

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 00 SC 0 P0 L0 # 581

Brown, Matt Alphawave Semi

Comment Type T Comment Status X

In the past, we have included all previously defined AUI for each new PHY type defined. Given that the PMA multiplexing methods were consistent this was simple to support. Now that we have switched to a different PMA multiplexing method (RS-FEC symbol) things are getting more complicated.

*SuggestedRemedy*

For each PHY new 200 Gb/s per lane or higher PHY type, include only one or two previous generations of AUI. Specifically, the new PHY types defined in 802.3dj indication only 100 Gb/s per lane and 200 Gb/s per lane AUIs as being optional within a PHY. Perhaps, also include 50 Gb/s per lane AUIs as well.

Proposed Response Response Status O

Cl 00 SC 0 P0 L0 # 185

Brown, Matt Alphawave Semi

Comment Type T Comment Status X

Many state diagrams in this draft as well as in the base standard use the operator "++" to indicate that the variable be incremented by 1. However, this operator is never defined.

*SuggestedRemedy*

Import Clause 21 and...  
Amend 21.5 to include definition of "++".  
Delete the following from state diagram conventions in multiple clauses. "The notation used in the state diagrams follows the conventions of 21.5. The notation ++ after a counter or integer variable indicates that its value is to be incremented."

Proposed Response Response Status O

Cl 1 SC 1.3 P46 L33 # 506

Dawe, Piers Nvidia

Comment Type TR Comment Status X

Add and update connector references as necessary. This is what is in 1.3:  
SFF-8402, Rev 1.1, September 13, 2014, Specification for SFP+ 1X 28 Gb/s Pluggable Transceiver Solution (SFP28).  
SFF-8432, Rev 5.1, August 8, 2012, Specification for SFP+ Module and Cage.  
SFF-8436, Rev 4.8, October 31, 2013, Specification for QSFP+ 10 Gb/s 4X Pluggable Transceiver.  
SFF-8665, Rev 1.9, June 29, 2015, Specification for QSFP+ 28 Gb/s 4X Pluggable Transceiver Solution (QSFP28).

*SuggestedRemedy*

Use these for now (most will be updated before this project is done):  
OSFP Octal Small Form Factor Pluggable Module, Rev 5.0, October 2, 2022  
QSFP-DD/QSFP-DD800/QSFP-DD1600 Hardware Specification for QSFP Double Density 8x Pluggable Transceivers, Rev 7.0, September 29, 2023  
SFF-8665 Rev 1.9.4, 2022-04-01, QSFP+ 4X Pluggable Transceiver Solutions  
SFF-TA-1011 Rev 1.1, 2024-04-19, Cross Reference to Select SFF Connectors and Modules  
SFF-TA-1027, Rev 1.0, 2024-04-16, QSFP2 Connector, Cage, & Module Specification  
SFF-TA-1031, Rev 1.0, 2023-06-11, SFP2 Cage, Connector, & Module Specification  
<https://osfpmsa.org/specification.html>  
<http://www.qsfp-dd.com/specification/>  
Refer to these documents from 179C.

Proposed Response Response Status O

Cl 1 SC 1.4.184da P49 L43 # 309

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

Comment Type TR Comment Status X

800GBASE-ER1 is defined as using 800GBASE-R encoding, but per 802.3df-2024, 1.4.184e - "The term 800GBASE-R represents a family of Physical Layer devices using the Physical Coding Sublayer (PCS) defined in Clause 172 for 800 Gb/s operation." This PHY as noted in Table 169-3a, uses PCS encoding as defined in Clause 186.

*SuggestedRemedy*

Define new name for family / encoding based on Clause 186 encoding.  
Modify definition of entry for 800GBASE-ER1 to reflect new family name.

Proposed Response Response Status O

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Cl 1 SC 1.4.184da P49 L44 # 111

Huber, Thomas

Nokia

Comment Type T Comment Status X

Since 800GBASE-ER1 and -ER1-20 have a separate PCS, the definition for 800GBASE-ER1 and ER1-20 should refer to 800GBASE-ER1 encoding rather than 800GBASE-R encoding

SuggestedRemedy

Change 800GBASE-R to 800GBASE-ER1 for both the ER1 and ER1-20 definitions.

Proposed Response Response Status O

Cl 1 SC 1.4.184da P49 L47 # 310

D'Ambrosia, John

Futurewei, U.S. Subsidiary of Huawei

Comment Type TR Comment Status X

800GBASE-ER1-20 is defined as using 800GBASE-R encoding, but per 802.3df-2024, 1.4.184e - "The term 800GBASE-R represents a family of Physical Layer devices using the Physical Coding Sublayer (PCS) defined in Clause 172 for 800 Gb/s operation." This PHY as noted in Table 169-3a, uses PCS encoding as defined in Clause 186.

SuggestedRemedy

Define new name for family / encoding based on Clause 186 encoding.  
Modify definition of entry for 800GBASE-ER1 to reflect new family name.

Proposed Response Response Status O

Cl 1 SC 1.5 P51 L11 # 74

Lusted, Kent

Intel Corporation

Comment Type TR Comment Status X

The abbreviation "MLSD" is used numerous times in Annex 178A to reference Maximum Likelihood Sequence Detection and should be added to the abbreviations list.

SuggestedRemedy

Add MLSD | Maximum Likelihood Sequence Detection

Proposed Response Response Status O

Cl 30 SC 30 P56 L33 # 369

He, Xiang

Huawei

Comment Type TR Comment Status X

Add TimeSync entity managed object classes for Inner FEC sublayers defined in Clause 177 and 184.

SuggestedRemedy

Add register set for Inner FEC sublayers in subclauses of 30.13.1: (30.13.1.1 - 30.13.1.14)

(Presentation will be prepared for this comment.)

Proposed Response Response Status O

Cl 30 SC 30.3.2.1.2 P53 L11 # 112

Huber, Thomas

Nokia

Comment Type T Comment Status X

There should also be an entry for 800GBASE-ER1 since it is a different PCS

SuggestedRemedy

Add a new editing instruction to insert 800GBASE-ER1 after 400GBASE-R.(or before the entry for 800GBASE-R).

Proposed Response Response Status O

Cl 30 SC 30.3.2.1.3 P53 L21 # 75

Huber, Thomas

Nokia

Comment Type T Comment Status X

There should also be an entry for 800GBASE-ER1 since it is a different PCS

SuggestedRemedy

Add a new editing instruction to insert 800GBASE-ER1 after 400GBASE-R (or before the entry for 800GBASE-R).

Proposed Response Response Status O

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Cl 45 SC 45 P57 L1 # 603  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 Inner FEC (Clause 177 or Clause 184) needs MDIO registers for TimeSync. They should look like the PMA/PMD clause registers.  
 SuggestedRemedy  
 Add the following MDIO registers for the Inner FEC, in the same style as the equivalent PMA/PMD MDIO registers  
 - TimeSync capability  
 - TimeSync transmit path data delay register  
 - TimeSync receive path data delay register  
 Proposed Response Response Status O

Cl 45 SC 45 P81 L9 # 370  
 He, Xiang Huawei  
 Comment Type TR Comment Status X  
 Add MDIO interface registers for Inner FEC sublayers defined in Clause 177 and 184.  
 SuggestedRemedy  
 Add definitions for the new register set defined for the Inner FEC sublayers in 30.3.1.1 - 30.1.1.14.  
 (Presentation will be prepared for this comment.)  
 Proposed Response Response Status O

Cl 45 SC 45.2.1.60b P65 L17 # 507  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 Shouldn't LR4 come before LR1 (same reach, narrower) and the order goes up the page, counting the bits forward  
 SuggestedRemedy  
 Swap 800GBASE-LR4 and 800GBASE-LR1  
 Proposed Response Response Status O

Cl 45 SC 45.2.1.60b P65 L24 # 508  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 800GBASE-DR4-2 has longer reach than 800GBASE-FR4-500  
 SuggestedRemedy  
 Swap them  
 Proposed Response Response Status O

Cl 45 SC 45.2.1.60c P67 L21 # 509  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 It's unfortunate that 800GBASE-ER1 and 800GBASE-ER1-20 are in different registers, and 800GBASE-ER1-20, having less reach, should come first  
 SuggestedRemedy  
 Move 800GBASE-ER1 from 1.73.14 to 1.74.0. 1.73.14 goes back to reserved - maybe it can be used for 800GBASE-LR20-1 ;)  
 Proposed Response Response Status O

Cl 73 SC 73 P83 L1 # 460  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 We are now using a Next Page to advertise IEEE defined PHYs. However the order of when Next Pages are introduced, defined and then used is a bit out of order. So re-arranging the order in which AN is specified would help readers to better understand what how Next Pages are defined, how to use them and when to use them.  
 SuggestedRemedy  
 Presentation will be provided.  
 Proposed Response Response Status O

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Cl 73 SC 73 P85 L9 # 149  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 Table 73-5 is missing the indication of higherst priority.  
 SuggestedRemedy  
 change 1.6Tb/s 8lane in the capability column to 1.6Tb/s 8 lane, highest priority.  
 Proposed Response Response Status O

Cl 73 SC 73.9.1.1 P86 L26 # 194  
 Ran, Adeo Cisco  
 Comment Type TR Comment Status X  
 The existing semantics of the link\_status parameter of AN\_LINK.indication enables only two values, OK and FAIL. This imposes a need to bring up a link within a specified time (link\_fail\_inhibit\_timer), otherwise AN will restart (per the Arbitration state diagram, Figure 73-11). This can cause numerous problems in a segmented link.  
 The AN should be tolerant to a link in which one or more of the devices is still in the process of training. This can be achieved by adding a third possible value to link\_status, indicating that the negotiated PHY is still training.  
 SuggestedRemedy  
 A presentation with proposed content is planned.  
 Proposed Response Response Status O

Cl 90A SC 90A P519 L43 # 456  
 Opsasnick, Eugene Broadcom  
 Comment Type T Comment Status X  
 In table 90A-1, the column titled "Alignment marker/ codeword marker insertion/removal" has a value of 2.56ns for 1.6T in the last row. This value should be the xMII time (at MAC data rate) of one Alignment marker block. The 1.6TE PCS lanes are now running at 100G vs 25G for slower speeds, so this number does not scale directly from the other entries. The value for the 1.6T row should be 1.28ns (a full AM group = 8 256b/257b blocks, so the MII time = 8 \* 256 / 1600 = 1.28ns). Note that this column has correct values for 25G, 40G, 50G, and 100G. However, the value listed for 200G, 400G and 800G of 2.56ns should be 5.12ns and should also be fixed in maintenance.  
 SuggestedRemedy  
 Change the accuracy impairment value of 2.56 ns to 1.28 ns for the 1.6T Ethernet rate in Table 90A-1.  
 Proposed Response Response Status O

Cl 90A SC 90A.3 P519 L43 # 330  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 For the added row in Table 90A-1, the potential timestamp accuracy impairment due to alignment marker insertion/removal for 1.6T is incorrect. It should be 1.28ns, not 2.56ns. The values for 200G, 400G, and 800G are also erroneous (should all be 5.12ns). I've filed a maintenance request to correct these, too.  
 SuggestedRemedy  
 Change 2.56 to 1.28ns in the added row for Table 90A-1  
 Proposed Response Response Status O

Cl 93B SC 93B P520 L6710 # 55  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 We have been talking about "die-to-die" loss for while now. Add at test point reference to this and reference to section Annex 93B. One reference to this is in diminico\_3dj\_01\_2307 slide 6 and 7.  
 SuggestedRemedy  
 Add TP0d and TP5d to figure 93B-1 and table 93B-1  
 Proposed Response Response Status O

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Cl 116 SC 116 P92 L40 # 445  
 Simms, William NVIDIA  
 Comment Type E Comment Status X  
 spacing of text on line 40 is different than spacing of the same text in lin 38  
 SuggestedRemedy  
 make spacing the same  
 Proposed Response Response Status O

Cl 116 SC 116 P102 L5 # 152  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 200GBASE-R SM PMA delay constraint is missing  
 SuggestedRemedy  
 Proposed Response Response Status O

Cl 116 SC 116 P94 L6 # 150  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 In table 116-3, the last two column, missusage of PMD names.  
 SuggestedRemedy  
 change PHY type of CL 178 and 179 in the table to the correct nomenclature, i.e.,  
 200GBASE-KR1 and 200GBASE-CR1  
 Proposed Response Response Status O

Cl 116 SC 116 P107 L4 # 153  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 In Table 116-9, there should be no applicable SP1 and SP6 for 113.4375GBd PMD lane  
 SuggestedRemedy  
 change the content of row SP1 and SP6 in the column of 113.4375GBd PMD lane to N/A  
 Proposed Response Response Status O

Cl 116 SC 116 P95 L4 # 151  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 In table 116-3a, the last two column, missusage of PMD names.  
 SuggestedRemedy  
 change PHY type of CL 178 and 179 in the table to the correct nomenclature, i.e.,  
 400GBASE-KR2 and 400GBASE-CR2  
 Proposed Response Response Status O

Cl 116 SC 116.1.3 P92 L30 # 311  
 D'Ambrosia, John Futurewei, U.S. Subsidiary of Huawei  
 Comment Type TR Comment Status X  
 With the adoption of the objective to do 500m over 4 WDM lanes on a single mode fiber  
 and its nomenclature 800GBASE-FR4-500, "FR" is no longer limited to just represent 2km  
 (e.g. FR-500). This introduces an inconsistency for 200GBASE-FR1 and 200GBASE-DR1  
 (DR1 is not FR1-500). In addition, when looking at 2km for 1,2,4,8 fibers- a confusing  
 "family" of PHYs emerges (200GBASE-FR1, 400GBASE-DR2-2, 800GBASE-DR4-2, and  
 1.6TBASE-DR8-2)  
 SuggestedRemedy  
 Rename 200GBASE-FR1 to 200GBASE-DR1-2  
 Proposed Response Response Status O

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Cl 116 SC 116.1.4 P94 L6 # 312

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

Comment Type TR Comment Status X

200/400G BASE-R BM-PMA and 200/400G BASE-R-SM-PMA are noted as optional in Tables 116-3, 116-4, and 116-4a, but that is not quite correct. They are conditional dependent on the PHY type and on whether specific AUIs are implemented or not.

*Suggested Remedy*

For 100Gb/s based PHYs the 200GBASE-R BM-PMA is mandatory, all AUIs are optional, and 200GBASE R SM PMA is "C" / conditional if either 200GAUI-1 is implemented.  
For 200Gb/s based PHYs the 200GBASE-R SM-PMA is mandatory, all AUIs are optional, and 200GBASE R BM PMA is "C" / conditional if either 200GAUI-2 is implemented.

For 100Gb/s based PHYs the 400GBASE-R BM-PMA is mandatory, all AUIs are optional, and 400GBASE R SM PMA is "C" / conditional if either 400GAUI-2 is implemented.  
For 200Gb/s based PHYs the 400GBASE-R SM-PMA is mandatory, all AUIs are optional, and 400GBASE R BM PMA is "C" / conditional if either 400GAUI-4 is implemented.

Change entries as described above in Tables 116-3, 116-4 and 116-4a for 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA to C / with notes as stated above

Modify entry in Table 178-1 to 200GBASE-R BM PMA to Conditional. Add note "c" A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C is implemented.  
Modify entry in Table 178-2 to 400GBASE-R BM PMA to Conditional. Add note "c" A 400GBASE-R BM PMA must be implemented if a 400GAUI-4 C2C is implemented.  
Modify entry in Table 179-1 to 200GBASE-R SM PMA to Conditional. Add note "c" A 200GBASE-R SM PMA must be implemented if a 200GAUI-1 C2C is implemented.  
Modify entry in Table 179-2 to 400GBASE-R SM PMA to Conditional. Add note "c" A 400GBASE-R SM PMA must be implemented if a 400GAUI-2 C2C is implemented.  
Modify entry in Table 181-1 to 200GBASE-R BM PMA to Conditional. Add note "c" A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C/C2M is implemented.  
Modify entry in Table 180-2 to 400GBASE-R BM PMA to Conditional. Add note "c" A 400GBASE-R BM PMA must be implemented if a 400GAUI-4 C2C/C2M is implemented.  
Modify entry in Table 182-1 to 200GBASE-R BM PMA to Conditional. Add note "c" A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C/C2M is implemented.  
Modify entry in Table 182-2 to 400GBASE-R BM PMA to Conditional. Add note "c" A 400GBASE-R BM PMA must be implemented if a 400GAUI-4 C2C/C2M is implemented.

Proposed Response Response Status

Cl 116 SC 116.1.4 P94 L6 # 530

Rechtman, Zvi Nvidia

Comment Type T Comment Status X

The comment refers to Table 116-3.  
The SM\_PMA and BM\_PMA introduce a new case of optional PMA implementation. For instance 200GBASE-KR2 PHY cannot implement SM\_PMA without implementing 200GAUI-1 C2C interface.

It will be beneficial to add a note about the conditions which allow/require implementation of BM\_PMA and SM\_PMA  
Same apply to Table 116-3a, Table 116-4, Table 169-2

*Suggested Remedy*

Add a footnote labeled 'b' next to the 'O' marking for 200GBASE-R SM-PMA in the entries for 200GBASE-KR2, 200GBASE-KR4, 200GBASE-CR2, and 200GBASE-CR4. The footnote 'b' should state: 'Applicable only when 200GAUI-1 C2C interface is used within the PHY

Proposed Response Response Status

Cl 116 SC 116.1.4 P98 L18 # 313

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

Comment Type TR Comment Status X

there is no PMD called 400GBASE-LR4

*Suggested Remedy*

Change 400GBASE-LR4 to 400GBASE-LR4-6

Proposed Response Response Status

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Cl 116 SC 116.2.4 P99 L1 # 314

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

Comment Type TR Comment Status X

In support of 200 Gb/s per lane signaling - 200GBASE-R BM-PMA and 400GBASE-R PMA, Clause 176 was developed. No addition was made to 116.2 Summary of 200GbE and 400 GbE sublayers was made.

SuggestedRemedy

Modify last sentence of 116.2.4 and add additional text  
 The 200GBASE-R and 400GBASE-R PMAs, which supports bit multiplexing, is specified in Clause 120.  
 The 200GBASE-R and 400GBASE-R PMAs, which supports symbol multiplexing, is specified in Clause 176.  
 Note that "PMA" is used as a general term to represent both types of PMAs for each speed.

Proposed Response Response Status

Cl 116 SC 116.3.2 P99 L52 # 195

Ran, Adeo Cisco

Comment Type TR Comment Status X

segment-by-segment training requires passing the RTS status of each device/sublayer in both directions.  
 When there is a physical interface with a training protocol, RTS is communicated using the protocol. But when two sublayers are attached, e.g. PMD and PMA, the status has to be communicated through the service interface.

This can be achieved if the inter-sublayer service interface includes both IS\_SIGNAL.indication and IS\_SIGNAL.request.

The values of the parameter SIGNAL\_OK should be extended to allow communicating that a sublayer is in the process of training. A new value IN\_PROGRESS would enable that.

Similar changes should be applied in clauses 169 and 174. The mapping of RTS to SIGNAL\_OK should be defined in annex 176A.

SuggestedRemedy

A presentation with proposed content is planned.

Proposed Response Response Status

Cl 116 SC 116.5 P106 L5 # 531

Rechtman, Zvi Nvidia

Comment Type TR Comment Status X

The comment refers to Table 116-8.  
 There is an additional logical skew present in the 200GBASE-R and 400GBASE-R2 BM\_PMA of 2 RS-FEC CWs. These skew values should not be included in the skew budget calculations for this table. To prevent misinterpretations, an explicit note is required

SuggestedRemedy

Insert a note in Table 116-8 that states: 'The additional 2 RS-FEC CWs logical skew in clause 176 BM\_PMA for 200GBASE-R and 400GBASE-R should not to be factored in the skew budget calculations for this table

Proposed Response Response Status

Cl 116 SC 116.5 P107 L46 # 510

Dawe, Piers Nvidia

Comment Type T Comment Status X

A new footnote has appeared "At the PCS receive input, 1 UI is equivalent to 1 bit." attached to an unchanged number. There is no equivalent footnote for Table 116-8. In 802.3, "bit" means MAC bit. I don't know what point the footnote is making - that PCS lanes use binary signalling not PAM4? Nor why it is here. If it were kept, it should say "1 bit on a PCS lane" or similar.

SuggestedRemedy

Delete footnote f

Proposed Response Response Status

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Cl 119 SC 119.2.4.1 P111 L26 # 333

de Koos, Andras Microchip Technology

Comment Type T Comment Status X

I understand why the use of the stateless encoder decoder is restricted to 200GBASE-R, and 400GBASE-R over 200Gbps lanes. Allowing it on other PMDs/AUIs would be out-of-scope for the 802.3dj project.

HOWEVER, shouldn't common sense prevail, here?

The stateless encoder/decoder was designed such that it is all-but-identical to the stateful encoder, only differing in their treatment of /E/ blocks. Since the 200GBASE-R and 400GBASE-R links are always protected by FEC, it is not as if /E/ blocks can occur at random causing divergent behaviour of the two encoder/decoder types.

There is absolutely no danger of causing backward-compatibility issues, because the stateful encoder/decoder are still allowed for all PMDs

The stateless encoder/decoder was added to the standard to allow greater implementation flexibility (removing long timing paths). But any new PCS implementation that may attach to either 100Gbps/lane or 200Gbps/lane PMDs would have to implement the stateful encoder/decoder! With the stateless encoder, the standard is offering more implementation flexibility that implementors cannot actually use.

SuggestedRemedy

Consider removing the restriction on PMD type when using the stateless encoder and decoder in subclauses 119.2.4.1 and 119.2.5.8, respectively.

Proposed Response Response Status O

Cl 119 SC 119.2.5.8 P112 L27 # 470

Slavick, Jeff Broadcom

Comment Type E Comment Status X

Extraneous "either"

SuggestedRemedy

remove the word "either"

Proposed Response Response Status O

Cl 120 SC 120.1.1a P114 L30 # 66

Dudek, Mike Marvell

Comment Type T Comment Status X

Table 116-1 and Table 116-2 include the 200Gb/s per lane PMDs which require the symbol muxing PMA. This bit muxing PMA would only be used for lower speed AUIs. Saying it supports any of the PMDs in the tables is confusing.

SuggestedRemedy

Change to "The 200GBASE-R PMA(s) can support any of the two, or four lane 200Gb/s PMDs in Table 116-1 and the 400GBASE-R PMA(s) can support any of the four, or 8 lane 400Gb/s PMDs in Table 116-2". As a less preferred approach PMD's could be changed to PHYs in the original sentence and an additional sentence could be added saying "The single lane 200Gb/s PMDs in Table 116-1 and the two lane 400Gb/s in table 115-2 require the symbol-muxing PMAs described in clause 176."

Proposed Response Response Status O

Cl 120F SC 120F.1 P522 L7 # 67

Dudek, Mike Marvell

Comment Type T Comment Status X

Clause 176 is for the symbol mux PMA it should not be used for Annex 120F

SuggestedRemedy

Remove the reference to 176.9.1.2

Proposed Response Response Status O

Cl 169 SC 169 P116 L15 # 155

Mi, Guangcan Huawei Technologies Co., Ltd

Comment Type TR Comment Status X

same as the previous comment on 800GBASE-CR4

SuggestedRemedy

make the description consistent

Proposed Response Response Status O

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Cl 169 SC 169 P116 L17 # 154  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 In Table 169-1, Row of 800GBASE-CR4 was described as 800Gb/s PHY using 800GBASE-R encoding over four lanes of twinaxial copper cable, which is inconsistent with the description in page 49, 1.4.184aa  
 SuggestedRemedy  
 make the language consistent.  
 Proposed Response Response Status O

Cl 169 SC 169 P118 L4 # 156  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 In table 169-3, Phy type and clause correlation was marked incorrectly for the columns of 800GBASE-DR8 PMD and 800GBASE-DR8-2 PMD  
 SuggestedRemedy  
 remove the unnecessary M in the following rows for 800GBASE-DR8 PMD: 800GBASE-DR4, 800GBASE-FR4-500. remove the unnecessary M in the following rows for 800GBASE-DR8-2 PMD: 800GBASE-DR4-2, 800GBASE-FR4, and 800GBASE-LR4.  
 Proposed Response Response Status O

Cl 169 SC 169 P123 L5 # 158  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 In Table 169-4, the delay constraints on 800GBASE-R BM-PMA and 800GBASE-R SM-PMA are missing  
 SuggestedRemedy  
 add appropriate rows with TBD if no consensus has been built.  
 Proposed Response Response Status O

Cl 169 SC 169 P127 L4 # 157  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 In Table 116-6, there should be no applicable SP1 and SP6 for 113.4375GBd PMD lane  
 SuggestedRemedy  
 change the content of row SP1 and SP6 in the column of 113.4375GBd PMD lane to N/A  
 Proposed Response Response Status O

Cl 169 SC 169.1.3 P116 L42 # 315  
 D'Ambrosia, John Futurewei, U.S. Subsidiary of Huawei  
 Comment Type TR Comment Status X  
 800GBASE-ER1-20 and 800GBASE-ER1 are both defined as using 800GBASE-R encoding, but per 802.3df-2024, 1.4.184e - "The term 800GBASE-R represents a family of Physical Layer devices using the Physical Coding Sublayer (PCS) defined in Clause 172 for 800 Gb/s operation." These two PHYs as noted in Table 169-3a, they use PCS encoding as defined in Clause 186.  
 SuggestedRemedy  
 Define new name for family / encoding based on Clause 186 encoding.  
 Eliminate table entries for ER1-20 and ER1 from Table 169-3a.  
 Create new table for PHY type and clause correlation for new family based on Clause 186 encoding.  
 Modify description of entry for 800GBASE-ER1-20 in Table 169-1 to reflect new family name.  
 Modify description of entry for 800GBASE-ER1 in Table 169-1 to reflect new family name.  
 Proposed Response Response Status O

Cl 169 SC 169.1.3 P116 L43 # 76  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The descriptions of 800GBASE-ER1-20 and 800GBASE-ER1 should refer to 800GBASE-ER1 encoding rather than 800GBASE-R encoding since the ER1[-20] PCS is distinct from the 800GBASE-R PCS  
 SuggestedRemedy  
 Change 800GBASE-R to 800GBASE-ER1 in the last two rows of the table.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 169 SC 169.1.3 P119 L19 # 320

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

Comment Type TR Comment Status X

For 800GBASE-LR1 in Table 169-3a  
 800GBASE-R BM-PMA is conditional, pending implementation of 800GAUI-8 C2C/C2M  
 800GBASE-R SM PMA is conditional, pending implementation of 800GAUI-4 C2C/C2M

*SuggestedRemedy*

Change entries for 800GBASE-LR1 to C for 800GBASE-R BM-PMA and 800GBASE-R SM-PMA  
 Add note "C= Conditional, 800GBASE-R BM-PMA is conditional, pending implementation of 800GAUI-8 C2C/C2M  
 800GBASE-R SM PMA is conditional, pending implementation of 800GAUI-4 C2C/C2M"

Proposed Response Response Status O

Cl 169 SC 169.1.4 P117 L12 # 316

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

Comment Type TR Comment Status X

Table 169-2 introduces the 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA in Table 169-2, but there is no real explanation to the use of the sub-layers - just the required PMA service interfaces, as noted in Items C&E. The clarification of these two sublayers is actually defined in 176.2 Conventions, which doesnt make sense.

*SuggestedRemedy*

Move definitions of 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA from 176.2 to 169.1.3 Nomenclature

Proposed Response Response Status O

Cl 169 SC 169.1.4 P117 L12 # 317

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

Comment Type TR Comment Status X

800GBASE-R BM-PMA and 800GBASE-R-SM-PMA are noted as optional in Tables 169-2, 169-3, and Table 169-3a, but that is not quite correct. They are conditional dependent on the PHY type and on whether specific AUIs are implemented or not. .

*SuggestedRemedy*

For 100Gb/s based PHYs the 800GBASE-R BM-PMA is mandatory, all AUIs are optional, and 800GBASE R SM PMA is "C" / conditional if either 800GAUI-4 is implemented.  
 For 200Gb/s based PHYs the 800GBASE-R SM-PMA is mandatory, all AUIs are optional, and 800GBASE R BM PMA is "C" / conditional if either 800GAUI-8 is implemented.

Change entries as described above in Tables 169-2, 169-3 and 169-3a for 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA to C / with notes as stated above.

Modify entry in Table 178-3 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C is implemented.  
 Modify entry in Table 179-3 to 800GBASE-R SM PMA to Conditional. Add note "c" A 800GBASE-R SM PMA must be implemented if a 800GAUI-4 C2C is implemented.  
 Modify entry in Table 180-3 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C/C2M is implemented.  
 Modify entry in Table 181-1 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C/C2M is implemented.  
 Modify entry in Table 182-3 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C/C2M is implemented.  
 Modify entry in Table 183-1 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C/C2M is implemented.

Proposed Response Response Status O

Cl 169 SC 169.1.4 P118 L22 # 69

Dudek, Mike Marvell

Comment Type T Comment Status X

There are errors in Table 169-3. 800GBASE-DR8-PMD is not needed for 800GBASE-DR4 or 800GBASE-FR4-500, 800GBASE-DR8-2 PMD is not needed for 800GBASE-DR4-2, 800GBASE-FR4, or 800GBASE-LR4,

*SuggestedRemedy*

Delete the offending "M"s

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 169 SC 169.1.4 P118 L22 # 68

Dudek, Mike Marvell

Comment Type T Comment Status X

There are errors in Table 169-3. 800GBASE-DR8-PMD is not needed for 800GBASE-DR4 or 800GBASE-FR4-500, 800GBASE-DR8-2 PMD is not needed for 800GBASE-DR4-2, 800GBASE-FR4, or 800GBASE-LR4,

SuggestedRemedy

Delete the offending "M"s

Proposed Response Response Status O

Cl 169 SC 169.1.4 P119 L20 # 77

Huber, Thomas Nokia

Comment Type T Comment Status X

The 800GXS can contain AUIs - so the C2C and C2M clauses should be marked as optional for the ER1 and ER1-20 PHYs, as should the associated PMAs.

SuggestedRemedy

Indicate that 800GBASE-R BM-PMA, 800GAUI-8 C2C, 800GAUI-8 C2M, 800GBASE-R SM-PMA, 800GAUI-4 C2C, and 800GAUI-4 C2M are optional for both ER1 and ER1-20 PHYs.

Proposed Response Response Status O

Cl 169 SC 169.2 P119 L28 # 318

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

Comment Type TR Comment Status X

In support of 200 Gb/s per lane signaling - 800GBASE-R BM-PMA, Clause 176 was developed. No addition was made to 169.2 Summary of 800 GbE architecture

SuggestedRemedy

Modify 169.2.4 to read -  
The PMA sublayer provides a medium-independent means to support the use of a range of physical media.  
The 800GBASE-R PMA, which supports bit multiplexing, is specified in Clause 173.  
The 800GBASE-R PMA, which supports symbol multiplexing, is specified in Clause 176.  
Note that "PMA" is used as a general term to represent both types of PMAs.

Proposed Response Response Status O

Cl 169 SC 169.2 P119 L28 # 319

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

Comment Type TR Comment Status X

800GBASE-ER1 and 800GBASE-ER1-20 use the Clause 186 800GBASE-ER1 PCS/PMA. This layer is not described as part of 169.2.

SuggestedRemedy

Create 169.2.4c 800GBASE-ER1 PCS/PMA  
The 800GBASE-ER1 PCS performs encoding of data from the 800GMII, performs GMP mapping, applies FEC, and transfers the encoded data to the PMA. The 800GBASE-ER1 PMA sublayer perform the mapping of transmit and receive data streams between the PCS and PMA via the PMA service interface, and the mapping and multiplexing of transmit and receive data streams between the PMA and PMD via the PMD service interface.  
The 800GBASE-ER1 PCS is specified in Clause xxx.

Proposed Response Response Status O

Cl 169 SC 169.2 P119 L31 # 193

Ran, Adee Cisco

Comment Type TR Comment Status X

A new 800GBASE-ER1 PCS is defined in clause 186. It should be mentioned in the introduction clause, 169.2.3 ("Physical Coding Sublayer (PCS)" in 802.3df) which currently only refers to the 800GBASE-R PCS.

SuggestedRemedy

Bring 169.2.3 into the draft and amend it to include the clause 186 PCS.

Proposed Response Response Status O

Cl 169 SC 169.3.2 P122 L14 # 322

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

Comment Type TR Comment Status X

There is no inter-sublayer interface for the PMA sublayer shown in the figure

SuggestedRemedy

Add placeholder text for future text.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 169 SC 169.3.2 P122 L35 # 78

Huber, Thomas

Nokia

Comment Type T Comment Status X

A similar diagram is needed for 800GBASE-ER1 and 800GBASE-ER1-20 PHYs.

*SuggestedRemedy*

Use figure 169-2b as a basis. Replace 800GBASE-R PCS with 800GBASE-ER1 PCS, 800GBASE-LR1 Inner FEC with 800GBASE-ER1 PMA, and 800GBASE-R PMD with 800GBASE-ER1 PMD (and of course renams all the service interfaces to align with that).

Proposed Response Response Status O

Cl 169 SC 169.3.2 P122 L54 # 321

D'Ambrosia, John

Futurewei, U.S. Subsidiary of Huawei

Comment Type TR Comment Status X

There is no figure describing 800GBASE-ER1/-20 describing inter-sublayer service interaces including 800GBASE-ER1 PCS/PMA

*SuggestedRemedy*

Add placeholder text for future text.

Proposed Response Response Status O

Cl 169 SC 169.4 P123 L5 # 532

Rechtman, Zvi

Nvidia

Comment Type TR Comment Status X

The comment refers to Table 169-4.  
The Inner-FEC delay appears to be missing from the table

*SuggestedRemedy*

add 800GBASE-R inner FEC (values are TBDs)

Proposed Response Response Status O

Cl 170 SC 170.1 P135 L12 # 461

Slavick, Jeff

Broadcom

Comment Type T Comment Status X

The title of Clause 173 does include BM.

