Cl **1** *SC* **1.4** *P* **53** *L* **8** # 194

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

We're heavily using round-robin but have no definition for it

SuggestedRemedy

Add a definition of round-robin "A process that iterates through each possible source/destination once and then continuously repeats the iteration using the same order each time."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **1** *SC* **1.5** *P* **57** *L* **22** # 33

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

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

The abbreviation FAW is not listed

SuggestedRemedy

Add to 1.5
FAW frame alignment word

Response *Response Status* **C**

REJECT.
"FAW" is a field specific to the FEC frame defined in Clause 186, like PS, TS, etc., and thus is not an acronym in the broad sense. If we add one field name (acronym) like this we would effectively be obligated to add all (acronym) field names.

Cl **45** *SC* **45.2.1** *P* **71** *L* **30** # 10

Marris, Arthur — Cadence Design Systems

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

An address space of 1500 needs to be reserved in Table 45-3 for the duplication of ILT training registers for the AUI upper component

SuggestedRemedy

Expand the address space allocated to "Duplication of ILT training registers for the AUI upper component" appropriately, suggest 1.3000 to 1.4500, as the range of the PMA test block error bin counters is likely to be reduced. Add a new subclause at the end of PMA/PMD register subsection to describe these registers

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.161** *P* **90** *L* **14** # 38

Bruckman, Leon — Nvidia

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

Missing new preset 6 that was added duirng D1.3 CRG

SuggestedRemedy

In Table 45-129 change "Reserved" for Initial condition request = 101 to "preset 6"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.165** *P* **92** *L* **10** # 39

Bruckman, Leon — Nvidia

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

Missing new preset 6 that was added duirng D1.3 CRG

SuggestedRemedy

In Table 45-131 change "Reserved" for Initial condition request = 101 to "preset 6"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.168a** *P* **94** *L* **8** # 2

Marris, Arthur — Cadence Design Systems

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

Grammar. Change "defines" to "define"

SuggestedRemedy

Change "defines" to "define". Also correct typo by changing "1.1464" to "1.1463"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.168c** *P* **95** *L* **35** # 3

Marris, Arthur — Cadence Design Systems

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

Correct table reference

SuggestedRemedy

Correct table reference on line 39 to be to 45-133c. Also in bit description for 1.1477.8 delete "lane 0"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.168d** *P* **96** *L* **12** # 4

Marris, Arthur — Cadence Design Systems

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

Make minor tweaks to bit descriptions in Table 45-133d

SuggestedRemedy

For 1.1478.13 change "It indicates" to "This bit indicates"
For 1.1478.10 change "each input lane is" to "all input lanes are"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.177b** *P* **99** *L* **1** # 5

Marris, Arthur — Cadence Design Systems

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

Correct register number in the title

SuggestedRemedy

Change "1.1816" to "1.1819"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.178c** *P* **100** *L* **3** # 6

Marris, Arthur — Cadence Design Systems

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

Correct table number

SuggestedRemedy

Change "45-142c" to "45-141c" in two places, and change subclause number from "45.2.1.178c" to "45.2.1.177c"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Correct the subclause and table numbering with editorial license.

In addition, to match the change of the feature name in CL 186, change the text in the Description column of this table from:
"alignment marker location transparency"
to:
"alignment marker location"
in 45.2.1.178c and 45.2.1.178c.1.

Cl **45** *SC* **45.2.1.213b** *P* **101** *L* **15** # 40

Bruckman, Leon — Nvidia

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

In table 45-142c new 1.2402.15 bit defined as "PRBS31 is FEC encoded" is not used in the draft. Clause 177 uses 8 bits for this function that will be defined in clause 45.2.1.213e

SuggestedRemedy

Either change the definition of bit 1.2402.15 to "Reserved", or change the references in section 177.9 to become a sinlge bit pointing to this bit

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change bit 1.2402.15 to "Reserved"

Cl **45** *SC* **45.2.1.213e** *P* **103** *L* **6** # 7

Marris, Arthur — Cadence Design Systems

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

Editor's note needs to be removed

SuggestedRemedy

Replace editor's note with suitable content

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The bits for this register are defined already in 177.4.9.1 and are listed in Table 177-7. Add necessary table and text in 45.2.1.213e.

Cl **45** *SC* **45.2.1.213n** *P* **107** *L* **23** # 8

Marris, Arthur — Cadence Design Systems

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

Correct register range and add table to define these error bin counter registers

SuggestedRemedy

51 registers are required so make the range 1.2600 through 1.2650. Add table to indicate how the 48-bit values map to three register locations

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.213n** *P* **107** *L* **25** # 196

Slavick, Jeff — Broadcom

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

We want to avoid referencing clauses from Clause 45 just basic overview of the register but have a one way reference from those using the register storage location.

Also all the registers for a given lane should latch when bin 0 bits 15:0 are read.

SuggestedRemedy

Have the clause read as follows:

The PMA test block error bin counter registers provide emulation of FEC error statistics from a PRBS data stream. These registers are reset to all zeros when the register is read by the management function or upon reset, and held at all ones in the case of overflow. Three registers are used to read the value of each 48-bit counter, the values of all registers for a given PMAL are latched when the first register of bin 0 is read.

There are 17 bin counter registers for eight PMALs. The bin 1 register keeps a count of test blocks with 1 test symbol error, the bin 2 register keeps a count of test blocks with 2 test symbol errors, and so on up to 15 test symbol errors. The bin 16p register counts test blocks with 16 or more test symbol errors.

Response *Response Status* **C**

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

Cl **45** *SC* **45.2.1.213n** *P* **107** *L* **34** # 198

Slavick, Jeff — Broadcom

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

Add Tables to show lane 0 bin 0 registers.

SuggestedRemedy

Add a Table that defines the 3 registers a given "Bin" counter is composed of.

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.4** *P* **121** *L* **19** # 231

Ran, Adee — Cisco

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

The term "link codeword" appears many times in the updated Clause 73 as an initial part of expressions like "link codeword Base page" here, and similar expressions "link codeword Message code" and "link codeword Unformatted".

The usual English word order suggests that "link codeword" is a compound adjective, making it a specific type of "Base page", specific type of "Message code", or specific type of "Unformatted"...

I think it is quite different: "Base Page" is one thing, "Next Page" is another thing; "Message code" is one kind of Next Page, and "Unformatted" is another kind of Next Page. These three can be referred to together as "link codeword".

The terminology in D1.4 makes the text difficult to follow, worse than what it was in the original Clause 73 (despite the good intent to clean it), and would make readers familiar with Clause 73 confused. It is especially difficult in constructs like "link codeword Message code Next Page" (which is a link codeword of type Next page of subtype message code).

SuggestedRemedy

Use the following terms:
"Base page link codeword" (one type of link codeword)
"Next page link codeword" (another type of link codeword; with two subtypes, Message code or Unformatted)
"Message code Next page link codeword" (a subtype of Next page link codeword)
"Unformatted Next Page link codeword" (a subtype of Next page link codeword)

In most cases, the terms "Base Page", "Next Page", "Message code Next page" and "Unformatted Next page" can be used without adding "link codeword".

Change across clause 73 and Annex 73A with editorial license.

Response *Response Status* **C**

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

Cl **73** *SC* **73.5.1** *P* **122** *L* **32** # 232

Ran, Adee Cisco

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

73.5 has been amended by 802.3ck. The editorial instruction should include this note.
Also applies to 73.6, 73.7, 73.8 which were amended by 802.3ck and/or 802.3df.
(Also 73.10, but it already includes the required note)

SuggestedRemedy

Insert "(as modified by IEEE Std 802.3ck-2022)" or "(as modified by IEEE Std 802.3ck-2022 and IEEE Std 802.3df-2024)" into the editorial instructions, as appropriate.

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.5.1** *P* **122** *L* **32** # 233

Ran, Adee Cisco

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

Editorial instructions should be within the subclause they address.
This applies to 73.5.1 and 73.6.

SuggestedRemedy

Move the editorial instruction into the subclauses.

