation (178A-34) should include quantization noise PSD.

SuggestedRemedy

Add quantization noise PSD to the equation. Please refer to slide 9 of the supporting document for the proposed change.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.10.2** *P* **761** *L* **51** # 369

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, more text should be added to describe the procedure for deriving the probability density function of the quantization noise and its addition to the probability distribution function of the noise and interference.

SuggestedRemedy

Add the suggested text in slides 10-11 of the supporting document before the last sentence of the paragraph.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178A** *SC* **178A.1.11** *P* **762** *L* **39** # 370

Shakiba, Hossein Huawei Technologies Canada

Comment Type **T** *Comment Status* **R** *Quantization noise*

Following first comment, quantization noise should be added before sampler output is applied to the feed-forward filter in Figure 178A-10.

SuggestedRemedy

Add quantization noise to the figure. Please refer to slide 12 of the supporting document for the proposed change.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178B** *SC* **178B** *P* **765** *L* **19** # 542

Dawe, Piers Nvidia

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

This annex needs an introductory diagram, and the terminology needs cleaning up

SuggestedRemedy

Per comment

Response *Response Status* **C**

REJECT.
The suggested remedy does not provide sufficient detail to implement.

Cl **178B** *SC* **178B.5** *P* **766** *L* **33** # 355

Ran, Adee Cisco

Comment Type **E** *Comment Status* **A** *(bucket)*

The first two paragraphs of 178B.5 are not about the protocol, but about AUI components and PMDs.
They seem to belong to 178B.4, based on its title.

SuggestedRemedy

Move these paragraphs to 178B.4.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The first paragraph of 178B.5 is related to the section, so it should stay in 178B.5.
Move the second paragraph of 178B.5 to the begining of 178B.4
Implement with editorial license.

Cl **178B** *SC* **178B.5** *P* **767** *L* **1** # 381

Healey, Adam Broadcom Inc.

Comment Type **T** *Comment Status* **A** *(bucket)*

The "continue training" bit is in the control field. Also the cross-reference to 178B.8.8 does not point to the definition of the "Continue training" bit.

SuggestedRemedy

Change to "The continue training bit in the control field of the training frames (see 178B.7.2) if training is enabled."

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.2.1** *P* **783** *L* **13** # 124

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *Interfaces*

"other" interface is a bit ambigous and the listed situations are the typical use case but does not cover all use cases. As a remote PCS (after a XS) could do either local or clock forwarding modes.

SuggestedRemedy

Rename client_is_pcs to be "uses_local_clock_only" and update the definition to be "Boolean variable that indicates if the PMA will never swap to a forwarded clock. For example this will be true for the first PMA below the RS."

Replace both uses of client_is_pcs with uses_local_clock_only in Fig 178B-7

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Related slides in the following contribution were reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_01/brown_3dj_03a_2501.pdf

Implement the changes provided on slide 26 of brown_3dj_03a_2501 with editorial license.

Cl **178B** *SC* **178B.14.2.1** *P* **783** *L* **31** # 382

Healey, Adam Broadcom Inc.

Comment Type **T** *Comment Status* **A** *(bucket)*

The "Continue training" bit is in the control field.

SuggestedRemedy

Change the last sentence of the definition of local_rts to "The logical-NOT of this variable is encoded as the “continue training” bit in the control field of transmitted training frames."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.
Also in the definition of remote_rts change: "of the status field" to "of the control field".

Cl **178B** *SC* **178B.14.3.5** *P* **789** *L* **41** # 141

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket)*

Ambigous transition if timer_done and tf_lock both occur simultaneously

SuggestedRemedy

Add "!recovery_timer_done *" to the transition back to TRAIN_LOCAL

Response *Response Status* **C**

ACCEPT.

Cl **178B** SC **178B.14.3.5** P **790** L **20** # 142

Slavick, Jeff — Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Fig 178B-9 has text box overlapping lines

SuggestedRemedy

tf_offset in GET_NEW_MARKER is covering up lies

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Fix the GET_NEW_MARKER box and text to avoid overlap.

Cl **178B** SC **178B.14.3.5** P **790** L **20** # 143

Slavick, Jeff — Broadcom

Comment Type **E** *Comment Status* **A** *(bucket)*

Fig 178B-9 has an extraneous line

SuggestedRemedy

extran | to th right of the UCT exiting POLARIY_INVERT

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Remove extraneous line from Figure 178B-9.

Cl **178B** SC **178B.14.3.5** P **790** L **27** # 144

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *State diagram*

Fig 178B-9 needs to clarify the transitions out of TEST_MARKER.

SuggestedRemedy

Change the transition from TEST_MARKER to INVALID_MARKER to be "(!valid_marker * !inverse_valid_marker) + (polarity_correction * inverse_valid_marker)"

Change the transition from TEST_MARKER to POLARITY_INVERT to be "!polarity_correction * inverse_marker_valid"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Related slides in the following contribution were reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_01/brown_3dj_03a_2501.pdf

Implement the changes on either slide 30 or slide 32, at the editor's discretion, of brown_3dj_03a_2501 with editorial license.

Cl **178B** SC **178B.15** P **792** L **6** # 7

Marris, Arthur — Cadence Design Systems

Comment Type **T** *Comment Status* **A** *(bucket)*

MDIO register bit references need to be added to Tables 178B-6 and 178B-7

SuggestedRemedy

Consider a proposal on how to do this during the January 2025 802.3dj task force meeting

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the repsonse to comment #170

Cl **179** SC **179.12** P **399** L **21** # 315

Ran, Adee — Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

The PMD is specified in 179.8 and 179.9. 179.14 contains management variable mapping and is irrelevant here.