*SuggestedRemedy*

Remove the BM- from Table 171-1 for the Clause 173 entry and footnote A

Proposed Response Response Status O

Cl 171 SC 171.3 P137 L41 # 386

Nicholl, Gary

Cisco

Comment Type T Comment Status X

There is an issue with subclause 171.3.3 generated by 802.3df. There is an incorrect reference of "171.6.2" in the following bullets:

- An additional signal TXRD indicates the state of the rx\_rm\_degraded variable (see 171.6.2) as detected by the PHY 800GXS in the transmit direction
- An additional signal TXLD indicates the state of the FEC\_degraded\_SER variable (see 171.6.2) as detected by the PHY 800GXS in the transmit direction

*SuggestedRemedy*

Import subclause 171.3.3 and correct the two bullets as follows:

- An additional signal TXRD indicates the state of the rx\_rm\_degraded variable (see 172.2.6.2.2) as detected by the PHY 800GXS in the transmit direction
- An additional signal TXLD is the logical OR of the FEC\_degraded\_SER and rx\_local\_degraded variables (see 172.2.6.2.2) as detected by the PHY 800GXS in the transmit direction.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 171 SC 171.5 P141 L47 # 385  
 Nicholl, Gary Cisco  
 Comment Type T Comment Status X  
 There sentence below the editor's not is a repeat of what is captured in 171.3.2. It is also not related to "link fault signaling" as defined in 81.3.4, which is the topic of this subclause.  
 SuggestedRemedy  
 Delete the sentence below the editor's note.  
 Proposed Response Response Status O

Cl 171 SC 171.8 P144 L23 # 79  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 In tables 171-3 and 171-5, it is not clear what has changed in the rows that are shown.  
 SuggestedRemedy  
 Indicate the changes with revision marks  
 Proposed Response Response Status O

Cl 171 SC 171.8 P145 L6 # 462  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 The MDIO mapping table is different from Clause 175, it should use the new form that Clause 175 is using.  
 SuggestedRemedy  
 Have Tables 171-5a through 171-5d use the same format as Clause 175  
 Proposed Response Response Status O

Cl 174 SC 174 P164 L20 # 159  
 Mi, Guangcan Huawei Technologies Co., Ltd  
 Comment Type TR Comment Status X  
 In Table 174-4, the notes for 1.6TBASE-KR8 and 1.6TBASE-CR8 says includes the medium in one direction. No length of the medium was provided, nor any explicit delay due to the medium was provided. While In Table 169-4, a definitive of 14ns allocated for one direction through cable medium was provided for 800GBASE-CR4. One would assume 1.6TBASE-CR8 would be consistent with 800GBASE-CR4. The same problem applies to 1.6TBASE-KR8.

SuggestedRemedy  
 Put in explicit allocation of delay constraints for the medium used in 1.6T BASE-CR8 and 1.6TBASE-KR8. Align with that of 800GBASE-CR4 and 800GBASE-KR4, if technically feasibly.  
 Proposed Response Response Status O

Cl 174 SC 174.1.2 P155 L47 # 180  
 Brown, Matt Alphawave Semi  
 Comment Type T Comment Status X  
 This list of interface widths has been traditionally included in "new ethernet rate introduction" clauses since 10 Gb/s Ethernet. It seems unnecessary and present and extra burden to amend with each new interface added. The number of lanes is abundantly clear in each clause that defines and interface. The original intent was to point out that the structural detail of the specified interfaces are to be as specified while others that are not are not specified.

SuggestedRemedy  
 Delete the paragraph and lists from page 155 line 47 to page 156 line 12.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 174A SC 174A.1 P539 L10 # 205

Ran, Adeo Cisco  
 Comment Type TR Comment Status X

The first subclause of Annex 174 is currently a mini "table of contents" of the clause. This isn't required.

Instead, an introduction to the annex would be helpful for readers. It should provide the relationship between bit error ratio as defined in the project's objective and the frame loss ratio, as well as the purpose of defining error requirements for internal interfaces within the physical layer.

*SuggestedRemedy*

A presentation with proposed content is planned.

Proposed Response Response Status

Cl 174A SC 174A.2 P539 L19 # 206

Ran, Adeo Cisco  
 Comment Type TR Comment Status X

174A.2 "Frame loss ratio for RS to RS link" is empty.

Since this annex defines several performance metrics, the titles of specific subclauses should be based on the sub-link in question, while the specific requirement (FLR, BER, etc.) should preferably be in the subclause text.

*SuggestedRemedy*

A presentation with proposed content is planned.

Proposed Response Response Status

Cl 174A SC 174A.3 P539 L25 # 190

Ran, Adeo Cisco  
 Comment Type TR Comment Status X

174A.3 "Frame loss ratio for a Physical Layer implementation" is empty.

I assume a "Physical Layer implementation" means the path between the RS and the MDI. It is unclear how frame loss ratio can be defined for this path, because the two interfaces are not equivalent; frames are defined only at the RS, and cannot be identified, checked for errors, or counted on the MDI. Similarly, the signals on the MDI cannot be compared to the data stream on the RS, so no other "error metric" can be defined.

This is in contrast to "RS to RS link" and other subclauses, in which such checking and counting is possible.

This subclause should be deleted.

*SuggestedRemedy*

Delete 174A.3.

Proposed Response Response Status

Cl 174A SC 174A.4 P539 L30 # 191

Ran, Adeo Cisco  
 Comment Type TR Comment Status X

174A.4 "Frame loss ratio for an xMII Extender" is empty.

Since this annex defines several performance metrics, the titles of specific subclauses should be based on the sub-link in question, while the specific requirement (FLR, BER, etc.) should preferably be in the subclause text.

*SuggestedRemedy*

A presentation with proposed content is planned.

Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 174A SC 174A.5 P539 L36 # 192

Ran, Adee Cisco  
 Comment Type TR Comment Status X

174A.5 "Frame loss ratio for PHY" is empty.

Since this annex defines several performance metrics, the titles of specific subclauses should be based on the sub-link in question, while the specific requirement (FLR, BER, etc.) should preferably be in the subclause text.

*SuggestedRemedy*

A presentation with proposed content is planned.

Proposed Response Response Status O

Cl 175 SC 175 P169 L1 # 332

de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X

Has any thought been given to how to calculate the latency through the 1.6TBASE-R PCS, i.e. the path data delay values for the purposes of TimeSync? I do not see anything within the 1.6TBASE-R PCS that would prevent proper calculation of the path data delay values.

Clause 90.7.1 is instructive here, explaining that the path data delays should be "reported as if the DDMP is at the start of the FEC codeword". However, the existing language in 90.7.1 is awkward for PCSs with more than one FEC engine like the 1.6TBASE-R PCS, which has four FEC codewords in parallel.

*SuggestedRemedy*

No proposed change to Clause 175. Clause 90.7.1 could be cleaned up to account for when there are multiple FEC codewords in parallel, but I assume that is out-of-scope for the 802.3dj project? I'll submit a maintenance request.

Proposed Response Response Status O

Cl 175 SC 175.2.1 P172 L26 # 376

Ofelt, David Juniper Networks  
 Comment Type T Comment Status X

Text says to interleave two codewords from flow 0 and two from flow 1, but it isn't clear that those two should be from different FEC encoders.

*SuggestedRemedy*

After FEC encoding, a FEC codeword from each of the two encoders in flow 0 and a FEC codeword from each of the two encoders in flow 1 are then interleaved and distributed to individual PCS lanes.

Proposed Response Response Status O

Cl 175 SC 175.2.4.2 P173 L26 # 481

Slavick, Jeff Broadcom  
 Comment Type T Comment Status X

A note that modifying the data stream could affect TimeSync would be useful.

*SuggestedRemedy*

Add the following note: "NOTE -- Insertion or removal of characters may affect protocols like times synchronization (see 90.4.1.2)"

Proposed Response Response Status O

Cl 175 SC 175.2.4.4 P173 L41 # 463

Slavick, Jeff Broadcom  
 Comment Type T Comment Status X

The last sentence is giving the transcoded blocks sent to each flow a name. So it's not really make a flow of blocks. If anything it's making a series or stream of blocks.

*SuggestedRemedy*

Change the last sentence to read: "The transcoded blocks sent to flow 0 are referred to as tx\_xcoded\_f0<256:0> and the ones sent to flow 1 as tx\_xcoded\_f1<256:0>."

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 175 SC 175.2.4.5 P173 L50 # 331

de Koos, Andras Microchip Technology

Comment Type T Comment Status X

Different scrambler seeds for the two flows are NOT strictly necessary for the 1.6TBASE-R PCS. The output PCSLs are never bit muxed, so having identical outputs from FEC A and FEC C, for example, should never have any adverse effect on "clock content" of the SerDes output.

It doesn't hurt to have the scramblers be seeded differently, however.

*SuggestedRemedy*

Consider changing the last sentence on page 173 from:

When reset is asserted, the two scramblers shall be initialized to a value other than zero and different from each other.

To:

When reset is asserted, the two scramblers shall be initialized to values other than zero.

(snuck in an editorial correction there, too!)

Proposed Response Response Status O

Cl 175 SC 175.2.4.5 P174 L3 # 377

Ofelt, David Juniper Networks

Comment Type T Comment Status X

Editor's Note asks if we should require different reset values for the scramblers.

*SuggestedRemedy*

Yes, we should!

Proposed Response Response Status O

Cl 175 SC 175.2.4.5 P174 L3 # 454

Opsasnick, Eugene Broadcom

Comment Type T Comment Status X

The Editor's note at the end of subclause 175.2.4.5 "Scrambler" states that there are no requirements or restrictions in the 1.6TE PCS baselines for the scrambler seeds for each flow. The note also mentions that the corresponding sub-clause in 802.3df for 800GE PCS states that the two flows would have identical outputs if the seeds are identical and the data input is identical (such as after reset). The 1.6TE PCS does not have two separate sets of PCSLs like 800GE PCS, but the PCSL formation could have back-to-back repeating RS-symbol values if identical seeds are used. Suggest to require different seeds after reset in the scramblers of each flow as written in the paragraph above the editor's note.

*SuggestedRemedy*

Remove the editor's note at the top of page 174, and leave the wording in 175.2.4.5 as-is with the requirement that the two scramblers are initialized with different seeds.

Proposed Response Response Status O

Cl 175 SC 175.2.4.6 P174 L42 # 464

Slavick, Jeff Broadcom

Comment Type T Comment Status X

tx\_am\_sf doesn't allow but provides a way to communicate the mandatory degrade status.

*SuggestedRemedy*

Change "allows the local PCS to communicate the status of the FEC degraded feature to the remote PCS" to "communicates the local PCS FEC degraded status to the remote PCS".

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 175 SC 175.2.4.6 P175 L22 # 453

Opsasnick, Eugene Broadcom

Comment Type T Comment Status X

Sub-clause 172.2.4.6 has a reference to a text file containing the 800GBASE-R alignment marker values. CL 175 should add a similar note with a corresponding text file for the 1.6TBASE-R alignment markers.

*SuggestedRemedy*

Add text near line 22: "NOTE—A text file containing the alignment marker patterns, as shown in Table 175–1 is available at <https://standards.ieee.org/downloads/802.3/>."

A presentation will be submitted with a corresponding text file containing the 1.6TBASE-R AM values.

Proposed Response Response Status

Cl 175 SC 175.2.4.6 P176 L5 # 465

Slavick, Jeff Broadcom

Comment Type T Comment Status X

am\_mapped\_f0 and am\_mapped\_f1 aren't solely based on the 10b-distribution and we never talk about how this two variables are us splitting the alingment marker group up.

*SuggestedRemedy*

Change:  
 "The variables am\_mapped\_f0 and am\_mapped\_f1 are then derived from 10-bit interleaving the group of 16 alignment markers, am\_x, using the following procedure"  
 To:  
 "The alignment marker group is mapped into variables am\_mapped\_f0 and am\_mapped\_f1 as follows. First a 10-bit interleaving the group of 16 alignment markers, am\_x, is done using the following procedure "

Proposed Response Response Status

Cl 175 SC 175.2.4.6 P176 L25 # 466

Slavick, Jeff Broadcom

Comment Type T Comment Status X

am\_mapped\_f0 and am\_mapped\_f1 contain data that is sent into flow 0/1 and through codewords AB and CD.

*SuggestedRemedy*

Change:  
 "Note that am\_mapped\_f0 contains the 10-bit symbols of FEC codewords A and B, and am\_mapped\_f1 contains the 10-bit symbols of FEC codewords C and D. "  
 To:  
 "Note that am\_mapped\_f0 is sent to flow 0 which produces FEC codewords A and B, and am\_mapped\_f1 is sent to flow 1 which produces FEC codewords C and D."

Proposed Response Response Status

Cl 175 SC 175.2.4.6.2 P177 L6 # 467

Slavick, Jeff Broadcom

Comment Type T Comment Status X

Add a intro to what tx\_scrambled is.

*SuggestedRemedy*

Change:  
 "The variables tx\_scrambled\_am\_f0<10279:0> and tx\_scrambled\_am\_f1<10279:0> are constructed in one of two ways."  
 To:  
 "In each flow a 10280-bit block of data is formed with two FEC codewords worth of message data, tx\_scrambled\_am\_f0<10279:0> in flow 0 and tx\_scrambled\_am\_f1<10279:0> in flow 1 and they are constructed in one of two ways. "

Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 175 SC 175.2.5.3 P181 L40 # 468  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 The counters for correctd, uncorrected and error have always been mandatory, while the cw counter and bin counters have been optional. So Should is not appropriate.  
 SuggestedRemedy  
 Change:  
 "The following counters should be implemented to aid a network operator in determining the link quality."  
 To:  
 "The PCS provides the following counters that track FEC decoder statistics."  
 Proposed Response Response Status

Cl 175 SC 175.2.5.3 P182 L9 # 469  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 The Note about tracking statistics across all 4 decoders is missing from the bin counter.  
 SuggestedRemedy  
 Add this to the definition of the FEC\_codeword\_error\_bin\_i  
 "Note that this counter tracks codewords with errors across all four codewords."  
 Proposed Response Response Status

Cl 175 SC 175.5.1.3.1 P201 L29 # 475  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 There is more details to the AM lock function add a reference  
 SuggestedRemedy  
 add a "(see 175.5.1.6.4)" after Table 119-1  
 Proposed Response Response Status

Cl 175A SC 175A P539 L8 # 455  
 Opsasnick, Eugene Broadcom  
 Comment Type T Comment Status X  
 Annex 175A contains tabular data for an example created by the 1.6TBASE-R PCS TX functions, including the scrambler output, RS-FEC codeword generation, and PCS lane interleaving. The editor's note on page 539 has a placeholder for a link to a text file that has the machine readable text data. That data file needs to be created.  
 SuggestedRemedy  
 A presentation is planned to submit a data file which corresponds to the Annex 176A example and can be referenced in the editor's note  
 Proposed Response Response Status

Cl 176 SC 176 P195 L1 # 597  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 Has any thought been put into how to calculate the path data delay values (MII-MDI latencies for timestamping) for the SM-PMAs? For bit-mux PMAs, it is very simple - i.e. it is all implementation delay, since the intrinsic delay from bit muxing/demultiplexing is negligible. But at first glance, determining the latency across the Clause 176 PMA looks like more of a challenge.  
 a. I don't believe that the intrinsic (i.e. non-implementation) delay is deterministic, due to the partial deskew.  
 b. But apart from the partial deskew, the latency across the SM-PMA should be deterministic using the principles in Annex 90A.7 (max latency value used for Tx path data delay, min latency value used for Rx path data delay).  
 c. Traditionally, how to calculate the delays through the PHY layers has been an implementation concern, but this is because the calculation was straightforward at lower rates. At 200Gbps lanes, the standard does not have the luxury of being able to ignore this. If it is overly complicated or ambiguous, and opposite ends of a link do not implement it in the same fashion, the system Time Synchronization will be impaired.  
 SuggestedRemedy  
 Consider a note in Clause 176 (or next to the PMA path data delay MDIO registers - 45.2.1.176, 45.2.1.177) that the path data delay values for the SM-PMA should be calculated via the method in Annex 90A.7.  
 I don't think it is necessary, but if a more detailed explanation is deemed useful, then a subclause could be added to Clause 90.7 spelling out explicitly how the path data delay values should be calculated for the SM-PMA.  
 Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176 P242 L10 # 21  
 Liu, Cathy Broadcom  
 Comment Type T Comment Status X  
 In this section, precoding is mentioned to CR, KR and C2C links. How about C2M link? It should add C2M since C2M LT session specifies precoding as one of the options.  
 SuggestedRemedy  
 Add C2M link into the statement: "The precoding specifications in this subclause apply to the input and output lanes of a PMA that are connected to the service interface of an xBASE-CRn or xBASE-KRn PMD, or are part of an xAUI-n C2C/C2M link."  
 Proposed Response Response Status O

Cl 176 SC 176.2 P196 L46 # 471  
 Slavick, Jeff Broadcom  
 Comment Type E Comment Status X  
 Is respectively necessary here? X is just a list of different rates.  
 SuggestedRemedy  
 remoe the ", repsectively,"  
 Proposed Response Response Status O

Cl 176 SC 176.2 P196 L53 # 472  
 Slavick, Jeff Broadcom  
 Comment Type E Comment Status X  
 Is respectively necessary here? X is just a list of different rates.  
 SuggestedRemedy  
 remoe the ", repsectively"  
 Proposed Response Response Status O

Cl 176 SC 176.2 P197 L3 # 473  
 Slavick, Jeff Broadcom  
 Comment Type E Comment Status X  
 Is respectively necessary here? X is just a list of different rates.  
 SuggestedRemedy  
 remoe the ", repsectively"  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.1 P200 L1 # 533  
 Rechtman, Zvi Nvidia  
 Comment Type TR Comment Status X  
 The comment refers to Figure 176–2.  
 The functions of "Delay odd PCSs by 2 RS-FEC codewords" on Tx path and "Delay even PCSs by 2 RS-FEC codewords" can be misleading, as they could be interpreted as a delay by 10,880 symbols.  
 The intention is to delay the odd (Tx) and even (Rx) PCSs by 136 symbols in order to get multiplex and demultiplex symbols from different 2 RS-FEC CWs.  
 Same apply to Figure 176–9  
 SuggestedRemedy  
 Modify the description in the Tx path box from "Delay odd PCSs by 2 RS-FEC codewords" to "Delay odd PCSs by 136 symbols" and in the Rx path box from "Delay even PCSs by 2 RS-FEC codewords" to "Delay even PCSs by 136 symbols"  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.1 P200 L11 # 367  
 He, Xiang Huawei  
 Comment Type TR Comment Status X  
 20b deskew is incorrect. According to Motion #10 in [https://www.ieee802.org/3/dj/public/23\\_07/motions\\_3cwfdfj\\_2307.pdf](https://www.ieee802.org/3/dj/public/23_07/motions_3cwfdfj_2307.pdf), it is required to deskew to codeword boundaries.  
 SuggestedRemedy  
 Change "20b deskew" to "deskew to codeword boundaries" or simply "deskew"  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176.5.1.1 P200 L35 # 478  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 test pattern generate is overlapping with the IS\_SIGNAL\_requrst line in Figure 176-2  
 SuggestedRemedy  
 Move "test pattern genrate" to not overlap with the inst.IS\_SIGNAL.request line  
 Same in Figure 176-9,10,13,14,15,19,20,24,25,26  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.3.1 P201 L24 # 594  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 Functionally, is there anything preventing the SM-PMAs from performing a full deskew instead of only to 20/40-bit boundaries?  
 A full deskew at the SM-PMA would NOT change end-to-end latency, since the skew is all ultimately undone at the Rx PCS.  
 Keeping the PMA as light as possible (less buffering required) is OK, but if an implementation chooses to do so, performing a full deskew (i.e. to AMs, or CW boundaries) should be allowed for both Rx and Tx.

Cl 176 SC 176.5.1.1 P200 L35 # 479  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 test pattern generate is overlapping with the IS\_SIGNAL\_requrst line in Figure 176-2  
 SuggestedRemedy  
 Move "test pattern genrate" to not overlap with the inst.IS\_SIGNAL.request/indication line  
 Same in Figure 176-9,10,13,14,15,19,20,24,25,26  
 Proposed Response Response Status O

SuggestedRemedy  
 Add the following note the 20/40 bit deskew clauses (176.5.1.3.1, 176.6.1.2.1, 176.7.1.2.1, 176.8.1.2.1):  
 Full deskew (to AM boudaries) of PCSLs may optioanlly be performed by the SM-PMA transmit function.  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.3.1 P201 L24 # 598  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 Skew in series within the PHY sub-layers may not have deterministic sum, making accurate path data delay calculation impossible. See Annex 90A.6 for a more detailed explanation. Towards the MDI, the transmit SM-PMA function should thus have the option to undo any skew introduced by the Tx PCS layer and AUI links. (i.e. do a full de-skew). In the Rx direction, the same problem exists. If the SM-PMA does not do a full deskew, then the remaining skew, in series with skew from other layers in the PHY (from AUIs, for example) and from the medium, will have a non-deterministic sum. Adding an option for the SM-PMA to do a full deskew (not just a 20/40-bit deskew) would be a way to allow implementations to avoid the TimeSync impairment due to skew between the PHY layers. This is a lot to digest - I can present the reasoning here if leadership thinks it would be worthwhile.  
 SuggestedRemedy  
 Consider requiring (or allowing as an option) a full deskew instead of the 20/40 bit deskew in clauses (176.5.1.3.1, 176.6.1.2.1, 176.7.1.2.1, 176.8.1.2.1).  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176.5.1.3.1 P201 L24 # 596

de Koos, Andras Microchip Technology

Comment Type T Comment Status X

In the AM lock and deskew clauses, is a full deskew not necessary? The goal of the Clause 176 PMA, if I understand correctly, is that at the output lane(s), each set of 4 consecutive 10-bit symbols must come from 4 different RS-FEC codewords. In the current draft, this is not achieved.

Without skew, everything works because the symbol delay is in the same direction as the FEC CW delay. But with n\*20b of skew, where some odd PCSLs arrive before even PCSLs, after the 10bit delay on odd PCSLs, (Clause 176.5.1.3.4) and the 2 CW delay (Clause 176.5.1.3.4), there will still be a period of overlap where symbols from the same FEC codeword appear at the same time. Symbols from the same RS\_FEC CW can thus appear within 2 symbols after the output mux.

Before skew (showing boundary between FEC words 1 and 2):

PCSL0: B2 A2 B1 A1 B1 A1  
PCSL1: A2 B2 A1 B1 A1 B1

20-bit skew : PCSL1 arrives before PCSL0 (when PCSL0 is finishing A1/B1, PCSL1 has already started A2/B2)

PCSL0: B2 A2 B1 A1 B1 A1  
PCSL1: A2 B2 A1 B1 A1 B1

10-bit delay on odd lane (Clause 176.5.1.3.4):

PCSL0: B2 A2 B1 A1 B1 A1  
PCSL1: A2 B2 A1 B1 A1 B1

2 FEC CW delay on odd lane (Clause 176.5.1.3.4):

PCSL0: B2 A2 B1 A1 B1 A1  
PCSL1: A1 B1 A0 B0 A0 B0

-> B1s line up on PCSL 0 and 1 for one 8:1 two-symbol mux cycle.

with more than 20 bits of skew, there will be more "codeword overlap".

Adding a "full deskew" may not be too costly.

Or, is this potential overlap due to skew understood and planned for in the AUI/PMD loss budgets?

SuggestedRemedy

Consider requiring a full deskew instead of the 20/40 bit deskew in clauses (176.5.1.3.1, 176.6.1.2.1, 176.7.1.2.1, 176.8.1.2.1).

Proposed Response Response Status O

Cl 176 SC 176.5.1.3.1 P201 L28 # 534

Rechtman, Zvi Nvidia

Comment Type T Comment Status X

There is reference in the text to lock process in Figure 119-12. However, there are exceptions to Figure 119-12 as outlined in 176.5.1.6. It can be beneficial to refer to 176.5.1.6 which include both the reference to Figure 119-12 and the list of exceptions list

SuggestedRemedy

Add a reference to 176.5.1.6 instead of Figure 119-12

Proposed Response Response Status O

Cl 176 SC 176.5.1.3.1 P201 L32 # 368

He, Xiang Huawei

Comment Type TR Comment Status X

20b deskew is incorrect. According to Motion #10 in [https://www.ieee802.org/3/dj/public/23\\_07/motions\\_3cwfdfj\\_2307.pdf](https://www.ieee802.org/3/dj/public/23_07/motions_3cwfdfj_2307.pdf), it is required to deskew to codeword boundaries.

SuggestedRemedy

Remove the second and third paragraph in 176.5.1.3.1 and reuse 119.2.5.1.

Proposed Response Response Status O

Cl 176 SC 176.5.1.3.3 P202 L45 # 535

Rechtman, Zvi Nvidia

Comment Type T Comment Status X

The comment refers to Figure 176-4

The diagram represent a specific skew case between PCS lane, for instance in the absence of skew between the original PCS lanes, the "first" symbol A might be created by different A codeword which should be denote by A'.

SuggestedRemedy

Option1:

Modify only the first A symbol of the odd PCS lanes to be A'.

Option2:

Split the drawing into two: one for 200GBASE-R and another for 400GBASE-R. Then, add index numbers to the A, B symbols.

This could make it easier to understand the drawings and the roles of the symbols in each context.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176.5.1.3.4 P202 L48 # 599

de Koos, Andras Microchip Technology

Comment Type T Comment Status X

The SM-PMA adds a lot of latency due to the 2x RS-FEC CW delay in the 8:1 and 16:2 SM-PMAs, as compared to the bit-mux PMAs

For setups with an MII-Extender it is actually worse, since the penalty would also exist between the DTE\_XS and PHY\_XS. If latency is a concern, it actually becomes preferable to use 100Gbps links for the DTE\_XS <-> PHY\_XS AUI interface, negating the advantages of 200Gbps links!

The latency penalty for the 8:1 and 16:2 PMAs should be noted in Clauses 176.5.1.3.4 and 176.6.1.2.4.

SuggestedRemedy

Add the following note to the 2xFEC CW delay sub-clauses (176.5.1.3.4 and 176.6.1.2.4):  
Note that the delay added to the odd PCSs (and to the even PCSs at the far-end) causes an end-to-end latency increase of 51.4ns as compared to BM-PMAs.

Proposed Response Response Status O

Cl 176 SC 176.5.1.3.4 P202 L51 # 537

Rechtman, Zvi Nvidia

Comment Type TR Comment Status X

The sentence "This is equivalent to adding a delay of 2 RS-FEC codewords to the odd PCS lanes (2 codewords x 544 symbols per codeword / 8 PCS lanes = 136 symbols)." can be misinterpreted:

136 symbol delay x 4 odd PCS lanes = 544 symbols delay in total (not 2 RS-FEC codewords delay)

SuggestedRemedy

Remove "This is equivalent to adding a delay of 2 RS-FEC codewords to the odd PCS lanes (2 codewords x 544 symbols per codeword / 8 PCS lanes = 136 symbols)."

Modify: "Adding the two codeword delay to odd numbered lanes enables the multiplexing of four consecutive RSFEC symbols from four different codewords at the output of the 8:1 symbol multiplexer."

To: "Adding the 136 symbol delay to odd numbered lanes enables the multiplexing of four consecutive RSFEC symbols from four different codewords at the output of the 8:1 symbol multiplexer."

Proposed Response Response Status O

Cl 176 SC 176.5.1.3.4 P203 L4 # 293

Galan, Jose Vicente Maxlinear Inc

Comment Type T Comment Status X

For Figure 176-5 , it has to be explained what A'/B' shall be.

SuggestedRemedy

Add an explanation for A'/B', e. g. "A'/B'"are the symbols from previous 2 CWs that are delayed"

Proposed Response Response Status O

Cl 176 SC 176.5.1.3.4 P203 L45 # 536

Rechtman, Zvi Nvidia

Comment Type T Comment Status X

The comment refers to Figure 176-5

The diagram represents a specific skew case between PCS lanes. For instance in the absence of skew between the PCS lanes in the PMA:IS\_UNITDATA\_0:7.request primitive, the first symbol of A' of the odd PCS lane should be marked as A' because of the additional one symbol delay prior to the 136 symbols delay

SuggestedRemedy

Option1:  
Modify only the first A' symbol of the odd PCS lanes to be A".

Option2:  
Split the drawing into two: one for 200GBASE-R and another for 400GBASE-R. Then, add index numbers to the A, B and A', B' symbols.  
This could make it easier to understand the drawings and the roles of the symbols in each context.

Proposed Response Response Status O

Cl 176 SC 176.5.1.3.5 P203 L25 # 476

Slavick, Jeff Broadcom

Comment Type E Comment Status X

It's a multiplexor or a multiplexing function

SuggestedRemedy

add the word function after multiplexing

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176.5.1.3.5 P204 L1 # 291  
 Galan, Jose Vicente Maxlinear Inc  
 Comment Type T Comment Status X  
 In Figure 176-6, the output lane arrow is indicated in the opposite direction than the actual transmission order of the output PCSL symbols  
 SuggestedRemedy  
 Change the direction of the arrow to follow the actual transmission order.  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.4.2 P204 L42 # 595  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 Is there anything preventing an implementation from performing a full deskew at the Rx PMA? It is not technically required, but does not cause any adverse functional effects. A full deskew at the Rx SM-PMA would NOT change end-to-end latency, since the skew is all ultimately undone at the Rx PCS. A deskew upstream would simply offload the deskew from the Rx PCS.  
 Implementations with a SM-PMA attached to an RxPCS will undoubtedly perform the Alignment marker lock only once (not once in the PMA and again in the PCS). AM-lock plus deskew is a very natural coupling of functions.  
 SuggestedRemedy  
 Consider adding the following note to the Rx Alignment marker lock clauses (176.5.1.4.2, 176.6.1.3.2, 176.7.1.3.2, 176.8.1.3.2):  
 After the Alignment Marker lock, no deskew of the PCSLs is required. However, deskewing the PCSLs before the would not have and adverse functional effects.  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.5 P205 L20 # 484  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 Detailed functions and state diagrams has no content  
 SuggestedRemedy  
 Change 176.5.1.6 to be a sub-heading of 176.5.1.5 (4th tier I think).  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.6.1 P205 L31 # 485  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 The Variables state that these all of them, not inheriting Cl119 functions except for some replacements.

SuggestedRemedy  
 Copy Figure 119-12 into Cl 176 and modify it to use:  
 restart\_lock\_dir \*\*with dir in italics \*\*  
 amps\_lock\_dir \*\* with dir in italics \*\*  
 pcs\_lane\_mapping\_dir \*\* with dir in italics \*\*  
 add a NOTE that italics dir is either mux or demux  
 In Variables, Constants and Counters sections define everything that is used, referring to Cl 119 when possible.  
 Change referenes to Figure 119-12 to point to the new figure.

With editorila license  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.6.1 P208 L14 # 487  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 To support 400G also using the same state machines we need to make Figure 176-8 and the definition of symbol\_pair\_lock\_demux have a <y> in it.  
 SuggestedRemedy  
 Add a <y> to symbol\_pair\_lock\_demux defintion and in Figure 176-8. Upute the definition in 176.5.1.6.1 for symbol\_pair\_lock\_demux<y> to have a range of of y=0  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176.5.1.6.4 P206 L38 # 474  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 Figure 119-12 uses functions and variables defined in CL119 but those aren't called out to be used, just that restart\_lock\_mux is used to replace restart\_lock  
 SuggestedRemedy  
 add "using the state variables defined in 119.2.6.2" after Table 119-1 with editorial license  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.6.5 P208 L11 # 482  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 Counter\_done needs to be at the end of the counter name.  
 SuggestedRemedy  
 Change symbol\_pair\_lock\_counter\_done\_demux to symbol\_pair+lock\_counter\_demux\_done  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.6.5 P206 L48 # 477  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 Figure 119-12 uses functions and variables defined in CL119 but those aren't called out to be used, just that restart\_lock\_mux is used to replace restart\_lock  
 SuggestedRemedy  
 add "using the state variables defined in 119.2.6.2" after Table 119-1 with editorial license  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.6.6 P207 L6 # 378  
 Ofelt, David Juniper Networks  
 Comment Type T Comment Status X  
 Should there be an arc from ALIGNMENT\_FAIL to LOSS\_OF\_ALIGNMENT?  
 SuggestedRemedy  
 If so, add the arc  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.6.5 P208 L9 # 483  
 Slavick, Jeff Broadcom  
 Comment Type E Comment Status X  
 I think it's best if the Start of the counter is the last thing in the Box  
 SuggestedRemedy  
 Move "Start symbol\_pair\_lock\_counter\_demux" to be the last thing in LOSS\_OF\_SYMBOL\_PAIR\_LOCK box  
 Proposed Response Response Status O

Cl 176 SC 176.5.1.6.6 P208 L34 # 538  
 Rechtman, Zvi Nvidia  
 Comment Type TR Comment Status X  
 The comment refers to Figure 176-8—PMA receive symbol-pair lock state diagram  
 The state diagram is defined as single state machine per the entire PMA. However, each PMA lane may have a different reference skew, leading to varying SLIP operation requirements per PMA lane (e.g. one PMA lane doesn't require SLIP because all PCS lanes of that lane are locked, but other PMA lane still need to skew to find the 20 symbol bit boundaries)therefore the state diagram should be define per PMA lane and not for per PMA.  
 SuggestedRemedy  
 Modify the state diagram per PMA lane and not per PMA, this include change in the variables to be defined per <y>:  
 restart\_lock\_demux<y>  
 symbol\_pair\_lock\_demux<y>  
 start symbol\_pair\_lock\_counter\_demux<y>  
 symbol\_pair\_lock\_demux<y>  
 Proposed Response Response Status O

Cl 176 SC 176.5.2 P208 L40 # 601

de Koos, Andras Microchip Technology

Comment Type E Comment Status X

Is specifying the 1:8 SM-PMA really necessary? Apart from the layers it attaches to and the labels on the interfaces, it is identical to the 8:1 PMA. Same thing for 16:2 vs 2:16 for 400G, 32:4 vs 4:32 for 800G, and 16:8 vs 8:16 for 1.6T.

Alternately, could SM-PMAs be specified unidirectionally, rather than specifying transmit and receive? So 8:1 would only specify the PCS-PMD direction, and 1:8 would specify the PMD-PCS direction.

Having so many sub-clauses that just point to other sub-clauses is an easy way to cause confusion.

SuggestedRemedy

Consider specifying the 1:8 and 8:1 (and equivalent SM-PMAs for other rates) together.

Proposed Response Response Status O

Cl 176 SC 176.6 P213 L1 # 600

de Koos, Andras Microchip Technology

Comment Type E Comment Status X

Would it not be possible to merge Clause 176.5 and 176.6? They are 95% similar, so repeating everything is hardly necessary.