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.5.1** *P* **122** *L* **38** # 219

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *AN differential swing*

The ancient "DME electrical characteristics" table needs updating. Compare the default preset to start training: 800 to 1000 mV (but see another comment) for CR and KR, 800 to 1000 *0.75 +/-0.025 which is 580 to 775 mV for C2C and C2M, 900 mV for the traditional C2M max, and 850 mV XLPPI max. Traditional C2M and XLPPI can't defend themselves because they don't do AN.
Just as for the transition to 50 ppm, we should move carefully towards where we should be, while paying attention to backward compatibility.

SuggestedRemedy

Bring Table 73-1, DME electrical characteristics, into the draft. It contains:
Transmit differential peak-to-peak output voltage 600 to 1200 mV
Receive differential peak-to-peak input voltage 200 to 1200 mV.
Implement at least slide 7 of simms_3dj_adhoc_01_250220.pdf:

Parameter	Min	Max 0	Max 1	Units
Transmit differential peak-to-peak output voltage	600	1200	1000	mV
Receive differential peak-to-peak input voltage	200	1200	1200	mV

0 When not indicating a technology in the Extended Technology Ability Field (i.e. no 200G/lane)
1 When indicating one or more technologies in the Extended Technology Ability Field (i.e. some 200G/lane)
This is only a long overdue first step. Consider making more progress by implementing slide 10 or 11.
See another comment with a proposal to report "too loud" with the RF bit.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #261.

Cl **73** *SC* **73.6.2.7** *P* **127** *L* **31** # 220

Dawe, Piers Nvidia

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

There is a "Remote Fault bit" with no clear indication of what it is for. It's not the real Remote Fault, because the MACs are not yet connected during AN. But it could be useful. It could be used by a transmitter whose receiver is not receiving anything (Vpkpk < 200 mV), or is receiving something that's not AN (such as a regular scrambled RF Ethernet signal, or a Fibre Channel signal), or a signal that's too loud to be understood adequately.

SuggestedRemedy

Add text detailing the use(s) of this bit.

Response *Response Status* **C**

REJECT.
The suggested remedy does not provide sufficient detail to make a change to the draft.

Cl **73** *SC* **73.10.2** *P* **134** *L* **15** # 234

Ran, Adee Cisco

Comment Type **T** *Comment Status* **R** *AN/LT timers*

A value of 60 seconds for link_fail_inhibit_timer does not guarantee a reasonably short time-to-link, and on the downside it creates an unacceptably long time to recover from a failed auto-negotiation attempt if at least one of the link partners adheres to it.

The current value was adopted in order to allow ILT in all ISLs to complete. This should be maintained, but the time to recovery from failure (or enable restart by management) should be shorter,

This can be enabled by adding a third possible value IN_PROGRESS to pcs_status. The rules for generating this value can be derived from existing PCS variables.

With this new value, the period for link_fail_inhibit_timer can be reduced to 12 seconds (as in 802.3ck) or even lower.

SuggestedRemedy

A detailed proposal will be submitted.

Response *Response Status* **C**

REJECT.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_03/ran_3dj_02a_2503.pdf

There was no consensus to implement the proposed changes at this time. Further work and consensus building on this topic are encouraged.

The proposed changes are not required to make this draft technically complete. The commenter is encouraged to pursue this further during Working Group ballot.

Cl **73** *SC* **73.10.2** *P* **134** *L* **15** # 224

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *AN/LT timers*

If ILT works as planned, this timer should be invoked very rarely: the link should come up before it expires unless there is e.g. a bad cable.

SuggestedRemedy

Increase the lime limit. Add a counter to flag when AN has tried say 10 times (possibly with different candidate abilities). Maybe at that point it should report to management and shut down the non-functioning link.

Response *Response Status* **C**

REJECT.

The suggested remedy does not provide sufficient detail to implement. Also, the proposed changes would change behaviour for PHYs already in the base standard.

Cl **116** *SC* **116.2.9** *P* **147** *L* **39** # 41

Bruckman, Leon Nvidia

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

Text is hard to parse.

SuggestedRemedy

Change: "For each ISL, ILT provides a mechanism for a receiver to control transmitter states, such as equalization, modulation, and precoding states, on the peer transmitter," to: "For each ISL, ILT provides a mechanism for a receiver to control peer transmitter states, such as equalization, modulation, and precoding,"

Response *Response Status* **C**

ACCEPT.

Cl **116** *SC* **116.3.2** *P* **149** *L* **4** # 235

Ran, Adee Cisco

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

The editorial instruction says "Replace Figure 169-2 with the following figure:", which is Figure 116-2.

Similarly in several subsequent instructions (which should be to insert Figure 116-2a, replace Figure 116-3, etc.).

SuggestedRemedy

Change "169" to "116" in the all editorial instructions in clause 116.

Response *Response Status* **C**

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

Cl **116** *SC* **116.3.2** *P* **149** *L* **13** # 236

Ran, Adee Cisco

Comment Type **E** *Comment Status* **A** *PCS SI below*

The PMA service interface shown is missing an arrow for PMA:IS_SIGNAL.request.
This primitive is part of the inter-sublayer service interface (as defined in 116.3.3.4) and should be provided by all sublayers using it. It is indeed shown for all other sublayers, but not here.

Although there is no explicit instruction in the PCS sublayers on generation of this primitive, its definition in 116.3.3.4 should be sufficient.

Also in several other service interface diagrams and in some block diagrams, as listed in the suggested remedy.

SuggestedRemedy

Add a downward arrow with label "PMA:IS_SIGNAL.request" from the PCS to the PMA in each of the following figures:
Figure 116-2, Figure 116-2a, Figure 116-3, Figure 116-3a
Figure 169-2, Figure 169-2a, Figure 169-3 (twice)
Figure 174-2, Figure 174-3 (twice), Figure 174-4
Figure 185-3

Add a downward arrow with label "FEC:IS_SIGNAL.request" into the Inner FEC sublayer in Figure 185-3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Based on the response to comment #248, the singal IS_SIGNAL.request is being added to the TX interface of the PCS supporting 802.3dj PHYs.

The figures listed in the suggested remedy must all add the "inst:PMA_IS_SIGNAL.request" signal to the service interface below the PCS (or DTE XS) for the PHYs defined in 802.3dj.

Implement the suggested remedy, except that Figure 185-3 is removed based on the response to comment #21.

Also add the IS_SIGNAL.request signal out of the PCS sublayer in any additional figures that might be missing from this list.

Implement with editorial license.

[Editor's note: CC 169 174 185]

Cl **116** *SC* **116.3.3.4** *P* **153** *L* **42** # 237

Ran, Adee Cisco

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

The description of IS_SIGNAL.REQUEST says:
"The IS_SIGNAL.request primitive is generated by the transmit process to propagate the detection of severe error conditions (e.g., no valid signal being received by the sublayer) to the next lower sublayer <.>"

The parenthetic phrase is misleading; it is naturally interpreted as if there is no signal in the receive direction. Indeed, the semantics of the IS_SIGNAL.indication primitive in 116.3.3.3 uses the exact same phrase.

In fact the "request" primitive is all about the transmit direction; it is used to indicate that no valid signal is transmitted by the sublayer.

SuggestedRemedy

Change to "(e.g., no valid signal is transmitted)".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
It is ambiguous as to where the "received" is pointing to. The suggested remedy changes the context as the intent is to point out a valid signal is not being received from the sublayer above.
Change "(e.g., no valid signal being received by the sublayer)"
To "(e.g., no valid signal being received by the sublayer on IS_UNITDATA.request in the transmit direction)"
Make a similar change in 116.3.3.3.

Cl **116** *SC* **116.3.3.4.1** *P* **154** *L* **5** # 238

Ran, Adee Cisco

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

In IS_SIGNAL.request, the SIGNAL_OK can take the value FAIL.
"A value of FAIL indicates the sublayer has not established communication with the next higher sublayer."
This value is also the appropriate value with the sublayer is not functional for some reason (e.g. it is reset). This is a possible situation even when IN_PROGRESS and READY are supported.