SuggestedRemedy

Change the reference per the comment.

Response *Response Status* **C**

ACCEPT.

Cl **179** SC **179.14** P **400** L **10** # 90

Opsasnick, Eugene — Broadcom

Comment Type **TR** *Comment Status* **A** *reset variable*

In Table 179-20, the variable PMD_reset has a variable reference to subclause 178B.14.2.1; however, that subclause does not define "PMD_reset".

SuggestedRemedy

Suggest adding a subclause to CL 179 (perhaps 179.8.10) to define the PMD_reset variable similar to 180.5.6, 181.5.6, 182.5.6, 183.5.6, and 185.5.6 and 187.5.6 with title "PMD reset function" and subclause text:
"If the variable PMD_reset is asserted, the PMD shall be reset as defined in 45.2.1.1.1.".

And change the cross-reference in Table 179-20 from 178B.14.2.1 to this new subclause in Clause 179.

A similar subclause should also be added as 178.8.10 titled "PMD reset function" withthe same text as above.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #88.

Cl **179A** *SC* **179A.5** *P* **799** *L* **16** # 458

Kocsis, Sam — Amphenol

Comment Type **T** *Comment Status* **R** *(withdrawn)*

ILddCA,min is greater than ILddCH,min

SuggestedRemedy

Add an Editor's note to provide context and explain that testing the ILddCH,min condition is not possible.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179A** *SC* **179A.5** *P* **801** *L* **47** # 532

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *(bucket)*

17.5

SuggestedRemedy

17.75, twice

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment indicates a typo in a label in Figure 179A-2. Replace 17.5 with 17.75 and Implement formating with editorial license.

Cl **179A** *SC* **179A.5** *P* **802** *L* **12** # 560

Heck, Howard — TE Connectivity

Comment Type **T** *Comment Status* **A** *(bucket)*

The first channel min calculation in Figure 179A-3 contains an error. The equation states that 13 dB @ 53.125 GHz = (16+4.45+4.45)-(2*9.75). The correct equationis 13 dB = (16+8.25+8.25)=(2*9.75). The 8.25 dB is taken from Table 179A-3 (Minimum insertion loss budget values at 53.125 GHz)

SuggestedRemedy

Change the equation in Figure 179A-3 to "Channel Min (TP0d-TP5d) = 13 dB @ 53.125 GHz = (16+8.25+8.25)-(2*9.75)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement as proposed in suggested remedy.

Cl **179A** *SC* **179A.5** *P* **802** *L* **13** # 531

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *(bucket)*

13 dB ... = (16+4.45+4.45)-(2*9.75)

SuggestedRemedy

13 dB ... = (16+8.25+8.25)-(2*9.75)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #560.

Cl **179B** *SC* **179B.(new)** *P* **811** *L* **54** # 455

Sekel, Steve — Wilder Technologies

Comment Type **T** *Comment Status* **R** *(withdrawn)*

Reference impedance is 92.5 ohm differential, with test instruments being 100 ohm differential (50 ohm single ended). This introduces a discontunity in the test environment which does not exist in application environment. Lab measurements suggest the location (in time delay) of this discontinunity will change some compliance measurement results. The location within the test fixtures should be specified in a new sub-clause in section 179B.4

SuggestedRemedy

Problem will be presented with proposed location of 92.5 to 100 ohm discontinunity within the compliance test fixtures will be presented in contribuion during 802.3 interim meeting

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179B** *SC* **179B.2.1** *P* **803** *L* **39** # 453

Sekel, Steve — Wilder Technologies

Comment Type **T** *Comment Status* **R** *(withdrawn)*

ILdd is listed as TBD

SuggestedRemedy

Proposed values and equations will be presented with measurement data in contribution during January 802.3 Interim meeting.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179B** *SC* **179B.4.1** *P* **806** *L* **1** # 380

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **ER** *Comment Status* **R** *(bucket)*

There doesn't appear to be a figure - was it deleted? is this an editorial issue?

SuggestedRemedy

add figure to 179B-2

Response *Response Status* **C**

REJECT.
The issue is not editorial. The suggested remedy does not provide sufficient detail to implement.

Cl **179B** *SC* **179B.4.6** *P* **811** *L* **8** # 216

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(bucket)*

It is out of convention to specify a value "Less than xxx".
Similar issue in Table 179B-5.

SuggestedRemedy

Change "Integrated near-end crosstalk noise voltage" to "Integrated near-end crosstalk noise voltage (max)"
Change "Less than TBD" to "TBD"
Make similar updates in Table 179B-5.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.
Note that comment #217 proposes a value to use in place of TBD.

Cl **179C** *SC* **179C.1** *P* **814** *L* **12** # 519

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(bucket)*

Media Dependent Interface

SuggestedRemedy

Medium Dependent Interface

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Medium Dependent Interface is consistent with the current nomenclature definitions.
Change "Media Dependent Interface" to "Medium Dependent Interface" across the draft with editorial license.

Cl **179D** *SC* **179D.1.1** *P* **828** *L* **34** # 518

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **A** *(bucket)*

This says "a common set of electrical parameters specified in 179.11, enabling a 1 m length". What length(s) it enables is not relevant to this discussion of connector types and breakout, and it is not accurate.

SuggestedRemedy

Delete "enabling a 1 m length"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The current project scope supports multiple cable types of varying lengths, and so the current text is incorrect.
Implement the suggested remedy with editorial license.

Cl **180** *SC* **180.3** *P* **412** *L* **15** # 227

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *signal ok*

Signal_OK as shown in Fig 180-2 is from the Inner sublayer above then goes into ILT box on TX and another ILT box on the RX has Signal_OK out. We talk about Signal_OK then jump into inter-suplayer variables before intorudcing ILT.