Even the figures for 200GBASE-R SM-PMA (Figure 176-3, Figure 176-4, Figure 176-5) have a general form with a variable number of PCSs that are suitable for 400GBASE-R

SuggestedRemedy

Consider merging subclauses 176.5 and 176.6

Proposed Response Response Status O

Cl 176 SC 176.6.1 P213 L4 # 602

de Koos, Andras Microchip Technology

Comment Type E Comment Status X

Clauses 176.6, 176.7 and 176.8 are missing the 'overview' sub-clauses (with tables) that exist in Clause 176.5 (e.g. 176.5.1.1). The equivalent content is there but is placed directly in each PMA sub-clause (e.g. 176.6.1)

SuggestedRemedy

Structure the subclauses consistently between 200GBASE-R and 400GBASE-R, 800GBASE-R, 1.6TBASE-R.

Proposed Response Response Status O

Cl 176 SC 176.6.1 P213 L5 # 80

Huber, Thomas Nokia

Comment Type T Comment Status X

The 800G 32:4 PMA, 400G 16:2 PMA and the 200G 8:1 PMA are basically the same, other than the numbers of lanes. The 1.6T 16:8 is different since it has 40b deskew and 4-symbol interleaving. All of the PMAs with the same number of lanes on both sides are essentially the same. It would simplify maintenance and likely reader understanding as well if the number of lanes were parameterized as m and n

SuggestedRemedy

Reorganize 176.5 through 176.8 into 3 clauses: one for 200/400/800 m:n PMAs, one for 1.6T m:n PMAs, and one for 200/400/800/1.6T m:m PMAs, and use a single set of text and figures with the parameters m and n for the number of lanes. Include a table showing PHY rates and the values of m and n (e.g. with columns PHY, m, and n, and rows 200GBASE-R, 8, 1; 400GBASE-R, 16, 2; etc.).

Proposed Response Response Status O

Cl 176 SC 176.6.1 P214 L53 # 539

Rechtman, Zvi Nvidia

Comment Type TR Comment Status X

The comment refers to Figure 176-11.

The functions of "Delay odd PCSs by 2 RS-FEC codewords" on Tx path and "Delay even PCSs by 2 RS-FEC codewords" can be misleading, as they could be interpreted as a delay by 10,880 symbols.

The intention is to delay the odd (Tx) and even (Rx) PCSs by 68 symbols in order to get multiplex and demultiplex symbols from different 2 RS-FEC CWs.

Same apply to Figure 176-13

SuggestedRemedy

Modify the description in the Tx path box from "Delay odd PCSs by 2 RS-FEC codewords" to "Delay odd PCSs by 68 symbols" and in the Rx path box from "Delay even PCSs by 2 RS-FEC codewords" to "Delay even PCSs by 68 symbols"

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176.6.1.2.1 P215 L22 # 486  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 The deskew process doesn't need an exception since the referred texts says to do it across "ALL" PCSLs  
 SuggestedRemedy  
 Remove the deskew across 16 lanes exception in 176.6.1.2.1  
 Remove the deskew across 32 lanes exception in 176.7.1.2.1  
 Proposed Response Response Status O

Cl 176 SC 176.6.1.2.5 P216 L1 # 290  
 Galan, Jose Vicente Maxlinear Inc  
 Comment Type T Comment Status X  
 In Figure 176-12, the output lane arrow is indicated in the opposite direction than the actual transmission order of the output PCSL symbols  
 SuggestedRemedy  
 Change the direction of the arrow to follow the actual transmission order.  
 Proposed Response Response Status O

Cl 176 SC 176.7.1 P221 L20 # 379  
 Maniloff, Eric Ciena  
 Comment Type E Comment Status X  
 Table 176-7 Includes two references to 400GBASE-R, these should be replaced with 800GBASE-R  
 SuggestedRemedy  
 Replace the text "400GBASE-R" with "800GBASE-R" in Table 176-7.  
 Proposed Response Response Status O

Cl 176 SC 176.7.1.2.2 P223 L39 # 459  
 Opsasnick, Eugene Broadcom  
 Comment Type T Comment Status X  
 In Figure 176-16 and Figure 176-17, on the following page, the symbol pattern of the even PCSLs in the upper half (PCSL 16-31) is not shown. It would be easier to see the RS symbol patterns if the figures included at least one even PCSL in the range of 16-31.  
 SuggestedRemedy  
 These two figures show PCSLs for lanes 0,1, and 31. Suggest to show the PCSL sybol pattern for lanes 0,1,...15, 16, 17,...31.  
 Proposed Response Response Status O

Cl 176 SC 176.7.1.2.2 P223 L52 # 593  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 The 800GBASE-R PCS has 4 FEC engines, so figures 176-16, 176-17, 176-18 should use C,D to illustrate the symbols on PCSLs 16-31, rather than A',B'. The A',B' notation is used in 200GBASE-R and 400GBASE-R figures to denote CWs from engines A and B but with the 2CW delay.  
 SuggestedRemedy  
 Ammend Figures 176-16, 176-17, 176-18 to avoid the A',B' notation  
 Proposed Response Response Status O

Cl 176 SC 176.7.1.2.2 P224 L38 # 294  
 Galan, Jose Vicente Maxlinear Inc  
 Comment Type T Comment Status X  
 In all Figures in the 800G PMA section, it is referred to A'/B' symbols, although we have 4 RS CWs  
 SuggestedRemedy  
 Change to use A,B,C,D for the 4 RS CWs, instead of A, B, A', B'  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176.7.1.2.4 P225 L1 # 289  
 Galan, Jose Vicente Maxlinear Inc  
 Comment Type T Comment Status X  
 In Figure 176-18, the output lane arrow is indicated in the opposite direction than the actual transmission order of the output PCSL symbols  
 SuggestedRemedy  
 Change the direction of the arrow to follow the actual transmission order.  
 Proposed Response Response Status O

Cl 176 SC 176.8.1.1 P231 L14 # 480  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 test pattern check is overlapping with IS\_SIGNAL.request  
 SuggestedRemedy  
 Move "test pattern check" to no overlap withPMA.IS\_SIGNAL.request in Figure 176-21  
 Proposed Response Response Status O

Cl 176 SC 176.9.1.2 P242 L12 # 540  
 Rechtman, Zvi Nvidia  
 Comment Type TR Comment Status X  
 The text currently refers to xAUI-n C2C. However, the adopted PMA baseline proposal stated that the "Precoding capability in all physically instantiated interfaces is 'Tx:required, Rx:optional'" (per ran\_3dj\_01a\_2303 slide 10). This specification should also encompass xAUI-n C2M.  
 SuggestedRemedy  
 Add xAUI-n C2M  
 Proposed Response Response Status O

Cl 176 SC 176.9.1.2 P242 L23 # 541  
 Rechtman, Zvi Nvidia  
 Comment Type T Comment Status X  
 The paragraph refers only to the case of PMD control function operation, need to refer to Annex 176A for all electrical interfaces  
 SuggestedRemedy

Replace:  
 "If the PMA is connected to the service interface of an xBASE-CRn or xBASE-KRn PMD and training is enabled by the management variable mr\_training\_enable (see 136.7), then recoder\_tx\_out\_enable\_i and precoder\_rx\_in\_enable\_i shall be set as determined by the PMD control function in the LINK\_READY state on lane i (see 136.8.11.7.5 and Figure 136-7). The method by which the MD control function affects these variables is implementation dependent."

With:  
 "If the PMA support the Control function and start-up protocol for electrical interfaces and training is enabled by the management variable mr\_training\_enable (see Annex 176A), then precoder\_tx\_out\_enable\_i and precoder\_rx\_in\_enable\_i shall be set as determined by the control function in the LINK\_READY state on lane i (see 176A.10.4 and Figure 176A-6). The method by which the PMA control function affects these variables is implementation dependent"

Proposed Response Response Status O

Cl 176 SC 176.11 P243 L31 # 181  
 Brown, Matt Alphawave Semi  
 Comment Type T Comment Status X  
 A similar subclause has traditionally been included in the PMA subclauses, defining the skew at each instantiated interface from the PMD to the PCS. Until now, there was only one type of PMA for each Ethernet rate. Now we have two types defined in two separate clauses for 200G, 400G, and 800G. A rate-neutral and type-neutral specification is required. This seems beyond a subclause in Clause 176.  
 SuggestedRemedy  
 Create a new annex (or perhaps a subclause in 176B) used to defined the skew and skew relationships through the PHY sublayer stack. A presented supporting this will be provided.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176 SC 176C P594 L1 # 298  
 Loewenthal, Arnon alphawave semi  
 Comment Type T Comment Status X  
 Annex 176C "SM-PMA test vectors" is currently empty.  
 SuggestedRemedy  
 Add test vectors for 200GBASE-R 8:1, 400GBASE-R 16:2, 800GBASE-R 32:4, and 1.6TBASE-R 16:8 to Annex 176C based on supporting contribution on May interim.  
 Proposed Response Response Status O

Cl 176A SC 176A P548 L6 # 196  
 Ran, Adeo Cisco  
 Comment Type ER Comment Status X  
 The annex title includes "Control function and start-up protocol", while in the subclauses and text there are alternative terms such as "interface control function", "Start-up protocol", and "training" (176A.9).  
 This mega-function requires nomenclature to describe it. It would be good to have an acronym-friendly name so that it can be included in tables of other clauses (e.g. Table 116-3, Table 179-1).  
 SuggestedRemedy  
 A presentation with proposed nomenclature is planned.  
 Proposed Response Response Status O

Cl 176A SC 176A P555 L29 # 446  
 Simms, William NVIDIA  
 Comment Type E Comment Status X  
 3 states of Coefficient select echo are undefined  
 SuggestedRemedy  
 note in table 176A-3 that 010, 011, 100 are undefined/invalid  
 Proposed Response Response Status O

Cl 176A SC 176A.1 P548 L12 # 577  
 Law, David HPE  
 Comment Type TR Comment Status X  
 The use of the terms 'segment' and 'link' in Annexe 176A, for example in 176A.1 where it says, 'in single-segment or multiple-segment links', are problematic.  
 IEEE Std 802.3 subclause 1.4.505 'segment' defines it as 'The medium connection, including connectors, between Medium Dependent Interfaces (MDIs) in a CSMA/CD local area network.'. Subclause 1.4.372 'link' defines it as 'The transmission path between any two interfaces of generic cabling. (From ISO/IEC 11801.)'.

As a result, I believe it would only be correct to call an electrical channel between two PMD sublayers a 'segment'. I do not believe that the electrical channel between any other combinations of sublayers is a 'segment'.

SuggestedRemedy  
 I would suggest 'section' as an alternate to 'segment', but that was used for 'The portion of the link between the PSE Power Interface (PI) and the PD PI.' (see 1.4.378) when PoE had a similar definition problem. Alternatives, therefore, might be 'Division' and 'Sector'.

As another approach, the following is a rewording of 176A.1 to avoid the use of the terms 'segment' and 'link' without the use of a new term. I acknowledge, however, that such an approach would require a significant rewrite of the Annexxe.

The start-up protocol facilitates timing recovery and equalization of the electrical channel between adjacent sublayers, or chains of multiple adjacent sublayers while providing a mechanism through which the receiver can configure the transmitter to optimize performance. The protocol supports these functions through the continuous exchange of fixed-length training frames across the electrical channel between adjacent sublayers and the transport of end-to-end indications across chains of multiple adjacent sublayers.

Proposed Response Response Status O

Cl 176A SC 176A.2 P548 L24 # 198  
 Ran, Adeo Cisco  
 Comment Type ER Comment Status X  
 "tx\_symbol and rx\_symbol variables" do not appear in this annex. They are in fact parameters of the service interface primitives of the sublayer that implements the control function.  
 SuggestedRemedy  
 Tie the text defining the symbols to the service interface of the sublayer.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176A SC 176A.2.1 P547 L3 # 563

Law, David HPE  
 Comment Type T Comment Status X

The first 'shall' statement in Annex 176A (normative) 'Control function and start-up protocol for electrical interfaces' is in 176A.2.3.1 'PRBS13 function'. It seems, however, that there should be 'shall' statements in relation to the entire Training frame structure.

*SuggestedRemedy*

- [1] In subclause 176A.2.1, change 'The training frame marker is a run ...' to read 'The training frame marker shall be a run ...'.
- [2] In subclause 176A.2.2, change 'The control field comprises ...' to read 'The control field shall be comprised of ...'.
- [3] In subclause 176A.2.2, change 'The status field comprises ...' to read 'The status field shall be comprised of ...'.
- [4] In subclause 176A.2.3, change 'The training pattern is the result of a ...' to read 'The training pattern shall be the result of a ...'.

Proposed Response Response Status O

Cl 176A SC 176A.2.2 P549 L9 # 561

Law, David HPE  
 Comment Type T Comment Status X

Subclause 176A.2.2 'Control and status fields' says that 'The control field comprises 16 bits with the structure defined in 176A.3.', yet figure 176A-1 'Training frame structure' above shows the control field comprising of 16 cells. It, therefore, appears that the field is comprised of 16 cells that convey 16 bits.

*SuggestedRemedy*

- [1] Change the first paragraph of 176A.2.2 to read 'The control field is comprised of 16 cells which convey 16 bits with the structure defined in 176A.3. The status is comprised of 16 cells which convey 16 bits with the structure defined in 176A.4.'
- [2] Change the last sentence of the penultimate paragraph of 176A.2.2 to read 'Within each field, the order of transmission is from bit 15 to bit 0, conveyed by cell 15 to cell 0 respectively.'

Proposed Response Response Status O

Cl 176A SC 176A.2.2 P549 L25 # 562

Law, David HPE  
 Comment Type T Comment Status X

Subclause 176A.2.2 says '... if a violation of the DME encoding rules is detected within the control field or the status field, the contents of both fields in that frame are ignored.'. If this is requirement, suggest it should be stated using a 'shall' statement.

*SuggestedRemedy*

Change '... the contents of both fields in that frame are ignored.' to read '... the contents of both fields in that frame shall be ignored.'.

Proposed Response Response Status O

Cl 176A SC 176A.2.3.2 P552 L14 # 199

Ran, Adeo Cisco  
 Comment Type TR Comment Status X

"The default identifier for each lane is its lane number (e.g., the default value for identifier\_0 is 0 which selects polynomial\_0)"

Some interfaces have 8 lanes.

The default mapping provided in Table 176A-1 can be used instead.

*SuggestedRemedy*

Change to "The default identifier for each lane is the same as that of the PRBS13 function, as shown in Table 176A-1".

Proposed Response Response Status O

Cl 176A SC 176A.2.3.2 P552 L26 # 494

Slavick, Jeff Broadcom  
 Comment Type T Comment Status X

The PRBS gen should "stop" if training stops.

*SuggestedRemedy*

Add "while training is in progress while this mode is selected" after "is not stopped or reset".

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176A SC 176A.2.3.2 P552 L31 # 497

Slavick, Jeff Broadcom

Comment Type T Comment Status X

There is only 1 mode of operation for PRBS13 free-running, PAM4. We do have 1 free mode.

*SuggestedRemedy*

Add PRBS13-free running with precode as an option for a training pattern.

Proposed Response Response Status O

Cl 176A SC 176A.2.3.3 P552 L34 # 548

Rechtman, Zvi Nvidia

Comment Type TR Comment Status X

In the case of multi-lane operation, if all lanes exits the QUIET state simultaneously and use the same PRBS31 initial seed, there will be an undesired crosstalk effect. This potential issue needs to be addressed

*SuggestedRemedy*

Explicitly define that each lane must use different initial seed.

Proposed Response Response Status O

Cl 176A SC 176A.2.3.3 P552 L40 # 200

Ran, Adeo Cisco

Comment Type TR Comment Status X

"These three variations are produced as described for the PRBS13 free-running function in 176A.2.3.2"

PRBS13 free-running is defined only with PAM4 and does not have PAM2 or PAM4+precoding variants. These variants are defined for the PRBS13 function in 176A.2.3.1, but the definition of the precoding variant includes resetting of the precoder state at the beginning of each training frame, which would be inadequate.

*SuggestedRemedy*

Change to the following:

The initial state of the PRBS31 generator shall not be all zeros. It may be any other value.

When the training pattern selector is set to PAM4, the training pattern is generated in a similar manner to the definition in 176A.2.3.2, except that PRBS31 generator output is used instead of PRBS13 generator output.

When the training pattern selector is set to PAM2, the training pattern is generated in a similar manner to the definition in 176A.2.3.2, except that PRBS31 generator output is used instead of PRBS13 generator output, and the pair of bits {A, A} is used instead of {A, B}.

When the training pattern selector is set to PAM4 with precoding, the training pattern is generated from the PRBS31 PAM4 pattern by precoding the Gray-mapped PAM4 symbols as specified in 135.5.7.2. The precoder initial state is not specified. The state is not re-initialized or reset during generation of the training pattern.

Proposed Response Response Status O

Cl 176A SC 176A.2.3.3 P552 L41 # 496

Slavick, Jeff Broadcom

Comment Type T Comment Status X

PRBS13 free-running can only provide PAM4 it does not have a select for PAM2 or PAM4 with precode while PRBS31 does have those options. So how can we refer to PRBS13 free running for how to map the PRBS data to training pattern.

*SuggestedRemedy*

Split the 2nd paragraph of 176A.2.3.3 into 3 paragraphs tha defines how the pattern for each of the the possible encoding options as is done in 176A.2.3.1

Proposed Response Response Status O

Cl 176A SC 176A.2.3.3 P552 L43 # 495  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 The PRBS gen should "stop" if training stops.  
 SuggestedRemedy  
 Add "while training is in progress while this mode is selected" after "is not stopped or reset".  
 Proposed Response Response Status O

Cl 176A SC 176A.2.3.3 P552 L46 # 498  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 There is no zero pad for PRBS31 free-running. This means we could have a run length of 31 3's in a row when the maximal run length of the PRBS pattern runs into Frame Marker. The Zero pad is really part of the Frammer Marker ensuring there is a distinct edge ahead of 16 UI run 3's for the start of the frame marker.  
 SuggestedRemedy  
 Bring the zero-pad back into the definition of the training frame. Stating that it is immediately precedes the training frame marker to provide a disticnt transition from training pattern to frame marker of the next training frame.  
 Proposed Response Response Status O

Cl 176A SC 176A.3 P553 L20 # 358  
 Healey, Adam Broadcom Inc.  
 Comment Type T Comment Status X  
 Training pattern options have been added to give receiver additional flexibility to successfully complete training. However, that flexibility is limited by a menu of fixed combinations of encoding and test pattern options. It would be better if encoding and test pattern selections were separated to allow receivers to request whatever combination best suits their needs. There is space in the control and status field structures to accommodate this.

SuggestedRemedy  
 In Table 176A-2, restore bits in control field bits 8 and 9 to the original "Modulation and precoding request" encoding defined in Clause 162. Define bits 5 and 6 to be "Test pattern request" with 00=PRBS13, 01=Free-running PRBS13, 10=Reserved, and 11=Free-running PRBS31. Restore bits 10 and 11 in the status field (Table 176A-3) to the "Modulation and precoding status" encoding defined in Clause 162. Define bits 12 and 13 to be "Test pattern status" using the same encodings as the control field. Update Figure 176A-2, 176A.3.2, and 176A.10.3.1 accordingly. Also add subclauses corresponding the Modulation and precoding request/status fields.  
 Proposed Response Response Status O

Cl 176A SC 176A.3.1 P553 L45 # 499  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 Remove the specificity of how many presets there are.  
 SuggestedRemedy  
 Change:  
 "The initial condition request bits are used to select one of the five predefined transmitter equalizer configurations (presets) specified in the AUI or PMD clauses."  
 To:  
 "The initial condition request bits are used to select a predefined transmitter equalizer configurations (presets) specified in the AUI or PMD clauses."  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176A SC 176A.4 P555 L10 # 549

Rechtman, Zvi

Nvidia

Comment Type T Comment Status X

The comment refers to Table 176A-3—Status field structure. The field in bit 14 - "One" require some explanation. It's unclear whether it refers to the support of the newly adopted test patterns, the support of multi-segment operation, or both.

*SuggestedRemedy*

Define the purpose of this bit

Proposed Response Response Status O

Cl 176A SC 176A.4 P555 L17 # 61

Dudek, Mike

Marvell

Comment Type T Comment Status X

It would be better to have the existing patterns the same as for previous clause 136.

*SuggestedRemedy*

In Table 176A-3 use the 1 in bit 12 for the new patterns keeping the bits 11 and 10 the same as they were in clause 136 i.e. change 010 to PAM4 PRBS13, 100 to PAM4 free running PRBS13, 011 to PAM4 PRB13 with precoding and 110 to PAM4 free-running PRBS31

Proposed Response Response Status O

Cl 176A SC 176A.4 P555 L27 # 501

Slavick, Jeff

Broadcom

Comment Type T Comment Status X

You have self generated data you're sending but you don't have your self setup to send mission data yet.

*SuggestedRemedy*

Remove the "No data is available," from the option 1 of Extend training bit

Proposed Response Response Status O

Cl 176A SC 176A.4.3 P556 L4 # 574

Law, David

HPE

Comment Type T Comment Status X

176A.4.3 'Receiver frame lock' says that 'When the receiver frame lock bit is set to 1, the receiver is indicating that it has identified training frame marker positions and is in a state where the response time requirements specified in 176A.10 are met.'. It then goes on to say 'Receiver frame lock ... is not set to 1 until training and local\_tf\_lock are both true.'.

176A.10 is 'Variables, functions, timers, counters, and state diagrams', so I wonder if the reference should be to 176A.8 'Handshake timing'? In addition, I don't believe the variables training and local\_tf\_lock are conditioned on the response time requirements specified in 176A.10 being met, at least I didn't see it in their descriptions.

*SuggestedRemedy*

In 176A.4.3 change the text '... response time requirements specified in 176A.10 are met.' to read '... response time requirements specified in 176A.8 are met.' and the text '... and is not set to 1 until training and local\_tf\_lock are both true.' To read '... and is not set to 1 until training and local\_tf\_lock are both true and the response time requirements specified in 176A.10 can be met.'

Proposed Response Response Status O

Cl 176A SC 176A.4.8 P556 L37 # 564

Law, David

HPE

Comment Type T Comment Status X

176A.4.8 'Coefficient status' says that 'The acknowledge reflects the value of coef\_sts resulting from the procedure described in 176A.6.3.'. I don't see a procedure that sets coef\_sts in 176A.6.3, but there is one in 176A.6.4. With that said, is it correct that it is just this procedure that sets coef\_sts? On review of Figure 176A-9 'Coefficient update state diagram', I see it directly sets coef\_sts to 'not\_upd' in the OUT\_OF\_SYNC state and indirectly sets coef\_sts using the procedure described in 176A.6.4 through calls to the UPDATE\_C(k) function in the NEW\_REQUEST state. This seems to be confirmed by the first paragraph of 176A.6.4 which says 'The handling of incoming requests is specified by the coefficient update state diagram (Figure 176A-9). The behavior of the UPDATE\_C(k) function shall be consistent with the following algorithm.'.

*SuggestedRemedy*

Change 'The acknowledge reflects the value of coef\_sts resulting from the procedure described in 176A.6.3.' to read 'The coefficient status bits reflect the value of coef\_sts variable generated by the coefficient update state diagram (Figure 176A-9)'.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176A SC 176A.4.8 P556 L37 # 576

Law, David

HPE

Comment Type T Comment Status X

176A.4.8 'Coefficient status' says 'The acknowledge reflects the value of coef\_sts resulting from the procedure described in 176A.6.3.'. While it is correct that the coef\_sts variable is updated by the UPDATE\_C(k) function in 176A.6.3, I believe the OUT\_OF\_SYNC, NEW\_INDEX, and WAIT states of the Coefficient update state diagram also update the coef\_sts variable. Further, 176A.10.3.2 says that the ENCODE\_STS function 'Encodes portions of the status field of transmitted training frames.' and that '... coef\_sts is mapped to the coefficient status bits ...'.

*SuggestedRemedy*

Since calls of the UPDATE\_C(k) function and direct updates of the coef\_sts variable all occur in the Coefficient update state diagram, suggest that 'The acknowledge reflects the value of coef\_sts resulting from the procedure described in 176A.6.3.' in 176A.4.8 should be changed to just read 'The acknowledge reflects the value of coef\_sts generated by the Coefficient update state diagram '.

Proposed Response Response Status

Cl 176A SC 176A.4.1+ P555 L46 # 447

Simms, William

NVIDIA

Comment Type E Comment Status X

Should the status field name be unqualified? The field name in the text of the table and text sections below the table do not clearly identify text as a field.

*SuggestedRemedy*

Change Receiver ready to RECEIVER\_READY or at maybe receiver\_ready and use the same in the text below the table 176A-3- Status field structure. Pertains to all field names.

Proposed Response Response Status

Cl 176A SC 176A.6 P557 L3 # 201

Ran, Adele

Cisco

Comment Type TR Comment Status X

"When the interface control state diagram (Figure 176A-6) is in the TRAIN\_LOCAL state, the device may request its link partner to..."

It is important to also note at which states requests from the link partner should be processed, and what happens in the other states - this may not be obvious.

*SuggestedRemedy*

Insert the following paragraphs after the first one:

When the interface control state diagram is in either the TRAIN\_LOCAL or TRAIN\_REMOTE state, the device shall respond to requests received from the link partner.

When the interface control state diagram is in any state other than TRAIN\_LOCAL or TRAIN\_REMOTE, the device shall not send any requests to the link partner and shall ignore requests from the link partner.

Proposed Response Response Status

Cl 176A SC 176A.6.2 P557 L53 # 500

Slavick, Jeff

Broadcom

Comment Type T Comment Status X

To support AUI or PMDs only providing a subset of the available PRESETs we should define a behavior in that scenario

*SuggestedRemedy*

Add a statement that if the AUI or PMD does not specify coefficient values for a given preset setting then no change is made to the existings settings and ic\_sts response of updated is provided.

Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176A SC 176A.6.4 P558 L17 # 457

Opsasnick, Eugene Broadcom

Comment Type T Comment Status X

This the entire block of pseudo-code in this subclause is exactly the same as the code in subclause 136.8.11.4.4, and the entire subcluse only differs by adding one coefficient (-3) to the k\_list. I suggest replacing the text of the entire subclause with a referenece to subclause 136.8.11.4.4.

*SuggestedRemedy*

New text for this subclause:  
 "The handling of incoming requests is specified by the coefficient update state diagram (Figure 136-9).

The behavior of the UPDATE\_C(k) function shall be consistent with the algorithm specified in 136.8.11.4.4 with one exception:

- The set of of valid equalizer coefficient indices, k\_list, is expanded by one from {-2, -1, 0, 1} to {-3, -2, -1, 0, 1}.

Proposed Response Response Status O

Cl 176A SC 176A.6.4 P558 L21 # 565

Law, David HPE

Comment Type E Comment Status X

176A.6.4 says that 'The variables coef\_req, coef\_sts, and k are defined in 176A.10.3.1.', however, 176A.10.3.1 'Variables' uses all lowercase for the coef\_sts values (e.g., updated, coefficient at limit and equalization limit) and coef\_req (e.g, decrement, increment) whereas 176A.10.3.1 uses all uppercase for the coef\_sts values (e.g., UPDATED, COEFFICIENT AT LIMIT AND EQUALIZATION LIMIT) and coef\_req (e.g., DECREMENT, INCREMENT).

*SuggestedRemedy*

The formatting of the variable values defined in 176A.10.3.1 'Variables' and used in 176A.6.4 should match.

Proposed Response Response Status O

Cl 176A SC 176A.6.4 P558 L46 # 568

Law, David HPE

Comment Type E Comment Status X

Change 'coef\_sts = COEFFICIENT AT LIMIT' (COEFFICIENT misspelt) to read 'COEFFICIENT AT LIMIT'

*SuggestedRemedy*

See comment.

Proposed Response Response Status O

Cl 176A SC 176A.6.4 P558 L54 # 448

Simms, William NVIDIA

Comment Type E Comment Status X

It took me longer than usual to realize the algorithm continues on page 559

*SuggestedRemedy*

Maybe put a '---continued---' at the last line of page 558. Disregard if this is inconsistent with IEEE style

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176A SC 176A.8 P559 L45 # 202

Ran, Adeo Cisco  
 Comment Type TR Comment Status X

"When the receiver frame lock bit in the status field of transmitted training frames is set to 1, the time from the receipt of a new request to the acknowledgment of that request shall be less than 2 ms"

This requirement was defined in 802.3cd when training was limited in time (to 3 seconds) in order to prevent limiting the number of change requests due to delayed responses.

The new training scheme is not limited in time, and a receiver can use as many requests as it needs.

In some multi-tasking implementations, a hard 2 ms maximum may be challenging to meet. To avoid real-time requirements, it would be sufficient to have 2 ms as the average response time (and it does not need to be normative). The maximum response time can be relaxed without impact to the protocol.

*SuggestedRemedy*

Change to  
 "When the receiver frame lock bit in the status field of transmitted training frames is set to 1, the time from the receipt of a new request to the acknowledgment of that request shall be less than 20 ms. It is recommended that the average response time is less than 2 ms".

Proposed Response Response Status O

Cl 176A SC 176A.9 P560 L19 # 197

Ran, Adeo Cisco  
 Comment Type ER Comment Status X

The "Segment by segment training" seems to be an introductory subclause that explains the purpose of the whole thing.

It would help readers if this introduction is placed at the beginning of the annex. The current introduction in 176A.1 seems too brief.

*SuggestedRemedy*

Move 176A.9 and its subclauses into 176A.1 (with some hierarchy) or after it.

Rephrase the text as necessary to make it a good introduction to the control function (e.g., explain what "RTS" stands for).

Proposed Response Response Status O

Cl 176A SC 176A.9.2 P562 L14 # 555

Law, David HPE  
 Comment Type T Comment Status X

Figure 176A-5 'Retimer reference model' shows the data multiplexor driven by the tx\_mode value, with the multiplexor select set to 0 when tx\_mode = training and set to 1 when tx\_mode = data. Subclause 176A.10.2.1 'Variables', however, defines three values for tx\_mode, training, local\_pattern and data. Figure 176A-5, therefore, does not define the multiplexor select value for when tx\_mode = local\_pattern.

*SuggestedRemedy*

Update the figure to reflect the third value of tx\_mode and the local pattern generator for each interface.

Proposed Response Response Status O

Cl 176A SC 176A.9.2 P562 L22 # 554

Law, David HPE  
 Comment Type T Comment Status X

The arrow pointing to the Interface A 'Driver' block and arrow pointing from the Interface B 'CDR' block both seem to be pointing in the wrong direction.

*SuggestedRemedy*

Reverse the direction of both arrows.

Proposed Response Response Status O

Cl 176A SC 176A.10.1 P562 L53 # 553

Law, David HPE  
 Comment Type T Comment Status X

Subclause 176A.10.1 'State diagram conventions' says that 'The notation used in the state diagrams follows the conventions of 21.5.', however subclause 21.5 does not address the operation of timers.

*SuggestedRemedy*

Suggest that the text 'All timers operate in the manner described in 14.2.3.2.' be inserted as the new second sentence of the second paragraph of subclause 176A.10.1.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176A SC 176A.10.2.1 P563 L44 # 566

Law, David HPE  
 Comment Type T Comment Status X

The last sentence of the tx\_disable variable description says that the '... output on the lane is disabled.'. Is this correct, the first sentence says that tx\_disable '... controls the transmitter's output on the interface.' and tx\_disable is defined under subclause 176A.10.2 'Per-interface variables, functions and timers'. Suggest that the reference to 'lane' is changed to 'interface', or use 'all lanes of the interface' in the variable description to reflect the segment\_ready variable description immediately above.

SuggestedRemedy

Either

[a] Change the text '... output on the lane is disabled.' in the last sentence of the tx\_disable variable description to read '... output on the interface is disabled.'

or

[b] Change [1] the text '... the transmitter's output on the interface.' in the first sentence of both the tx\_disable and tx\_mode variable descriptions to read '... the transmitter output on all lanes of the interface.'; and [2] the text '... output on the lane is disabled.' in the last sentence of the tx\_disable variable description to read '... output on all lanes of the interface is disabled.'

Proposed Response Response Status O

Cl 176A SC 176A.10.2.1 P563 L44 # 567

Law, David HPE  
 Comment Type T Comment Status X

Suggest a description of what happens when the tx\_disable variable is set to false is added to the variable description.

SuggestedRemedy

[1] Add 'When it is false, tx\_mode controls the content of the transmitter's output on the interface.' or 'When it is false, tx\_mode controls the content of the transmitter's output on all lanes of the interface.', depending on the response to my other comment, to the end of the tx\_disable variable description.

[2] Change the text '... of the interface.' in the first sentence of the tx\_mode variable description to read '... of the interface when tx\_disable is false.'

Proposed Response Response Status O

Cl 176A SC 176A.10.3 P564 L16 # 571

Law, David HPE  
 Comment Type T Comment Status X

176A.10.3 'Per-lane variables, functions, timers and counters' says 'The device implements one instance of each of the interface control state diagrams, and the set of associated ... for each of the n physical lanes on each of its interfaces (see 176A.9)'. I don't think this is correct as I believe that the interface control state diagram is one for each interface of a device (see 176A.10.2), and it is the frame lock and coefficient update state diagrams that are one for each lane of each interface of a device.

SuggestedRemedy

Change "The device implements one instance of each of the interface control state diagrams ..." to read 'The device implements one instance of each of the frame lock and coefficient update state diagrams ...'.

Proposed Response Response Status O

Cl 176A SC 176A.10.3.1 P565 L5 # 572

Law, David HPE  
 Comment Type T Comment Status X

The variables local\_tf\_lock, remote\_tf\_lock, local\_rx\_ready and remote\_rx\_ready are all defined in 176A.10.3 'Per-lane variables, functions, timers and counters' and are related to a lane, yet they are used by figure 176A-6 'Interface control state diagram'. 176A.10.2 'Per-interface variables, functions and timers' says 'A device implements one instance of each of the interface control state diagrams independently for each of its interfaces (see 176A.9)'.

SuggestedRemedy

Perhaps figure 176A-6 'Interface control state diagram' should use a 'interface' version of each of these variables that are a logical AND of the respective lane variable in the case of a multi-lane interface.

Proposed Response Response Status O

Cl 176A SC 176A.10.3.1 P565 L7 # 573

Law, David HPE  
 Comment Type T Comment Status X

The description of the local\_tf\_lock variable in 176A.10.3.1 says that 'The value of this variable is encoded as the "training lock" bit in the status field of transmitted training frames.', however, there isn't a "training lock" bit defined for the training frames. Since 176A.4.3 'Receiver frame lock' says 'Receiver frame lock ... is not set to 1 until training and local\_tf\_lock are both true.' it seems that local\_tf\_lock is encoded in the 'Receiver frame lock' bit.