SuggestedRemedy

Change to "A value of FAIL indicates the sublayer is not functional or has not established communication with the next higher sublayer."

Response *Response Status* **C**

ACCEPT.

Cl **119** *SC* **119.2.5.8.2** *P* **166** *L* **15** # 239

Ran, Adee Cisco

Comment Type **T** *Comment Status* **R** *PCS encode/decode*

The stateless decoder assumes that the received data represent valid Ethernet data and does not check it for valid frame structure, unlike the State-diagram decoder.

This should be emphasized for readers familiar with the original decoder defined in Clause 119 to prevent surprises. For example, validation suites may check the PCS with data that is not valid Ethernet and expect it to reject it.

The suggested remedy applies to this subclause (119.2.5.8.2) and to 175.2.5.9. It should also apply to 172.2.5.9.2, but it is currently not in the draft and may be out of scope.

SuggestedRemedy

Add a NOTE at the end of 119.2.5.8.2:
NOTE--The stateless decoder relies on the Reed-Solomon decoder for error correction and marking, and unlike the state-diagram decoder, it does not check the validity of Ethernet frames.

Add a similar note at the end of 175.2.5.9.
Add a similar note at the end of 172.2.5.9.2 if it is considered in scope.

Response *Response Status* **C**

REJECT.

The stateless PCS decoder is defined in 172.2.5.9.2 and there are references to it from CL 119 and CL 175. The best place for this note would be in 172.2.5.9.2 with the decoder definition itself. Since it would apply to all PHYs, not just those defined by 802.3dj, it would be more appropriate to add this note through maintenance.

There is no consensus to make this proposed change.

Cl **119** *SC* **119.3.4a** *P* **167** *L* **33** # 240

Ran, Adee Cisco

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

"The following counter is optional if the PCS is used in any of the following PHY types..."

What if it is used in other PHY types? is it not optional? or not allowed?

Although it is a new counter it should be optional for all PHY types. A PCS that operates in e.g. 400GBASE-DR4 and includes this counter should not be considered non-compliant.

Arguably, we could make it mandatory for the listed PHYs (it is mandatory in 175.2.5.3) and optional in all other cases. The suggested remedy does not take that path.

Also applies to the counters in 119.3.4b.

SuggestedRemedy

Delete the words "if the PCS is used in any of the following PHY types" and the lists of PHY types".
Implement in 119.3.4a and 119.3.4b with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #157.

Cl **119** *SC* **119.3.4a** *P* **167** *L* **33** # 157

Opsasnick, Eugene Broadcom

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

119.3.4a and 119.3.4b add optional FEC counters, FEC_cw_counter and FEC_codeword_error_bin_i. In each subclause, the register definition is preceeded by a statement that the defined counter is optional for the 200G/lane PHY types. While it is intended to add these registers as optional for the new PHY types in 802.3dj, this seems to imply that these new registers are "required" for all other PHYs (for example, previously specified PHYs over 50G and 100G lanes). It was likely the intent to not add these registers (as either required or optional) for other, older PHY types. However, there should be nothing wrong with just adding these registers as "optional" for all 200GE/400GE PHYs -- being optional would not affect the conformance of any previous implementations. Suggest removing the woring about being optional for specific PHY types and just make them optional for any implementation of the 200G/400G PCS.

SuggestedRemedy

In 119.3.4a and 119.3.4b remove the text:
"The following counter(s) is(are) optional if the PCS is used in any of the following PHY types:
- 200GBASE-KR1
- 200GBASE-CR1
- 200GBASE-DR1
- 200GBASE-DR1-2
- 400GBASE-KR2
- 400GBASE-CR2
- 400GBASE-DR2
- 400GBASE-DR2-2".

and modify the register definitions to say they are optional. Something like:

In 119.3.4a, change: "A 48-bit counter that counts"
to: "An optional 48-bit counter that counts"

In 119.3.4b, change: "A set of fifteen 32-bit counters"
to "An optional set of fifteen 32-bit counters"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It is out of scope to specify new (even optional) counters for existing 200G/400G PHYs not defined in 802.3dj. These optional counters should be defined only for use in the new PHYs specified in 802.3dj. However, the text needs to be updated to make this clear.

On page/line 167/33,
Change:
"The following counter is optional if the PCS is used in any of the following PHY types:"
To:
"The following optional counters may be implemented for these PHY types:"

On page/line 167/50,
Change:
"The following counters are optional if the PCS is used in any of the following PHY types:"
To:
"The following optional counters may be implemented for these PHY types:"

Implement with editorial license.

Cl **119** *SC* **119.3.4b** *P* **168** *L* **8** # 42

Bruckman, Leon Nvidia

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

For Annex 174A BLER, bin counters are 0 to 15, not 1 to 15

SuggestedRemedy

Change: "A set of fifteen 32-bit counters where counter i counts once for each codeword received with exactly i correctable 10-bit symbols when align_status is true, i = 1 to 15"
to: "A set of sixteen 32-bit counters where counter i counts once for each codeword received with exactly i correctable 10-bit symbols when align_status is true, i = 0 to 15"

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **119** *SC* **119.6** *P* **168** *L* **14** # 241

Ran, Adee Cisco

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

In the base standard, 119.6 lists the 200G/400G PMDs that need AN support from the PCS. The list should be expanded to include the new PMDs in this project.

SuggestedRemedy

Bring in subclause 119.6 (as modified by 802.3ck) and add 200GBASE-CR1, 200GBASE-KR1, 400GBASE-CR2, and 400GBASE-KR2, with editorial license.

Response *Response Status* **C**

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

Cl **169** *SC* **169.2.4b** *P* **179** *L* **11** # 158

Opsasnick, Eugene Broadcom

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

The line "For 800GBASE-LR1 the 800GBASE-LR1 Inner FEC is specified in Clause 184.", the repeating 800GBASE-LR1 is confusing.

SuggestedRemedy

Change "For 800GBASE-LR1 the 800GBASE-LR1 Inner FEC is specified in Clause 184."

to either:
"For the 800GBASE-LR1 PHY, the Inner FEC is specified in Clause 184."
or:
"The 800GBASE-LR1 Inner FEC is specified in Clause 184."

Response *Response Status* **C**

REJECT.
Though it is somewhat awkward, the wording is consistent with many other similar sentences in 169.2. This is just a rare case where the sublayer name has the same qualifier as the PHY type.

Cl **169** *SC* **169.2.4c** *P* **179** *L* **13** # 159

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *segmented FEC*

169.2.4c describes a "Segmented FEC sublayer" with a reference to its definition in CL 186. However, CL 186 has no reference to and never uses the term "Segemented FEC". It does however describe a portion of the 800G-ER1 FEC sublayer as an "Inverse FEC". The term "Segmented FEC" is usually associated with an overall FEC architecture, not a particular sublayer.

SuggestedRemedy

Change 169.2.4c to describe the "800GBASE-ER1 FEC" sublayer Instead of the "Segemented FEC" sublayer or else add something to CL 186 that defines what a "Segmented FEC sublayer" is.

The term "Segmented FEC" also appears in 169.3.2 on page 180, line 17. It should probably be changed to "800GBASE-ER1 FEC".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace 169.2.4b and 169.2.4c with the following...

"169.2.4b FEC sublayer

The 800GBASE-R and 800GBASE-LR1 Inner FEC sublayers provide error correction, in addition to that provided by the 800GBASE-R PCS, for the PMD.
For 800GBASE-DR4-2, 800GBASE-FR4, and 800GBASE-LR4, the 800GBASE-R Inner FEC is specified in Clause 177.
For 800GBASE-LR1, the 800GBASE-LR1 Inner FEC is specified in Clause 184.

The 800GBASE-ER1 FEC sublayer terminates the FEC provided by the 800GBASE-R PCS and replaces it with a separate FEC for use with the 800GBASE-ER1 and 800GBASE-ER1-20 PMDs.
The 800GBASE-ER1 FEC is specified in Clause 186."

Implement with editorial license.