SuggestedRemedy

Referencing Fig 180-2 would be helfull here. After the 1st paragraph add sentence: The PMD in this clause support Inter-sublayer Layer Training (ILT) type O1, see Annex 178B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

A definitive statement as proposed in the suggested remedy is beyond the intent of the service interface clause, which is defining interfaces between sublayers.

However, it would be helpful to the reader to point out references for each of the major functions in the block diagram.

In 180.3, change "training_status of the inter-sublayer training function" to "training_status of the inter-sublayer training (ILT) function (see 180.5.12)". Update 181.3, 182.3, 183.3 in a similar way.

In 180.5.1 add text pointing out reference to subclauses defining these. Update , 181.5.1, 182.5.1, and 183.5.2 in similar way.

Implement with editorial license.

Cl **180** *SC* **180.5.4** *P* **415** *L* **1** # 318

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucketp)*

"The state of the Global_PMD_signal_detect variable is conveyed to PMD client sublayers via the PMD service interface"

This is not true anymore; the service interface conveys the state of the ILT function (as shown in the diagram). The variable has a different semantic and is only accessible through management.

SuggestedRemedy

Delete the quoted sentence.

Implement similarly in other optical PMD clauses as necessary, with editorial license.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.7.1** *P* **418** *L* **12** # 319

Ran, Adee Cisco

Comment Type **T** *Comment Status* **R** *(withdrawn)*

The maximum optical return loss tolerance in 200GBASE-DR1 is different than in the other PMDs.
I assume this is due to the transmitter's connector; if that's true, should there be a different specification for a 200GBASE-DR1 with a multi-fiber MDI (breakout)? The receiver in that case can still have a single-lane MDI.
Should the transmitter's RINxxOMA in this case be measured with a reflectance corresponding to a single-lane MDI?

SuggestedRemedy

Not sure what the answer is and where this distinction should be made.

Whatever the solution is, implement similarly in clause 182 as necessary, with editorial license.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.8** *P* **421** *L* **41** # 321

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

The words "shall meet the" appear twice in succession.

SuggestedRemedy

Delete once.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.8** *P* **421** *L* **42** # 322

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

"per the definitions in 180.9" seems irrelevant. There are not specifications related to Table 180-10 in 180.9.

SuggestedRemedy

Delete "per the definitions in 180.9".

Implement similarly in other optical PMD clauses as necessary, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **180** *SC* **180.8.3.1.1** *P* **424** *L* **1** # 328

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

Table 180-14 is for 800GBASE-DR4.

SuggestedRemedy

Change the reference to Table 180-13.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.4** *P* **430** *L* **32** # 186

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *taps*

Value for minimum "number of equalizer pre-cursor taps" is TBD.

SuggestedRemedy

Either set the the value to 0 allowing the number of pre-cursor taps to vary from 0 to 3 or straddle the minimum/maximum columns with a value of 3, permitting only a value of 3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Based on the results of straw polls TF-1/2/3, in Table 180-18, Table 181-13, Table 182-18, Table 183-14 set the minimum number of pre-cursor taps to 0.

In Table 182-18, delete the row specifying number of post-cursor taps.

Implement with editorial license.

Straw poll #TF-1 (Chicago rules) #TF-2 (choose 1) -- directional
In Table 180-18, Table 181-13, Table 182-18, Table 183-14, I support setting minimum number of pre-cursor taps to:
A: 0
B: 1
C: 2
D: 3
TF-1: A: 41 B: 24 C: 21 D: 30
TF-2: A: 34 B: 7 C: 7 D: 20

Straw poll #TF-3 (choose 1) -- directional
In Table 180-18, Table 181-13, Table 182-18, Table 183-14, I support setting minimum number of pre-cursor taps to:
A: 0
B: 3
A: 43 B: 22

Cl **180** *SC* **180.9.5** *P* **430** *L* **4** # 171

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *SER*

The TDECQ test method points to clause 121.8.5.3, which uses a target SER of 4.8e-4, which is not appropriate for 200G/lane AUIs. As given in Table 174A-1, the appropriate value for 200G/lane AUIs should be 4.56e-4 for uncorrelated bit errors.

SuggestedRemedy

Add a new exception to the list:
"Target PAM4 symbol error ratio of 4.56e-4."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Add a new exception to the list:
"The target PAM4 symbol error ratio is 4.56e-4 and the related Q_t value is 3.428."
Implement with editorial license.

Cl **180** *SC* **180.9.5** *P* **430** *L* **22** # 240

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *TDECQ*

TDECQ masuremnt needs to define test condition when there is an optional AUI

SuggestedRemedy

Add following codition to the list of requiremetns in 180.9.5: Where AUI is exposed, a conforming implementation must meet TDECQ with the exposed AUI configured for applicable module stress input test as in 176C.4.4.5 Receiver jitter tolerance, 120G.3.4.3 Module stressed input tolerance, or 120E.3.4.1 Module stressed input test and the recovered AUI clock driving the TDECQ pattern. See Ghiasi_3dj_01_2501

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_01/ghiasi_3dj_01a_2501.pdf

Add the following TDECQ exceptions to be appropriately reworded:
- Counter-propagating asynchronous optical signals (crosstalk) as specified for the aggressor used in receiver stress tests is applied to all the PMD receive inputs at TP3. For Clause 180/181, the crosstalk test pattern can be pattern 3, 5, or 7. For Clause 182/183, the crosstalk pattern can be pattern 5 or 7.