*SuggestedRemedy*

Change the text '... is encoded as the "training lock" bit ...' in the local\_tf\_lock variable description to read '... is encoded in the "Receiver frame lock" bit ...'.

Proposed Response Response Status O

Cl 176A SC 176A.10.3.3 P566 L21 # 569

Law, David HPE  
 Comment Type T Comment Status X

176A.10.3.3 'Timers' is a subclause of 176A.10.3 'Per-lane variables, functions, timers and counters', yet the three times listed, quiet\_timer, propagation\_timer and recovery\_timer are all used by the interface control state diagram. 176A.10.2 'Per-interface variables, functions and timers' says 'A device implements one instance of each of the interface control state diagrams, and the set of associated variables, functions, counters and timers defined in this subclause, independently for each of its interfaces(see 176A.9).' As a result, it seems these timers should be moved to 176A.10.2.3 'Timers' and the descriptions should be updated to reflect that they operate on a per-interface basis.

*SuggestedRemedy*

- [1] Move the quiet\_timer, propagation\_timer and recovery\_timer definitions to 176A.10.2.3 'Timers' and delete 176A.10.3.3 'Timers'.
- [2] Change the text '... the interface control state diagram on a lane enters the ...' in the description of quiet\_timer, propagation\_timer and recovery\_timer to read '... the interface control state diagram on an interface enters the ...'.

Proposed Response Response Status O

Cl 176A SC 176A.10.4 P566 L46 # 458

Opsasnick, Eugene Broadcom  
 Comment Type T Comment Status X

The state diagram shown in Figure176A-8 "Training frame lock state diagram" on page 570 and Figure 176A-9 "Coefficient update state diagram" are exactly the same as the state diagrams of the same names in Figure 136-8 and Figure 136-9. Only the reset signal is renamed from "mr\_restart\_training" to "mr\_restart".

*SuggestedRemedy*

Remove Figure 176A-8 and Figure 176A-9.

Change "mr\_restart" to "mr\_restart\_training" in subclause 176A.10.2.1 on page 564, line 21.

Change the text at the bottom of page 566 to refer to the equivalent state diagrams in clause 136 instead of the removed figures (with editorial license).

Any variables defined in subclause 176A.10.3.1 which are only used in the removed state diagrams can also be removed.

Proposed Response Response Status O

Cl 176A SC 176A.10.4 P566 L52 # 570

Law, David HPE  
 Comment Type T Comment Status X

176A.10.2 'Per-interface variables, functions and timers' says 'A device implements one instance of each of the interface control state diagrams independently for each of its interfaces (see 176A.9).' and 176A.10.4 'State diagrams' says 'The interface control state diagram (Figure 176A-6) defines the operation of the startup protocol for AUIs and PMDs'. 176A.10.4 'State diagrams', however, goes on to say, 'The interface control, frame lock and coefficient update state diagrams shall be implemented for each lane.'. This doesn't seem to be in alignment with the prior text and doesn't seem to be correct.

*SuggestedRemedy*

Change the last paragraph of 176A.10.4 to read 'The interface control and RTS update state diagrams shall be implemented for each interface of a device. The frame lock and coefficient update state diagrams shall be implemented for each lane of each interface of a device.'.

Proposed Response Response Status O

Cl 176A SC 176A.10.4 P566 L54 # 542

Rechtman, Zvi Nvidia  
 Comment Type TR Comment Status X

The operation of precoding after the completion of the start-up protocol is missing

*SuggestedRemedy*

Add the following text:  
 "If the LINK\_READY state is entered with local\_tp\_mode set to "PAM4 with precoding", then the PMA shall transmit all subsequent data on the corresponding lane with precoding (see 176.9.1.2).  
 If the LINK\_READY state is entered with remote\_tp\_mode set to "PAM4 with precoding", then the PMA shall subsequently received data on the corresponding lane includes precoding (see 176.9.1.2)"

Proposed Response Response Status O

Cl 176A SC 176A.10.4 P568 L20 # 551

Law, David HPE  
 Comment Type T Comment Status X

There is a spurious '<' withing the transition condition from the state TRAIN\_LOCAL to the state TRAIN\_REMOTE.

*SuggestedRemedy*

Suggest that 'local\_tf\_lock<\* local\_rx\_ready' should read 'local\_tf\_lock \* local\_rx\_ready'.

Proposed Response Response Status O

Cl 176A SC 176A.10.4 P568 L20 # 552

Law, David HPE  
 Comment Type T Comment Status X

There should be an underscore between the timer name and 'done'.

*SuggestedRemedy*

Suggest that 'recovery\_timer done' should be changed to read 'recovery\_timer\_done'.

Proposed Response Response Status O

Cl 176A SC 176A.10.4 P568 L48 # 550

Rechtman, Zvi Nvidia  
 Comment Type T Comment Status X

The comment refers to Figure 176A-6—Interface control state diagram. The RECOVERY state coupled with the absence of timeouts, introduces a new challenge in identifying marginal performance cases. These cases may lead to repeated transitions between TRAIN\_LOCAL/TRAIN\_REMOTE/SEGMENT\_READY state to/from RECOVERY state in scenarios of alternating local\_tf\_lock. A possible solution is to limit the number of RECOVERY events by counting and limiting the number of transitions to the RECOVERY state.

*SuggestedRemedy*

Define a new counter: "recovery\_event\_count". This counter increments each time the control state diagram transitions into the RECOVERY state.

Effects on the state diagram:  
 The "recovery\_event\_count" should be initialized to 0 in the "SEND\_TRAINING" state. Upon entering the RECOVERY state, the "recovery\_event\_count" should be incremented by 1.

State diagram transition change:  
 The transition condition from the RECOVERY state to the FAIL state needs to be modified as follows:  
 Change "recovery\_timer done" to "recovery\_timer done || recovery\_event\_count > X", where X is 5 (or to be determined).

Proposed Response Response Status O

Cl 176A SC 176A.10.4 P569 L17 # 556

Law, David HPE  
 Comment Type T Comment Status X

The WAIT\_ADJACENT to SWITCH\_CLOCK transition condition uses the variable mr\_training\_enabled, however subclause 176A.10.2.1 'Variables' defines the variable mr\_training\_enable, not mr\_training\_enabled.

*SuggestedRemedy*

Change the transition condition '(!mr\_training\_enabled + segment\_ready) \* ...' to read '(!mr\_training\_enable + segment\_ready) \* ...'.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176A SC 176A.10.4 P570 L9 # 557

Law, David

HPE

Comment Type E Comment Status X

Subclause 176A.10.1 'State diagram conventions' says that 'The notation used in the state diagrams follows the conventions of 21.5.'. Subclause 21.5.3 'State transitions' says 'The following terms are valid transition qualifiers:' and item d) says 'An unconditional transition: UCT'. As a result, it is not necessary to expand UCT on it's first use in Annex 176A.

SuggestedRemedy

Change the text 'UCT (unconditional transition)' to read 'UCT'.

Proposed Response Response Status O

Cl 176A SC 176A.10.4 P571 L9 # 575

Law, David

HPE

Comment Type T Comment Status X

The UPDATE\_IC function is called in the OUT\_OF\_SYNC state of the Figure 176A-9 Coefficient update state diagram. The UPDATE\_IC function uses the ic\_req variable to set the coefficients (see 176A.6.2), and the ic\_req variable is derived from the 'initial condition request' bits from the control field of the received training frames (see 176A.10.3.1).

Since, however, the OUT\_OF\_SYNC state is entered during reset (reset or mr\_restart set true), it would seem unlikely that training frames are being received. If that is the case, it isn't clear what the value of the ic\_req variable is, and therefore what the coefficients should be set to.

176A.6.2 says that 'The transmitter equalizer is set to preset 1 upon entry to the QUIET state of the interface control state diagram.'. Since the QUIET state of the Interface control state diagram is also entered during reset, it seems the coefficients should be set to preset 1 when the Coefficient update state diagram is in the OUT\_OF\_SYNC state.

SuggestedRemedy

- [1] Delete the first sentence of the ic\_req definition in 176A.10.3.1.
- [2] Add the text 'If the Coefficient update state diagram is in the OUT\_OF\_SYNC state ic\_req is set to preset 1. Otherwise, it is derived from the "initial condition request" bit of the control field of received training frames on the correspondent lane of the interface.' to the end of the ic\_req definition in 176A.10.3.1.

Proposed Response Response Status O

Cl 176A SC 176A-6 P568 L21 # 449

Simms, William

NVIDIA

Comment Type ER Comment Status X

Figure 176A-6 has an extraneous < in the name 'local\_tf\_lock<\*'.

SuggestedRemedy

change to 'local\_tf\_lock\*'

Proposed Response Response Status O

Cl 176D SC 176D.1 P595 L16 # 584

Ghiasi, Ali

Ghiasi Quantum/Marvell

Comment Type T Comment Status X

C2C loss is TBD

SuggestedRemedy

Assuming 28 dB budget and package A length ~300 mm and ~125 mm for package B

Proposed Response Response Status O

Cl 176D SC 176D.2 P596 L19 # 62

Dudek, Mike

Marvell

Comment Type T Comment Status X

The note "The electrical specifications of C2C components are not equivalent to those of the corresponding PMD's isn't helpful. What does "not equivalent" mean?. Which corresponding PMD's?"

SuggestedRemedy

Delete the note.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176D SC 176D.2 P596 L32 # 583  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Functional block diagram shown for C2C indicate ball-ball specifications  
 SuggestedRemedy  
 C2C component should be called C2C device and change the TP0 to TP0d and TP5 to TP5d  
 Proposed Response Response Status O

Cl 176D SC 176D.3.3 P597 L33 # 423  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Signaling rate of 106.255 ± 50 ppm in Table 176D-1 is incorrect  
 SuggestedRemedy  
 Change "106.255 ± 50 ppm" to "106.25 ± 50 ppm"  
 Proposed Response Response Status O

Cl 176D SC 176D.3.3 P597 L22 # 422  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Transmitter measurement bandwidth is TBD  
 SuggestedRemedy  
 Replace TBD with 62 GHz  
 Proposed Response Response Status O

Cl 176D SC 176D.3.3 P598 L16 # 450  
 Simms, William NVIDIA  
 Comment Type E Comment Status X  
 Where does the value for SNDR of 32.5dB come from?  
 SuggestedRemedy  
 No change suggested, looking for source material  
 Proposed Response Response Status O

Cl 176D SC 176D.3.3 P597 L33 # 398  
 Wu, Mau-Lin MediaTek  
 Comment Type TR Comment Status X  
 The value of '106.255 +/- 50 ppm' is not correct.  
 SuggestedRemedy  
 Change '106.255' to '106.25'.  
 Proposed Response Response Status O

Cl 176D SC 176D.3.4.4 P602 L47 # 424  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Reference to ERL methodology is missing  
 SuggestedRemedy  
 Add reference to 176D.4.3.  
 Proposed Response Response Status O

Cl 176D SC 176D.3.3 P597 L33 # 361  
 Healey, Adam Broadcom Inc.  
 Comment Type T Comment Status X  
 Typo.  
 SuggestedRemedy  
 Change "106.255" to "106.25".  
 Proposed Response Response Status O

Cl 176D SC 176D.3.4.4 P603 L18 # 425  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 4th order Bessel-Thomson filter BW is TBD  
 SuggestedRemedy  
 Replace TBD with 62 GHz  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176D SC 176D.3.4.4 P603 L30 # 426  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 "Insertion loss at 26.5625 GHz"  
 Nyquist frquency in Table 176D-4 is incorrect  
 SuggestedRemedy  
 Change "26.5625 GHz" to "53.125 GHz"  
 Proposed Response Response Status O

Cl 176D SC 176D.3.4.4 P603 L31 # 451  
 Simms, William NVIDIA  
 Comment Type TR Comment Status X  
 Moot point maybe given table is all TBD, but the frequency should be 53.125GHz  
 SuggestedRemedy  
 change to 53.125GHz  
 Proposed Response Response Status O

Cl 176D SC 176D.3.4.4 P603 L34 # 427  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 COM values in Table 176D-4 are TBD  
 SuggestedRemedy  
 Replace TBD with 3 dB  
 Proposed Response Response Status O

Cl 176D SC 176D.3.4.5 P604 L1 # 428  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Reference to test procedure is missing  
 SuggestedRemedy  
 Add reference to 176D.3.4.4  
 Proposed Response Response Status O

Cl 176D SC 176D.4 P604 L24 # 430  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Minimum COM is TBD  
 SuggestedRemedy  
 Replace TBD with 3 dB in Table 176D-5 and in line 38 of page 604  
 Proposed Response Response Status O

Cl 176D SC 176D.4 P604 L27 # 429  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Table reference is missing  
 SuggestedRemedy  
 Add reference of ERL to 176D.4.3.  
 Add reference of differential-mode to common-mode return loss to 176D.4.4.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176D SC 176D.4.1 P604 L50 # 141  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Missing TBDs  
 SuggestedRemedy  
 Ro= 50 ohms  
 Rdr=50 ohms  
 RDt=50 ohms  
 Receiver 3 dB BW=0.55\*106.25=58.4375 GHz  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P605 L10 # 142  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Transmitter equalizer coefficients  
 SuggestedRemedy  
 Given little benefit of TX FFE C(-3) - NA  
 C(0)=0.65  
 C(-1)= [ -0.3:0.02:0 ]  
 C(-2)= [ 0:.02:0.14 ]  
 C(1)= [ -0.14:.02:0.14 ] also goes positive to allow slowing driver for reflection mitigation  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P605 L26 # 123  
 Sakai, Toshiaki Socionext  
 Comment Type T Comment Status X  
 COM reference package parameter vlaue. (transmission line parameter tau)  
 In "Table 176D-6" classB package model Transmission line parameter  $\tau(\text{tau})$  value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, Ilim\_3dj\_01a\_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.  
 SuggestedRemedy  
 Change  $\tau(\text{tau})$  value in Table 176D-6 (class B package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.  
 Or simply delete this row, as the  $\tau(\text{tau})$  value in table 93A-3 is 6.141e-3 ns/mm.  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P605 L35 # 504  
 Howard Heck Intel Corporation  
 Comment Type T Comment Status X  
 We need to fill in values for the TBDs AUI C2C device & package parameters in Table 176D-6and COM parameters in Table 176D-7.  
 SuggestedRemedy  
 Adopt the values proposed below for AUI C2C:  
 Table 176D-6:  
 R\_0 = 50 ohms, R\_d, = 50 ohms,  
 Table 176D-7:  
 $f_{r} = 0.75 * f_b$ , A\_v = 0.413 V, A\_fe = 0.413 V, A\_ne = 0.608 V, SNR\_Tx = 33 dB, A\_dd 0.02, R\_LM = 0.95, eta\_0 = 1.25e-8 V^2/GHz, M = 32,  
 d\_w = 4, N\_fix = 28, N\_g = 0, N\_f = NA, N\_max = NA,, sigma\_RJ = 0.01.  
 j W\_min(j) W\_max(j)  
 -4 0 0.5  
 -3 -0.15 0  
 -2 0 0.4  
 -1 -0.7 0  
 1 -0.35 0.85  
 2 -0.8  
 0.6  
 3-4 -0.2 0.3  
 5-8 -0.15 0.15  
 9-28 -0.05 0.05  
 A presentation is planned for the May 2024 interim in which we will provide analysis to supportthe proposed values.  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P605 L35 # 431  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Single-ended reference resistance R0 value in Table 176D-6 is TBD  
 SuggestedRemedy  
 Replace TBD with 50 Ohm  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176D SC 176D.4.1 P605 L50 # 432  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Receiver 3 dB bandwidth fr value in Table 176D-7 is TBD  
 SuggestedRemedy  
 Replace TBD with 0.58\*fb  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P605 L52 # 143  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 C2C should be aligned with C2M and addressing TBDs  
 SuggestedRemedy  
 SNRTx=33 dB  
 Add=0.02 UI  
 Sigma=0.01 UI  
 RLM=0.95  
 Eta0=1.25E-8  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P605 L52 # 144  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 C2C reference equalizer should be aligned with C2M and addressing TBDs  
 SuggestedRemedy  
 Propose to use fix 25 tap FFE with 1T DFE  
 Max # of pre-cursor taps = 6  
 DFE max tap weight = 0.75  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P606 L33 # 433  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Zero 2 frequency and pole 3 frequency of Continuous time filter are inconsistent with Table 178-13  
 SuggestedRemedy  
 Replace zero 2 frequency with fb/80  
 Change pole 3 frequency from "fb" to "fb/80"  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P606 L40 # 434  
 Li, Tobey MediaTek  
 Comment Type T Comment Status X  
 Transmitter differential peak output in Table 176D-7 is TBD  
 SuggestedRemedy  
 Replace Av with 0.413 V  
 Replace Afe with 0.413 V  
 Replace Ane with 0.608 V  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P606 L49 # 435  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Transmitter transition time Tr value in Table 176D-7 is TBD  
 SuggestedRemedy  
 Replace TBD with Tr = 4 ps  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176D SC 176D.4.1 P607 L5 # 436  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Level separation mismatch ratio RLM in Table 176D-7 is TBD  
 SuggestedRemedy  
 Replace TBD with 0.95  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P607 L8 # 437  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Number of samples per unit interval in Table 176D-7 is TBD  
 SuggestedRemedy  
 Replace TBD with 32  
 Proposed Response Response Status O

Cl 176D SC 176D.4.2 P607 L31 # 63  
 Dudek, Mike Marvell  
 Comment Type T Comment Status X  
 An insertion loss of only 20dB is less than desirable and the equation is TBD. We shouldn't specify the loss at this time  
 SuggestedRemedy  
 Change 20dB to TBD.  
 Proposed Response Response Status O

Cl 176D SC 176D.4.1 P605 L16 # 122  
 Sakai, Toshiaki Socionext  
 Comment Type T Comment Status X  
 COM reference package parameter vlaue. (transmission line parameter tau)  
 In "Table 176D-6" class A package model Transmission line parameter  $\tau(\text{tau})$  value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, Ilim\_3dj\_01a\_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.  
 SuggestedRemedy  
 Change  $\tau(\text{tau})$  value in Table 176D-6 (class A package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.  
 Or simply delete this row, as the  $\tau(\text{tau})$  value in table 93A-3 is 6.141e-3 ns/mm.  
 Proposed Response Response Status O

Cl 176E SC 176E.2 P615 L20 # 64  
 Dudek, Mike Marvell  
 Comment Type T Comment Status X  
 The note "The electrical specifications of C2C components are not equivalent to those of the corresponding PMD's. Specifically the test points at which module compliance is defined are different isn't helpful. What does "not equivalent" mean?. Which corresponding PMD's? Although the module test points are different those for the host are the same as Clause 179.  
 SuggestedRemedy  
 Delete the note.  
 Proposed Response Response Status O

Cl 176E SC 176E.2 P615 L23 # 129  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Figure depicts loss should be bump-bump  
 SuggestedRemedy  
 ...application and the associated ILdd bump-bump budget at 53.125 GHz  
 To make it more clear Host C2M Component should be changed to Host C2M Device and Module C2M Device  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176E SC 176E.2 P615 L33 # 130  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Loss budgets are TBD  
 SuggestedRemedy  
 See Ghiasi C2M May-24 Contribution for background on the numbers  
 IIDD=28 dB  
 Connector with one via = 3 dB  
 Module Idd = 3.6 dB  
 Host Idd=21.4 dB  
 Proposed Response Response Status O

Cl 176E SC 176E.3.3 P617 L35 # 132  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Eye height and VEC are TBD  
 SuggestedRemedy  
 See Ghiasi C2M May-24 Contribution for background on the numbers  
 VEC=10.7 dB  
 VEO=8 mV  
 Proposed Response Response Status O

Cl 176E SC 176E.3.3 P617 L10 # 186  
 Ran, Adeo Cisco  
 Comment Type TR Comment Status X  
 Host output characteristics need to be defined with consideration of the variable output settings that can result from training.  
 This will affect the entire subclause 176E.3.3.  
 SuggestedRemedy  
 Define the output characteristics using a methodology similar to that of transmitter specifications in 179.9.4.  
 Use a table similar to Table 179-7 but with different values due to the higher host channel insertion loss budget for C2M.  
 A detailed proposal will be provided.  
 Proposed Response Response Status O

Cl 176E SC 176E.3.3.3 P620 L32 # 220  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns  
 SuggestedRemedy  
 Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"  
 Proposed Response Response Status O

Cl 176E SC 176E.3.3 P617 L33 # 131  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 3 dB BW is TBD  
 SuggestedRemedy  
 propose to use  $0.55 \times \text{Baudrate} = 58.4375 \text{ GHz}$  but in current OCM code we use Butterworth, should the COM for C2M be changed to BT4 filter?  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176E SC 176E.3.4 P621 L13 # 187

Ran, Adee Cisco  
 Comment Type TR Comment Status X

Module output characteristics need to be defined with consideration of the variable output settings that can result from training.

This will affect the entire subclause 176E.3.4.

*SuggestedRemedy*

Define the output characteristics using a methodology similar to that of transmitter specifications in 179.9.4.

Use a table similar to Table 179-7 but with different values due to the lower insertion loss assumed for the module output test.

A detailed proposal will be provided.

Proposed Response Response Status

Cl 176E SC 176E.3.4.2 P622 L49 # 221

Noujeim, Leesa Google  
 Comment Type T Comment Status X

Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns

*SuggestedRemedy*

Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"

Proposed Response Response Status

Cl 176E SC 176E.3.5 P621 L7 # 133

Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X

BW is TBD

*SuggestedRemedy*

propose to use 0.55\*Baudrate=58.4375 GHz

Proposed Response Response Status

Cl 176E SC 176E.3.5 P624 L3 # 188

Ran, Adee Cisco  
 Comment Type TR Comment Status X

Host input characteristics need to be defined with consideration of the availability of training.

This will affect the entire subclause 176E.3.5.

*SuggestedRemedy*

Define the input characteristics using a methodology similar to that of receiver specifications in 179.9.5, with the required changes due to the lack of a cable assembly.

Use a table similar to Table 179-10 but with additional rows for DC common-mode voltage and AC common-mode voltage tolerance.

A detailed proposal will be provided.

Proposed Response Response Status

Cl 176E SC 176E.3.6 P628 L26 # 189

Ran, Adee Cisco  
 Comment Type TR Comment Status X

Module input characteristics need to be defined with consideration of the availability of training.

This will affect the entire subclause 176E.3.6.

*SuggestedRemedy*

Define the input characteristics using a methodology similar to that of receiver specifications in 179.9.5, with the required changes due to the lack of a cable assembly and usage of MCB instead of HCB.

Use a table similar to Table 179-10 but with additional rows for DC common-mode voltage tolerance and AC common-mode voltage tolerance.

A detailed proposal will be provided.

Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176E SC 176E.4.1 P621 L6 # 134  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Loss is TBD  
 SuggestedRemedy  
 See Ghiasi C2M May-24 Contribution for background on the numbers  
 Bump-bump Insertion loss at Nyquist frequency (53.125 GHz) is less than or equal to 28 dB  
 Proposed Response Response Status O

Cl 176E SC 176E.4.1 P632 L6 # 73  
 Lusted, Kent Intel Corporation  
 Comment Type TR Comment Status X  
 The IL\_dd for AUI C2M channel is a TBD  
 SuggestedRemedy  
 Set IL\_dd = 33 per [https://www.ieee802.org/3/dj/public/24\\_01/lusted\\_3dj\\_03\\_2401.pdf](https://www.ieee802.org/3/dj/public/24_01/lusted_3dj_03_2401.pdf)  
 Proposed Response Response Status O

Cl 176E SC 176E.4.2 P605 L50 # 72  
 Lusted, Kent Intel Corporation  
 Comment Type TR Comment Status X  
 The COM parameter values for the AUI C2M electrical interfaces in Annex 176E are different from the AUI C2C  
 SuggestedRemedy  
 Create a new COM parameter values table in 176E.4.2 and use the COM parameter values from [https://www.ieee802.org/3/dj/public/24\\_03/lit\\_3dj\\_01a\\_2403.pdf](https://www.ieee802.org/3/dj/public/24_03/lit_3dj_01a_2403.pdf) slide 6 and 11, which are:

f\_r = 0.58  
 c(-3) = 0  
 c(-2) = 0 min, 0.12 max  
 c(-1) = -0.4 min, 0 max  
 c(0) = 0.54  
 c(1) = 0  
 A\_v = 0.413  
 A\_fe = 0.413  
 A\_ne = 0.45  
 eta\_0 = 1.25e-8  
 SNR\_TX = 33  
 sigma\_RJ = 0.01  
 A\_DD = 0.02  
 R\_LM = 0.95  
 d\_w = 5  
 Nfix = 10  
 N\_g = 1  
 N\_f = 4  
 N\_max = 60  
 w\_max(1) = 1  
 w\_min(1) = 0  
 b\_max(1) = 0.75  
 b\_min(1) = 0

additionally, set MLSE = 0 (not enabled)

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176E SC 176E.5 P633 L12 # 203  
 Ran, Adeo Cisco  
 Comment Type TR Comment Status X  
 Measurement methodology for C2M should consider the variable output settings that can result from training. Eye opening parameters with specific transmitter settings are not the relevant metrics for transmitter quality anymore.  
 The measurement methodology of CR transmitter, which focuses on training-related equalizer parameters and training-independent signal parameters, is more suitable.  
 SuggestedRemedy  
 Move the measurement methodology section into another annex that both Clause 179 and Annex 176E can refer to.  
 A detailed proposal will be provided.  
 Proposed Response Response Status

Cl 176E SC 176E.5.2 P633 L39 # 135  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Eye opening reference receiver parameters will be different between TP1d and TP4a measurement  
 SuggestedRemedy  
 Given that number of module plug implementation will have COC or even if there is package it will be core-less ~8 mm so there is no need to add package after HCB given the loss of the HCB and plug boards are similar.  
 At TP4a this is just the output of the module should be tested with synthetic  
 - short trace  
 - long trace  
 recommendation is to measure at the ASIC ball otherwise we would need at least 2 test cases with Package A and 2 with Package B  
 Proposed Response Response Status

Cl 176E SC 176E.5.2 P633 L33 # 522  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 decision-feedback equalizer? The table mentions "feed-forward coefficient"  
 SuggestedRemedy  
 Update this text  
 Proposed Response Response Status

Cl 176E SC 176E.5.2 P633 L39 # 365  
 Healey, Adam Broadcom Inc.  
 Comment Type T Comment Status X  
 The title of Table 176E-7 suggests that it should contain reference receiver parameters. Many of the parameters in the table are not relevant to a reference receiver or an eye diagram measurement. It is understood that this may become moot if a different test method is adopted, but until this decision is made the table can be trimmed down to remove "TBDs" that will never need to be defined.  
 SuggestedRemedy  
 Remove parameters "maximum start frequency", "maximum frequency step", all "transmitter" parameters including "number of signal levels" and "level separation mismatch ratio", "number of samples per unit interval", and "target detector error ratio". It is also questionable whether device termination and package model parameters are needed (they were not used in Annex 120G).  
 Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176E SC 176E.5.2 P633 L47 # 136  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 TP1d and TP4a measurement should be done without device model with just 50 scope termination  
 SuggestedRemedy  
 Device model - NA  
 Single ended transmitter termination - NA  
 Single ended reference resistance - 50 ohms  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P633 L52 # 438  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Single-ended reference resistance R0 value in Table 176E-7 is TBD  
 SuggestedRemedy  
 Replace TBD with 50 Ohm  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P634 L5 # 137  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Single ended receive termination and receive 3 dB BW  
 SuggestedRemedy  
 Single ended receive termination is the 50 ohm scope termination  
 Receive 3 dB BW=0.55\*106.25=58.4375 GHz  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P634 L6 # 439  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Receiver 3 dB bandwidth fr value in Table 176E-7 is TBD  
 SuggestedRemedy  
 Replace TBD with 0.58\*fb  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P634 L8 # 65  
 Dudek, Mike Marvell  
 Comment Type T Comment Status X  
 There shouldn't be any Tx parameters in a specification for a reference receiver.  
 SuggestedRemedy  
 Delete the rows for transmitter termination resistance, transmitter equalizer coefficients, transmitter differential peak output voltage, transition time, transmitter signal to noise ratio, RLM,  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P634 L8 # 138  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Transmitter equalizer coefficients  
 SuggestedRemedy  
 Given little benefit of TX FFE C(-3) - NA  
 C(0)=0.65  
 C(-1)= [ -0.3:0.02:0 ]  
 C(-2)= [ 0:.02:0.14 ]  
 C(1)= [ -0.14:.02:0.14 ] also goes positive to allow slowing driver for reflection mitigation  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176E SC 176E.5.2 P634 L34 # 440  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Pole & zero frequency values of continuous time filter are TBD  
 SuggestedRemedy  
 Replace zero 1 frequency, fz1, with fb/2.5 GHz  
 Replace zero 2 frequency, fz2, with fb/80 GHz  
 Replace pole 1 frequency, fp1, with fb/2.5 GHz  
 Replace pole 2 frequency, fp2, with fb GHz  
 Replace pole 3 frequency, fp3, with fb/80 GHz  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P634 L43 # 441  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Transmitter transition time Tr value in Table 176E-7 is TBD  
 SuggestedRemedy  
 Replace TBD with Tr = 4 ps  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P634 L50 # 139  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Jitter and noise parameters are TBD  
 SuggestedRemedy  
 See Ghiasi C2M May-24 Contribution for background on the numbers  
 Eta0=1.25E-8  
 Transmitter SNR = NA for reference receiver but may use 33 dB for COM code  
 Transmitter Sigma = NA for reference receiver but may use 0.01 UI for COM code  
 Transmitter dual-Dirac jitter = NA for reference receiver but may use 0.02 UI for COM code  
 Transmitter RLM = NA for reference receiver but may use 95% for COM code  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P634 L53 # 442  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Level separation mismatch ratio RLM in Table 176E-7 is TBD  
 SuggestedRemedy  
 Replace TBD with 0.95  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P635 L5 # 443  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Number of samples per unit interval in Table 176E-7 is TBD  
 SuggestedRemedy  
 Replace TBD with 32  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P635 L35 # 444  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 "Dp equal to 3" is not right as there are 3 pre-taps for the host  
 SuggestedRemedy  
 Change "Dp equal to 3" to "Dp equal to 4"  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176E SC 176E.5.2 P635 L50 # 140  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Reference equalizer is TBD  
 SuggestedRemedy  
 Propose to use fix 25 tap FFE with 1T DFE  
 Max # of pre-cursor taps = 6  
 DFE max tap weight = 0.75  
 Proposed Response Response Status O

Cl 176E SC 176E.5.2 P636 L49 # 523  
 Dawe, Piers Nvidia  
 Comment Type TR Comment Status X  
 "within the time interval  $t_s \pm 0.05$  UI and with accumulated probability for each sample weighted by the function  $w(t)$  defined by Equation (176E-4)": this makes the measurement too tolerant to jitter.  
 SuggestedRemedy  
 Remove the Gaussian weighting function  $w(t)$ , increase  $\pm 0.05$  to  $\pm 0.07$ , same as TDECQ. This will make VEC look worse, but will be a better measurement to protect the link. Use this method for CR also, with "software channel" ("far end eye measurement") as appropriate.  
 Proposed Response Response Status O

Cl 177 SC 177 P257 L28 # 22  
 Liu, Cathy Broadcom  
 Comment Type T Comment Status X  
 This section only mentions that the inner FEC decoder is soft-decision decoder and the details implementation is beyond the scope of the this standard. However, shall we specify the soft-decision decoder's performance bound? If not, the optical PMD BER target or link budget might be missed.  
 SuggestedRemedy  
 To specify the soft-decision decoder shall provide TBD dB (say 2dB) coding gain over end-end FEC provided that the error statistics are sufficiently random.  
 Proposed Response Response Status O

Cl 177 SC 177.1.3 P249 L10 # 81  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The second bullet could be written more clearly  
 SuggestedRemedy  
 Revise to read "Distributing (collecting) the convolutional interleaved data to (from) eight Inner FEC flows  
 Proposed Response Response Status O

Cl 177 SC 177.1.3 P249 L14 # 82  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The fifth bullet could be written more clearly  
 SuggestedRemedy  
 Revise to read "8:1 interleaving (1:8 deinterleaving) the eight Inner FEC flows to (from) a single flow"  
 Proposed Response Response Status O

Cl 177 SC 177.1.4 P250 L25 # 83  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 Indicating PAM4 decoding as optional seems a bit misleading. The P{MD isn't doing soft-decoding in any case, so the FEC must do some sort of decoding to recover the bits from the PAM4 symbols.  
 SuggestedRemedy  
 Generalize the label in the box to "Decoding", and explain in the text in 177.5.x that there are multiple options for decoding.  
 Proposed Response Response Status O

Cl 177 SC 177.1.4 P250 L32 # 543

Rechtman, Zvi Nvidia  
 Comment Type T Comment Status X

The comment refers to Figure 177-2.  
 There is a footnote that PAM4 decoding is optional in case of soft decoding.  
 However, the DataPath is defined using bit streams, also the  
 FEC:IS\_UNITDATA\_i.indication primitives has two value of 0 or 1, therefore PAM4  
 decoding must to take place

*SuggestedRemedy*

Either remove the footnote, or elaborate on the intention of this footnote.

Proposed Response Response Status O

Cl 177 SC 177.4.1 P251 L36 # 605

de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X

Due primarily to the convolutional interleaver/deinterleaver, there is a large variation in the  
 input-to-output latency of the Inner FEC sublayer. As such, there is concern that the  
 method to properly calculate the path data delay for the Inner FEC sublayer should be  
 explained in Clause 90, similarly to what is done for the variation from FEC codewords and  
 PCS-lane distribution in clause 90.7.1.

*SuggestedRemedy*

Do nothing.  
 Using the general method in Clause 90A, allocating the maximum value of the intrinsic  
 delay to the transmit PHY and the minimum value of the intrinsic delay to the receive PHY,  
 there is no ambiguity.  
 So it should not be necessary to add to Clause 90 for every new PHY type. The principles  
 laid out in Annex 90A.7 should apply.  
 If anything, a general note could be added in Clause 177 (or in Clause 45 with the MDIO  
 registers for path data delay values) explaining that the Tx/Rx path data delay values  
 should be calculated following the guidelines in Annex 90A.7, where the maximum latency  
 value is used for the Tx path data delay, and the minimum latency value is used for Rx path  
 data delay.