Cl **169** *SC* **169.2.4c** *P* **179** *L* **15** # 119

Dudek, Mike — Marvell

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

Poor English (missing object)

SuggestedRemedy

Change " and replaces with a
separate FEC " to "and replaces it with a separate FEC"

Response *Response Status* **C**

ACCEPT.

Cl **169** *SC* **169.2.10** *P* **179** *L* **38** # 43

Bruckman, Leon — Nvidia

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

Text is hard to parse.

SuggestedRemedy

Change: "For each ISL, ILT provides a mechanism for a receiver to control transmitter states, such as equalization, modulation, and precoding states, on the peer transmitter,"
to: "For each ISL, ILT provides a mechanism for a receiver to control peer transmitter states, such as equalization, modulation, and precoding,"

Response *Response Status* **C**

ACCEPT.

Cl **169** *SC* **169.2.10** *P* **179** *L* **42** # 161

Opsasnick, Eugene — Broadcom

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

"and to coordinate transition to DATA mode" is missing a "the".

SuggestedRemedy

Change:
"and to coordinate transition to DATA mode"
To:
"and to coordinate the transition to DATA mode"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Similar text occurs in several other clauses.
Implement the suggested remedy with editorial license in 169.2.10 and other locations where similar text is used.

Cl **169** *SC* **169.3.2** *P* **180** *L* **27** # 242

Ran, Adee — Cisco

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

Figure 169-2 and Figure 169-3 exist in this amendment.

SuggestedRemedy

Make the cross-references active.

Response *Response Status* **C**

ACCEPT.

Cl **170** *SC* **170.1** *P* **190** *L* **34** # 162

Opsasnick, Eugene — Broadcom

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

The two lists of features for 800GMII and 1.6TMII in lines 34-46 are so similar, they should be combined into a single list. This would match what is written in the based spec in 117.1 for 200GMII/400GMII.

SuggestedRemedy

Change:
"The 800GMII has the following characteristics:
- It supports a speed of 800 Gb/s.
- Data and delimiters are synchronous to a clock reference.
- It provides independent 64-bit wide transmit and receive data paths.
- It supports full duplex operation only.

The 1.6TMII has the following characteristics:
- It supports a speed of 1.6 Tb/s.
- Data and delimiters are synchronous to a clock reference.
- It provides independent 64-bit wide transmit and receive data paths.
- It supports full duplex operation only."

to:

The 800GMII/1.6TMII have the following characteristics:
- The 800GMII supports a speed of 800 Gb/s.
- The 1.6TMII supports a speed of 1.6 Tb/s.
- Data and delimiters are synchronous to a clock reference.
- They provide independent 64-bit wide transmit and receive data paths.
- They support full duplex operation only.

Response *Response Status* **C**

ACCEPT.

Cl **171** *SC* **171.1** *P* **197** *L* **17** # 120

Dudek, Mike Marvell

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

In table 171-1 Footnote c should have been changed to footnote d on clauses 120G, 176C and 176D as well as 120F

SuggestedRemedy

change footnote c to footnote d on these clauses

Response *Response Status* **C**

ACCEPT.

Cl **171** *SC* **171.1** *P* **198** *L* **16** # 121

Dudek, Mike Marvell

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

In table 171-1a Footnote a should have been changed to footnote b on clauses 120G, 176C and 176D as well as 120F

SuggestedRemedy

change footnote a to footnote b on these clauses

Response *Response Status* **C**

ACCEPT.

Cl **171** *SC* **171.2** *P* **200** *L* **24** # 243

Ran, Adee Cisco

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

Figure 172-2 exists in this amendment.

SuggestedRemedy

Make the cross-reference active.

Response *Response Status* **C**

ACCEPT.

Cl **171** *SC* **171.8** *P* **209** *L* **4** # 244

Ran, Adee Cisco

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

Table 171-3 title and column heading mentions Clause 172.
Similarly Table 171-5a through 171-5c refer to Clause 175.

It is unclear why clause 171 should have tables of variables defined in other clauses. Assuming this is not an error, it should be clarified. The original text of 171.8 seemed to have some explanation, but the replacement text does not.

SuggestedRemedy

Add an explanation of the references to clauses 172 and 175, similar to what was included in the deleted text, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license.

Cl **171** *SC* **171.8** *P* **209** *L* **16** # 44

Bruckman, Leon Nvidia

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

In Tables 171-3, 171-5, 171.5b and 171-5d in the first column the names wrap around oddly

SuggestedRemedy

Fix the variable names in the first column of Tables 171-3, 171-5, 171-5b and 171-5d to be in one line

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **171** *SC* **171.8** *P* **209** *L* **20** # 245

Ran, Adee Cisco

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

"in subns" is not defined and is not helpful for the reader (what it means is anyone's guess). The register names in Clause 45 (added by 802.3cx) have "in sub-ns" instead, which is only slightly better.

Based on clause 30, these registers are in units of 2^-16 ns.

Multiple instances in the draft.

SuggestedRemedy

Change all instances of "in subns" preferably to "in units of 2^-16 ns", or if not within scope, to "in sub-ns".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
802.3cx-2023 uses the terms "sub-ns" as a quasi-unit of time and defines it in subclause 45.2.4.49 for use in the Table 45-314 register definitions as "units of 2^-16 ns", which these PHY XS register reference (registers 4.1809 to 4.1812). The TimeSync registers definitions in Table 171-3 of subclause 171.8 should be consistent with the register descriptions in Table 45-314 and use the "sub-ns" term as a unit of time.

In Table 171-3 on page 209, in the second column titled "PHY XS register name", change the units named "subns" to "sub-ns" in 4 places. Note "_subns_" is used in several variable names in the first and fourth columns of table 171-3 and should not be changed.

In addition, in 171.8, just prior to table 171-3 add the definiton of "sub-ns" as taken from 45.2.4.29:

"The maximum and minimum PHY XS transmit and receive path data delay values in table 171-3 are provided in two components. The first component (registers 4.1801 and 4.1802, 4.1803 and 4.1804, 4.1805 and 4.1806, 4.1807 and 4.1808) provides the integer nanoseconds portion of the PHY XS path data delays, in units of nanoseconds. The second component (registers 4.1809, 4.1810, 4.1811, and 4.1812) provides the fractional nanoseconds portion of the PHY XS path data delays, in units of 2^(-16) ns."

In addition, fix the typo in Table 171-3 in the line for MDIO status register PHY_XS_delay_ns_RX_min, in the third column, from "4.1807, 4.1809" to "4.1807, 4.1808".

Implement the above changes with editorial license.

Cl **172** *SC* **172.6** *P* **230** *L* **30** # 246

Ran, Adee Cisco

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

In the base standard, 172.6 lists the 800G PMDs that need AN support from the PCS. The list should be expanded to include the new PMDs in this project.

SuggestedRemedy

Bring in subclause 172.6 (added by 802.3df) and add 800GBASE-CR4 and 800GBASE-KR4, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license.

Cl **173** *SC* **173.4.2** *P* **231** *L* **45** # 98

Huber, Thomas Nokia

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

Since 800GBASE-ER1 is now described as a FEC sublayer, the interface below an 8:32 PMA can also be 800GBASE-ER1 FEC sublayer.

SuggestedRemedy

Change
"The interface below the PMA (32 lanes) connects with a PHY 800GXS or 800GBASE-LR1 Inner FEC."
to
"The interface below the PMA (32 lanes) connects with a PHY 800GXS, 800GBASE-ER1 FEC, or 800GBASE-LR1 Inner FEC.",
and update Figure 173-3 to include 800GBASE-ER1 as well.

Response *Response Status* **C**

ACCEPT.

Cl **174** *SC* **174.1.4** *P* **234** *L* **35** # 75

Huang, Kechao Huawei

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

In "Table 174-2 and Table 174-3 specifies
the correlation", the word "specifies" should be changed to "specify"

SuggestedRemedy

Change it as suggested

Response *Response Status* **C**

ACCEPT.