Note that another comment proposes adding a new pattern: PRBS31 encoded by the xBASE-R Inner FEC, which if adopted may also be used for Clause 182/183.

- Where transmit direction where AUI is exposed, the AUI input recovered clock is the clock source for the SSPRQ test pattern. The AUI pattern may be either PRBS31Q or a valid xBASE-R signal.

Implement with editorial license.

Straw poll TF-4 (choose 1) -- directional
I support adoption of additional criteria for TDECQ where counter-progagating signals with data stream asynchronous with the transmit path are applied to the receive optical inputs as proposed in ghiasi_3dj_01.
Yes: 48
No: 18

Straw poll TF-5 -- directional
I support adoption of additional criteria for TDECQ where PMD transmit clock is synchronized to the clock recovered on the AUI input (with or without jitter stress) as proposed in ghiasi_3dj_01.
Yes: 42
No: 24

Straw poll TF-6 -- decision
I support adopting exception "- Counter-propagating asynchronous optical signals (crosstalk) as specified for the aggressor used in receiver stress tests is applied to all the PMD receive inputs at TP3. For Clause 180/181, the crosstalk test pattern can be pattern 3, 5, or 7. For Clause 182/183, the crosstalk pattern can be pattern 5 or 7."
Yes: 47
No: 20

Straw poll TF-7 -- decision
I support adopting TDECQ exception "- Where transmit direction where AUI is exposed, the AUI input recovered clock is the clock source for the SSPRQ test pattern. The AUI pattern may be either PRBS31Q or a valid xBASE-R signal.
Yes: 38
No: 28

Cl **180** *SC* **180.9.5** *P* **430** *L* **30** # 251

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *taps*

Number of pre-cursor is maximum with min TBD

SuggestedRemedy

What was agreed during Sept 2024 meeting to go with fixed 3 pre-cursors and not a floating at least for now, given than agreement merge the TBD and max line and just enter 3 similar to FFE length of 15.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **180** *SC* **180.9.5** *P* **430** *L* **32** # 422

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *taps*

For commonality of implementation and becasue there is no expected reason for needing a different tap allocation for the TDECQ reference equalizer for the different clauses the TDECQ reference equalizer should be made the same for the clauses 180,181,182 and 183. In D1.3 all the clauses have the same 15 FFE length and the same 3 maximum number of pre-cursor taps however the minimum number of equalizer pre-cursor taps for the TDECQ reference equalizer is TBD in table 180-18 (for 200GBASE-DR1 etc.) as it is for 800GBASE-FR4-500 in table 181-13 and 800GBASE-FR4 etc. in table 183- 14 whereas for 200GBASE-DR1-2 etc in table 182-18 the format is different with a maximum number of post cursor taps of 13 implying a minimum number of pre-cursor taps of 2.

SuggestedRemedy

Make the format of the tables the same. Adopt a minimum number of pre-cursor taps of 2 and maximum number of ppre-cursor taps of 3 for all the tables.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **180** *SC* **180.9.5** *P* **430** *L* **32** # 172

Johnson, John Broadcom

Comment Type **TR** *Comment Status* **A** *taps*

In Table 180-18, the minimum number of equalizer pre-cursor taps is TBD. In the absence of further proposals, this value should be 0, consistent with the 5-tap FFE defined in 121.8.5.4.

SuggestedRemedy

Change TBD in Table 180-18 to 0.
Delete the associated editors note.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **180** *SC* **180.9.5** *P* **430** *L* **35** # 331

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *(bucket)*

Footnote a of Table 180-18 says "Relative to main tap".
"Main tap" is not defined anywhere, though it may be assumed that it is the largest positive value.
Even with that assumption, It is unclear whether this means that the coefficient limits are normalized by the main tap's coefficient or that the coefficient indices are such that the main tap index is 0, or both.

I suspect the answer is "both" but it is not clear from the text.

SuggestedRemedy

Change footnote a to read "The main tap is marked by i=0. The minimum and maximum values are relative to this tap's coefficient."

Implement similarly in other optical PMD clauses as necessary, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy (also in 181, 182, and 183) with editorial license.
[Editor's note: CC: 180, 181, 182, 183]

Cl **180** *SC* **180.10.1** *P* **433** *L* **47** # 336

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

Why is "IEC 62368-1" in green? It is not expected to become an active cross-reference.

Similarly for IEC references in 180.10.2.

SuggestedRemedy

Change the format of these references to regular text.

Implement similarly in other optical PMD clauses as necessary, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **180** *SC* **180.11** *P* **435** *L* **46** # 337

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

"PMD_signal_detect_3, to PMD_signal_detect_2"

SuggestedRemedy

Delete "to".

Implement similarly in other optical PMD clauses as necessary, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license

Cl **181** *SC* **181.1** *P* **438** *L* **49** # 338

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

169.2 is included in this amendment.

SuggestedRemedy

Make it an active link.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **181** *SC* **181.3** *P* **440** *L* **2** # 228

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *signal ok*

Signal_OK as shown in Fig 180-2 is from the Inner sublayer above then goes into ILT box on TX and another ILT box on the RX has Signal_OK out. We talk about Signal_OK then jump into inter-suplayer variables before intorudcing ILT.

SuggestedRemedy

Referencing Fig 180-2 would be helfull here. After the 1st paragraph add sentence: The PMD in this clause support Inter-sublayer Layer Training (ILT) type O1, see Annex 178B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #227

Cl **181** *SC* **181.3** *P* **440** *L* **6** # 339

Ran, Adee — Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

"where i = 0 to n–1"
For this PMD, the number of PMD lanes is always 4 (as stated on the subsequent line). Using "n" just makes life harder for the reader, especially since n (with this meaning) only appears a few times in the clause, and in some places (e.g. Figure 181-2, 181.5.2, 181.5.3) explicit numbers are used.