Proposed Response Response Status O

Cl 177 SC 177.4.1 P251 L50 # 610

Huang, Kechao Huawei Technologies Co., Ltd.  
 Comment Type T Comment Status X

"The convolutional interleaver is composed of 3 delay lines where the first delays the PHYs  
 data by eight  
 RS-FEC codewords, the second by four RS-FEC codewords and the last adds no delay" is  
 correct only if the Q values are 544/272/136/68 for 200G/400G/800G/1.6T. However, the Q  
 values should be 192/96/48/24 as shown in slides 6-11 of he\_3dj\_01\_2307 for  
 200G/400G/800G/1.6TbE.

*SuggestedRemedy*

Suggest to modify Line 50-51 in page 251 as follows:  
 The convolutional interleaver is composed of three parallel delay lines (numbered 0 to 2),  
 as illustrated in Figure 177-3. Each delay operator "D" represents a storage element of 40  
 bits. From one delay line to the next higher delay line, Q delay operators are deleted.  
 Modify the Q values to 192/96/48/24 for 200G/400G/800G/1.6T

Proposed Response Response Status O

Cl 177 SC 177.4.1 P251 L51 # 544

Rechtman, Zvi Nvidia  
 Comment Type TR Comment Status X

The values of Q and the description of the Convolutional interleaver functionality doesn't  
 match the adopted values in he\_3dj\_01\_2307.pdf  
 The values should be:  
 200G BASE-R: Q = 192  
 400G BASE-R: Q = 96  
 800G BASE-R: Q = 48  
 1.6T BASE-R: Q = 24

*SuggestedRemedy*

Modify the Q values to:  
 200G BASE-R: Q = 192  
 400G BASE-R: Q = 96  
 800G BASE-R: Q = 48  
 1.6T BASE-R: Q = 24

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 177 SC 177.4.1 P252 L9 # 292  
 Galan, Jose Vicente Maxlinear Inc  
 Comment Type **TR** Comment Status **X**  
 The Q values of Convolutional interleaver are not in line with previous contributions, D0.1, D0.2, with the TP2 test vectors of Annex 177A and have to be corrected.  
 SuggestedRemedy  
 Q=24 for 1.6TBASE-R, Q=48 for 800GBASE-R, Q=96 for 400GBASE-R and Q=192 for 200GBASE-R  
 Proposed Response Response Status

Cl 177 SC 177.4.1 P252 L19 # 488  
 Slavick, Jeff Broadcom  
 Comment Type **T** Comment Status **X**  
 The delay line for Cl177 starts with feeding data into the longest delay line while Cl184 sends it to the delay line with the shortest delay.  
 SuggestedRemedy  
 Change Cl177 to have the Delay Line 0 be the minimal delay and the Delay Line 2 to be the longest delay.  
 Proposed Response Response Status

Cl 177 SC 177.4.1 P252 L9 # 366  
 He, Xiang Huawei  
 Comment Type **TR** Comment Status **X**  
 The Q values are not the same as the baseline adopted.  
 SuggestedRemedy  
 According to the adopted baseline, change the Q values as follows:  
 — 200G BASE-R: Q = 192  
 — 400G BASE-R: Q = 96  
 — 800G BASE-R: Q = 48  
 — 1.6T BASE-R: Q = 24  
 Proposed Response Response Status

Cl 177 SC 177.4.1 P256 L50 # 545  
 Rechtman, Zvi Nvidia  
 Comment Type **TR** Comment Status **X**  
 The description in "The convolutional interleaver is composed of 3 delay lines where the first delays the PHYs data by eight RS-FEC codewords, the second by four RS-FEC codewords and the last adds no delay"  
 Seems to represent block interleave and not convolutional interleave.  
 SuggestedRemedy  
 Modify to:  
 "The convolutional interleaver is composed of 3 delay lines.  
 For 200GBASE-R the first line (line0) delays the PHYs data by  $4 \times 2 \times 192 = 1,536$  RS-FEC Symbols, the second line (line1) by  $4 \times 1 \times 192 = 768$  RS-FEC symbols and the last line (line3) adds no delay.  
 For 400GBASE-R the first line (line0) delays the PHYs data by  $4 \times 2 \times 96 = 768$  RS-FEC Symbols, the second line (line1) by  $4 \times 1 \times 96 = 384$  RS-FEC symbols and the last line (line3) adds no delay  
 For 800GBASE-R the first line (line0) delays the PHYs data by  $4 \times 2 \times 48 = 384$  RS-FEC Symbols, the second line (line1) by  $4 \times 1 \times 48 = 192$  RS-FEC symbols and the last line (line3) adds no delay  
 For 1.6TBASE-R the first line (line0) delays the PHYs data by  $4 \times 2 \times 24 = 192$  RS-FEC Symbols, the second line (line1) by  $4 \times 1 \times 24 = 96$  RS-FEC symbols and the last line (line3) adds no delay.  
 Proposed Response Response Status

Cl 177 SC 177.4.1 P252 L18 # 295  
 Galan, Jose Vicente Maxlinear Inc  
 Comment Type **T** Comment Status **X**  
 Usually, a convolutional interleaver switches round-robin from low to high delay lines and the convolutional de-interleaver switches round-robin from high to low delay lines. Why in Figure 177-3 it is defined the other way round?  
 SuggestedRemedy  
 Change the convolutional interleaver order if that is the case.  
 Proposed Response Response Status

Cl 177 SC 177.4.1 P256 L53 # 546

Rechtman, Zvi Nvidia  
 Comment Type T Comment Status X

The input and output round-robin operation is defined relatively to the delay/buffering size of each lane. However, there are lines index that represent the delay and simplify the definition.

*SuggestedRemedy*

Change:  
 "The input data round-robins between the three delay lines beginning with the eight RS-FEC delay line, then the four RS-FEC delay line and lastly the zero delay line. The output of the convolutional interleaver round-robins between the three delay lines receiving one RS-FEC symbol-quartet from each at a time beginning with the eight RS-FEC delay line, then four RS-FC delay line, and lastly the zero delay line"

To:  
 "The input data round-robins between the three delay lines beginning with the line0, then line1 delay line and lastly line2. The output of the convolutional interleaver round-robins between the three delay lines receiving one RS-FEC symbol-quartet (4 symbols) from each at a time beginning with line0, then line1, and lastly line2"

Proposed Response Response Status

Cl 177 SC 177.4.3 P252 L37 # 607

de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X

Was there not a proposal to make the circular shift optional, in order to minimize latency?

*SuggestedRemedy*

Consider removing the circular shift if it does offer not any worthwhile benefit.

Proposed Response Response Status

Cl 177 SC 177.4.3 P252 L37 # 606

de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X

I'm not convinced that the circular shift really adds any robustness. Yes, it distances bit-pairs belonging to the same RS-FEC codeword, but...  
 Without the shift, the consecutive bit pairs (after 8:1 multiplexing) belonging to the same RS-FEC code words would each protected by different Inner FEC code words, would they not?  
 So is the circular shift just protecting against uncorrected inner-FEC codewords that would all land on the same RS-FEC codeword? Seems overkill. Are there simulations/models showing the benefit of including circular shift?

*SuggestedRemedy*

Consider removing the circular shift if it does not offer any worthwhile benefit.

Proposed Response Response Status

Cl 177 SC 177.4.4 P253 L48 # 611

Huang, Kechao Huawei Technologies Co., Ltd.  
 Comment Type T Comment Status X

The systematic Hamming code is most naturally defined in terms of its parity-check matrix, as pointed out in many textbooks and standard documents. One famous example is the systematic double-extended Hamming(128,119) code in OIF-400ZR and ITU-T G.709.3.

*SuggestedRemedy*

Suggest to include the construction process and parity-check matrix of the adopted Hamming(68,60) code to enhance the completeness of the document. A Supporting Presentation will be provided.

Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 177 SC 177.4.4 P253 L48 # 612  
 Huang, Kechao Huawei Technologies Co., Ltd.  
 Comment Type T Comment Status X  
 "The generation matrix G(60,8) for the Hamming(68,60) encoder is given in Table 177-1" is not accurate. The generation matrix for the Hamming(68,60) should be with 60 rows and 68 columns, where the most-left 60 columns is the identity matrix.  
 SuggestedRemedy  
 Suggest to change the sentence to "The generator matrix of the Hamming(68,60) code is  $G=[I_{60} ; G_{(60 \times 8)}]$ , where  $I_{60}$  is the 60x60 identity matrix, and  $G_{(60 \times 8)}$  is a 60x8 matrix used to generate the 8 parity bits given in Table 177-1."  
 Proposed Response Response Status O

Cl 177 SC 177.4.6 P254 L # 608  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 A figure illustrating the pad bits and their interval for each inner FEC flow would be useful. I always find myself referring to the equivalent RS-FEC Figures (Figure 119-6 and Figure 119-8)  
 SuggestedRemedy  
 Consider adding a figure illustrating the pad insertion and interval, in the same style as Figure 119-6  
 Proposed Response Response Status O

Cl 177 SC 177.4.6 P254 L31 # 604  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 Phase of inner FEC pad bits vs outer FEC parity bits:  
 - An inaccuracy in the path data delay of up to 12ps due to arbitrary phase between the output FEC parity bits and the inner FEC pad bits of the phase is not accounted for.  
 - This arbitrary phase would affect the path data delay values.  
 - Almost negligible, if my math is correct.  
 SuggestedRemedy  
 3 possible ways to address:  
 a. Impose a phase relationship between the RS FEC code word boundaries and the inner FEC pad bits, which would mean large-scale changes to the draft.  
 b. Specify (in clause 90, perhaps) that the path data delay contribution through the inner FEC sublayer shall be strictly additive to the path data delay contribution through the PCS and PMA layers.  
 c. Ignore. Based on 90A.7, the effect here is small enough to not address specifically.  
 "Whether the potential delay difference between the aggregated delay and the sum of the individual function delays is small enough to satisfy the timing requirements is up to the individual application."  
 I prefer option (c). It should not be necessary to add specific text or impose new logical rules to the Inner FEC pad bits to address a potential 12ps path data delay impairment.  
 Proposed Response Response Status O

Cl 177 SC 177.4.6 P254 L33 # 296  
 Galan, Jose Vicente Maxlinear Inc  
 Comment Type T Comment Status X  
 It is not declared when the first pad insertion should happen.  
 SuggestedRemedy  
 Indicate in the text that the first pad insertion will happen right at the beginning of CWs, same as in the test vectors.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 177 SC 177.4.6 P254 L44 # 489  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 The last paragraph describing options for how the pad insertion could be done is unnecessary. The requirement that it occurs every 8704 CW and follows the Figure 177-6 is sufficient.  
 SuggestedRemedy  
 Remove the last paragraph of 177.4.6  
 Proposed Response Response Status O

Cl 177 SC 177.4.6 P254 L44 # 84  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The last paragraph on p254 is not necessary - implementations are always free to do things in different orders, as long as the end result matches the specified behavior.  
 SuggestedRemedy  
 Delete the paragraph.  
 Proposed Response Response Status O

Cl 177 SC 177.4.6.1 P255 L25 # 174  
 Ramesh, Sridhar Maxlinear Inc  
 Comment Type E Comment Status X  
 "Pad frame sequence" naming does not convey purpose in alignment. Suggest to call this field "Frame Alignment Sequence" instead.  
 SuggestedRemedy  
 Pad Frame Alignment Sequence  
 Proposed Response Response Status O

Cl 177 SC 177.4.6.2 P255 L49 # 297  
 Galan, Jose Vicente Maxlinear Inc  
 Comment Type T Comment Status X  
 The details of how to use the IBSF are beyond the scope of this standard. Does it mean this is vendor discretionary? Or will it be defined in other standard?  
 SuggestedRemedy  
 Clarify in the text where the use of the IBSF will be defined.  
 Proposed Response Response Status O

Cl 177 SC 177.4.7.2 P256 L12 # 547  
 Rechtman, Zvi Nvidia  
 Comment Type TR Comment Status X  
 The 128,120 Hamming code is very sensitive to error propagation since it can correct up to one error in hard decoding and three errors in soft decoding. Hence, precoding is required  
 SuggestedRemedy  
 Add precoding, and use the same definition of precoding similar to 176.9.1.2.  
 Proposed Response Response Status O

Cl 177 SC 177.4.7.2 P256 L13 # 582  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Pre-coding was shown on riani\_3dj\_01a\_2303 FECI baseline that when was adopted, and pre-coding is essential for FECi PMDs  
 SuggestedRemedy  
 Please insert text for pre-coder in this sub-clause. as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error. See Ghiasi/Riani May-24 presentation on the need for pre-coder  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 177 SC 177.5 P256 L24 # 85  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 According to figure 177-2, the first process the receiver performs is PAM4 decoding (or soft-decision decoding).  
 SuggestedRemedy  
 Add a subclause for the decoding process.  
 Proposed Response Response Status O

Cl 177 SC 177.5.1 P256 L25 # 86  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 This subclause is confusing and seems to be prescribing a specific implementation. The goal of the process is to find codeword boundaries and remove the pad. If we simply reverse the processes of the tx, this process would (in a logical sense) be performed on the interleaved stream, and would search for the (interleaved) FS pattern  
 SuggestedRemedy  
 Rewrite the text to describe searching for the FS pattern and finding it at the expected interval  
 Proposed Response Response Status O

Cl 177 SC 177.5.1 P256 L50 # 490  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 Monitor and drop says you monitor on all flows. But Figure 177-7 is a per flow state diagram. So is each Flow checking for 140 bad out of 150? And 150 is not a multiple of 8 for it to span across all flows evenly.  
 SuggestedRemedy  
 Change:  
 "keeps monitoring 150 consecutive codewords on all flows, if at least 140 codewords are invalid, drop sync and restart from step a). "  
 To:  
 "each flow counts the number of invalid codewords seen in consecutive non-overlapping 150 codeword windows, if at least 140 codewords are invalid, drop sync and restart from step a). "  
 Proposed Response Response Status O

Cl 177 SC 177.5.1 P257 L1 # 609  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 A figure illustrating the possible one bit-pair of skew and the relationship to the Inner FEC flows would be very helpful here. I only understand because I recall the Task Force presentations!  
 SuggestedRemedy  
 Consider adding a figure illustrating how the position of the 1 bit-pair of skew determines the Inner FEC flow number.  
 Proposed Response Response Status O

Cl 177 SC 177.5.3 P257 L29 # 183  
 Brown, Matt Alphawave Semi  
 Comment Type T Comment Status X  
 177.5.3 lists a few counter to be supported by the inner FEC. The definition for some of these could be improved. Further, additional counters should be included provides bins of error counts to help estimate quality of the link.  
 SuggestedRemedy  
 A contribution with more details will be provided.  
 Proposed Response Response Status O

Cl 177 SC 177.5.3.1 P257 L45 # 493  
 Slavick, Jeff Broadcom  
 Comment Type T Comment Status X  
 Defining how a miscorrected codeword can occur could be phrased more clearly.  
 SuggestedRemedy  
 Change:  
 "Note that for soft-decision decoded Inner FEC codewords, when there is more than one bit error in a codeword, there is always a non-zero chance that miscorrection could happen."  
 To:  
 "Note that when there is more than one bit error in a codeword there is a chance that the soft decision decoder could miscorrect the codeword."  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 177 SC 177.6 P262 L5 # 505

Ren, Hao Huawei  
 Comment Type **TR** Comment Status **X**

In Figure 177-8, the input variable of state FS\_LOCK\_INIT is not correct. It would cause a FS lock error.

*SuggestedRemedy*

FS\_LOCK\_INIT state should be entered after all the 8 flows obtain their inner FEC codeword boundaries and inner FEC flow 0 is identified, when fs\_lock is false.

Propose change:

Change the input variable from '!all\_synced' to 'all\_synced \* !fs\_lock'.

Change the definition of all\_synced from

'A Boolean variable that is set to true when sync\_flow<x> is true for all eight flows and is set to false when sync\_flow<x> is false for any x.'

to

'A Boolean variable that is set to true when inner FEC flow 0 is identified and is set to false when sync\_flow<x> is false for any x.'

(in page 258 line 48-50)

Proposed Response Response Status **O**

Cl 177 SC 177.6.2.1 P258 L52 # 492

Slavick, Jeff Broadcom  
 Comment Type **T** Comment Status **X**

Countes automagically have a \_done variable created for them, so no need to define fc\_cnt\_done

*SuggestedRemedy*

Remove fc\_cnt\_done definition

Proposed Response Response Status **O**

Cl 177 SC 177.6.2.3 P260 L3 # 176

Ramesh, Sridhar Maxlinear Inc  
 Comment Type **TR** Comment Status **X**

Counters defined here do not seem consistent with those defined in Table 177-4.

*SuggestedRemedy*

Please make definitions of counters consistent with status variables shown on Table 177-4, page 263

Proposed Response Response Status **O**

Cl 177 SC 177.6.2.3 P260 L3 # 175

Ramesh, Sridhar Maxlinear Inc  
 Comment Type **TR** Comment Status **X**

Add a counter for uncorrectable codewords (detected with additional one bit parity)

*SuggestedRemedy*

uncorr\_cw\_cnt  
 Countes the number of inner FEC codewords considered uncorrectable by inner FEC decoder

Proposed Response Response Status **O**

Cl 177 SC 177.6.3 P262 L8 # 491

Slavick, Jeff Broadcom  
 Comment Type **E** Comment Status **X**

In Figure 177-8 the wrong character is showing up for the <= symbol

*SuggestedRemedy*

Fix <= symbol in Figure 177-8

Proposed Response Response Status **O**

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 177 SC 177.10 P264 L28 # 182

Brown, Matt Alphawave Semi

Comment Type T Comment Status X

In order for the Inner FEC in combination with the SM-PMA above to interoperate with the already specified 200GBASE-R, 400GBASE-R, and 800GBASE-R PCS, the total skew introduced by the Inner FEC plus the SM-PMA above should be no higher than the the BM-PMA defined for each rate. Furthermore, the skew should exclude the systematic skew that is added then removed by the 8:1 and 16:2 SM-PMA for 200G/400G.

SuggestedRemedy

Specify the maximum skew for the combination of Inner FEC sublayer and the SM-PMA sublayer above it, excluding the systematic skew added then removed by the SM-PMA. A number needs to be determined.

Proposed Response Response Status O

Cl 177A SC 177A P643 L5 # 306

Maki, Jeffery Juniper Networks

Comment Type T Comment Status X

Annex title unnecessarily uses the acronym IMDD. Not clear what purpose is achieved that cannot be achieved simply by omitting the use of the acronym IMDD.

SuggestedRemedy

Delete the acronym IMDD.

Proposed Response Response Status O

Cl 178 SC 178 P270 L17 # 23

Liu, Cathy Broadcom

Comment Type E Comment Status X

Table 178-4 "120F-1.6TGAUI-16 C2C"

SuggestedRemedy

change to "120F-1.6TAUI-16 C2C"

Proposed Response Response Status O

Cl 178 SC 178.1 P268 L45 # 364

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The Annex 176A control function is required and should be included in Table 178-1 (as is done in Table 179-1).

SuggestedRemedy

Add "176A - Control" as "Required" in Tables 178-1, 178-2, 178-3, and 178-4.

Proposed Response Response Status O

Cl 178 SC 178.8.9 P275 L33 # 363

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The reference to 179.8.9 seems inappropriate here since that subclause contains cross-references specific to the Clause 179.

SuggestedRemedy

Replicate the content of 179.8.9 here, replacing references to Clause 179 electrical requirements to the corresponding references in Clause 178.

Proposed Response Response Status O

Cl 178 SC 178.9.1 P275 L39 # 395

Kocsis, Sam Amphenol

Comment Type T Comment Status X

The reference impedance should match the system impedance, Rd as defined in COM spreadsheets.

SuggestedRemedy

92-ohm, TBD, or straw poll based on proposed values presented in Task Force contributions

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.9.2 P275 L48 # 230  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 3dB BW is TBD  
 SuggestedRemedy  
 Change it to 65 GHz.  
 Rational, considering the common and cost effective 1.85mm connector BW, and associated ~7% measurement error, give rise to this number.  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P275 L48 # 60  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 The Bessel-Thomson filter should track fr. Between 0.5 fb and 0.6 fb have been shown in presentations.  
 SuggestedRemedy  
 change TBD to 67GHz  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P275 L49 # 399  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Transmitter measurement bandwidth is TBD  
 SuggestedRemedy  
 Replace TBD with 62 GHz  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P276 L18 # 452  
 Simms, William NVIDIA  
 Comment Type T Comment Status X  
 SCMR may need to be relaxed for 200Gb/s. Measure of 15dB full band at TP0v given full band Vcm noise of 80mVpp at TP2.  
 SuggestedRemedy  
 Likely need to tighten 80mV Vcm in table 179-7 for 200Gb/s  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P276 L19 # 231  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 dERL (min) is TBD  
 SuggestedRemedy  
 Change it to -3 dB. See lim\_3dj\_01\_2403a.  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P276 L20 # 232  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 RLcc (min) is TBD  
 SuggestedRemedy  
 Change it to 3.25 dB. See lim\_3dj\_01\_2403a.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.9.2 P276 L28 # 233  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 "absolute value of step size for all taps (max)" ingreated from 802.3ck, value not suitable for 802.3dj at 200G/L, and no simod supports"  
 SuggestedRemedy  
 Change it 0.02, see See lim\_3dj\_01\_2405  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P276 L31 # 288  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 "value at min state for c(-1) (max) " from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"  
 SuggestedRemedy  
 change it to -0.4, see lim\_3dj\_01\_2405  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P276 L29 # 234  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 "value at minimum state for c(-3) (max) " from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"  
 SuggestedRemedy  
 C(-3) is not needed, delete it, see lim\_3dj\_01\_2405  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P276 L34 # 27  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 adjust SNDR with loss correction factor which is about 1 dB basd on prior assumptions  
 SuggestedRemedy  
 change SNDR to 33,5 dB.  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P276 L30 # 235  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 "value at max state for c(-2) (min) " from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"  
 SuggestedRemedy  
 change it to 0.16, see lim\_3dj\_01\_2405  
 Proposed Response Response Status O

Cl 178 SC 178.9.2 P276 L38 # 236  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Output jitter (max) TBD  
 SuggestedRemedy  
 reapcle TBDs with:  
 Jrms : 0.023 UI  
 J2.7u03: 0.102 UI  
 J2.7u: 0.110 UI  
 Even--odd jitter, pk-pk: 0.025 UI  
 See lim\_3dj\_01\_2403a, lim\_3dj\_01\_2405, and [1], [2], [3]  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.9.2.1.2 P277 L37 # 28  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 scale ERL parameter form 0.3ck  
 SuggestedRemedy  
 in table 178-7 change TBD's as follows  
 Tr 0.005 ns  
 βx 0 GHz  
 ρx 0.618  
 N 400 UI  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.2 P278 L26 # 29  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 scale ERL parameter form 0.3ck  
 SuggestedRemedy  
 in table 163-7 change TBD's as follows  
 Tr 0.005 ns  
 βx 0 GHz  
 ρx 0.618  
 N 400 UI  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.2 P278 L26 # 237  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Tr is TBD  
 SuggestedRemedy  
 repalce it with 0.005 ns, see lim\_3dj\_01\_2403a  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.2 P278 L27 # 238  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Betax is TBD  
 SuggestedRemedy  
 repalce it with 0 GHz, see lim\_3dj\_01\_2403a  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.2 P278 L29 # 239  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Rox is TBD  
 SuggestedRemedy  
 repalce it with 0.618, see lim\_3dj\_01\_2403a  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.2 P278 L31 # 240  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 N is TBD  
 SuggestedRemedy  
 repalce it with 400, see lim\_3dj\_01\_2403a  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.2 P278 L32 # 241  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Nbx is TBD  
 SuggestedRemedy  
 repalce it with 44, see lim\_3dj\_01\_2403a, lim\_3dj\_01\_2405  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.9.2.3 P278 L46 # 242  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 mac freq is TBD  
 SuggestedRemedy  
 repalce it with 80 GHz, see lim\_3dj\_01\_2403a  
 Proposed Response Response Status O

Cl 178 SC 178.9.3 P280 L9 # 244  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 dERL is TBD  
 SuggestedRemedy  
 repalce it with -3dB, see lim\_3dj\_01\_2403a  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.4 P278 L4 # 243  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Nv is TBD  
 SuggestedRemedy  
 repalce it with 400, seelim\_3dj\_01\_2403a  
 Proposed Response Response Status O

Cl 178 SC 178.9.3.3 P280 L40 # 245  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 3dB BW is TBD  
 SuggestedRemedy  
 Change it to 65 GHz.  
 Rational, considering the common and cost effective 1.85mm connector BW, and associated ~7% measurement error, give rise to this number  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.4 P279 L4 # 30  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 The baud rate has doubled from .3ck,. If loading is scaled down with the baud rate, the physical setting time would remain unchanged. Adjust Nv and Dp accordingly.  
 SuggestedRemedy  
 Change Nv=TBD to Nv=400  
 Proposed Response Response Status O

Cl 178 SC 178.9.3.3 P281 L41 # 32  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 The Bessel-Thomson filter should track fr which betwee 0.5 and 0.6 has been shown in presenations.  
 SuggestedRemedy  
 change TBD to 67GHz  
 Proposed Response Response Status O

Cl 178 SC 178.9.2.6 P279 L22 # 31  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 adjust SCMR with loss correction factor  
 SuggestedRemedy  
 add + loss correction factor to equation 178-1  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.9.3.3 P282 L12 # 246  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 FEC symbol error ratio is not aligned with DER value  
 SuggestedRemedy  
 change it to 2e-3  
 Proposed Response Response Status O

Cl 178 SC 178.9.3.3 P282 L16 # 249  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 COM for test1 and test2 are TBDs  
 SuggestedRemedy  
 Repalced both with 3 dB, see lim\_3dj\_01\_2405  
 Proposed Response Response Status O

Cl 178 SC 178.9.3.3 P282 L13 # 247  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 IL for Class A PKG are TBDs  
 SuggestedRemedy  
 For Test1, reaplce them with IL(min): 13.5dB, lImax: 14.5 dB; for Test2, reaplce them with  
 IL(min): 27.5dB, lImax: 28.5; see li\_3dj\_01\_2311, lusted\_3dj\_02\_2311.pdf  
 Proposed Response Response Status O

Cl 178 SC 178.9.3.3 P282 L16 # 400  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 COM values in Table 178–10 are TBD  
 SuggestedRemedy  
 Replace TBD with 3 dB  
 Proposed Response Response Status O

Cl 178 SC 178.9.3.3 P282 L15 # 248  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 IL for Class B PKG are TBDs  
 SuggestedRemedy  
 For Test1, reaplce them with IL(min): 10.5dB, lImax: 11.5 dB; for Test2, reaplce them with  
 IL(min): 21.5dB, lImax: 22.5; see li\_3dj\_01\_2311, lusted\_3dj\_02\_2311.pdf  
 Proposed Response Response Status O

Cl 178 SC 178.9.3.4 P282 L45 # 401  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 "The test channel COM, calculated per items 3) through 7) in 93C.2, is at least 3 dB"  
 The reference to the test channel COM is wrong.  
 SuggestedRemedy  
 Change it to "The test channel COM, calculated peritem e) through h) in 178.9.3.3, is at  
 least 3 dB" to be correct  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10 P284 L11 # 250  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 COM(min) is TBD  
 SuggestedRemedy  
 Repalced both with 3 dB, see lim\_3dj\_01\_2405  
 Proposed Response Response Status O

Cl 178 SC 178.10 P284 L11 # 402  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Minimum COM in Table 178-11 is TBD  
 SuggestedRemedy  
 Replace TBD with 3 dB in Table 178-11 and in line 28 of page 284  
 Proposed Response Response Status O

Cl 178 SC 178.10 P284 L11 # 33  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 Use 3 dB as minimum COM as in .3ck or  
 SuggestedRemedy  
 change TBD to 3 (same in 178.10.1 line 28)  
 Proposed Response Response Status O

Cl 178 SC 178.10 P284 L12 # 251  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 IL(max) is TBD  
 SuggestedRemedy  
 Repalced the TBD with:  
 28 dB, Class A PKG pairs with Class A PKG  
 25 dB, Class A PKG pairs with Class B PKG  
 22 dB, Class B PKG pairs with Class B PKG  
 Proposed Response Response Status O

Cl 178 SC 178.10 P284 L12 # 34  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 reference is wrong and lidd should reflect tp0d to tp05d.  
 SuggestedRemedy  
 change reference to 178.10.2  
 and TBD to 40 dB  
 or eliminate the reference to lidd  
 Proposed Response Response Status O

Cl 178 SC 178.10 P284 L14 # 252  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Channel ERL TBD  
 SuggestedRemedy  
 Repalced it with 11 dB, see oif2023.531.00  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P284 L27 # 359

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The reader may be tempted to interpret the parameters in Tables 178-12 and 178-13 as implementation requirements. E.g., "Receiver discrete-time equalizer parameters" may mistakenly be interpreted as requirements for receiver implementations. It would be worthwhile to add text here clarifying that the parameters represent a minimum level performance and that there is expected to be a variety of approaches to implementation that achieve this performance.

SuggestedRemedy

Add text stating the parameter values in the tables are chosen to represent the minimum required transmitter and receiver performance and they do not represent required implementation details. Compliant implementations are only required to meet or exceed this minimum level of performance. Similarly in 179.11.7 and 176.D.4.1.

Proposed Response Response Status O

Cl 178 SC 178.10.1 P284 L28 # 253

Li, Mike Intel

Comment Type TR Comment Status X

COM TBD

SuggestedRemedy

Repalced it with 3 dB, see lim\_3dj\_01\_2405

Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L18 # 118

Sakai, Toshiaki Socionext

Comment Type T Comment Status X

COM reference package parameter vlaue. (transmission line parameter tau)  
In "Table 178-12" class A package model Transmission line parameter  $\tau$ (tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, Ilim\_3dj\_01a\_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

SuggestedRemedy

Change  $\tau$ (tau) value in Table 178-12 (class A package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.

Or simply delete this row, as the  $\tau$ (tau) value in table 93A-3 is 6.141e-3 ns/mm.

Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L19 # 356

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

In Table 178-12, the transmission line parameter "tau" is set to 6.141e-4. In the adopted baseline proposal li\_3dj\_01a\_2311 (slides 8 and 9), the value is specified to be 6.141e-3.

SuggestedRemedy

Replace the "tau" values in the Table 178-12 with the adopted value 6.141e-3 (2 instances). Similarly in Table 179-15 and Table 176D-6.

Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L28 # 119

Sakai, Toshiaki Socionext

Comment Type T Comment Status X

COM reference package parameter vlaue.  
"Table 178-12" class B package model Transmission line parameter  $\tau$ (tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, Ilim\_3dj\_01a\_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

SuggestedRemedy

Change  $\tau$ (tau) value in Table 178-12 (class B package)from 6.141e-4 ns/mm to 6.141e-3 ns/mm.

Or simply delete this row, as the  $\tau$ (tau) value in table 93A-3 is 6.141e-3 ns/mm.

Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L31 # 357

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

In Table 178-12, the transmission line parameters for the "Class B package model" do not match the adopted baseline proposal li\_3dj\_01a\_2311 slide 9.