Cl **174** *SC* **174.2.12** *P* **237** *L* **39** # 45

Bruckman, Leon Nvidia

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

Text is hard to parse.

SuggestedRemedy

Change: "For each ISL, ILT provides a mechanism for a receiver to control transmitter states, such as equalization, modulation, and precoding states, on the peer transmitter," to: "For each ISL, ILT provides a mechanism for a receiver to control peer transmitter states, such as equalization, modulation, and precoding,"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement with editorial license.

Cl **174** *SC* **174.3.3** *P* **242** *L* **4** # 247

Ran, Adee Cisco

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

174.3.3 says "The semantics of the inter-sublayer service interface primitives for the 800GBASE-R sublayers are described in 116.3.3.1 through 116.3.3.3".
This project adds 116.3.3.4 with the semantics of IS_SIGNAL.request.

The same sentence appears also in 169.3.3 (not currently included in the amendment) .

In both cases, the reference can be to the parent subclause which will cover everything.

SuggestedRemedy

Change "in 116.3.3.1 through 116.3.3.3" to "in 116.3.3".
Add 169.3.3 to the draft and apply the same change there.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement with editorial license.

Cl **174** *SC* **174.5** *P* **243** *L* **23** # 122

Dudek, Mike Marvell

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

Better wording

SuggestedRemedy

Change "No physically instantiated interfaces at SP2 and SP3 (PMD service interface) are specified " to "No physically instantiated interfaces are specified at SP2 and SP3 (PMD service interface) "

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The general wording change is a good suggestion. However, SP3 should be SP5.

Change:
"No physically instantiated interfaces at SP2 and SP3 (PMD service interface) are specified."
To:
"No physically instantiated interfaces are specified at SP2 and SP5 (PMD service interface)."

Cl **174** *SC* **174.5** *P* **245** *L* **12** # 173

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **R** *Skew value*

Table 174-5 should have a max skew of 25ns listed for SP2. (This is required as a reference from 177.4.1.2.)

SuggestedRemedy

Add Maximum skew values for SP2 in table 174-5.

Response *Response Status* **C**

REJECT.
SP2 and SP5 are only applicable if there is a physically instantiated interface at the PMD service interface. There are no physically instantiated PMD service interfaces defined for 1.6TBASE-R PHYs at this time, nor any other PHYs defined in the 802.3dj project.

Therefore, the values for SP2 and SP5 should not be added to Table 174-5.

The reference from 177.4.1.2 is addressed by comment #77.

Cl **174A** *SC* **174A.6** *P* **662** *L* **31** # 16

Brown, Matt
Alphawave Semi

Comment Type **T** *Comment Status* **A** *Error ratio*

CRC error ratio based on 6E-11. However, this would not account for an Extender plus a pair of AUIs in the PHY. Options:
(a) disallow extender
(b) state that either extender or AUIs in PHY, but not both
(c) reduced FLR for PCS-to-PCS to 5.8E-11.

SuggestedRemedy

A contribution will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed part 2 of the following contribution:
https://www.ieee802.org/3/dj/public/25_03/brown_3dj_04a_2503.pdf

Straw poll TF-3 and TF-4 showed consensus for adopting option 2 in brown_3dj_04a_2503.

Implement option #2 as shown in slides 18 and 24 with editorial license.

Straw Poll TF-3 (pick one) and TF-4 (chicago)
For addressing 800GBASE-ER1 frame loss ratio budget I support the following option as outlined in brown_3dj_04a_2503:
A: option 1
B: option 2
C: option 3
D: option 4
E: option 5
F: abstain

TF-3: A: 2 B: 27 C: 1 D: 2 E: 8 F: 24
TF-4: A: 2 B: 31 C: 3 D: 4 E: 16 F: 23

Related to this comment the text in 187.2 and 174A should be updated based on the following:
- align with similar subclauses in other PMD clauses
- to account for the new CRC error ratio measured at the FEC decoder output rather than at the 800GBASE-R PCS
- to address the concern raised in D1.4 Comment #155, if adopted
- to fix reference to 174A.5 instead of 174A.4
- in 174A.6 there is a reference to 174A.9 which defines codeword error ratio, not CRC error ratio

Change the text in 187.2 as follows:

"With a compliant input signal, a PHY receiver is expected to meet the frame loss ratio specifications in 174A.5.

With a compliant input signal, a PMD receiver is expected to meet the CRC error ratio specifications in 174A.6, measured at the FEC decoder output."

Add new subclause 174A.x after 174A.9 which define CRC error ratio, and in 174A.6 change "see 174A.9" to "see 174A.x".

Implement all with editorial license.

Cl **175** *SC* **175.1.4.2** *P* **248** *L* **53** # 248

Ran, Adee Cisco

Comment Type **T** *Comment Status* **A** *PCS SI below*

As stated in another comment, the last two rows of Table 176-6 (and the footnote they point to) are equivalent to an assumption that a PCS or DTE XS always generates IS_SIGNAL.request with the value OK.

However, an implementation of a PCS or DTE XS can sometimes not generate a valid signal for the purpose of IS_SIGNALrequest - for example, when it is reset or disabled. It should be allowed (if not required) to indicate such a state by a value FAIL for this primitive.

This behavior above is already included in the definition of IS_SIGNAL.request in 116.3.3.4 (a PCS not generating a signal as specified falls under "severe error conditions"). If it is considered necessary, it can be included explicitly in the PCS clauses too.

The suggested remedy intends to make using the FAIL value required only for new implementations, to avoid adding new requirements to existing implementations.

SuggestedRemedy

In the "Service interface below the PCS" subclause (175.1.4.2), add the following paragraph:
The PCS provides signal status information to the sublayer below it using the inst:IS_SIGNAL.request primitive. The SIGNAL_OK parameter of this primitive has the value OK when the PCS is functional. A value of FAIL indicates that the PCS is not functional. Generating this primitive with the value FAIL when the PCS is not functional is required when the sublayer below the PCS is an SM-PMA or Inner FEC, and is otherwise optional.

Implement the same change in 172.1.5.2.

Add 119.1.4.2 to the draft and implement the same change there.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

IS_SIGNAL.request has already been added to the service interfaces of the PMA, FEC and PMD sublayers in all relevant 802.3dj clauses to support ILT.

Adding IS_SIGNAL.request(SIGNAL_OK) to all relatated PCSs, for 200G/400G/800G/1.6TE (Clauses 119, 172, and 175) will not change the funtional behavior of the PCS sublayer, but will create a cleaner service interface definition for ILT functionality and possibly other features. In addition, the specifications for SIGNAL_OK generation in the PMA and FEC sublayers becomes cleaner. The value of SIGNAL_OK sent by the PCS is always OK when out of reset, or FAIL during reset. This change is limited to the PHYs defined in 802.3dj.

Implement the suggested remedy in 175.1.4.2, 172.1.5.2, and 119.1.4.2 with editorial license.

Also add the IS_SIGNAL.request output to the service interface below the PCS in figures 119-2, 172-2, and 175-2.

Remove the last two rows and footnote (e) from Table 176-6 (which are there to account for an attached PCS not having the IS_SIGNAL.request present) and remove footnote (f) from Figure 176-2.

[Editor's note: CC 119 172 176]

Cl **175** *SC* **175.2.4.7** *P* **258** *L* **5** # 249

Ran, Adee Cisco

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

"to form two 514 10-bit symbol FEC messages mA and mB from tx_scrambled_am_f0 in flow 0 and mC and mD from tx_scrambled_am_f1 in flow 1"

This is not quite clear...
"two 514 10-bit" has too many numbers in a row, and the initial "two" seems to refers to m_A and m_B - but then there are m_C and m_D, so should it be "four"?

SuggestedRemedy

Change to "to form two FEC messages, mA and mB, from tx_scrambled_am_f0, and two FEC messages, mC and mD, from tx_scrambled_am_f1, where each FEC message contains 514 10-bit symbols".

Or reword in some other way (175.2.4.8 seems to repeat the same statements in a different way).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Update the text based on the suggested remedy with editorial license.