Note that the "n" in 800GAUI-n is a different variable and should be kept as is.

SuggestedRemedy

Change to "where i = 0 to 3".
Delete "The number of parallel streams, n, is 4.".

In 181.5.4 change n to 4.
In 181.5.5, in Table 181-15, and in Table 181-16, change "n-1" to 3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **181** *SC* **181.4.1** *P* **440** *L* **25** # 340

Ran, Adee — Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

169.4 is included in this amendment.

SuggestedRemedy

Make it an active link.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **181** *SC* **181.4.2** *P* **440** *L* **28** # 341

Ran, Adee — Cisco

Comment Type **ER** *Comment Status* **A** *(bucket)*

169.5 is included in this amendment.

SuggestedRemedy

Make it an active link (twice).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **181** *SC* **181.9.5** *P* **454** *L* **4** # 173

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *SER*

The TDECQ test method points to clause 121.8.5.3, which uses a target SER of 4.8e-4, which is not appropriate for 200G/lane AUIs. As given in Table 174A-1, the appropriate value for 200G/lane AUIs should be 4.56e-4 for uncorrelated bit errors.

SuggestedRemedy

Add a new exception to the list:
"Target PAM4 symbol error ratio of 4.56e-4."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Add a new exception to the list:
"The target PAM4 symbol error ratio is 4.56e-4 and the related Q_t value is 3.428."
Implement with editorial license.

Cl **181** *SC* **181.9.5** *P* **454** *L* **22** # 241

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *TDECQ*

TDECQ masuremnt needs to define test condition when there is an optional AUI

SuggestedRemedy

Add following codition to the list of requiremetns in 180.9.5: Where AUI is exposed, a conforming implementation must meet TDECQ with the exposed AUI configured for applicable module stress input test as in 176C.4.4.5 Receiver jitter tolerance, 120G.3.4.3 Module stressed input tolerance, or 120E.3.4.1 Module stressed input test and the recovered AUI clock driving the TDECQ pattern. See Ghiasi_3dj_01_2501

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #240

Cl **181** *SC* **181.9.5** *P* **454** *L* **30** # 187

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *taps*

Value for minimum "number of equalizer pre-cursor taps" is TBD.

SuggestedRemedy

Either set the the value to 0 allowing the number of pre-cursor taps to vary from 0 to 3 or straddle the minimum/maximum columns with a value of 3, permitting only a value of 3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **181** *SC* **181.9.5** *P* **454** *L* **30** # 250

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *taps*

Number of pre-cursor is maximum with min TBD

SuggestedRemedy

What was agreed during Sept 2024 meeting to go with fixed 3 pre-cursors and not a floating at least for now, given than agreement merge the TBD and max line and just enter 3 similar to FFE length of 15.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **181** *SC* **181.9.5** *P* **454** *L* **31** # 174

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *taps*

In Table 181-13, the minimum number of equalizer pre-cursor taps is TBD. In the absence of further proposals, this value should be 0, consistent with the 5-tap FFE defined in 121.8.5.4.

SuggestedRemedy

Change TBD in Table 181-13 to 0.
Delete the associated editors note.
For the editor's consideration: If the specs are identical, delete Table 181-13 completely and refer to Table 180-18.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **182** *SC* **182.3** *P* **465** *L* **6** # 229

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *signal ok*

Signal_OK as shown in Fig 180-2 is from the Inner sublayer above then goes into ILT box on TX and another ILT box on the RX has Signal_OK out. We talk about Signal_OK then jump into inter-suplayer variables before intorudcing ILT.

SuggestedRemedy

Referencing Fig 180-2 would be helfull here. After the 1st paragraph add sentence: The PMD in this clause support Inter-sublayer Layer Training (ILT) type O1, see Annex 178B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See resolution to comment #227

Cl **182** *SC* **182.7.1** *P* **471** *L* **27** # 33

Landry, Gary — Texas Instruments

Comment Type **TR** *Comment Status* **A** *(bucket)*

OMAouter vs max(TECQ, TDECQ) figure was not updated when the OMAouter (min) values were changed in D1.3.

SuggestedRemedy

Update the figure to match D1.3 data. To be specific, OMAouter (min) line should be -0.3 dBm for max(TECQ, TDECQ) < 0.9 dB and 1.2+max(TECQ, TDECQ) dBm for > 0.9 dB.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **182** *SC* **182.9.5** *P* **483** *L* **1** # 346

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *SER*

"Target PAM4 symbol error ratio of 9.6 × 10^-3"
If this value is used instead of 4.8e-4 as TDECQ was originally defined, then TDECQ of an ideal transmitter would be negative, because the normalization factor Q_t is "consistent with the BER and target symbol error ratio for Gray coded PAM4" (which is 4.8e-4).

This makes TDECQ something other than a "penalty" as it is typically understood.

In addition, as demonstrated by several presentations, TDECQ with such high SER is not feasible, as test signal achieving the maximum TDECQ cannot be measured..

It would make more sense to keep the target PAM4 SER as 4.8e-4 (with the same Q_t) and instead relax the maximum TDECQ value in this clause by a factor corresponding to the lower Q function of the higher SER, to allow a more closed eye:

- For SER=4.8e-4: Q(SER*2/3)=-3.414 (as in 121.8.5.3)
- For SER=9.6e-3: Q(SER*2/3)=-2.489
- 10*log10(3.414/2.489)=1.37 dB
Thus the relaxation should be 1.37 dB.