SuggestedRemedy

Replace the characteristic impedance for stage 1 with 92 Ohms, and the length/characteristic impedances for stage 2 through 4 with 70 Ohms/1 mm, 80 Ohm/1 mm, and 100 Ohm/0.5 mm respectively. Similarly in Table 179-15 and Table 176D-6.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P285 L38 # 403  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Single-ended reference resistance R0 value in Table 178-13 is TBD  
 SuggestedRemedy  
 Replace TBD with 50 Ohm  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L40 # 255  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 RD(T) TBD  
 SuggestedRemedy  
 Repalced it w 46.25 ohm, see see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L38 # 254  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Ro TBD  
 SuggestedRemedy  
 Repalced it w 50 ohm, see see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L40 # 396  
 Kocsis, Sam Amphenol  
 Comment Type T Comment Status X  
 Rd(t) = "TBD"  
 SuggestedRemedy  
 Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better align with Zc definition in package  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L38 # 35  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 (Table 178-12): Computation can be independent of R0. Add a note to explain. S parameter can utilize any R0. For computation purposes s-parameters are converted to 50 ohms which is the native impedance for the most common test equipment.  
 SuggestedRemedy  
 Change R0 for TBD to 50 ohms and add a note indicating the imported s-parameter are to be converted into 50 ohm reference before computation.  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P285 L41 # 256  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 RD(R) TBD  
 SuggestedRemedy  
 Repalced it w 46.25 ohm, see see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P285 L41 # 397  
 Kocsis, Sam Amphenol  
 Comment Type T Comment Status X  
 RD(r) = "TBD"  
 SuggestedRemedy  
 Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better align with Zc definition in package  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L12 # 404  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Receiver 3 dB bandwidth fr value in Table 178-13 is TBD  
 SuggestedRemedy  
 Replace TBD with 0.58\*fb  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L11 # 360  
 Healey, Adam Broadcom Inc.  
 Comment Type T Comment Status X  
 Parameters "f\_min", "delta\_f", and "M" are defined in Table 178-13 but are not used in Annex 178A. Any guidance on appropriate choices for measurement start frequency, frequency step, and simulation time step may be provided in a general way in Annex 178A (see, for example, 178A.1.3). The values for these parameters rarely, if ever, change and it seems unnecessary to add a rows for them to an already lengthy table.  
 SuggestedRemedy  
 Remove these parameters from Table 178-13. Also remove these parameters from Tables 179-16 and Table 176D-7.  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L12 # 71  
 Lusted, Kent Intel Corporation  
 Comment Type TR Comment Status X  
 The COM parameter values for the 200GBASE-KR1, 400GBASE-KR2, 800GBASE-KR4 and 1.6TBASE-KR8 PMDs are TBDs  
 SuggestedRemedy  
 In table 178-13, use the COM parameter values from [https://www.ieee802.org/3/dj/public/24\\_01/healey\\_3dj\\_01\\_2401.pdf](https://www.ieee802.org/3/dj/public/24_01/healey_3dj_01_2401.pdf) slide 18, which are:  
 f\_r = 0.58  
 c(-3) = 0  
 c(-2) = 0  
 c(-1) = 0  
 c(0) = 1  
 c(1) = 0  
 A\_v = 0.413  
 A\_fe = 0.413  
 A\_ne = 0.45  
 eta\_0 = 6e-9  
 SNR\_TX = 33  
 sigma\_RJ = 0.01  
 A\_DD = 0.02  
 R\_LM = 0.95  
 d\_w = 5  
 Nfix = 10  
 N\_g = 0  
 N\_f = 0  
 N\_max = 0  
 b\_max(1) = 0.85  
 b\_min(1) = 0  
 additionally, set MLSE = 0 (not enabled)  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L12 # 257  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 fr TBD  
 SuggestedRemedy  
 Repalced it w 0.5, see see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P286 L12 # 36  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 T(able 178–13) Presentations so far have used fr of 0.5, 0.55, 0.58, and 0.6. 67 Ghz limits on test equipment and cabling/connector modal physics suggest at least a 9 dB loss is required for good measurements at 67 GHz. Set fr to 0.6 or lower to achieve this.  
 SuggestedRemedy  
 change TBD to 0.6.  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L13 # 405  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 The max/min values and step size of transmitter equalizer in Table 178-13 need to match those in the Table 178–6 and thost in sub-clauses 179.9.4.1.4 & 179.9.4.1.5  
 SuggestedRemedy  
 On line 14 replace TBD with -0.06:0.02:0  
 On line 18 replace TBD with 0:0.02:0.12  
 On line 22 replace TBD with -0.34:0.02:0  
 On line 26 replace TBD with 0.5  
 On line 28 replace TBD with -0.2:0.02:0  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L14 # 258  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 C(-3) not needed  
 SuggestedRemedy  
 Delete it, see see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L18 # 37  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 Presentations so far have not shown the need for Tx FFE. Change to no TXFFE until further data is provided.  
 Rx noise may suggest a need for the TXFFE which would improve performance. It's not clear from a channel perspective that the TX FFE is not a zero sum gain compared to the Rx noise loss of COM. Until Rx FFE noise is better defined zero out TxFFE.  
 SuggestedRemedy  
 Change TBDs for c(-3),c(-2),c(-1), and c(1) to zero. Set C(0) tp 1.  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L18 # 259  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 C(-2) TBD  
 SuggestedRemedy  
 Replace it w  
 0:0.16:0.02(min,max, step),  
 see see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L22 # 260  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 C(-1) TBD  
 SuggestedRemedy  
 Replace it w  
 -0.4:0.02 (min,max, step),  
 see see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P286 L26 # 261  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 C(0) TBD  
 SuggestedRemedy  
 Replace it w 0.54,  
 see see lim\_3dj\_01\_2405, slide 5.  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L32 # 263  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 g1 inherited from 802.3ck, no simod support, not appropraite  
 SuggestedRemedy  
 Replace them w  
 -15 :0, 1 (min, max, step)  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L26 # 262  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 C(1) TBD  
 SuggestedRemedy  
 Replace it w  
 -0.2.0.0.02 (min,max, step),  
 see see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L40 # 265  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 fz1,fz2 from 802.3ck, no simod support, not appropraite  
 SuggestedRemedy  
 Replace them w  
 fb/4.223, fb/80 (fz1,fz2)  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L32 # 264  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 g2 inherited from 802.3ck, no simod support, not appropraite  
 SuggestedRemedy  
 Replace them w  
 -5 :0, 1 (min, max, step)  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L42 # 266  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 f1,fp2, fp3 from 802.3ck, no simod support, not appropraite  
 SuggestedRemedy  
 Replace them w  
 fb/1.8973, fb/2.6562, fb/80 (fp1,fp2, fp3)  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P286 L46 # 267  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Av, Afe, Ane TBDs  
 SuggestedRemedy  
 Replace them w  
 0.413, 0.413, 0.608 V (Av, Afe, Ane)  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L46 # 406  
 Li, Tobey MediaTek  
 Comment Type T Comment Status X  
 Transmitter differential peak output voltage in Table 178-13 is TBD  
 SuggestedRemedy  
 Replace Av with 0.413 V  
 Replace Afe with 0.413 V  
 Replace Ane with 0.608 V  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L46 # 38  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 It not clear the power sources have significantly changed from 0.3ck and to avoid the  
 complication of small voltage requirement from packages use the 0.3ck voltages.  
 SuggestedRemedy  
 set Av and Afe to 0.413 and Ane to 0.608  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L50 # 407  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Transmitter transition time Tr value in Table 178-13 is TBD  
 SuggestedRemedy  
 Replace TBD with Tr = 4 ps  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L50 # 268  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Tr TBD  
 SuggestedRemedy  
 Replace it w 0.004 ns  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P286 L53 # 269  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 eta0  
 SuggestedRemedy  
 Replace it w 5e-9 V^2/GHz  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P286 L53 # 408  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 One sided noise spectral density in Table 178-13 is TBD  
 SuggestedRemedy  
 Replace TBD with 6e-9 V<sup>2</sup>/GHz  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L8 # 272  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 ADD TBD  
 SuggestedRemedy  
 Replace it w 0.02 UI,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L5 # 270  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 SNRTX TBD  
 SuggestedRemedy  
 Replace it w 33 dB  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L9 # 273  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 RLM TBD  
 SuggestedRemedy  
 Replace it w 0.95,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L7 # 271  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 sigmaRJ TBD  
 SuggestedRemedy  
 Replace it w 0.01 UI,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L10 # 409  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Level separation mismatch ratio RLM in Table 178-13 is TBD  
 SuggestedRemedy  
 Replace TBD with 0.95  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P287 L13 # 275  
 Li, Mike Intel  
 Comment Type **TR** Comment Status **X**  
 Nfix TBD  
 SuggestedRemedy  
 Replace it w 24,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status **O**

Cl 178 SC 178.10.1 P287 L16 # 277  
 Li, Mike Intel  
 Comment Type **TR** Comment Status **X**  
 Nf TBD  
 SuggestedRemedy  
 Replace it w 5,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status **O**

Cl 178 SC 178.10.1 P287 L13 # 274  
 Li, Mike Intel  
 Comment Type **TR** Comment Status **X**  
 dw TBD  
 SuggestedRemedy  
 Replace it w 6,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status **O**

Cl 178 SC 178.10.1 P287 L17 # 278  
 Li, Mike Intel  
 Comment Type **TR** Comment Status **X**  
 Namx TBD  
 SuggestedRemedy  
 Replace it w 60,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status **O**

Cl 178 SC 178.10.1 P287 L15 # 276  
 Li, Mike Intel  
 Comment Type **TR** Comment Status **X**  
 Ng TBD  
 SuggestedRemedy  
 Replace it w 4,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status **O**

Cl 178 SC 178.10.1 P287 L18 # 279  
 Li, Mike Intel  
 Comment Type **TR** Comment Status **X**  
 Wamx(j) TBD  
 SuggestedRemedy  
 Replace it w 0.7,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status **O**

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.1 P287 L19 # 280  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 Wmin(j) TBD  
 SuggestedRemedy  
 Replace it w -0.7,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L22 # 283  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 no foaltoing tap coefficient max limit  
 SuggestedRemedy  
 Added a new line for floating tap coefficeint max limit and set it to 0.05  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L20 # 281  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 bmaxTBD  
 SuggestedRemedy  
 Replace it w 0.85,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L23 # 284  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 no foaltoing tap coefficient min limit  
 SuggestedRemedy  
 Added a new line for floating tap coefficeint min limit and set it to -0.05  
 see lim\_3dj\_01\_2405, slide  
 Proposed Response Response Status O

Cl 178 SC 178.10.1 P287 L21 # 282  
 Li, Mike Intel  
 Comment Type TR Comment Status X  
 bminTBD  
 SuggestedRemedy  
 Replace it w 0.3,  
 see lim\_3dj\_01\_2405, slide 5  
 Proposed Response Response Status O

Cl 178 SC 178.10.2 P287 L # 42  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 Selecting values the "Receiver discrete-time equalizer parameters" are critical for making progress. Many presentations a have shown quite a variation. Select values based on what seems consistent or use straw ballot to determine.  
 SuggestedRemedy  
 use straw polls from the following  
 Dw 4, 6, or 8  
 Nfix 10, 15, 24  
 Ng 1, 2, 3  
 Nf 3, 4, 5  
 Nmax 40 60 120  
 Wmax(j)=1  
 Wmin(-1,0,1)=0. otherwise -0.5  
 bmax(1) = 0,5 0.75 0 85  
 bmin(1)= 0 -0,5 -0.75 -0 85  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.10.2 P287 L5 # 41  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 SNR\_TX can be SNDR when loss correction is employed  
 SuggestedRemedy  
 Change TBD to 33.5 dB  
 Proposed Response Response Status O

Cl 178 SC 178.10.2 P287 L37 # 40  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 Define the channel insertion loss to include the package i.e TP0d to TP5d.  
 SuggestedRemedy  
 change TBD to 40 dB  
 Proposed Response Response Status O

Cl 178 SC 178.10.3 P288 L29 # 43  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 scale ERL parameter form 0.3ck  
 SuggestedRemedy  
 in table 178-14 change TBD's as follows  
 Tr 0.005 ns  
 $\beta \times 0$  GHz  
 $\rho \times 0.618$   
 N 7000 UI  
 Proposed Response Response Status O

Cl 178A SC 178A.1.5 P650 L7 # 228  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 The port labels on Figure 178A-6 are inconsistent with the cascade order implied in 178A-12 and with the text on line 1.  
 SuggestedRemedy  
 In Fig 178A-6 replace "Port 2" with "Port 1" and replace "Port 1" with "Port 2"  
 Alternatively, replace Figure 178A-6 with a copy of Figure 178A-2 and reverse the arrow directions and swap Port 1 with Port 2.  
 Proposed Response Response Status O

Cl 178A SC 178A.1.8 P654 L42 # 209  
 Shakiba, Hossein Huawei Technologies Canada  
 Comment Type T Comment Status X  
 Reference to the wrong section 178A.1.6.4  
 SuggestedRemedy  
 Change reference to section 178A.1.8.1  
 Proposed Response Response Status O

Cl 178A SC 178A.1.9 P657 L51 # 210  
 Shakiba, Hossein Huawei Technologies Canada  
 Comment Type T Comment Status X  
 $h_{ISI}$  in equation (178A-29) should not include the main cursor ( $h_{ISI}(\text{main}) = 0$ )  
 SuggestedRemedy  
 Add a case to define  $h_{ISI}(n) = 0$  for  $n = d+1$   
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178A SC 178A.1.10 P658 L43 # 362

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The relationship between "detector error ratio", "PAM-L symbol error ratio", and "bit error ratio" is not documented and, as a result, not generally understood. While these quantities are related, they are not interchangeable. Prior assumptions that they are interchangeable has led to errors in the translation between COM results and expected (measured) receiver performance. This new annex gives us an opportunity to clarify the relationship between DER0 and other terms or to replace DER0 with a more generally understood term.

SuggestedRemedy

Slide 5 of <https://www.ieee802.org/3/dj/public/23\_11/healey\_3dj\_01a\_2311.pdf> suggest expressions for relationship between detector error ratio and other terms. Either replace "DER0" with a target PAM-4 symbol error ratio (or bit error ratio) and adjust the equations for calculating COM accordingly, or document the relationship between DER0 and the other two terms.

Proposed Response Response Status O

Cl 178A SC 178A.1.10.2 P659 L12 # 285

Li, Mike Intel

Comment Type TR Comment Status X

DER0 EQ is wrong

SuggestedRemedy

change  $P(y_0) = \text{DER0}$  to  $1 - P(y_0) = \text{DER0}$ , see slide 3 of lim\_3dj\_02\_2405, see also a marked version in the support data sheet.

Proposed Response Response Status O

Cl 178A SC 178A.1.11 P660 L27 # 286

Li, Mike Intel

Comment Type TR Comment Status X

EQ (178A-36)

SuggestedRemedy

Update the equation per slide 4 of lim\_3dj\_02\_2405, see also a marked version in the support data sheet.

Proposed Response Response Status O

Cl 178A SC 178A.1.11 P660 L33 # 287

Li, Mike Intel

Comment Type TR Comment Status X

EQ (178A-37)

SuggestedRemedy

Update the equation per slide 4 of lim\_3dj\_02\_2405, see also a marked version in the support data sheet.

Proposed Response Response Status O

Cl 178A SC 178A.1.11.1 P660 L27 # 211

Shakiba, Hossein Huawei Technologies Canada

Comment Type T Comment Status X

The factor 2/3 in equation (178A-36) is specific to PAM4. This change does not apply if the equation is rewritten.  
See contributions lim\_3dj\_02\_2405.pdf and shakiba\_3dj\_01\_2405.pdf.

SuggestedRemedy

Change 2/3 to  $L/2(L-1)$  to make it general. Note that  $L=4$  still yields 2/3. Please refer to contribution tbd.

Proposed Response Response Status O

Cl 178A SC 178A.1.11.1 P660 L33 # 212

Shakiba, Hossein Huawei Technologies Canada

Comment Type T Comment Status X

The factor 3/4 in equation (178A-37), as is or rewritten, is specific to PAM4.  
See contributions lim\_3dj\_02\_2405.pdf and shakiba\_3dj\_01\_2405.pdf.

SuggestedRemedy

Change 3/4 to  $(L-1)/L$  to make it general. Note that  $L=4$  still yields 3/4. Please refer to contribution tbd.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178A SC 178A.1.11.1 P660 L52 # 213  
 Shakiba, Hossein Huawei Technologies Canada  
 Comment Type T Comment Status X  
 Although clear, the result of the PDF convolution conv[p(y),p(y/b1)] is a PDF and assumed to have been normalized to satisfy the PDF sum requirement.  
 SuggestedRemedy  
 Either mention that after convolution, the result should be normalized, or add a normalization coefficient of 1/b1 in font of conv.  
 Proposed Response Response Status O

Cl 178A SC 178A.1.11.1 P661 L1 # 214  
 Shakiba, Hossein Huawei Technologies Canada  
 Comment Type T Comment Status X  
 Although clear, the result of the PDF convolution of equation (178A-39) is a PDF and assumed to have been normalized to satisfy the PDF sum requirement.  
 SuggestedRemedy  
 Either mention that after convolution, the result should be normalized, or add a normalization coefficient of 1/(1-b1) in font of conv.  
 Proposed Response Response Status O

Cl 179 SC 179.9.3 P309 L14 # 387  
 Kocsis, Sam Amphenol  
 Comment Type T Comment Status X  
 The reference impedance should match the system impedance, Rd as defined in COM spreadsheets.  
 SuggestedRemedy  
 92-ohm, TBD, or straw poll based on proposed values presented in Task Force contributions  
 Proposed Response Response Status O

Cl 179 SC 179.9.4 P309 L23 # 388  
 Kocsis, Sam Amphenol  
 Comment Type T Comment Status X  
 BT LP 3dB BW of "40GHz"  
 SuggestedRemedy  
 "TBD" as cited in other places of the document  
 Proposed Response Response Status O

Cl 179 SC 179.9.4 P309 L23 # 410  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 "4th order Bessel-Thomson filter with 3 dB bandwidth of 40 GHz" is inconsistent with Clause 178.9.2, Annex 176D.3.3, and Annex 176E.3.3  
 SuggestedRemedy  
 Change "40 GHz" to either "TBD" or "62 GHz"  
 Proposed Response Response Status O

Cl 179 SC 179.9.4 P309 L23 # 124  
 Sakai, Toshiaki Socionext  
 Comment Type T Comment Status X  
 Ttransmitter signal measurement filter bandwidth description.  
 "Unless specified otherwise, transmitter signal measurements are made for each lane separately using a fourth-order Bessel-Thomson low-pass response with 3 dB bandwidth of 40 GHz, with AC-coupled connection from TP2 to the test equipment."  
 The 4th-BW filter BW should be "TBD GHz", the same as for CL178.9.2, AN176D.3.3 and AN176E.3.3, as the Nyquist frequency of the signal is 53.125GHz and 40GHz is too low..  
 SuggestedRemedy  
 Change 40GHz to TBD GHz.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.9.4 P309 L23 # 225  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Adopted baseline [https://www.ieee802.org/3/dj/public/24\\_01/ran\\_3dj\\_01a\\_2401.pdf](https://www.ieee802.org/3/dj/public/24_01/ran_3dj_01a_2401.pdf) has BT filter bandwidth as TBD but D1.0 has 40GHz. 3dB bandwidth of 40GHz is insufficient for 200Gbps/lane PAM4  
 SuggestedRemedy  
 Increase to 65GHz, consistent with test equipment capabilities and demonstrated channel rolloff eg in [https://www.ieee802.org/3/dj/public/23\\_11/weaver\\_3dj\\_01\\_2311.pdf](https://www.ieee802.org/3/dj/public/23_11/weaver_3dj_01_2311.pdf) and [https://www.ieee802.org/3/dj/public/24\\_01/benartsi\\_3dj\\_01\\_2401.pdf](https://www.ieee802.org/3/dj/public/24_01/benartsi_3dj_01_2401.pdf) OR change to TBD  
 Proposed Response Response Status

Cl 179 SC 179.9.4 P310 L27 # 513  
 Dawe, Piers Nvidia  
 Comment Type TR Comment Status X  
 Our way of measuring jitter doesn't work well enough with the increased max host loss over 3ck. It is not clear that it can or should be fixed. Our way of defining SNDR doesn't work correctly over host loss either. This can be fixed, but "vertical and horizontal noise" act together to degrade BER: more of one goes with less of the other.  
 SuggestedRemedy  
 Delete the SNDR and jitter specs. Add a VEC-like, TDECQ-like spec using this clause's COM reference receiver which can be implemented in a scope. Similarly for KR and C2C.  
 Proposed Response Response Status

Cl 179 SC 179.9.4 P309 L44 # 511  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 AC common-mode voltages are not as large as this in practice, even at 200G/lane  
 SuggestedRemedy  
 Reduce both AC common-mode voltage limits for CR, KR, C2C and C2M.  
 Proposed Response Response Status

Cl 179 SC 179.9.4.1.1 P312 L2 # 44  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 The baud rate has doubled from .3ck,. If loading is scaled down with the baud rate, the physical setting time would remain unchanged. Adjust Np and Dp accordingly.  
 SuggestedRemedy  
 Change Np from 200 to 400. change Dp from 4 to 8.  
 Proposed Response Response Status

Cl 179 SC 179.9.4 P309 L46 # 512  
 Dawe, Piers Nvidia  
 Comment Type TR Comment Status X  
 Supply voltages and voltage swing trend downwards over the years. This 1200 mV max has not changed since 10GBASE-KR, a long time ago. C2M has 750 mV.  
 SuggestedRemedy  
 Reduce 1200 mV to e.g. 1000 mV, here, in the receiver Table 179-10 and in the text in 179.9.5.2. Reduce the steady-state voltage vf max from 0.6 V to 0.5 V. Similarly for KR and C2C.  
 Proposed Response Response Status

Cl 179 SC 179.9.4.1.1 P312 L42 # 45  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 SNDR reduces with loss and used that way for equation 178A-18.  
 SuggestedRemedy  
 Insert a subsection e) Loss correction factor for fitted pulse measurements. See presentation  
 Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.9.4.1.2 P312 L53 # 46  
 Mellitz, Richard Samtec  
 Comment Type T Comment Status X  
 scale Nv from .3ck  
 SuggestedRemedy  
 change Nv to 400  
 Proposed Response Response Status O

Cl 179 SC 179.9.4.3 P314 L39 # 226  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Nb of 6 should be increased since hosts shouldn't be penalized for having reflections within capability of receiver to compensate; hosts in this generation should have equalization capability well beyond 6 UI.  
 SuggestedRemedy  
 increase Nb to 20 (or TBD based on ref receiver capabilities)  
 Proposed Response Response Status O

Cl 179 SC 179.9.4.6 P315 L15 # 514  
 Dawe, Piers Nvidia  
 Comment Type TR Comment Status X  
 As explained in other comments, up to 3ck the SNDR spec acted together with the jitter spec to protect the link performance - but we don't have a satisfactory way of measuring jitter at today's speeds and losses, and separating the two things out "leaves margin on the table".  
 SuggestedRemedy  
 Delete the SNDR section. Add a VEC-like, TDECQ-like spec using this clause's COM reference receiver which can be implemented in a scope. Similarly for KR and C2C.  
 Proposed Response Response Status O

Cl 179 SC 179.9.4.6 P315 L17 # 47  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 SNDR reduces with loss and used that way for equation 178A-18.  
 SuggestedRemedy  
 change  
 The transmitter SNDR is defined by the measurement method described in 120D.3.1.6 to  
 The transmitter SNDR is defined by the measurement method described in 120D.3.1.6 plus a power loss factor defined in xxx  
 Proposed Response Response Status O

Cl 179 SC 179.9.4.7 P310 L25 # 204  
 Ran, Adeo Cisco  
 Comment Type TR Comment Status X  
 Jitter specification is TBD.  
 Based on  
[https://www.ieee802.org/3/dj/public/adhoc/electrical/24\\_0104/calvin\\_3dj\\_elec\\_01a\\_240104.pdf](https://www.ieee802.org/3/dj/public/adhoc/electrical/24_0104/calvin_3dj_elec_01a_240104.pdf), the jitter measurement methodology of existing clauses 162, 163, and 120G (specifically using the two edges R03/F30) is feasible for measurements with a loss 30 dB. It is expected that the same method can be used for higher losses as long as the scope can maintain CDR lock.  
 This methodology should be used for all electrical interfaces, with adequate adjustments.  
 SuggestedRemedy  
 A detailed proposal will be provided.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.9.4.7 P315 L24 # 515  
 Dawe, Piers Nvidia  
 Comment Type TR Comment Status X  
 Measuring jitter separately to other impairments relies on a better slew rate to noise ratio than we have at the observation point, and better than what is needed to make good links.  
 SuggestedRemedy  
 Delete the jitter section. Add a VEC-like, TDECQ-like spec using this clause's COM reference receiver which can be implemented in a scope. Similarly for KR and C2C.  
 Proposed Response Response Status O

Cl 179 SC 179.9.5.3 P319 L22 # 49  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 The COM values need to be set to make progress. Until a more comprehensive proposal is presented use what is in 0.3ck and many other prior standards  
 SuggestedRemedy  
 set COM to 3 dB  
 Proposed Response Response Status O

Cl 179 SC 179.9.4.8 P315 L35 # 227  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns  
 SuggestedRemedy  
 Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"  
 Proposed Response Response Status O

Cl 179 SC 179.9.5.3 P319 L22 # 411  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 COM values in Table 179-11 are TBD  
 SuggestedRemedy  
 Replace TBD with 3 dB  
 Proposed Response Response Status O

Cl 179 SC 179.9.4.8 P315 L41 # 48  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 scale ERL parameter form 0.3ck  
 SuggestedRemedy  
 in table 163-7 change TBD's as follows  
 Tr 0.005 ns  
 βx 0 GHz  
 px 0.618  
 N 1600 UI  
 Proposed Response Response Status O

Cl 179 SC 179.9.5.3.3 P320 L18 # 412  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 4th order Bessel-Thomson filter BW is TBD  
 SuggestedRemedy  
 Replace TBD with 62 GHz  
 Proposed Response Response Status O

Cl 179 SC 179.9.5.4.2 P323 L38 # 177  
 Ramesh, Sridhar Maxlinear Inc  
 Comment Type TR Comment Status X  
 Table 179-12: Jitter mask extended below 40Khz and above 40MHz for completeness  
 SuggestedRemedy  
 Case A - please amend to <= 0.04, Case F, please amend to >= 40  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.9.5.5 P324 L5 # 219  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns  
 SuggestedRemedy  
 Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"  
 Proposed Response Response Status O

Cl 179 SC 179.10.1 P286 L50 # 39  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 scale Tr from .3ck. Understand that this is not the Tr at TP0d.  
 SuggestedRemedy  
 set Tr to 0.00375 ns  
 Proposed Response Response Status O

Cl 179 SC 179.11 P326 L21 # 413  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Minimum COM is TBD  
 SuggestedRemedy  
 Replace TBD with 3 dB in Table 179–13 and in line 41 of page 330  
 Proposed Response Response Status O

Cl 179 SC 179.11 P326 L21 # 50  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 The COM values need to be set to make progress. Until a more comprehensive proposal is presented use what is in 0.3ck and many other prior standards  
 SuggestedRemedy  
 set COM to 3 dB  
 Proposed Response Response Status O

Cl 179 SC 179.11.1 P326 L27 # 216  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 There is no test method or definition for the nominal characteristic impedance of the cable assembly. The components (eg paddle card, twinax) within a cable assembly may have different nominal characteristic impedances. There is no need to specify the nominal characteristic impedance of the cable assembly, since the performance of the cable assembly is determined by cl 179.11.2-7.  
 SuggestedRemedy  
 Remove "The nominal characteristic impedance of the cable assembly is 100 ohms"  
 Proposed Response Response Status O

Cl 179 SC 179.11.1 P326 L27 # 389  
 Kocsis, Sam Amphenol  
 Comment Type T Comment Status X  
 Nominal characteristic impedance of the cable assembly is "100-ohm"  
 SuggestedRemedy  
 Contributions to the task force have demonstrated the nominal characteristic impedance of the cable assembly is ~92-ohm  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.11.1 P326 L27 # 516  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 "Nominal impedance" is something for a datasheet not a spec. If someone wants to build a cable assembly with 95 ohm bulk cable and it passes the spec - that's OK.  
 SuggestedRemedy  
 Delete "The nominal differential characteristic impedance of the cable assembly is 100 [ohm]". Move the one remaining sentence into 179.11.  
 Proposed Response Response Status O

Cl 179 SC 179.11.2 P326 L42 # 217  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 The maximum frequency of 40GHz is insufficient for 200Gbps/lane PAM4  
 SuggestedRemedy  
 Increase to 65GHz, consistent with test equipment capabilities and demonstrated channel rolloff eg in [https://www.ieee802.org/3/dj/public/23\\_11/weaver\\_3dj\\_01\\_2311.pdf](https://www.ieee802.org/3/dj/public/23_11/weaver_3dj_01_2311.pdf) and [https://www.ieee802.org/3/dj/public/24\\_01/benartsi\\_3dj\\_01\\_2401.pdf](https://www.ieee802.org/3/dj/public/24_01/benartsi_3dj_01_2401.pdf) OR change to TBD  
 Proposed Response Response Status O

Cl 179 SC 179.11.3 P327 L31 # 218  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns  
 SuggestedRemedy  
 Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host-facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"  
 Proposed Response Response Status O

Cl 179 SC 179.11.3 P327 L34 # 390  
 Kocsis, Sam Amphenol  
 Comment Type T Comment Status X  
 ERL requirement for cable assemble sthat have COM less than "4dB"  
 SuggestedRemedy  
 Change "4dB" to "TBD". Historical precedent may not be relevant for this specification  
 Proposed Response Response Status O

Cl 179 SC 179.11.3 P327 L41 # 51  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 The data rate was doubled and cable length was scale by a factor of 2 from .3ck. Adjust ERL parameters accordingly  
 SuggestedRemedy  
 in table 179-14 change TBD's as follows  
 Tr 0.005 ns  
 Bx 0 GHz  
 px 0.618  
 N 4500 UI  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P331 L18 # 120  
 Sakai, Toshiaki Socionext  
 Comment Type T Comment Status X  
 COM reference package parameter vlaue. (transmission line parameter tau)  
 In "Table 179-15" class A package model Transmission line parameter  $\tau(\text{tau})$  value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, (Ilim\_3dj\_01a\_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.  
 SuggestedRemedy  
 Change  $\tau(\text{tau})$  value in Table 179-15 (class A package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.  
 Or simply delete this row, as the  $\tau(\text{tau})$  value in table 93A-3 is 6.141e-3 ns/mm.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.11.7 P331 L28 # 121  
 Sakai, Toshiaki Socionext  
 Comment Type T Comment Status X  
 COM reference package parameter vlaue. (transmission line parameter tau)  
 In "Table 179–15" class B package model Transmission line parameter  $\tau$ (tau) value is  
 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, (Ilim\_3dj\_01a\_2311.pdf  
 (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.  
 SuggestedRemedy  
 Change  $\tau$ (tau) value in Table 179-15 (class B package) from 6.141e-4 ns/mm to 6.141e-3  
 ns/mm.  
 Or simply delete this row, as the  $\tau$ (tau) value in table 93A-3 is 6.141e-3 ns/mm.  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P331 L42 # 414  
 Li, Tobey MediaTek  
 Comment Type T Comment Status X  
 Single-ended reference resistance R0 value in Table 179–15 is TBD  
 SuggestedRemedy  
 Replace TBD with 50 Ohm  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P331 L43 # 52  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 (Table 179–15): Computation can be independent of R0. Add a note to explain. S  
 parameter can utilize any R0. For computation purposes s-parameters are converted to 50  
 ohms which is the native impedance for the most common test equipment.  
 SuggestedRemedy  
 Change R0 for TBD to 50 ohms and add a note indicating the imported s-parameter are to  
 be converted into 50 ohm reference before computation.  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P331 L44 # 391  
 Kocsis, Sam Amphenol  
 Comment Type T Comment Status X  
 Rd(t) = "TBD"  
 SuggestedRemedy  
 Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better  
 align with Zc definition in package  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P331 L45 # 392  
 Kocsis, Sam Amphenol  
 Comment Type T Comment Status X  
 RD(r) = "TBD"  
 SuggestedRemedy  
 Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better  
 align with Zc definition in package  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P332 L12 # 415  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Receiver 3 dB bandwidth fr value in Table 179–16 is TBD  
 SuggestedRemedy  
 Replace TBD with 0.58\*fb  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.11.7 P332 L12 # 70

Lusted, Kent Intel Corporation

Comment Type TR Comment Status X

The COM parameter values for the 200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4 and 1.6TBASE-CR8 PMDs are TBDs

SuggestedRemedy

In table 179-16, Use the COM parameter values from [https://www.ieee802.org/3/dj/public/24\\_01/healey\\_3dj\\_01\\_2401.pdf](https://www.ieee802.org/3/dj/public/24_01/healey_3dj_01_2401.pdf) slide 18, which are:

- f\_r = 0.58
- c(-3) = 0
- c(-2) = 0
- c(-1) = 0
- c(0) = 1
- c(1) = 0
- A\_v = 0.413
- A\_fe = 0.413
- A\_ne = 0.45
- eta\_0 = 6e-9
- SNR\_TX = 33
- sigma\_RJ = 0.01
- A\_DD = 0.02
- R\_LM = 0.95
- d\_w = 5
- Nfix = 10
- N\_g = 0
- N\_f = 0
- N\_max = 0
- b\_max(1) = 0.85
- b\_min(1) = 0

additionally, set MLSE = 0 (not enabled)

Proposed Response Response Status

Cl 179 SC 179.11.7 P332 L12 # 53

Mellitz, Richard Samtec

Comment Type TR Comment Status X

T(able 179–16) Presentations so far have used fr of 0.5, 0.55, 0.58, and 0.6. 67 Ghz limits on test equipment and cabling/connector modal physics suggest at least a 9 dB loss is required for good measurements at 67 GHz. Set fr to 0.6 or lower to achieve this.

SuggestedRemedy

change TBD to 0.6.