Cl **175** *SC* **175.2.5.3** *P* **261** *L* **10** # 46

Bruckman, Leon Nvidia

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

For Annex 174A BLER, bin counters are 0 to 15, not 1 to 15

SuggestedRemedy

Change: "A set of fifteen 32-bit counters where counter i counts once for each codeword received with exactly i correctable 10-bit symbols when align_status is true (i=1 to 15)."
to: "A set of sixteen 32-bit counters where counter i counts once for each codeword received with exactly i correctable 10-bit symbols when align_status is true (i=0 to 15)."
Update also corresponding MDIO Table 175-4 entry

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **175** *SC* **175.2.6.2.2** *P* **263** *L* **38** # 15

Brown, Matt — Alphawave Semi

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

PCS_reset is defined as "Boolean variable that is true when set by a management entity and is false otherwise." But it is intended to reflect the state of management variable PCS_reset, so why not say that. There is a similar issue with PMA_reset in clause 176, FEC_reset in clauses 177, 184, and 186.

SuggestedRemedy

Change defintion of PCS_reset to "Boolean variable that that is set to true or false when PCS_management variable (see Table 175-3) is 1 or 0, respectively." or similar
Make similar changes in clauses 176, 177, 184, and 186.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **175** *SC* **175.2.6.3** *P* **264** *L* **53** # 250

Ran, Adee — Cisco

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

Here we have
"Note that EEE and low-power idle are not supported, and the optional states TX_LI and RX_LI are not used"
But in 175.2.4.1 and 175.2.5.9 there are references to the state-diagram encoder and decoder, respectively, without this note.

To avoid duplicity and apparent contradiction, this note should appear in the encoder and decoder definitions.

The "state diagram figures" subclause includes a lot of descriptive text and should perhaps be made shorter in other ways.

SuggestedRemedy

Delete the last paragraph of 175.2.6.2 (from "The transmit state diagram" to "172.2.4.1.2 and 172.2.5.9.2, respectively").
Add the required statements about EEE/LPI in 175.2.4.1 and 175.2.5.9 instead.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The suggested remedy mentions to delete text from 175.2.6.2, but appears that this should be a reference to 175.2.6.3.

Adding the statement about EEE/LPI to 175.2.4.1 and 175.2.6.9 is not necessary for the understanding of the functions since the referenced figures already contain a note that those states are only required to support EEE and it is already stated in 175.2.3 that EEE is not supported.

Delete the last paragraph of 175.2.6.3 from "The transmit state diagram" to "172.2.4.1.2 and 172.2.5.9.2, respectively".

Cl **176** *SC* **176.1.5** *P* **278** *L* **25** # 192

Slavick, Jeff — Broadcom

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

Are these foonotes really necessary? The only one that seems needed is footnote d.

SuggestedRemedy

Remove all footnotes from Table 176-1 and 176-2 except footnote d and remove the m:k and k:m before the BM-PMA. Remove all footnotes from Tables 176-3 and 176-4.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It would be better to remove footnotes which are not necessary. The details in the current footnotes are already captured in Annex 176B as well as the conventions and definitions in 176.1.3.

For Table 176-1, remove all footnotes except footnote (d), and remove the "k:m" modifier for BM-PMA.

For Table 176-2, remove all footnotes except footnote (d), and remove the "m:k" modifier for BM-PMA.

For Table 176-3, remove footnotes (b) and (c), and change footnote (a) to exclude 1.6TBASE-R 16:16.

For Table 176-4, remove all footnotes.

Implement with editorial license.

Cl **176** *SC* **176.2** *P* **280** *L* **40** # 163

Opsasnick, Eugene — Broadcom

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

It is strange that the same line "In addition to the primitives noted above, an associated clock is transferred from input to output along with
the IS_UNITDATA primitives in the transmit and receive direction." is repeated at the end of both subclause 176.2 and 176.3.

SuggestedRemedy

Both of these lines can probably be omitted since the same information is given at the end of the intro section 176.1.4.

Alternatively, it would make sense to modify each of these lines to be more specific to the generation of the interface signals at PMA service interface (176.2) and the service interface below the PMA. For example,
change the last sentense of 176.2 to be:
"In addition to the primitives noted above, an associated clock is transferred from input to output along with
the IS_UNITDATA primitives in the receive direction."

And change the last sentence of 176.3 to be:
"In addition to the primitives noted above, an associated clock is transferred from input to output along with
the IS_UNITDATA primitives in the transmit direction."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The sentence at the end of 176.1.4 states the following:
"The PMA transmit clock is passed from the interface above the PMA to the interface below in the transmit direction, and the PMA receive clock is passed from the interface below the PMA to the interface above in the receive direction.".

As the comment notes, this captures the same information that is in the last lines of 176.2 and 176.3. Additionally, the lines in 176.2 and 176.3 are redundant with each other.

Delete the last sentence in 176.2 and in 176.3.

Cl **176** SC **176.3** P **281** L **45** # 251

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *PCS SI below*

The last two rows of Table 176-6 include the value "no primitive". This is not a valid value for SIGNAL_OK, and it is somewhat unclean to define the logic this way.
The footnote says "When PMA:IS_SIGNAL.request input is not present", assuming that a PCS does not generate this primitive. But this primitive is not defined as optional, nor excluded from the PCS. The PCS clauses state that the service interface below the PCS "... is an instance of the inter-sublayer service interface defined in ...", and that means it includes the IS_SIGNAL.request primitive.

(Noting that "the service interface definitions are abstract and do not imply a particular implementation", having that primitive in the service interface below the PCS does not imply a particular implementation).

Since the two "no primitive" rows are identical to the two "OK" rows, this is equivalent to assuming that a PCS or DTE XS always generates OK. However, an implementation of a PCS or DTE XS can sometimes not generate a valid signal for the purpose of IS_SIGNALrequest - for example, when it is reset or disabled. It should be allowed (if not required) to indicate such a state by a value FAIL for this primitive, which would create the desired effect in this table. This is addressed by another comment. The suggested remedy here is independent of the resolution of the other comment.

SuggestedRemedy

In Table 176-6, delete the bottom two rows and footnote e.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #248.

Cl **176** SC **176.4.1** P **283** L **12** # 170

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *PRBS requirements*

The PRBS32 and PRBS32Q test pattern generators and checkers are now required in 176.7.4.1 and 176.7.4.2. The figure footnote (a) which indicate the test pattern generator and checker are optional should be removed at lines 12 and 31 of Figure 176-2 on page 283. as well as Figure 176-12 on page 300, and Figure 176-13 on page 302.

SuggestedRemedy

Update figures 176-2, 176-12, and 176-13 to remove the "optional" footnote fro mteh test pattern generator and test pattern checker. Also update any text that still referes to the test pattern generators and checkers as optional.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #123.

Cl **176** SC **176.4.2.3.2** P **285** L **14** # 76

Huang, Kechao Huawei

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

"a 20-bit boundary (two RS-FEC symbols)" should be changed to "a 20-bit (two RS-FEC symbols) boundary";
also "a 40-bit boundary (4 RS-FEC symbols)" should be changed to "a 40-bit (4 RS-FEC symbols) boundary" in page 285 line 25

SuggestedRemedy

Change it as suggested

Response *Response Status* **C**

REJECT.
The text is not incorrect as written. The suggested remedy does not improve clarity of the draft.

Cl **176** SC **176.4.2.4** P **285** L **41** # 164

Opsasnick, Eugene Broadcom

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

Cross-rreference to 176.4.3.4.1 should be 176.4.2.4.1.

SuggestedRemedy

Fix the cross reference and make it active.

Response *Response Status* **C**

ACCEPT.

Cl **176** SC **176.4.2.4** P **285** L **43** # 165

Opsasnick, Eugene Broadcom

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

Cross-rreference to 176.4.3.4.2 should be 176.4.2.4.2.

SuggestedRemedy

Fix the cross reference and make it active.

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.4.3.2** *P* **292** *L* **14** # 166

Opsasnick, Eugene Broadcom

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

The symbol demultiplexing function must achieve symbol lock on all input PMALs.