SuggestedRemedy

Change the target PAM4 SER to 4.8e-4.
Change the maximum TDECQ and TECQ from 3.2 dB to 3.2+1.37=4.57 dB.
Make corresponding changes to the receiver specifications (SECQ) in Table 181–6.

Implement similarly in clause 183 with modified values as necessary, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Similar as comment #146 to D1.2. A strawpoll was held and it was agreed to maintain the SER value 9.6x10-3. The comment does not contain sufficient evidence that this value not sufficient.
However, the Q_t value should be adjusted to align with the SER value.
In 182.9.5…
Change: "Target PAM4 symbol error ratio of 9.6×10-3."
To: "The target PAM4 symbol error ratio is 9.6×10-3 and the related Q_t value is 2.489."
In 183.9.5…
Change: "Target PAM4 symbol error ratio of 9.6×10–3 for 800GBASE-FR4 and 800GBASE-LR4"
To: "The target PAM4 symbol error ratio is 9.6×10-3 and the related Q_t value is 2.489."
Implement with editorial license.

Cl **182** *SC* **182.9.5** *P* **483** *L* **17** # 242

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *TDECQ*

TDECQ masuremnt needs to define test condition when there is an optional AUI

SuggestedRemedy

Add following codition to the list of requiremetns in 180.9.5: Where AUI is exposed, a conforming implementation must meet TDECQ with the exposed AUI configured for applicable module stress input test as in 176C.4.4.5 Receiver jitter tolerance, 120G.3.4.3 Module stressed input tolerance, or 120E.3.4.1 Module stressed input test and the recovered AUI clock driving the TDECQ pattern. See Ghiasi_3dj_01_2501

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #240

Cl **182** *SC* **182.9.5** *P* **483** *L* **25** # 175

Johnson, John Broadcom

Comment Type **TR** *Comment Status* **A** *taps*

In Table 182-18, the minimum number of equalizer pre-cursor and post-cursor taps is left blank. In the absence of further proposals, this FFE definition should be the same as given in Table 180-18, and the value for minimum pre-cursor taps should be 0, consistent with the 5-tap FFE defined in 121.8.5.4.

SuggestedRemedy

Format Table 182-18 to be the same as Table 180-18 (delete the row for number of post-cursor taps), and change the minimum number of pre-cursor taps to 0.
Delete the associated editors note.
For the editor's consideration: If the specs are identical, delete Table 182-18 completely and refer to Table 180-18.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **182** *SC* **182.9.5** *P* **483** *L* **25** # 249

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *taps*

Number of pre-cursor is not maximum but rather just 3

SuggestedRemedy

What was agreed during Sept 2024 meeting to go with fixed 3 pre-cursors and not a floating at least for now, given than agreement merge the cell with max cell and just enter 3 similar to FFE length of 15.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **182** *SC* **182.9.5** *P* **483** *L* **25** # 189

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *taps*

Value for minimum "number of equalizer pre-cursor taps" is not specified.

SuggestedRemedy

Either set the the value to 0 allowing the number of pre-cursor taps to vary from 0 to 3 or straddle the minimum/maximum columns with a value of 3, permitting only a value of 3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186

Cl **182** *SC* **182.12** *P* **490** *L* **3** # 109

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **ER** *Comment Status* **R** *(withdrawn)*

type 400GBASE-DR4 is not the PMD type of clause 182

SuggestedRemedy

change to type" 200GBASE-DR1-2, 400GBASE-DR2-2, 800GBASE-DR4-2, and 1.6TBASE-DR8-2"

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **182** *SC* **182.12** *P* **490** *L* **8** # 110

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **ER** *Comment Status* **R** *(withdrawn)*

PMD types should be updated in the text.

SuggestedRemedy

change "type 400GBASE-DR4" to " type 200GBASE-DR1-2, 400GBASE-DR2-2, 800GBASE-DR4-2, and 1.6TBASE-DR8-2"

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **183** *SC* **183.3** *P* **494** *L* **6** # 230

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *signal ok*

Signal_OK as shown in Fig 180-2 is from the Inner sublayer above then goes into ILT box on TX and another ILT box on the RX has Signal_OK out. We talk about Signal_OK then jump into inter-suplayer variables before intorudcing ILT.

SuggestedRemedy

Referencing Fig 180-2 would be helfull here. After the 1st paragraph add sentence: The PMD in this clause support Inter-sublayer Layer Training (ILT) type O1, see Annex 178B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #227

Cl **183** *SC* **183.9.5** *P* **509** *L* **4** # 243

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *TDECQ*

TDECQ masuremnt needs to define test condition when there is an optional AUI

SuggestedRemedy

Add following codition to the list of requiremetns in 180.9.5: Where AUI is exposed, a conforming implementation must meet TDECQ with the exposed AUI configured for applicable module stress input test as in 176C.4.4.5 Receiver jitter tolerance, 120G.3.4.3 Module stressed input tolerance, or 120E.3.4.1 Module stressed input test and the recovered AUI clock driving the TDECQ pattern. See Ghiasi_3dj_01_2501

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #240

Cl **183** *SC* **183.9.5** *P* **509** *L* **14** # 176

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *taps*

In Table 183-14, the minimum number of equalizer pre-cursor taps is TBD. In the absence of further proposals, this value should be 0, consistent with the 5-tap FFE defined in 121.8.5.4.

SuggestedRemedy

Change TBD in Table 183-14 to 0.
Delete the associated editors note.
For the editor's consideration: If the specs are identical, delete Table 183-14 completely and refer to Table 180-18.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186.

Cl **183** *SC* **183.9.5** *P* **509** *L* **14** # 188

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *taps*

Value for minimum "number of equalizer pre-cursor taps" is TBD.