Proposed Response Response Status

Cl 179 SC 179.11.7 P332 L13 # 416

Li, Tobey MediaTek

Comment Type TR Comment Status X

The max/min values and step size of transmitter equalizer in Table 179-16 need to match those in the Table 179–7 and thost in sub-clauses 179.9.4.1.4 & 179.9.4.1.5

SuggestedRemedy

- On line 14 replace TBD with -0.06:0.02:0
- On line 18 replace TBD with 0:0.02:0.12
- On line 22 replace TBD with -0.34:0.02:0
- On line 26 replace TBD with 0.5
- On line 28 replace TBD with -0.2:0.02:0

Proposed Response Response Status

Cl 179 SC 179.11.7 P332 L46 # 417

Li, Tobey MediaTek

Comment Type T Comment Status X

Transmitter differential peak output voltage in Table 179–16 is TBD

SuggestedRemedy

- Replace Av with 0.413 V
- Replace Afe with 0.413 V
- Replace Ane with 0.608 V

Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.11.7 P332 L50 # 418  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Transmitter transition time Tr value in Table 179–16 is TBD  
 SuggestedRemedy  
 Replace TBD with Tr = 4 ps  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P332 L53 # 419  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 One sided noise spectral density in Table 179–16 is TBD  
 SuggestedRemedy  
 Replace TBD with  $6e-9 \sqrt{2}/\text{GHz}$   
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P333 L8 # 420  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Level separation mismatch ratio RLM in Table 179–16 is TBD  
 SuggestedRemedy  
 Replace TBD with 0.95  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P333 L9 # 421  
 Li, Tobey MediaTek  
 Comment Type TR Comment Status X  
 Number of samples per unit interval in Table 179–16 is TBD  
 SuggestedRemedy  
 Replace TBD with 32  
 Proposed Response Response Status O

Cl 179 SC 179.11.7 P333 L11 # 54  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 (table 179-16) Selecting values the "Receiver discrete-time equalizer parameters" are critical for making progress. Many presentations have shown quite a variation. Select values based on what seems consistent or use straw ballot to determine.  
 SuggestedRemedy  
 use straw polls from the following  
 Dw 4, 6, or 8  
 Nfix 10, 15, 24  
 Ng 1, 2, 3  
 Nf 3, 4, 5  
 Nmax 40 60 120  
 Wmax(j)=1  
 Wmin(-1,0,1)=0. otherwise -0.5  
 bmax(1) = 0,5 0.75 0 85  
 bmin(1)= 0 -0,5 -0.75 -0 85  
 Proposed Response Response Status O

Cl 179A SC 179A P664 L # 24  
 Liu, Cathy Broadcom  
 Comment Type E Comment Status X  
 Figure 179A-1 and figure 179A-2 are not showing completely in my PDF file  
 SuggestedRemedy  
 Proposed Response Response Status O

Cl 179A SC 179A.2 P662 L6710 # 56  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 Reference to a diagram with TP0d and TP5d is required  
 SuggestedRemedy  
 Add TP0d and TP5d to figure 93B-1 and table 93B-1  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179A SC 179A.4 P663 L44 # 585  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Host designated losses of 6.5, 11.5, and 16.5 are for TP0d to TP2  
 SuggestedRemedy  
 Move the losses to the TP0d to TP2 column  
 Min host loss is the MCB loss of 2.8 dB  
 Max loss is dependent on actual package loss and should be removed  
 Proposed Response Response Status O

Cl 179A SC 179A.5 P667 L32 # 586  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 MCB via allowance and HCB are TBD  
 SuggestedRemedy  
 See Ghiasi C2M May-24 presentation  
 MCB via = 0.8 dB  
 HCB=3.8 dB to allow practical implementations  
 Proposed Response Response Status O

Cl 179A SC 179A.4 P663 L50 # 524  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 Defining a "host channel" that includes most of the host but leaves out the connector, is not helpful. The connector is part of the host and its loss is significant.  
 SuggestedRemedy  
 Define the recommended channel either from pad TP0d to the outside of the connector, or more usefully, from TP0d to TP2 (the loss from outside of the connector to TP2 is the HCB loss which will be well defined)  
 Proposed Response Response Status O

Cl 179A SC 179A.7 P668 L9 # 393  
 Kocsis, Sam Amphenol  
 Comment Type E Comment Status X  
 "TP0 and TP5"  
 SuggestedRemedy  
 Change to "TP0d and TP5d"  
 Proposed Response Response Status O

Cl 179A SC 179A.5 P665 L24 # 229  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Doubling ILdd\_(host+TFmax) implies both ends of the link have the same host designations.  
 SuggestedRemedy  
 Replace "2\*ILdd\_(host+TFmax)" with "ILdd\_(host+tFmax)\_end1 + ILdd\_(host+tFmax)\_end2" or similar notation to accommodate asymmetric Link Configurations in Table 179A-3.  
 Proposed Response Response Status O

Cl 179A SC 179A.7 P668 L9 # 215  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 TP0 and TP5 are not the appropriate test points for Annex 179A COM  
 SuggestedRemedy  
 Change text to ".. between TP0d and TP5d"  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179A SC 179A.7 P668 L12 # 57  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 The COM values need to be set to make progress. Until a more comprehensive proposal is presented use what is in 0.3ck and many other prior standards  
 SuggestedRemedy  
 set COM to 3 dB  
 Proposed Response Response Status O

Cl 179B SC 179B.1 P669 L17 # 223  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Missing reference to Module compliance at TP1 and TP4  
 SuggestedRemedy  
 Add "Module measurements for Modules specified in Annex 176E are made at TP1 and TP4 with test fixtures as specified in 179B.3. "  
 Proposed Response Response Status O

Cl 179B SC 179B P670 L # 25  
 Liu, Cathy Broadcom  
 Comment Type E Comment Status X  
 Figure 179B-1 figure is not showing completely in my PDF file  
 SuggestedRemedy  
 Proposed Response Response Status O

Cl 179B SC 179B.4.2 P673 L13 # 58  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 scale ERL parameter form 0.3ck  
 SuggestedRemedy  
 in table 178-14 change TBD's as follows  
 Tr 0.005 ns  
 βx 0 GHz  
 px 0.618  
 N 1600 UI  
 Tfx 0  
 tw 1  
 DER0 2e-5  
 Proposed Response Response Status O

Cl 179B SC 179B P672 L # 26  
 Liu, Cathy Broadcom  
 Comment Type E Comment Status X  
 Figure 179B-2 figure is not showing completely in my PDF file  
 SuggestedRemedy  
 Proposed Response Response Status O

Cl 179B SC 179B.4.6 P676 L26 # 224  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 SFPxxx is unclear  
 SuggestedRemedy  
 Replace "The SFPxxx mated test fixture" with "The single-lane mated test fixture"  
 Proposed Response Response Status O

Cl 179B SC 179B.1 P669 L15 # 222  
 Noujeim, Leesa Google  
 Comment Type T Comment Status X  
 Incorrect Annex reference 120G  
 SuggestedRemedy  
 Replace 120G with 176E  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179B SC 179B.4.26 P676 L41 # 59  
 Mellitz, Richard Samtec  
 Comment Type TR Comment Status X  
 At least the symbol rate is known  
 SuggestedRemedy  
 set fb to 106.25 GBd  
 Proposed Response Response Status O

Cl 179C SC 179C.2.3 P688 L35 # 527  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 This says "the mechanical interface". The mechanical spec is SFF-TA-1027, QSFP2. It is a standard, not an MSA.  
 SuggestedRemedy  
 Change " the TBD MSA" to "SFF-TA-1027".  
 Proposed Response Response Status O

Cl 179C SC 179C.1 P680 L15 # 525  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 MDIs are mechanical entities. For 106.25 GBd operation, there are SFP2 (SFF-TA-1031) and QSFP2 (SFF-TA-1027). Any "SFP224" would be an SFP2 module or cable end with 200G-capable circuitry. But this annex is for the MDI, not the circuitry. Similarly for "QSFP224" and QSFP2.  
 SuggestedRemedy  
 Correct the names. Add references to SFF-TA-1011 which relates the names and specs for the SNIA-SFF modules, and SFF-8665, which defines the components of a QSFPx "solution".  
 Proposed Response Response Status O

Cl 179C SC 179C.2.4 P689 L35 # 528  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 There is no QSFP-DD1600 TBD MSA document. QSFP-DD1600 is defined in the singular QSFP-DD MSA document  
 SuggestedRemedy  
 Change "the QSFP-DD1600 TBD MSA" to "the QSFP-DD/QSFP-DD800/QSFP-DD1600 Hardware Specification".  
 Proposed Response Response Status O

Cl 179C SC 179C.1 P680 L17 # 526  
 Dawe, Piers Nvidia  
 Comment Type TR Comment Status X  
 Refer to the specification for each connector type where each is first mentioned. See another comment against 1.3 for the reference docs.  
 SuggestedRemedy  
 Per comment  
 Proposed Response Response Status O

Cl 179C SC 179C.2.5 P690 L21 # 529  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 There is no OSFP1600 TBD MSA document. OSFP1600 is defined in the singular OSFP MSA document, particularly section 4.  
 SuggestedRemedy  
 Change "the OSFP1600 TBD MSA" to "the OSFP Octal Small Form Factor Pluggable Module specification" or "section 4 of the OSFP Octal Small Form Factor Pluggable Module specification".  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179C SC Table 179C-4 P682 L38 # 394  
 Kocsis, Sam Amphenol  
 Comment Type E Comment Status X  
 "QSFP-DD800"  
 SuggestedRemedy  
 Change to "QSFP-DD1600"  
 Proposed Response Response Status O

Cl 180 SC 180.4 P349 L10 # 146  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Prior to 180.4 add section for PMA function to support precoder to mitigate burst errors  
 SuggestedRemedy  
 The transmitter need to supports  $1/(1+D)$  mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable  $1/(1+D)$  mod 4 precoding to mitigate burst error.  
 Proposed Response Response Status O

Cl 180 SC 180.4.1 P350 L13 # 160  
 Yu, Rang-chen InnoLight  
 Comment Type ER Comment Status X  
 A typo of 'L3' in figure 180-2, right side, 3rd channel output label.  
 SuggestedRemedy  
 It should be 'L2'.  
 Proposed Response Response Status O

Cl 180 SC 180.6.1 P353 L33 # 326  
 Welch, Brian Cisco  
 Comment Type TR Comment Status X  
 In later 100GPL specs (ie, 100GBASE-FR1) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.5 dB as it was not updated to reflect the changes to effective TDECQ(min).  
 SuggestedRemedy  
 Propose changing "Average launch power, each lane (min)" in Table 180-7 from -2.8 dBm to -3.3 dBm.  
 Proposed Response Response Status O

Cl 180 SC 180.6.2 P354 L35 # 517  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 In 802.3db we acknowledged that single-lane PMDs are often packaged in multilane modules, and subject to much the same crosstalk as multilane PMDs.  
 SuggestedRemedy  
 Delete footnote e, "No aggressors needed for 200GBASE-DR1." In 180.8.13 Stressed receiver sensitivity, add "For a receiver in a multilane device, the OMA outer of the aggressor lanes is specified in Table 180-8."  
 Proposed Response Response Status O

Cl 180 SC 180.6.3 P356 L47 # 127  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 The power budget does not explicitly say what the penalty allocation is for MPI and DGD. It's implied by the difference between Allocation for penalties (for max TDECQ) and TDECQ(max). This makes it hard for average readers to understand the power budget.  
 SuggestedRemedy  
 Add toTable 180-9, footnote (b), "This value includes an allocation of 0.1 dB for MPI and DGD penalties."  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 180 SC 180.6.3 P356 L47 # 170  
 Yu, Rang-chen Innolight  
 Comment Type T Comment Status X  
 Footnote b did not clarify what's the compisiton of total 3.5dB allocation for penalties.  
 SuggestedRemedy  
 Recommend to add "Allocations to penalties for DRx series including penalties due to dipersion 3.4dB, DGD and MPI 0.1dB" to footnote b.  
 Proposed Response Response Status O

Cl 180 SC 180.7.3.1.2 P260 L27 # 591  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 To support breakout, loopback, and OAN/OLT connectro should be labled  
 SuggestedRemedy  
 DR2-4 connector should be labled as Tx1Tx2Tx3Tx4 ----- Rx4Rx3Rx2Rx1  
 Proposed Response Response Status O

Cl 180 SC 180.7.1 P358 L28 # 335  
 Ferretti, Vince Corning  
 Comment Type TR Comment Status X  
 ITU-T G.652.B cabled fiber attenuation is only specified for 1310 nm and 1550 nm wavelengths. It is not specified for wavelengths between 1260 nm and 1310 nm and not meant to be used in xWDM applications  
 SuggestedRemedy  
 Remove ITU-T G.652.B (dispersion unshifted) as a fiber option.  
 Proposed Response Response Status O

Cl 180 SC 180.7.3.1.3 P361 L46 # 592  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 To support breakout, loopback, and OAN/OLT connectro should be labled  
 SuggestedRemedy  
 DR2-8 connector should be labled as Tx1Tx2Tx3Tx4Tx5Tx6Tx7Tx8  
 Rx8Rx7Rx6Rx5Rx4Rx3Rx2Rx1  
 Proposed Response Response Status O

Cl 180 SC 180.7.3.1.1 P360 L11 # 590  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 To support breakout, loopback, and OAN/OLT connectro should be labled  
 SuggestedRemedy  
 DR2-2 connector should be labled as Tx1Tx2 ----- Rx2Rx1  
 Proposed Response Response Status O

Cl 180 SC 180.7.3.2 P361 L9 # 338  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-1-1 has been superseded by IEC 61753-1.  
 SuggestedRemedy  
 Change "IEC 61753-1-1" to "IEC 61753-1"  
 Proposed Response Response Status O

Cl 180 SC 180.7.3.2 P361 L9 # 339  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 180 SC 180.7.3.3 P361 L42 # 340  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

Cl 180 SC 180.7.3.4 P361 L50 # 341  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

Cl 180 SC 180.8.5 P364 L23 # 1  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 121.8.5.2 Table 121-11 specifies ORL of 21.4dB be applied for TX testing. For 200GBASE-DR1, this needs to be 15.1dB.  
 SuggestedRemedy  
 Add a new exception to the list in 180.8.5:  
 "- The optical return loss is as given in Table 180-6."  
 Proposed Response Response Status O

Cl 180 SC 180.8.5 P364 L23 # 17  
 LeCheminant, Greg Keysight Technologies  
 Comment Type T Comment Status X  
 The current method for optimizing the tap weighs of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: "The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration". Note that the MMSE optimization method is used in almost all TDECQ measurements performed today

SuggestedRemedy  
 Add the following text at line 36 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration

Proposed Response Response Status O

Cl 180 SC 180.8.5 P364 L39 # 324  
 Welch, Brian Cisco  
 Comment Type TR Comment Status X  
 Current baseline proposal is lacking tap weight restrictions, which were indicated as TBD when adopted.  
 SuggestedRemedy  
 Propose adopting the TDECQ tap weight restrictions as presented in welch\_3dj\_01\_0524.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 180 SC 180.8.11 P365 L51 # 518

Dawe, Piers Nvidia  
 Comment Type T Comment Status X

"The upper -3 dB limit of the measurement apparatus is to be approximately equal to the signaling rate": I believe this dates back at least to the first Fibre Channel, ~1 Gb/s, long before adaptive equalisers that optimise the receiver bandwidth. We have a RIN spec to help the accuracy of the TDECQ spec, which is the actual assessment of signal quality. Gigabit Ethernet now uses 937.5 MHz, 75% of the signalling rate. Measuring a peaky noise spectrum in too much bandwidth gives a flattering average, which is not what we want.

*SuggestedRemedy*

Change the bandwidth for RIN measurement to be the same as the TDECQ receiver's BT4 filter (50% of signalling rate ~ 53.1 GHz) or 75%, or something in between.

Proposed Response Response Status O

Cl 180 SC 180.8.11 P365 L52 # 13

LeCheminant, Greg Keysight Technologies  
 Comment Type T Comment Status X

The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52)

*SuggestedRemedy*

The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method

Proposed Response Response Status O

Cl 180 SC 180.8.13 P366 L25 # 519

Dawe, Piers Nvidia  
 Comment Type T Comment Status X

More exceptions - I found these in 167.8.14

*SuggestedRemedy*

The applied sinusoidal jitter is specified in 180.8.13.1. The values of overshoot/undershoot and transmitter power excursion of the stressed receiver conformance signal are within the limits specified in Table 180-7. For a receiver in a multilane device, the OMA outer of the aggressor lanes is specified in Table 180-8.

Add a sinusoidal jitter section following 167.8.14.1 (but see next comment).

Proposed Response Response Status O

Cl 180 SC 180.8.13 P366 L26 # 520

Dawe, Piers Nvidia  
 Comment Type T Comment Status X

If the rising LF jitter slope for 113.4375 GBd is based on 4 MHz, 0.05 UI pk-pk, the LF jitter slope for 106.25 GBd must match in absolute time units (not UI) so that there is not an unbounded buffering requirement (or one jitter slope can be modified in shape).

*SuggestedRemedy*

In the FECi clauses, instead of 2e5/f, 0.05 UI, use 2.13e5/f, 0.053 UI. Or, here and in the other non-FECi PMD and PMA clauses, use 1.875e5/f, 0.047 UI.

Proposed Response Response Status O

Cl 180 SC 180.9.1 P366 L31 # 342

Lambert, Angie Corning  
 Comment Type T Comment Status X

IEC 60950-1 has been superseded by IEC 62368-1.

*SuggestedRemedy*

Change "IEC 60950-1" to "IEC 62368-1".

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 180 SC 180.10 P368 L11 # 521  
 Dawe, Piers Nvidia  
 Comment Type T Comment Status X  
 Bit number should match number of lanes  
 SuggestedRemedy  
 Change 1.9.4 to 1.9.n. Below, change 1.10.4 to 1.10.n. Similarly in other clauses.  
 Proposed Response Response Status O

Cl 181 SC 181.1 P372 L16 # 4  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 The PHY bracket in Figure 181-1 is shown encompassing the MDI layer, which isn't consistent with previous PMDs.  
 SuggestedRemedy  
 Shorten the PHY bracket to exclude the MDI layer.  
 Proposed Response Response Status O

Cl 181 SC 181.4 P373 L33 # 145  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Prior to 181.4 add section for PMA function to support precoder to mitigate burst errors  
 SuggestedRemedy  
 The transmitter need to supports  $1/(1+D)$  mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable  $1/(1+D)$  mod 4 precoding to mitigate burst error.  
 Proposed Response Response Status O

Cl 181 SC 181.6.1 P378 L13 # 6  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 Total average launch power (max) in Table 181-5 is TBD for 800GBASE-FR4-500.  
 SuggestedRemedy  
 Replace TBD with a value equal to the Average launch power, each lane (max) + 6 dB, which is  $4.9 + 6 = 10.9$  dB. This methodology is consistent with previous FR4 PMDs (clauses 122, 151).  
 Proposed Response Response Status O

Cl 181 SC 181.6.1 P378 L16 # 327  
 Welch, Brian Cisco  
 Comment Type TR Comment Status X  
 In later 100GPL specs (ie, 400GBASE-FR4) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.6 dB as it was not updated to reflect the changes to effective TDECQ(min).  
 SuggestedRemedy  
 Propose changing "Average launch power, each lane (min)" in Table 181-5 from -1.8 dBm to -2.2 dBm.  
 Proposed Response Response Status O

Cl 181 SC 181.6.1 P378 L16 # 162  
 Yu, Rang-chen InnoLight  
 Comment Type TR Comment Status X  
 recommend relationship between 'Tx\_OMAout (min)' and 'Tx\_Pavg (min)' (in Table 181-5) follow 400G FR4, with  $\Delta=3$ dB, assuming max. OER infinite.  
 SuggestedRemedy  
 With 'OMAout (min)'=0.8dBm, then 'Average launch power, each lane (min)' in Table 181-5 should be changed to -2.2dBm.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 181 SC 181.6.1 P378 L23 # 8  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 Difference in launch power between any two lanes (OMOuter) (max) in Table 181-5 is TBD for 800GBASE-FR4-500.  
 SuggestedRemedy  
 Replace TBD with a value of OMAouter(max) minus OMAouter(min) or 4 dB, whichever is smaller, consistent with other FRn/LRn clauses (122, 151).  
 Proposed Response Response Status O

Cl 181 SC 181.6.2 P380 L18 # 163  
 Yu, Rang-chen InnoLight  
 Comment Type TR Comment Status X  
 The delta between 'Tx\_Pavg(min)' and 'Rx\_Pavg(min)' should equal to 'Channel insertion loss' (3.5dB for FR4-500)  
 SuggestedRemedy  
 Rx\_Pavg (min)' in Table 181-6 should be -2.2dBm-3.5dB=-5.7dBm  
 Proposed Response Response Status O

Cl 181 SC 181.6.2 P380 L21 # 10  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 Difference in receive power between any two lanes (OMOuter) (max) in Table 181-6 is TBD for 800GBASE-FR4-500.  
 SuggestedRemedy  
 Replace TBD with a value of 4.1 dB, consistent with other FR4 PMDs (Cl. 122, 151)  
 Proposed Response Response Status O

Cl 181 SC 181.6.3 P381 L36 # 161  
 Yu, Rang-chen InnoLight  
 Comment Type TR Comment Status X  
 Power budget (for maximum TDECQ)' for 800GBASE-FR4-500 in Table 181-7 could be incorrect. It should be equal to channel IL + allocation for penalties (for maximum TDECQ).  
 SuggestedRemedy  
 Power budget (for maximum TDECQ)' in Table 181-7 should be updated to 7.4 dB  
 Proposed Response Response Status O

Cl 181 SC 181.6.3 P381 L48 # 128  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 The power budget does not explicitly say what the penalty allocation is for MPI and DGD. It's implied by the difference between Allocation for penalties (for max TDECQ) and TDECQ(max). This makes it hard for average readers to understand the power budget.  
 SuggestedRemedy  
 Add toTable 181-7, footnote (d), "This value includes an allocation of 0.5 dB for MPI and DGD penalties."  
 Proposed Response Response Status O

Cl 181 SC 181.6.3 P381 L48 # 169  
 Yu, Rang-chen InnoLight  
 Comment Type T Comment Status X  
 Footnote d did not clarify what's the composition of total 3.9dB allocation for penalties.  
 SuggestedRemedy  
 Recommend to add "Allocations to penalties for 800G-FR4-500 including penalties due to dispersion 3.4dB, DGD and MPI 0.5dB" to footnote d.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 181 SC 181.7 P383 L16 # 173  
 Yu, Rang-chen InnoLight  
 Comment Type T Comment Status X  
 DGDmax (in Table 181-8) probably used DGDmean=0.8ps, it should be 2.24ps refer to 802.3df DR series.  
 SuggestedRemedy  
 Recommend change to 2.24ps  
 Proposed Response Response Status O

Cl 181 SC 181.7.1 P383 L26 # 336  
 Ferretti, Vince Corning  
 Comment Type TR Comment Status X  
 ITU-T G.652.B cabled fiber attenuation is only specified for 1310 nm and 1550 nm wavelengths. It is not specified for wavelengths between 1260 nm and 1310 nm and not meant to be used in xWDM applications  
 SuggestedRemedy  
 Remove ITU-T G.652.B (dispersion unshifted) as a fiber option.  
 Proposed Response Response Status O

Cl 181 SC 181.7.3 P384 L43 # 343  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

Cl 181 SC 181.8.5 P386 L41 # 18  
 LeCheminant, Greg Keysight Technologies  
 Comment Type T Comment Status X  
 The current method for optimizing the tap weights of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: "The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration". Note that the MMSE optimization method is used in almost all TDECQ measurements performed today

SuggestedRemedy  
 Add the following text at line 53 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration  
 Proposed Response Response Status O

Cl 181 SC 181.8.5 P386 L41 # 2  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 The TDECQ methods reference channel requirements in 121.8.5.2 instead of the channel requirements in local clause 181.8.5.1.  
 SuggestedRemedy  
 Replace the reference to 121.8.5.2 with reference to 181.8.5.1.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 181 SC 181.8.5 P387 L3 # 325  
 Welch, Brian Cisco  
 Comment Type TR Comment Status X  
 Current baseline proposal is lacking tap weight restrictions, which were indicated as TBD when adopted.  
 SuggestedRemedy  
 Propose adopting the TDECQ tap weight restrictions as presented in welch\_3dj\_01\_0524.  
 Proposed Response Response Status O

Cl 181 SC 181.8.5.1 P387 L19 # 207  
 Parsons, Earl CommScope  
 Comment Type T Comment Status X  
 The maximum and minimum dispersion values in this table should be replaced by equations similar to ones found in previous clauses (i.e. Table 151-12). This method is sometimes called "CM1".  
 SuggestedRemedy  
 In the minimum column replace "-2.94" with " $0.0115 \times \lambda \times [1 - (1324/\lambda)^4]$ ". In the maximum column replace "1.66" with " $0.0115 \times \lambda \times [1 - (1300/\lambda)^4]$ ". These are the same values as in Table 151-12 with the coefficient divided by 4.  
 Proposed Response Response Status O

Cl 181 SC 181.8.11 P388 L52 # 14  
 LeCheminant, Greg Keysight Technologies  
 Comment Type T Comment Status X  
 The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52)  
 SuggestedRemedy  
 The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method  
 Proposed Response Response Status O

Cl 182 SC 182.1 P392 L44 # 301  
 Maki, Jeffery Juniper Networks  
 Comment Type TR Comment Status X  
 Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.  
 SuggestedRemedy  
 Delete the acronym IMDD.  
 Proposed Response Response Status O

Cl 182 SC 182.1 P393 L29 # 302  
 Maki, Jeffery Juniper Networks  
 Comment Type TR Comment Status X  
 Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.  
 SuggestedRemedy  
 Delete the acronym IMDD.  
 Proposed Response Response Status O

Cl 182 SC 182.1 P394 L23 # 303  
 Maki, Jeffery Juniper Networks  
 Comment Type TR Comment Status X  
 Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.  
 SuggestedRemedy  
 Delete the acronym IMDD.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 182 SC 182.1 P394 L50 # 304  
 Maki, Jeffery Juniper Networks  
 Comment Type TR Comment Status X  
 Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.  
 SuggestedRemedy  
 Delete the acronym IMDD.  
 Proposed Response Response Status O

Cl 182 SC 182.6.1 P401 L21 # 328  
 Welch, Brian Cisco  
 Comment Type TR Comment Status X  
 In later 100GPL specs (ie, 100GBASE-FR1) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.5 dB as it was not updated to reflect the changes to effective TDECQ(min).  
 SuggestedRemedy  
 Propose changing "Average launch power, each lane (min)" in Table 182-7 from -2.1 dBm to -2.6 dBm.  
 Proposed Response Response Status O

Cl 182 SC 182.1 P395 L21 # 5  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 The PHY bracket in Figure 182-1 does not encompass the PMD layer, which isn't consistent with previous PMDs.  
 SuggestedRemedy  
 Lengthen the PHY bracket to include the PMD layer.  
 Proposed Response Response Status O

Cl 182 SC 182.6.3 P404 L3 # 171  
 Yu, Rang-chen InnoLight  
 Comment Type T Comment Status X  
 Although TDECQmax is still TBD. However, the footnote b should also indicate the allocation for penalties, just leave dispersion section as TBD for future update.  
 SuggestedRemedy  
 Recommend to add "Allocations to penalties for DRx-2 series including penalties due to dispersion TBDdB, DGD and MPI 0.4dB" to footnote b.  
 Proposed Response Response Status O

Cl 182 SC 182.4 P397 L20 # 147  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Prior to 182.4 add section for PMA function to support precoder to mitigate burst errors  
 SuggestedRemedy  
 The transmitter need to supports  $1/(1+D) \bmod 4$  precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable  $1/(1+D) \bmod 4$  precoding to mitigate burst error.  
 Proposed Response Response Status O

Cl 182 SC 182.7.1 P405 L31 # 337  
 Ferretti, Vince Corning  
 Comment Type TR Comment Status X  
 ITU-T G.652.B cabled fiber attenuation is only specified for 1310 nm and 1550 nm wavelengths. It is not specified for wavelengths between 1260 nm and 1310 nm and not meant to be used in xWDM applications  
 SuggestedRemedy  
 Remove ITU-T G.652.B (dispersion unshifted) as a fiber option.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 182 SC 182.7.3 P406 L45 # 345  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

Cl 182 SC 182.7.3.1.3 P408 L15 # 589  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 To support breakout, loopback, and OAN/OLT connectro should be labled  
 SuggestedRemedy  
 DR2-8 connector should be labled as Tx1Tx2Tx3Tx4Tx5Tx6Tx7Tx8  
 Rx8Rx7Rx6Rx5Rx4Rx3Rx2Rx1  
 Proposed Response Response Status O

Cl 182 SC 182.7.3 P406 L45 # 344  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-1-1 has been superseded by IEC 61753-1.  
 SuggestedRemedy  
 Change "IEC 61753-1-1" to "IEC 61753-1"  
 Proposed Response Response Status O

Cl 182 SC 182.7.3.2 P408 L22 # 347  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

Cl 182 SC 182.7.3.1.1 P407 L11 # 587  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 To support breakout, loopback, and OAN/OLT connectro should be labled  
 SuggestedRemedy  
 DR2-2 connector should be labled as Tx1Tx2 ----- Rx2Rx1  
 Proposed Response Response Status O

Cl 182 SC 182.7.3.2 P408 L22 # 346  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-1-1 has been superseded by IEC 61753-1.  
 SuggestedRemedy  
 Change "IEC 61753-1-1" to "IEC 61753-1"  
 Proposed Response Response Status O

Cl 182 SC 182.7.3.1.2 P407 L27 # 588  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 To support breakout, loopback, and OAN/OLT connectro should be labled  
 SuggestedRemedy  
 DR2-4 connector should be labled as Tx1Tx2Tx3Tx4 ----- Rx4Rx3Rx2Rx1  
 Proposed Response Response Status O

Cl 182 SC 182.7.3.3 P409 L1 # 348  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 182 SC 182.7.3.4 P409 L8 # 349  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

Cl 182 SC 182.8.5 P411 L30 # 19  
 LeCheminant, Greg Keysight Technologies  
 Comment Type T Comment Status X  
 The current method for optimizing the tap weights of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: "The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration". Note that the MMSE optimization method is used in almost all TDECQ measurements performed today

SuggestedRemedy  
 Add the following text at line 44 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration  
 Proposed Response Response Status O

Cl 182 SC 182.8.5 P411 L30 # 3  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 121.8.5.2 Table 121-11 specifies ORL of 21.4dB be applied for TX testing. For 200GBASE-FR1, this needs to be 17.1dB.  
 SuggestedRemedy  
 Add a new exception to the list in 182.8.5:  
 "- The optical return loss is as given in Table 182-7."  
 Proposed Response Response Status O

Cl 182 SC 182.8.5 P411 L30 # 113  
 Stassar, Peter Huawei Technologies  
 Comment Type T Comment Status X  
 Currently reference is made to compliance channel in 121.8.5.2, which is for 500m instead of 2km  
 SuggestedRemedy  
 Create new subclause 182.8.5.1 and refer to it instead of 121.8.5.2. Create 182.5.2.1 with contents along the lines of 124.8.5.1 from 802.3df with the same compliance channel. Develop with editorial license  
 Proposed Response Response Status O

Cl 182 SC 182.8.11 P413 L10 # 15  
 LeCheminant, Greg Keysight Technologies  
 Comment Type T Comment Status X  
 The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52)  
 SuggestedRemedy  
 The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 182 SC 182.9.1 P413 L43 # 350  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 60950-1 has been superseded by IEC 62368-1.  
 SuggestedRemedy  
 Change "IEC 60950-1" to "IEC 63268-1".  
 Proposed Response Response Status O

Cl 183 SC 183.1 P418 L39 # 305  
 Maki, Jeffery Juniper Networks  
 Comment Type TR Comment Status X  
 Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.  
 SuggestedRemedy  
 Delete the acronym IMDD.  
 Proposed Response Response Status O

Cl 183 SC 183.4 P420 L37 # 148  
 Ghiasi, Ali Ghiasi Quantum/Marvell  
 Comment Type T Comment Status X  
 Prior to 183.4 add section for PMA function to support precoder to mitigate burst errors  
 SuggestedRemedy  
 The transmitter need to supports  $1/(1+D)$  mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable  $1/(1+D)$  mod 4 precoding to mitigate burst error.  
 Proposed Response Response Status O

Cl 183 SC 183.6.1 P425 L16 # 7  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 Total average launch power (max) in Table 183-6 is TBD for 800GBASE-FR4.  
 SuggestedRemedy  
 Replace TBD with a value equal to the Average launch power, each lane (max) + 6 dB, which is  $4.9 + 6 = 10.9$  dB. This methodology is consistent with previous FR4 PMDs (clauses 122, 151) and 800GBASE-LR4 in this Table.  
 Proposed Response Response Status O

Cl 183 SC 183.6.1 P425 L19 # 166  
 Yu, Rang-chen InnoLight  
 Comment Type TR Comment Status X  
 Recommended relationship between 'Tx\_OMAout (min)' and 'Tx\_Pavg (min)' for 800G LR4 (in Table 183-6) should follow 400G LR4-6, with delta equal to 3dB, assuming max . OER infinite.  
 SuggestedRemedy  
 With 'OMAout (min)'=1.9dBm, then 'Average launch power, each lane' for 800G LR4 in Table 183-6 should be changed to -1.1dBm.  
 Proposed Response Response Status O

Cl 183 SC 183.6.1 P425 L19 # 329  
 Welch, Brian Cisco  
 Comment Type TR Comment Status X  
 In later 100GPL specs (ie, 400GBASE-FR4) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.6 dB as it was not updated to reflect the changes to effective TDECQ(min).  
 SuggestedRemedy  
 Propose changing "Average launch power, each lane (min)" in Table 183-6 from -1.8 dBm to -2.2 dBm.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 183 SC 183.6.1 P425 L19 # 164  
 Yu, Rang-chen Innolight  
 Comment Type TR Comment Status X  
 recommend relationship between 'Tx\_OMAout (min)' and 'Tx\_Pavg (min)' (in Table 183-6) follow 400G FR4, with delta=3dB, assuming max. OER infinite.  
 SuggestedRemedy  
 With 'OMAout (min)=0.8dBm, then 'Average launch power, each lane (min) ' in Table 183-6 should be changed to -2.2dBm.  
 Proposed Response Response Status O

Cl 183 SC 183.6.1 P425 L28 # 9  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 Difference in launch power between any two lanes (OMAouter) (max) in Table 183-6 is TBD for 800GBASE-FR4.  
 SuggestedRemedy  
 Replace TBD with a value of OMAouter(max) minus OMAouter(min) or 4 dB, whicher is smaller, consistent with other FRn/LRn clauses (122, 151).  
 Proposed Response Response Status O

Cl 183 SC 183.6.1 P425 L24 # 12  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 The TX must be compliant over the full range of fiber length (dispersion), so the use of TDECQ alone is insufficient to determine Outer Optical Modulation Amplitude (OMAouter), each lane (min) in Table 183-6 for 800GBASE-FR4/LR4.  
 SuggestedRemedy  
 Replace TDECQ with max(TECQ, TDECQ) for both PMDs, as has been done in all other PMDs in Clauses 180-182. Note that max(TECQ, TDECQ) is already in Equation 183-1. For consistency, replace "Equation 183-1" with "-0.1 + max(TECQ, TDECQ)" in Table 183-6, and delete Equation 183-1 on page 435, line 20. Also update Figures 183-3, 183-5, 183-6 and surrounding text with max(TECQ, TDECQ).  
 Proposed Response Response Status O

Cl 183 SC 183.6.2 P427 L18 # 165  
 Yu, Rang-chen Innolight  
 Comment Type TR Comment Status X  
 The delta between 'Tx\_Pavg(min)' and 'Rx\_Pavg(min)' should equal to 'Channel insertion loss' (4.0dB for FR4)  
 SuggestedRemedy  
 Rx\_Pavg (min)' in Table 183-7 should be -2.2dBm-4.0dB=-6.2dBm  
 Proposed Response Response Status O

Cl 183 SC 183.6.1 P425 L27 # 503  
 Rodes, Roberto Coherent  
 Comment Type T Comment Status X  
 Change spec format consistent with FR4  
 SuggestedRemedy  
 Replace 0.5+TDECQ by 0.5+Max(TECQ,TDECQ)  
 Proposed Response Response Status O

Cl 183 SC 183.6.2 P427 L18 # 167  
 Yu, Rang-chen Innolight  
 Comment Type TR Comment Status X  
 The delta between 'Tx\_Pavg(min)' and 'Rx\_Pavg(min)' for 800G LR4 should equal to 'Channel insertion loss' (6.3dB for LR4)  
 SuggestedRemedy  
 Rx\_Pavg (min)' for 800G LR4 in Table 183-7 should be -1.1dBm-6.3dB=-7.4dBm  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 183 SC 183.6.2 P427 L21 # 11  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 Difference in receive power between any two lanes (OMAouter) (max) in Table 183-7 is TBD for 800GBASE-FR4.  
 SuggestedRemedy  
 Replace TBD with a value of 4.1 dB, consistent with other FR4 PMDs (Cl. 122, 151)  
 Proposed Response Response Status O

Cl 183 SC 183.6.3 P428 L51 # 502  
 Rodes, Roberto Coherent  
 Comment Type T Comment Status X  
 Adding explanation on allocation for penalties calculation.  
 SuggestedRemedy  
 Use same approach than for the inserion loss adding a note in the LR4 value with the text:"Allocation for penalties is calculated using an additional penalty of 0.7dB from DGD, and 0.4dB from MPI"  
 Proposed Response Response Status O

Cl 183 SC 183.6.3 P429 L6 # 168  
 Yu, Rang-chen InnoLight  
 Comment Type T Comment Status X  
 Footnote e did not clarify what's the compisiton of total 5dB allocation for penalties.  
 SuggestedRemedy  
 Recommend to add "Allocations to penalties for 800G-LR4 including penalties due to dipersion 3.9dB, DGD 0.7dB and MPI 0.4dB" to footnote e.  
 Proposed Response Response Status O

Cl 183 SC 183.6.3 P429 L6 # 172  
 Yu, Rang-chen InnoLight  
 Comment Type T Comment Status X  
 Although TDECQmax is still TBD. However, the footnote b should also indicate the allocation for penalties, just leave dispersion section as TBD for future update.  
 SuggestedRemedy  
 Recommend to add "Allocations to penalties for 800G-FR4 including penalties due to dipersion TBDdB, DGD and MPI 0.5dB" to footnote e.  
 Proposed Response Response Status O

Cl 183 SC 183.7 P431 L12 # 208  
 Parsons, Earl CommScope  
 Comment Type T Comment Status X  
 The positive and negative dispersion values in this table should come from a channel model that uses a statistical approach. A contribution on fiber disperison statistics will be submitted.  
 SuggestedRemedy  
 Replace TBDs with values agreed upon by the Task Force.  
 Proposed Response Response Status O

Cl 183 SC 183.7.1 P431 L31 # 125  
 Johnson, John Broadcom  
 Comment Type T Comment Status X  
 Clause 183.7.1 is TBD.  
 SuggestedRemedy  
 Use the same text and table as given in 182.7.1. Since this sub-clause only reiterates fiber cable specs from external standards, not 802.3 specific specs, this should not be controversial.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 183 SC 183.7.2 P431 L41 # 126

Johnson, John Broadcom

Comment Type T Comment Status X

Clause 183.7.2 is TBD.