SuggestedRemedy

Change this sentence:
"The symbol demultiplexing function locates the correct symbol demultiplex boundary and achieves symbol
lock on a given input lane."
To:
"The symbol demultiplexing function locates the correct symbol demultiplex boundary and achieves symbol
lock on each input PMAL."

Also on line 15, may want to change "After all input lanes" to be "After all input PMALs".
And on line 40 of the same page, maybe change "input. lane" to "PMAL" since most of the text is now using PMAL.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license.

Cl **176** *SC* **176.4.3.2.1** *P* **292** *L* **24** # 193

Slavick, Jeff Broadcom

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

and comprises of seems wrong.

SuggestedRemedy

Change "and comprises of" to "it is comprised of"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The convention in 802.3 is to use "is composed of" rather than "comprises". Also, the block diagram is not "composed of" anything, rather the "20-bit demultiplexing function" is.
Fix use of "comprise" and "comprises" here and elsewhere in the draft.
on page 292 line 24 change to "A functional block diagram of a 1:8 symbol-pair demultiplexer, which is composed of a 20-bit demultiplexing function and an alignment marker lock function (see 176.4.3.2.3), is shown in Figure 176-9."
on page 379 line 29 change "comprises" to "is composed of"
on page 433 line 34, page 457 line 3, page 483 line 34, page 508 line 1 change "comprised of" to "composed of"
on page 579 line 48, change "comprise" to "are composed of"
on page 773 line 44 (twice), change "is comprised of" to "is composed of"

Implement with editorial license.

[Editor's note: CC 179 180 181 182 183 186 178B]

Cl **176** *SC* **176.4.4.2.1** *P* **294** *L* **48** # 156

Opsasnick, Eugene Broadcom

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

It appears that a second variable was added to this list. The introductory sentence should be updated.

SuggestedRemedy

Change: "The following variable is common ..."
To: "The following variables are common ..."

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.4.4.2.1** *P* **295** *L* **39** # 167

Opsasnick, Eugene Broadcom

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

The index variable "n" is used in the definition of several dumux variables. It does correspond to how "n" is is used in Figure 172-3, and the generic usage for "m:n PMA" as well as "n:m PMA" However I would still be usful to define "n" at the introduction to the demux variables in a simlar way that "x" is defined in 176.4.4.2.

SuggestedRemedy

Add a sentence at line 39 or page 295 something like: "The index variable n represents the number of PMAL input lanes."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **176** *SC* **176.4.4.3** *P* **297** *L* **9** # 168

Opsasnick, Eugene Broadcom

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

Fix singlular tense verb to plural for the subject containing two named variables in this sentence.

SuggestedRemedy

Change:
"When all_locked_demux and the pcs_lanes_identified_demux variable is true, then."
To:
"When the all_locked_demux and pcs_lanes_identified_demux variables are both true, then."
with editorial license.

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.7.4** *P* **303** *L* **54** # 169

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *PRBS requirements*

The PRBS32 and PRBS32Q test pattern generators and checkers are now required in 176.7.4.1 and 176.7.4.2, but the introduction paragraph still says they are all optional.

SuggestedRemedy

Change this text:
"the PMA may optionally generate and detect test patterns."
to:
"the PMA shall generate and detect test patterns."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #123.

Cl **176** *SC* **176.7.4** *P* **304** *L* **54** # 123

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *PRBS requirements*

It is confusing that in this section it says "the PMA may optionally generate and detect test patterns" whereas in 176.7.4.1 it says "A PMA shall include a PRBS31 pattern generator and checker" and in 176.7.4.1 it says "A PMA shall include a PRBS31Q pattern generator and checker". Does this mean that all PMA's have to include both the PRBS31 and PRBS31Q generators and checkers but it is optional to use them? If I look at Figures 176-2,12 and 13, the test pattern generate and check are always respectively before the PAM4 encode and after the PAM4 decode but the SSPRQ and PRBSQ and square wave patterns shouldn't be further PAM4 encoded.

SuggestedRemedy

Clarify the diagrams and descriptions. I think the requirement for the PRBS31 test pattern generator and checker is only required for a PMA when it is connected to an Inner FEC, (or maybe the PRBS31Q pattern is not needed because it is generated by inputing PRBS31 into the PAM4 encoder.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_03/dudek_3dj_01_2503.pdf

Slides 8 to 14 in the following contribution were reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_03/brown_3dj_03a_2503.pdf

Implement the proposal in dudek_3dj_01_2503 slide 7 and slides 12 to 14 in brown_3dj_03a_2503 with editorial license.

Cl **176** *SC* **176.7.4.1** *P* **304** *L* **6** # 195

Slavick, Jeff — Broadcom

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

Is it "A" PMA or "The PMA". I think it should be the latter.

SuggestedRemedy

Change "A PMA" to "The PMA" in 176.4.1 through 176.4.6

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "A PMA" to "The PMA" in 176.7.4.1 through 176.7.4.6.

Cl **176** *SC* **176.7.4.1** *P* **304** *L* **6** # 26

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *PRBS requirements*

PRBS31 should be mandatory only for PMA bottom output/input adjacent to an xBASE-R Inner FEC sublayer and is otherwise not needed. PRBS31 never required on top side of a PMA.

SuggestedRemedy

Update 176.7.4.1 accordingly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #123.

Cl **176** *SC* **176.7.4.2** *P* **304** *L* **9** # 27

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *PRBS requirements*

PRBS31Q should be mandatory only for PMA input/output adjacent to PMD (bottom only) or an AUI component (top or bottom). It is otherwise not needed.

SuggestedRemedy

Update 176.7.4.2 accordingly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #123.

Cl **176** *SC* **176.7.4.7** *P* **304** *L* **31** # 197

Slavick, Jeff — Broadcom

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

The 1.6TBASE-16 PMA does not require these registers as they're only associated with 200Gbps interfaces per 174A.7

SuggestedRemedy

Add "(except in a 1.6TBASE-16 PMA)" after "pattern checker".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

1.6TBASE-R 16:16 is already excluded since the counters are limited to PMALs.

Change:
"Each PRBS31Q test pattern checker shall include block error detection and 17 related counters. Block error detection and behavior of the counters is defined in 174A.7.

The following counters shall be implemented per PMAL i, where i = 0 to n-1 and n is the number of PMALs."

To:
"The PRBS31Q test pattern checker in each PMAL shall include block error detection and 17 related counters. Block error detection and behavior of the counters is defined in 174A.7.

The following counters are implemented per PMAL i, where i = 0 to n-1 and n is the number of PMALs."

Cl **176** *SC* **176.7.4.7** *P* **304** *L* **31** # 116

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *PRBS requirements*

The block error detection and counters is required for the PRBS31 checker as well.

SuggestedRemedy

Change "Each PRBS31Q test pattern checker"
To "Each PRBS31 (see 176.7.4.1) or PRBS31Q (see 176.7.4.2) test pattern checker"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #123.

Cl **176** *SC* **176.11** *P* **307** *L* **7** # 171

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *PRBS requirements*

Variable PRBS31Q_pattern_enable is defined, but an enable variable for PRBS31 seems to be missing.

SuggestedRemedy

Add variable PRBS31_pattern_enable to table 176-8. PRBS31 ability variables should also be added to table 176-9.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #123.

Cl **176** *SC* **176.11** *P* **308** *L* **9** # 199

Slavick, Jeff Broadcom

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

To make the Clause 45 register expandable. Change the ordering of the register assignments to be bin then lane rather than lane then bin.