SuggestedRemedy

Either set the the value to 0 allowing the number of pre-cursor taps to vary from 0 to 3 or straddle the minimum/maximum columns with a value of 3, permitting only a value of 3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186.

Cl **183** *SC* **183.9.5** *P* **509** *L* **14** # 248

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *taps*

Number of pre-cursor is maximum with min TBD

SuggestedRemedy

What was agreed during Sept 2024 meeting to go with fixed 3 pre-cursors and not a floating at least for now, given than agreement merge the TBD and max line and just enter 3 similar to FFE length of 15.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #186.

Cl **184** *SC* **184.4.5** *P* **522** *L* **5** # 35

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

The description of the parity polynomial says "A partity polynomial p(x) of degree 15 is efind as the remainder from the division (modulo 2) of m(x) x x^16 by the generator polynomial showni in Equation (184-2)". The intent of this is that the resulting parity polynomial p(x) is in equation 184-2 (with the generator polynomial in (184-1), but that isn't what the text says.

SuggestedRemedy

Change the text to read: "A parity polynomial p(x) of degree 15 is defined as the remainder from the division (modulo 2) of m(x) x x^16 by the generator polymomial, as shown in Equation (184-2)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "A parity polynomial p(x) of degree 15 is defined as the remainder from the division (modulo 2) of m(x) x x16 by the generator polynomial shown in Equation (184–2)" to: "A parity polynomial p(x) of degree 15 (shown in Equation 184-2) is defined as the remainder from the division (modulo 2) of m(x) x x16 by the generator polynomial shown in Equation (184–1)"
Implement with editorial license.

Cl **184** *SC* **184.6.2.2** *P* **530** *L* **47** # 89

Opsasnick, Eugene — Broadcom

Comment Type **T** *Comment Status* **A** *reset variable*

FEC_reset is referred to in the definition of the "reset" variable, but FEC_reset is not defined except through a cross-reference to 45.2.1.1.1. The MDIO control variables table (Table 184-4) already has a cross reference to 184.6.2.2 as well as CL 45 and the MDIO register bit number,

SuggestedRemedy

Remove the cross-reference text "(see 45.2.1.1.1)" from the definition of reset in 184.6.2.2.

Add the definition of "FEC_reset" to the list of variables in 184.6.2.2 as: "Boolean variable that is true when set by a management entity and is false otherwise".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #88.

Cl **184** *SC* **184.9** *P* **535** *L* **15** # 2

Marris, Arthur — Cadence Design Systems

Comment Type **TR** *Comment Status* **A** *reset variable*

Make FEC_reset reference Inner FEC control register 1.2400

SuggestedRemedy

In Table 184-4 make the MDIO bit 1.2400.0 and reference 45.2.1.213a
Change variable name from "FEC_reset" to "Inner_FEC_reset" and also on page 530 line 47
In Table 45–177a delete rows "Inner FEC enable lane 1" to "Inner FEC enable lane 7" and in the row for "1.2400.0" change "enable" to "reset"
On page 530 line 47 for the reset variable change the cross reference from "45.2.1.1.1" to "45.2.1.213a"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #88.

Cl **185** *SC* **185.3.1.1** *P* **545** *L* **13** # 72

Sluyski, Mike — Cisco

Comment Type **E** *Comment Status* **R** *(bucket)*

This clause include a reference (184.4.11.1) and later to (185.5.2).

SuggestedRemedy

Would it be better and clearer to reference Figure 185-2 instead of text 184.4.11.1 (Picture is clearer than words). Likewise Reference to Figure 185-5 than text in 185.5.2.

Response *Response Status* **C**

REJECT.
Subclause 185.3.1.1 specifies the receipt of the PMD:IS_UNITDATA.request primitive.
The noted referece to 184.4.11.1 specifies how the primitive is created and contains relevent information not included in the Figure 185-2 or 185-3.
No change to the draft
[Editor's note: changed subclause from 185.3.1.1 800GBASE-L to 185.3.1.1]

Cl **185** *SC* **185.12.4.1** *P* **562** *L* **10** # 401

Maniloff, Eric — Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

Transmitter nominal center frequency is not applicable to this PMD.

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **185** *SC* **185.12.4.1** *P* **562** *L* **13** # 402

Maniloff, Eric — Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

Receiver nominal center frequency is not applicable to this PMD

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **185** *SC* **185.12.4.4** *P* **563** *L* **34** # 405

Maniloff, Eric — Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

Adjustable range of transmit
optical power is not defined for clause 185

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **185** *SC* **185.12.4.4** *P* **563** *L* **36** # 406

Maniloff, Eric — Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

Minimum average channel power at maximum adjustable power setting is not applicable to clause 185 PMDs

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **185** *SC* **185.12.4.24** *P* **562** *L* **40** # 403

Maniloff, Eric — Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

PMD receive center frequency ability is not applicable to this PMD

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **185** *SC* **185.2** *P* **542** *L* **36** # 71

Sluyski, Mike — Cisco

Comment Type **E** *Comment Status* **R** *(bucket)*

Does IEEE style allow embedded parameter values as part of the text (e.g. BERadded equal to 3.2 x 10-5 and BERadded equal to 6.4 x 10-5)

SuggestedRemedy

A small table might be clearer than values buried In text.

Response *Response Status* **C**

REJECT.
Stating parameter values as text is supported by IEEE and widely used in IEEE Std 802.3-2022.
No changes to the draft.
[Editor's note: changed subclause from 185.5.2 Error ratio allocation to 185.2]

Cl **185A** *SC* **185A** *P* **839** *L* **6** # 520

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *(bucket)*

ETCC is normative, like TDECQ or COM.