*SuggestedRemedy*

Use the same text as given in 182.7.2: "An optical fiber connection, as shown in Figure 183-7, consists of a mated pair of optical connectors." Since this is a basic definition of terms, it should not be controversial.

Proposed Response Response Status O

Cl 183 SC 183.7.3 P432 L40 # 351

Lambert, Angie Corning

Comment Type T Comment Status X

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

*SuggestedRemedy*

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response Response Status O

Cl 183 SC 183.8.5 P435 L25 # 20

LeCheminant, Greg Keysight Technologies

Comment Type T Comment Status X

The current method for optimizing the tap weights of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: "The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration". Note that the MMSE optimization method is used in almost all TDECQ measurements performed today

*SuggestedRemedy*

Add the following text at line 40 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration

Proposed Response Response Status O

Cl 183 SC 183.8.11 P437 L41 # 16

LeCheminant, Greg Keysight Technologies

Comment Type T Comment Status X

The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52)

*SuggestedRemedy*

The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 184 SC 184.1.1 P441 L8 # 308  
 Bruckman, Leon Huawei  
 Comment Type TR Comment Status X  
 The Inner FEC as defined, includes the PMA. Shall make this clear to the reader  
 SuggestedRemedy  
 Either add sentence: "This Inner FEC sublayer includes functionality often associated with the PMA sublayer", or split the PMA function  
 Proposed Response Response Status O

Cl 184 SC 184.2 P443 L7 # 87  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 Other diagrams of this type do not have dashed boxes around the transmit and received processes.  
 SuggestedRemedy  
 For consistency with the rest of the document, remove the dashed boxes  
 Proposed Response Response Status O

Cl 184 SC 184.2 P444 L5 # 88  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The second sentence of the paragraph (discussing the distribution to 32 lanes by the permutation function) seems to imply that the 32 lanes were interleaved into a serial stream after they were reordered and deskewed, but the text doesn't actually say that is done.  
 SuggestedRemedy  
 If the intent is that the 32 lanes are re-interleaved, and then the permutation function distributes the symbols back to 32 lanes (in something other than a round-robin manner), change the end of the first sentence to say "...reordered, deskewed, and serialized". If the intent is that the permutation process just moves symbols around among the 32 lanes, change the second sentence to say "The RS-FEC symbols are then rearranged across the 32 lanes by a permutation function."  
 Proposed Response Response Status O

Cl 184 SC 184.4 P445 L22 # 184  
 Brown, Matt Alphawave Semi  
 Comment Type T Comment Status X  
 The Inner FEC transmit (184.4) and receive (184.5) functions provide a BCH encoder/decoder and other functions to be performed on each PCS lane. Although there is one per PCS lane, these should be called "flows" rather than "lanes" to be consistent with other FEC clauses and to differentiate between "lanes" that go between sublayers.  
 SuggestedRemedy  
 When describing the process applied to each PCS lane in each direction, use the word "flow" rather than "lane".

Proposed Response Response Status O

Cl 184 SC 184.4.1 P445 L3 # 299  
 Loewenthal, Arnon alphawave semi  
 Comment Type T Comment Status X  
 Need to further define the deskew requirement. For now it is defined as optional. In practice full deskew is optional, but doing 10b alignment of RS symbols is mandatory.  
 SuggestedRemedy  
 Replace lines 8-18 with the requirement of partial deskew, which means 10b RS symbols resolution deskew.

Proposed Response Response Status O

Cl 184 SC 184.4.1 P445 L5 # 89  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 There are always many implementation options, but we don't have to describe them in the document, we just have to describe the behavior that is required.  
 SuggestedRemedy  
 Delete "when implemented" from the first sentence, and delete the second paragraph.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 184 SC 184.4.1 P445 L12 # 178

Brown, Matt Alphawave Semi

Comment Type T Comment Status X

The process provided in 184.4.1 "Alignment lock and deskew" merely maps bits on the FEC service interface to vectors; it does not include and RS-FEC symbol alignment. The process in 184.4.2 remaps the vectors such that there is alignment to the RS-FEC symbols and the lanes are properly ordered.

*SuggestedRemedy*

Either combine the two subclauses and process into one subclause or move the RS-FEC symbol alignment process in 184.4.2 to 184.4.1.

Proposed Response Response Status O

Cl 184 SC 184.4.1 P445 L12 # 90

Huber, Thomas Nokia

Comment Type T Comment Status X

What is the purpose of this mapping? There are 32 lanes being received; this process is simply aligning them based on the RS FEC frame, so it doesn't seem like a mapping is needed.

*SuggestedRemedy*

Either explain why this mapping process is needed, or delete it.

Proposed Response Response Status O

Cl 184 SC 184.4.2 P445 L19 # 300

Loewenthal, Arnon alphawave semi

Comment Type T Comment Status X

Need to further define the lanes reorder requirement. For now it is defined as optional. In practice full lanes reorder is optional, but partial reorder, meaning having flow-0 on lanes 0-15 and flow-1 on lanes 16-31 is required. Not doing that would impact end to end FEC performance and margins.

*SuggestedRemedy*

- Two options:  
 1. remove the word 'optional' from line 22.  
 2. Define the restriction of having flow-0 on lanes 0-15 and flow-1 on lanes 16-31.

Proposed Response Response Status O

Cl 184 SC 184.4.2 P445 L22 # 179

Brown, Matt Alphawave Semi

Comment Type T Comment Status X

The lane reorder process is stated as being optional, however, that is not the case. It is not required (or optional) if the lanes are already in order (e.g., connected to a PCS above) and mandatory if the lanes may not be in order (e.g., connected to an 8:32 PMA above), thus it is conditional, rather than optional.

*SuggestedRemedy*

Change the first 2 sentences in 184.4.2 to "If the sublayer above the Inner FEC does not provide the PCS lanes in order at the service interface, the lane reorder function shall reorder the PCS lanes according to the PCS lane number."

Proposed Response Response Status O

Cl 184 SC 184.4.2 P445 L22 # 91

Huber, Thomas Nokia

Comment Type T Comment Status X

Lane reordering is not optional; the lanes have to be put in the correct order. If they happen to arrive in the correct order, it's a simple process.

*SuggestedRemedy*

Change the second sentence to say "The lane reorder process shall order the PCS lanes according to the PCS lane number."

Proposed Response Response Status O

Cl 184 SC 184.4.2 P445 L26 # 92

Huber, Thomas Nokia

Comment Type T Comment Status X

It is not clear why this description is needed. Other clauses about reordering don't have this.

*SuggestedRemedy*

Delete the last paragraph

Proposed Response Response Status O

Cl 184 SC 184.4.3 P446 L1 # 93

Huber, Thomas

Nokia

Comment Type T Comment Status X

This figure is not clear, nor is the relationship of the figure to the pseudocode beneath it. I think the columns 0-3 are just numbers that relate to the post-FEC distribution process. I have no idea why there are 32 sets of 4 symbols, as the algorithm doesn't do anything on a four-symbol basis. The function is simply reversing flow1 and flow0 every two columns, so that each lane has interleaved symbols from all four codewords. This could be described more simply by using blocks of 16 symbols in the figure (i.e., block 0 would be lanes 0-15 in column 0, block 1 would be lanes 16-31 in column 0, etc.).

*SuggestedRemedy*

Revise the figure as suggested. The input side would look like this (where each row here is corresponding to 16 PCS lanes in the figure):

0 2 4 6

1 3 5 7

and the output would be

0 2 5 7

1 3 4 6

This will remove any confusion about whether the 32 blocks are supposed to be somehow related to the 32 PCS lanes, and it will be easier to see what is changing between the figures.

Proposed Response Response Status

Cl 184 SC 184.4.3 P446 L45 # 94

Huber, Thomas

Nokia

Comment Type T Comment Status X

The algorithm is unnecessarily complex. There is no need for bit-level detail since the operation is performed on 10-bit symbols - though really it seems to be performed on 160-bit entities. Per figure 184-3, it's essentially receiving as input alternating sets of 160 bits from flow0 and flow1, and changing the order from 0, 1, 0, 1, 0, 1, 0, 1 to 0, 1, 0, 1, 1, 0, 1, 0.

*SuggestedRemedy*

A minimal change would be to state that the algorithm operates on 10-bit symbols, delete the for j... loop and its terminator, and replace "10i+j" with "i" in the statement that describes the permutation..

Another option would be to rewrite the description around the 160-bit entities as described, and perhaps also change the figure to show those instead of 40-bit entities (which as noted in a previous comment seem to have no relevance to this process, or to the convolutional interleaver process that follows it).

Proposed Response Response Status

Cl 184 SC 184.4.4 P447 L22 # 95

Huber, Thomas

Nokia

Comment Type T Comment Status X

The description of the convolutional interleaver process could be improved. The variable i is used in the first part of the subclause as an index for the delay lines and as an indication of time within a sequence. Then at the bottom of page 447 it's used as a symbol index.

*SuggestedRemedy*

Revise the list above the figure to read as follows, eliminating the overloading of the index i and improving the clarity a bit (and change the figure to label the lines as b=0, b=1, b=2)::

a) The input and output switches are always aligned to the same row b, where b = 0 to 2

b) a block of 40 bits is read from row b

c) The contents of row b are shifted to the right by 40 bits

d) A block of 40 bits is written to row b

e) The switch position is updated to (b+1) mod 3

Proposed Response Response Status

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 184 SC 184.4.4 P447 L48 # 96  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 Since the convolutional interleaver operates separately on each PCS lane, there's no value in having an algorithm that includes the PCS lanes. Since it operates on 40-bit units, there's also no need to include bit-level description.  
*SuggestedRemedy*  
 State that the algorithm describes the operation on the 40 bit entities and is run on each PCS lane independently. This allows elimination of the p and j variables.  
 Proposed Response Response Status O

Cl 184 SC 184.4.4 P448 L3 # 97  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The algorithm relating the convolutional interleaver output to its input doesn't work when  $i < 36$  - it refers to negative block numbers for the input (permo) while the delay lines are filling, and those negative numbers need to be ignored as the process starts up. In other words, given the input sequence of 40-bit blocks 0, 1, 2, 3, ..., the convolutional interleaver is supposed to produce the output sequence 0, 3, 6, 9, 12, 15, 18, 1, 21, 4, 24, 7, 27, 10, 30, 13, 33, 16, then 36, 19, 2, and then each successive set of 3 is 3 more than the previous (so it continues 39, 22, 5, 42, 25, 8, ...). The algorithm says that output 0 is input  $0 - 18 \times (0 \bmod 3)$ , so that produces 0 as expected, but output 1 is then supposed to be input  $1 - 18 \times (1 \bmod 3)$ , which is -17, not 3.  
*SuggestedRemedy*  
 The text above figure 184-4 already provides an algorithmic description of how the interleaver works. Rather than a second algorithmic description, it might be better to show the worked example as noted in the comment - i.e., show a table of input blocks from 0 to 42, and the corresponding output blocks.  
 Proposed Response Response Status O

Cl 184 SC 184.4.4 P448 L5 # 613  
 Huang, Kechao Huawei Technologies Co., Ltd.  
 Comment Type T Comment Status X  
 For  $\text{permo}[p, 40x(i-18x \bmod 3)+j]$ , the column index  $40x(i-18x \bmod 3)+j$  may be a negative value  
*SuggestedRemedy*  
 Suggest to add one sentence after Line 9: When  $40x(i-18x \bmod 3)+j$  is negative,  $\text{permo}[p, 40x(i-18x \bmod 3)+j]$  will be undetermined value from initial buffer of the convolutional interleaver.  
 Proposed Response Response Status O

Cl 184 SC 184.4.5 P448 L12 # 98  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The first statement should not be a 'shall' (which indicates a PICS item of conformance). The second sentence is correct, in that there are 32 encoders, but what's actually required is that each lane has an encoder.  
*SuggestedRemedy*  
 Revise the paragraph to read: The BCH encoder works in conjunction with the RS(544,514) FEC to increase the FEC coding gain. There is a BCH encoder process for each PCS lane.  
 Proposed Response Response Status O

Cl 184 SC 184.4.5 P448 L40 # 99  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The variable p is being overloaded - it is used at line 35 as a lane index, and at line 40 as the parity polynomial. Since the BCH encoding is done per lane, there is really no need to have a variable related to the lane number. The text can simply state that the algorithm is applied to each lane individually.  
*SuggestedRemedy*  
 Change the line above the dashed list to say "The BCH encoding is done separately on each lane. The encoding of each BCH codeword u is defined as follows:  
 At the top of page 449, remove the 'for p...' loop from the pseudocode.  
 Proposed Response Response Status O

Cl 184 SC 184.4.6 P449 L16 # 100  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 Clarify that the circular shift is applied per lane.  
 SuggestedRemedy  
 Make similar changes to what was suggested in previous sections - remove the unnecessary variable p and associated for loop in the pseudocode, and add a sentence stating that the circular shift process is performed on each lane individually.  
 Proposed Response Response Status O

Cl 184 SC 184.4.7.1 P450 L12 # 101  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The DSP frame should probably be a level 3 clause of its own, rather than a sub-clause under BCH interleaver.  
 SuggestedRemedy  
 Change to a level 3 heading  
 Proposed Response Response Status O

Cl 184 SC 184.4.7.1 P450 L14 # 371  
 He, Xiang Huawei  
 Comment Type TR Comment Status X  
 It is said " 4-bit pilot symbols (PS) are inserted every 64 4-bit blocks (one 4-bit PS, 63 4-bit message blocks)."  
 But in Figure 184-5, message blocks m<0:63>, m<64-127>, ...between pilot symbols has 64 4-bit blocks.  
 SuggestedRemedy  
 Change Figure to match the text, i.e., change m<0:63> to m<0:62>, change m<64:127> to m<63:125>, etc.  
 Proposed Response Response Status O

Cl 184 SC 184.4.7.1 P450 L18 # 102  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The first sentence of the second paragraph could be written more clearly.  
 SuggestedRemedy  
 Replace with "Two streams of DSP frames, one for each polarization, are generated by the inner FEC."  
 Proposed Response Response Status O

Cl 184 SC 184.4.7.2 P450 L45 # 103  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 It is not clear what "192 bits that are complemented with zeros" is intended to mean. Based on what is in Table 184-2, I think the intent is that a zero is inserted after each bit of the PRBS9 output to form the bit-pairs that become the PS symbols. Also, the text talks about 4-bit PS symbols, but Table 184-2 is showing bit-pairs for each component rather than 4-bit symbols without explaining that outputs 0 and 1 are for the X polarization (so the X PRBS is spread across outputs 0 and 1) and outputs 2 and 3 are for the Y polarization.  
 SuggestedRemedy  
 Revise the two paragraphs above table 184-1 to read as follows:  
 For both DSP frame\_0 and DSP frame\_1, the generator is initialized using the seed at the start of every DSP frame. The generator produces a sequence of 192 bits. A zero bit inserted after each bit to generate the bit-pairs that form the pilot symbols, which use the outer points of the 16QAM constellation.  
 The generator polynomial and seed values are shown in Figure 184-6 and listed in Table 184-1. The complete pilot sequence is shown in Table 184-2. The bit-pairs for the X polarization are distributed in a round-robin manner to outputs 0 and 1. The bit-pairs for the Y polarization are distributed in a round-robin manner to outputs 2 and 3.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 184 SC 184.4.9 P452 L50 # 104

Huber, Thomas

Nokia

Comment Type T Comment Status X

The editor's note suggesting that the mapping to analog signals probably belongs in the PMD clause seems to make sense, in which case this clause is really not "DP-16QAM mapping", it's really just mapping to 4-level signals, which the PMD will then turn into DP-16QAM.

*SuggestedRemedy*

Change the title to "4-level signal mapper", and make the corresponding change in 184.5.3.

Proposed Response Response Status O

Cl 184 SC 184.4.9 P452 L50 # 105

Huber, Thomas

Nokia

Comment Type T Comment Status X

The overall flow would be improved if it went BCH interleaver, 4-level signal mapping, DSP frame, with all the pilot symbol details then in the DSP frame clause.

*SuggestedRemedy*

Revise so the flow is like this:  
 184.4.7 BCH interleaver  
 184.4.8 Four-level signal mapping (current 184.4.9, without subclauses)  
 184.4.9 DSP frame generation (current 184.4.7.1)  
 184.4.9.1 Pilot sequence (current 184.4.7.2 and 184.4.9.1)

Proposed Response Response Status O

Cl 184 SC 184.5.1 P455 L42 # 106

Huber, Thomas

Nokia

Comment Type T Comment Status X

The paragraph that begins with "the signals Rx\_Xi, Rx\_XQ, ..." doesn't seem to make sense. The Tx and Rx signals are not guaranteed to be the same (i.e., Tx\_XI can be received as any of the four components), but the contents of Tx\_XI aren't distributed to all the Rx signals.

*SuggestedRemedy*

Revise to say: The signals Rx\_XI, Rx\_XQ, Rx\_YI, and Rx\_YQ each represent one of the corresponding Tx\_XI, Tx\_XQ, Tx\_YI, Tx\_YQ signals from the transmitting PMD. The association between Tx and Rx components is arbitrary (e.g., Rx\_XI can be any of the 4 Tx components).

Proposed Response Response Status O

Cl 184 SC 184.5.8 P457 L45 # 107

Huber, Thomas

Nokia

Comment Type T Comment Status X

Similar changes should be made in the convolutional de-interleaver as were requested for the convolutional interleaver in earlier comments

*SuggestedRemedy*

Revise the items in the lettered list and the algorithm to align with whatever changes are agreed for the convolutional interleaver.

Proposed Response Response Status O

Cl 184 SC 184.6.5 P462 L1 # 372

He, Xiang

Huawei

Comment Type TR Comment Status X

It is possible that one polarization is locked but the other polarization can not get locked. With the current variable list and state diagrams this can not be identified or reported. (This is a little different from AM lock process across PCS lanes, where it is way up in the sublayers higher than the pilot sequence lock, and it may not be a problem.)

*SuggestedRemedy*

Recommend to add a timer (value TBD) to indicate that it has waited long enough after one polarization is locked but the other is still not locked.

Proposed Response Response Status O

Cl 184 SC 184.6.5 P462 L3 # 307

Bruckman, Leon

Huawei

Comment Type TR Comment Status X

Set TBD values of N and M

*SuggestedRemedy*

Set N=12, M=8. See contribution bruckman\_3dj\_01\_241205

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 184 SC 184.6.5 P462 L9 # 559

Law, David HPE  
 Comment Type T Comment Status X

The LOCK\_INIT state in Figure 184-9 'DSP lock state diagram' includes the action 'test\_sym <= false', however the test\_sym variable isn't defined in subclause 184.6.2 'Variables' and isn't used anywhere else in Figure 184-9.

It seems that this should have been 'test\_ps <= false' as the test\_ps variable isn't initialised during reset in the LOCK\_INIT state but used to control the GET\_SYMBOL to FIND\_1ST transition below.

*SuggestedRemedy*

Change 'test\_sym <= false' to read 'test\_ps <= false'.

Proposed Response Response Status O

Cl 184 SC 184.6.5 P462 L22 # 560

Law, David HPE  
 Comment Type T Comment Status X

N (the number of consecutive PS symbols matching the expected value for a given polarization stream required to enter frame lock), and M (the number of consecutive PS symbols that don't match the expected value for a given polarization stream required to exit frame lock) used in Figure 184-9 'DSP lock state diagram' aren't defined in subclause 184.6 'Inner FEC state diagrams' or its subclauses.

Suggest that these values should be defined in one place (I assume in subclause 184.5.4 'DSP frame synchronization and pilot removal' which includes the text 'The values of N and M are TBD. '), with a pointer to this subclause elsewhere.

*SuggestedRemedy*

[1] Insert a new subclause 184.6.5 'Constants' as follows, renumbering the following subclause.

184.6.5 Constants

M  
 The number of consecutive PS symbols that fail to match the expected value for a given polarization stream required to exit frame lock (see 184.5.4).

N  
 The number of consecutive PS symbols matching the expected value for a given polarization stream required to enter frame lock (see 184.5.4).

{2} In subclause 184.6.2 'Variables', change the text 'It is set to true when TBD PS symbols ...' to read 'It is set to true when M PS symbols ...' in the variable 'restart\_lock' description.

Proposed Response Response Status O

Cl 184 SC 184.6.5 P463 L6 # 558

Law, David HPE  
 Comment Type E Comment Status X

The variable 'alignment\_status' used in the LOSS\_OF\_ALIGNMENT and ALIGNMENT\_ACQUIRED states is misspelt.

*SuggestedRemedy*

Suggest that 'alignment\_status' should read 'alignmnet\_status'.

Proposed Response Response Status O

Cl 184 SC 184.8 P464 L10 # 373

He, Xiang Huawei  
 Comment Type TR Comment Status X

Only "alignment\_valid" is reported, not individual "dsp\_lock<x>" variables.

*SuggestedRemedy*

It is recommend to report both "dsp\_lock<x>" in table 184-7, as we did for PCS lane lock where we reported "Lane x aligned" for all PCS lanes.

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 185 SC 185.1 P468 L19 # 323

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

Comment Type TR Comment Status X

Table 185-1, Figure 185-1, Figure 185-2 does not reflect the PHY type and clause correlation in Table 169-3a. There is no mention of 800GBASE-R BM-PMA, 800GAU-I8 2C2, 800GAUI-8 C2M, 800GBASE SM-PMA, 800GAUI-4 C2C, and 800GAUI-4 C2M.

Baseline Proposal in [https://www.ieee802.org/3/dj/public/23\\_07/kota\\_3dj\\_01a\\_2307.pdf](https://www.ieee802.org/3/dj/public/23_07/kota_3dj_01a_2307.pdf) shows support for 800GAUI's.

SuggestedRemedy

Clause 185 needs to be updated to reflect these layers.

Table185-1needs the following entries -

- 800GBASE-R BM-PMA - conditional
- 800GAU-I8 2C2 - optional
- 800GAUI-8 C2M - optional
- 800GBASE SM-PMA - conditional
- 800GAUI-4 C2C - optional
- 800GAUI-4 C2M - optional

Add note "C= Conditional, 800GBASE-R BM-PMA is conditional, pending implementation of 800GAUI-8 C2C/C2M

800GBASE-R SM PMA is conditional, pending implementation of 800GAUI-4 C2C/C2M"

Figure 185-1 should include a PMA sublayer in the diagram and be added to legend below  
Figure 185-2 needs to be updated to show the 800GBASE-R PMA Sublayer and service interface between the PCS and Inner FEC

Proposed Response Response Status O

Cl 185 SC 185.3 P473 L31 # 114

Stassar, Peter Huawei Technologies

Comment Type T Comment Status X

The TBDs need to be replaced by values. Follow the same methodology as in 154 and latest draft D3.0 of P802.3cw

SuggestedRemedy

Replace contents by The sum of the transmit and receive delays at one end of the link contributed by the 800GBASE-LR1 PMD including 2 m of fiber in one direction shall be no more than 16 384 bit times (32 pause\_quanta or 20.48 ns).

A description of overall system delay constraints and the definitions for bit times and pause\_quanta can be found in 169.4 and its references.

Proposed Response Response Status O

Cl 185 SC 185.5.1 P477 L8 # 381

Maniloff, Eric Ciena

Comment Type T Comment Status X

The specification should have a Tx clock noise defined.

SuggestedRemedy

Add an entry for Tx clock phase noise (PN): Maximum PN mask

Add an entry for: Tx clock phase noise (PN); Maximum total integrated random jitter

Add an entry for: Tx clock phase noise (PN); Maximum total periodic jitter

Proposed Response Response Status O

Cl 185 SC 185.5.1 P477 L8 # 380

Maniloff, Eric Ciena

Comment Type T Comment Status X

800GBASE-LR1 is being defined to allow unlocked lasers with frequency errors larger than the DSP digital acquisition range. Additional parameters are required for the Tx laser to accommodate this. Values will be provided after further study, but the new paramaters can be added to Table 185-4. A supporting contribution will be provided.

SuggestedRemedy

Add the following parameters to Table 185-4:

Maximum Tx laser frequency slew rate: Preacquisition [Units GHz/s]

Maximum Tx laser frequency slew rate: Post acquisition [Units GHz/ms]

Laser Relative Frequency tracking accuracy [Units GHz]

Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 185 SC 185.5.1 P477 L8 # 384  
 Maniloff, Eric Ciena  
 Comment Type T Comment Status X  
 TQM is currently undefined. Recommend adopting RSNR Penalty as a TQM. Supporting Contribution to be provided.  
 SuggestedRemedy  
 Replace TQM with RSNR Penalty  
 Proposed Response Response Status O

Cl 185 SC 185.5.1 P477 L12 # 578  
 Kota, Kishore Marvell Semiconductor  
 Comment Type TR Comment Status X  
 Minimum transmit power specification has a big impact on coherent module designs. This has been defined in the initial proposals as a specification on the average power following other coherent physical layer specifications defined for DWDM systems. However, there is opportunity for a 800GBASE-LR1 PMD to change this in a way which can relax module transmit specifications  
 SuggestedRemedy  
 Define the minimum transmit power specification to be defined per lane instead of average. See [https://grouper.ieee.org/groups/802/3/dj/public/23\\_11/kota\\_3dj\\_01a\\_2311.pdf](https://grouper.ieee.org/groups/802/3/dj/public/23_11/kota_3dj_01a_2311.pdf) for an initial proposal based on this concept. Defining the power per lane provides an opportunity to relax lane mismatch specs.  
 Proposed Response Response Status O

Cl 185 SC 185.5.1 P477 L15 # 579  
 Kota, Kishore Marvell Semiconductor  
 Comment Type TR Comment Status X  
 The draft contains separate specifications of X-Y power imbalances and I-Q imbalance. However, there is an opportunity for a 800GBASE-LR1 PMD to change this in a way which can relax module transmit specifications  
 SuggestedRemedy  
 Having a separate X-Y and I-Q imbalance specification splits the imbalance power budget and results in a tighter specification than necessary. These specifications should be combined into a single lane-to-lane imbalance specification. See [https://grouper.ieee.org/groups/802/3/dj/public/23\\_11/kota\\_3dj\\_01a\\_2311.pdf](https://grouper.ieee.org/groups/802/3/dj/public/23_11/kota_3dj_01a_2311.pdf) for an initial specification methodology proposal.  
 Proposed Response Response Status O

Cl 185 SC 185.5.2 P478 L15 # 580  
 Kota, Kishore Marvell Semiconductor  
 Comment Type TR Comment Status X  
 Average receiver power (min) and the per-lane transmit power (min) specifications should be tied to an appropriate transmit quality metric similar to the TDECQ specifications in other IMDD clauses  
 SuggestedRemedy  
 See [https://grouper.ieee.org/groups/802/3/dj/public/24\\_01/kota\\_3dj\\_01a\\_2401.pdf](https://grouper.ieee.org/groups/802/3/dj/public/24_01/kota_3dj_01a_2401.pdf) and [https://grouper.ieee.org/groups/802/3/dj/public/23\\_11/kota\\_3dj\\_01a\\_2311.pdf](https://grouper.ieee.org/groups/802/3/dj/public/23_11/kota_3dj_01a_2311.pdf) for initial proposals on how to tie the RX sensitivity and TX power specifications with a transmit quality metric. This provides flexibility to allow module designers to explore design tradeoffs to simplify designs in ways which can benefit end users.  
 Proposed Response Response Status O

Cl 185 SC 185.5.3 P478 L43 # 382  
 Maniloff, Eric Ciena  
 Comment Type T Comment Status X  
 A value of -27dB is appropriate for Maximum discrete reflectance  
 SuggestedRemedy  
 Replace TBD for Maximum discrete reflectance with -27  
 Proposed Response Response Status O

Cl 185 SC 185.6 P479 L51 # 383  
 Maniloff, Eric Ciena  
 Comment Type T Comment Status X  
 A value of 24dB is appropriate for Optical Return Loss  
 SuggestedRemedy  
 Replace TBD in Table 185-7 with 24  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 185 SC 185.6.3 P480 L52 # 352  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

Cl 185 SC 185.11.4.6 P490 L27 # 353  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

Cl 185 SC 185.7.1 P481 L21 # 375  
 He, Xiang Huawei  
 Comment Type TR Comment Status X  
 The scrambled idle test pattern for 800GBASE-R PCS is defined in 172.2.4.11, not 175.2.4.11.  
 SuggestedRemedy  
 Change "175.2.4.11" to "172.2.4.11" and format as external reference.  
 Proposed Response Response Status O

Cl 186 SC 186 P491 L1 # 334  
 de Koos, Andras Microchip Technology  
 Comment Type T Comment Status X  
 ER1 PCS: Planting the seed for when the PCS is ready to be properly reviewed.  
 How to calculate the path data delay across the ER1 PCS/PMA? Clause 90 and Annex 90A give general rules, like how to calculate the rx/tx path data delay when there are functions within the PHY that introduce cyclical delay.  
 But the path data delay in the ER1 PCS is very different from anything that has been imagined in Clause 90 - an Ethernet stream that floats within a GMP frame will present unique challenges; it is not immediately clear how to determine the min/max latency across such a PCS.  
 This might be worse than the Alignment marker issue!  
 SuggestedRemedy  
 Proposed Response Response Status O

Cl 185 SC 185.7.1 P481 L21 # 374  
 He, Xiang Huawei  
 Comment Type TR Comment Status X  
 The 800GBASE-LR1 Inner FEC would not see or use scrambled idles as its input. The input to the 800GBASE-LR1 Inner FEC should be "scrambled idle processed by 800GBASE-R PCS".  
 SuggestedRemedy  
 Change "pattern description" column in Table 185-9 to "Scrambled idle procedd by 800GBASE-R PCS and then encoded by the 800GBASE-LR1 Inner FEC".  
 Proposed Response Response Status O

Cl 186 SC 186 P491 L1 # 108  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The baseline for the 800GBASE-ER1[-20] PCS has issues with PTP accuracy when an extender sublayer is used.  
 SuggestedRemedy  
 Update the baseline per presentations in the May meeting proposing a mechanism to reduce the PTP inaccuracy.  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 187 SC 187.3 P497 L31 # 115  
 Stassar, Peter Huawei Technologies  
 Comment Type T Comment Status X  
 The TBDs need to be replaced by values. Follow the same methodology as in 154 and latest draft D3.0 of P802.3cw  
 SuggestedRemedy  
 Replace contents by The sum of the transmit and receive delays at one end of the link contributed by the 800GBASE-LR1 PMD including 2 m of fiber in one direction shall be no more than 16 384 bit times (32 pause\_quanta or 20.48 ns). A description of overall system delay constraints and the definitions for bit times and pause\_quanta can be found in 169.4 and its references.  
 Proposed Response Response Status O

Cl 187 SC 187.5 P502 L17 # 117  
 Stassar, Peter Huawei Technologies  
 Comment Type T Comment Status X  
 Previously for Clause 154 and draft Clause 156 in D3.0 for P802.3cw 20 dB maximum receiver reflectance has been used, which is a common value in the industry and in draft Clause 155.5.2  
 SuggestedRemedy  
 For Receiver reflectance (max) replace TBD by 20 dB for both ER1-20 and ER1  
 Proposed Response Response Status O

Cl 187 SC 187.5.1 P501 L8 # 109  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The ppm value for this PMD should be 20 ppm  
 SuggestedRemedy  
 Repalce TBD with 20  
 Proposed Response Response Status O

Cl 187 SC 187.5.2 P501 L8 # 110  
 Huber, Thomas Nokia  
 Comment Type T Comment Status X  
 The ppm value for this PMD should be 20 ppm  
 SuggestedRemedy  
 Repalce TBD with 20  
 Proposed Response Response Status O

Cl 187 SC 187.6 P503 L44 # 116  
 Stassar, Peter Huawei Technologies  
 Comment Type T Comment Status X  
 Negative dispersion does not occur around 1550 nm. 0 ps/nm is the minimum. Only need min and max dispersion as in draft D3.0 of P802.3cw. A safe upper limit of 20 ps/nm.km can be used for a wavelength close to 1550 nm  
 SuggestedRemedy  
 Replace "Positive dispersion (max)" by "Chromatic dispersion (max)" with value 400 ps/nm for ER1-20 and 800 ps/nm for ER1. Replace "Negative dispersion (min)" by "Chromatic dispersion (min)" with value 0 ps/nm for both ER1-20 and for ER1.  
 Proposed Response Response Status O

Cl 187 SC 187.6.3 P504 L48 # 354  
 Lambert, Angie Corning  
 Comment Type T Comment Status X  
 IEC 61753-021-2 has been superseded by IEC 61753-021-02.  
 SuggestedRemedy  
 Change "IEC 61753-021-2" to "IEC 61753-021-02".  
 Proposed Response Response Status O

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 187 SC 187.11.4.6 P514 L25 # 355

Lambert, Angie Corning

Comment Type T Comment Status X

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response Response Status O