SuggestedRemedy

Change "informative" to "normative.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186** *P* **576** *L* **6** # 182

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(bucket)*

The acronym AMs is used but never defined. Better to just spell it out. Exception is if it is used specifically for a field name of "AM".

SuggestedRemedy

Change "AMs" to "alignment markers".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Make suggested change throughout clause 186. Implement with editorial license.

Cl **186** *SC* **186.2.2** *P* **568** *L* **23** # 37

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

The AM field was renamed FAM to clarify that it is not the 800GBASE-R AMs.

SuggestedRemedy

Change OH/AM to OH/FAM

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.3.6** *P* **572** *L* **51** # 38

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

With the addition of the AML field, the overhead is no longer a subset of what is in the OIF IA. Also, the reference to ITU-T G.709.6 should be to ITU-T G.709.1

SuggestedRemedy

Revise the text to read: "The frame overhead is based on the frame defined in subclause 4.3.3 of OIF-800ZR-01.0, which is a subset of what is defined in Recommendation ITU-T G.709.1."

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.4.1** *P* **580** *L* **20** # 127

Slavick, Jeff — Broadcom

Comment Type **T** *Comment Status* **A** *(bucket)*

Don't have the counters be their own sub-headings, just be inline functionality that is part of the decoder.

SuggestedRemedy

Add this sentence prior to the 186.2.4.1.1 heading "The following counters shall be implemented to aid a network operator in determining the link quality."

Remove the sub-headings of 186.2.4.1.1-4 and make them inline definitions like is done in 175.2.5.3

Update the references in Table 186-8
Implement with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **186** *SC* **186.3.3.1.2** *P* **589** *L* **17** # 40

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

In figure 186-13, 'mfas' should be 'faw' to align with the text in 186.3.3.1.5 (faw is used here to avoid conflict with the MFAS field in the PCS frame structure in clasue 186.2)

SuggestedRemedy

Change mfas to faw

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.2.1** *P* **597** *L* **6** # 41

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(bucket)*

As is tersely explained in 186.2.3.5.1 (with reference to G.709.6, where there is additional detail), the FAM field contains 32 bytes that are providing the frame alignment pattern, and 28 bytes that are reserved (0x00). The alignment process should only be looking at the 32 bytes; the 28 bytes that are transmitted as 0x00 are not required to match.

SuggestedRemedy

Revise the definition of fam_valid to consider only the 32 bytes that have the frame alignment pattern rather than the entire FAM field:
"A Boolean variable that is set to true if the first 256 bits of the FAM field are a valid PCS frame alignment mechanism sequence..."

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.5** *P* **605** *L* **40** # 192

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **R** *(withdrawn)*

Delay constraints are TBD.

SuggestedRemedy

Expect a contribution with proposals.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **187** *SC* **187.1** *P* **614** *L* **8** # 74

Sluyski, Mike — Cisco

Comment Type **E** *Comment Status* **A** *(bucket)*

The optical signal generated by these PMD types are modulated using a dual polarization 16-state quadrature amplitude modulation

SuggestedRemedy

either signal is plural as in signals or the are should be is if singular.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "The optical signal generated by these PMD types are modulated" to "The optical signals generated by these PMD types are modulated".

Cl **187** SC **187.2** P **615** L **34** # 75

Sluyski, Mike Cisco

Comment Type **E** *Comment Status* **A** *(bucket)*

Reference 174A.4 is not linked.

SuggestedRemedy

Link reference to 174A.4

Response *Response Status* **C**

ACCEPT.

Cl **187** SC **187.3.1.1** P **618** L **13** # 76

Sluyski, Mike Cisco

Comment Type **E** *Comment Status* **R** *(bucket)*

This clause include a reference (186.3.3.1.6) and later to (187.5.2).

SuggestedRemedy

Would it be better and clearer to reference Figure 187-2 instead of text 186.3.3.1.6 (Picture is clearer than words). Likewise Reference to Figure 187-5 than text in 187.5.2.

Response *Response Status* **C**

REJECT.
Subclause 187.3.1.1 specifies the receipt of the PMD:IS_UNITDATA.request primitive. The noted referece to 186.3.3.1.6 specifies how the primitive is created and contains relevent information not included in the Figure 187-2 or 187-3.
No change to the draft
[Editor's note: changed subclause from "187.3.1.1 800GBASE-E" to 187.3.1.1]

Cl **187** SC **187.8.6** P **628** L **8** # 160

Bruckman, Leon Nvidia

Comment Type **ER** *Comment Status* **A** *(bucket)*

Redundant "is".

SuggestedRemedy

Change: "ETCC is the quality metric is used to define"
To: "ETCC is the quality metric used to define"

Response *Response Status* **C**

ACCEPT.

Cl **187** SC **187.12.4.1** P **634** L **10** # 410

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

Transmitter nominal center frequency is not applicable to this PMD.

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **187** SC **187.12.4.1** P **634** L **13** # 411

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

Receiver nominal center frequency is not applicable to this PMD

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **187** SC **187.12.4.2** P **634** L **40** # 412

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

PMD receive center frequency ability is not applicable to this PMD

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **187** SC **187.12.4.4** P **635** L **34** # 413

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

Adjustable range of transmit
optical power is not defined for clause 187

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.

Cl **187** *SC* **187.12.4.4** *P* **635** *L* **36** # 414

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *(bucket)*

Minimum average channel power at maximum adjustable power setting is not applicable to clause 187 PMDs

SuggestedRemedy

Delete this entry.

Response *Response Status* **C**

ACCEPT.