SuggestedRemedy

Change Table 176-9 to be:
test_block_error_bin_<0:7>_0 for 1.2600 to 12623
test_block_error_bin_<0:7>_1 for 1.2624 to 12647
test_block_error_bin_<0:7>_3 for 1.2648 to 12671
test_block_error_bin_<0:7>_3 for 1.2672 to 12695
test_block_error_bin_<0:7>_4 for 1.2696 to 12719
test_block_error_bin_<0:7>_5 for 1.2720 to 12743
test_block_error_bin_<0:7>_6 for 1.2744 to 12767
test_block_error_bin_<0:7>_7 for 1.2768 to 12791
test_block_error_bin_<0:7>_8 for 1.2792 to 12815
test_block_error_bin_<0:7>_9 for 1.2816 to 12839
test_block_error_bin_<0:7>_10 for 1.2840 to 12863
test_block_error_bin_<0:7>_11 for 1.2864 to 12887
test_block_error_bin_<0:7>_12 for 1.2888 to 12911
test_block_error_bin_<0:7>_13 for 1.2912 to 12935
test_block_error_bin_<0:7>_14 for 1.2936 to 12959
test_block_error_bin_<0:7>_15 for 1.2960 to 12983
test_block_error_bin_<0:7>_16p for 1.2984 to 12307

Response *Response Status* **C**

REJECT.
The current allocation nicely groups sets of registers by lane. The changes proposed would mean that registers for a single lane would not be adjacent.

Cl **176B** *SC* **176B.6.1** *P* **694** *L* **39** # 31

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

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

800GAUI's are permissable within 800GBASE-LR1, 800GBASE-ER1 and 800GBASE-ER1-20 PHYS. The guidelines in 176B.6.1 do not reflect this.

SuggestedRemedy

Add sentence at end of last paragraph on 694:
These instantiations are also relevant to the 800GBASE-R PHY types listed in Table 169-4.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Add sentence at end of the first paragraph in 176B.6.1:
"These instantiations are also relevant to the 800GBASE-R PHY types listed in Table 169-4."
Also update diagrams and text to be inclusive of the 800GBASE-ER1/ER1-20 PHY types.
Implement with editorial license.

Cl **176C** *SC* **176C.1** *P* **701** *L* **24** # 85

Huang, Kechao Huawei

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

In "Physical layer partitioning options", the word "layer" should be changed to "Layer"

SuggestedRemedy

Change it as suggested, and make the same change in page 722 line 25, sub-clause 176D.1.

Response *Response Status* **C**

ACCEPT.

Cl **176C** *SC* **176C.2.1** *P* **702** *L* **6** # 267

Ran, Adee Cisco

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

"Functional specification" is 176C.2.1, below 176C.2 which is "Error ratio allocation". This is not the correct place in the hierarchy (and it is different from 176D).

SuggestedRemedy

Promote "Functional specification" to become 176C.3, renumbering the subsequent subclauses.

Response *Response Status* **C**

ACCEPT.

Cl **176C** *SC* **176C.2.1** *P* **702** *L* **7** # 72

Bruckman, Leon Nvidia

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

Not clear why is the Functional specification a sub-section of Error Ratio Allocation

SuggestedRemedy

Promote section "Functional specification" to 176C.3 to make it consistent with a similar section in Annex 176D

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #267.

Cl **176C** *SC* **176C.2.1** *P* **702** *L* **13** # 73

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *Functional specification*

In Annex 176D the similar section (176D.3) includes text describing the ILT support

SuggestedRemedy

After the third paragraph in the section add adjusted text from the third and fourth paragraphs in 176D.3

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #268.

Cl **176C** *SC* **176C.2.1** *P* **702** *L* **18** # 268

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *Functional specification*

There is no mention in the functional specifications that a C2C component should support the ILT function.
Also, the coefficients and presets supported by a C2C transmitter are not listed.

The suggested remedy is based on the corresponding text in 176D.3, and refers to the C2M presets in Table 176D-9, which are the same as those of C2C.

SuggestedRemedy

Change the 3rd paragraph and insert a paragraph after it, as follows:

"An n-lane C2C component is functionally equivalent to a corresponding n-lane PMD specified in Clause 178 (see 178.8) using PAM4 signaling at a nominal signaling rate of 106.25 GBd on each lane. The service interfaces are defined in 176C.3. Specifically, a C2C component shall provide the inter-sublayer link training (ILT) function for a Type E1 interface, specified in Annex 178B. When the variable mr_training_enable is true, the ILT function is used to request changes to the C2C peer transmitter state (modulation, training pattern, and precoder state), control the transmitter output on each lane, indicate the receiver state, and coordinate transition to DATA mode.

A C2C component transmitter supports the coefficient indexes k_list = {-3, -2 -1, 0, 1} and the initial conditions preset 1 through preset 6 and initialize (see Table 176D-9)."

Response *Response Status* **C**

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

Cl **176C** *SC* **176C.4.3** *P* **705** *L* **38** # 269

Ran, Adee Cisco

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

In Table 176C-2, Common-mode voltage has max and min in separate rows. In Annex 176D it is a range, which is more readable.
Also, the parameter should be called DC common-mode voltage, as in other clauses.

SuggestedRemedy

Change to "DC common-mode voltage", with range in a single row as in Table 176D-1.

Response *Response Status* **C**

ACCEPT.

Cl **176C** *SC* **176C.5.3** *P* **705** *L* **47** # 270

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *Steady-state voltage*

In Table 176C-2, the transmitter steady-state voltage is only defined in terms of a minimum dv_f of 0 V. This corresponds to a minimum v_f spec (0.4 V with A_v=0.385 V) but there is no maximum.
With the current specs v_f can be above 0.5 V. This would contradict the COM assumption about NEXT (A_ne=0.481 V).
Compare to C2M specifications in Table 176D-2 where the v_f specification is a range.

SuggestedRemedy

Change the dv_f specification from min to range, from 0 to 0.1 V, corresponding to v_f between 0.4 and 0.5 V.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment addresses a gap in the specification. The proposed change addresses the gap and is consistent with the adopted transmitter specification.

Implement the suggested remedy with editorial license.

Cl **176C** *SC* **176C.5.4** *P* **708** *L* **48** # 126

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *Steady-state voltage*

The max initiliazation voltage for ILT is 0.5 * (0.75+0.025) = 0.3875. Only if the receiver asks for a higher voltage than this during training will it ever exceed this and the receiver should be able to choose not to do this.

SuggestedRemedy

Change Amplitude tolerance from 0.5V to 0.39V. Add to the end of the footnote "in the Initialize condition". Make the same change in Tables 176D-4 and 176D-5.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Amplitude tolerance is defined in terms of steady-state voltage which is defined at preset 1, so the existing value is correct.

However, an informative note would be helpful to clarify the requirement.

Add the folowing note after Table 176C-4:
"NOTE -Steady-state voltage is defined with preset 1. It is not initially generated by a transmitter, due to the initialize setting in Table 176D-9. The receiver is not required to tolerate preset 1 unless it specifically requests it."
Add similar notes after Table 176D-4 and Table 176D-5.

In 176C.5.4.2 change
"When a PMD receiver is connected to a compliant transmitter that has the maximum allowed steady-state voltage (see Table 178-9)"
to
"When a PMD receiver is connected to a compliant transmitter that has a steady-state voltage (as defined in 179.9.4.1.2) equal to the Amplitude tolerance listed in Table 176C-4"

Implement with editorial license.

[CC: 176C, 176D]

Cl **176D** *SC* **176D.6.3** *P* **727** *L* **13** # 271

Ran, Adee Cisco

Comment Type **T** *Comment Status* **A** *DC common-mode*

In Table 176D-2, Host output DC common mode voltage range is 0 to 1 V, while in Clause 178 and Annex 176C it is 0.2 to 1 V (which follows precedence in 802.3ck).
Similarly for host input in 176D.6.5, Table 176D-4.
The ranges should be aligned.
To facilitate design with no AC coupling caps, the DC common mode should be large enough to prevent negative single-ended voltages.

SuggestedRemedy

Change the DC common-mode voltage range to "0.2 to 1" for both host output and input.
Also, change the module DC common-mode voltage tolerance requirements (input and output) to a range of 0.15 to 1.05 V.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following straw poll was taken.
Straw poll #E-7 (choose one) (decision)
I support accepting the suggested remedy with editorial license.
Y: 24 N: 6 A: 10

Implement the suggested remedy with editorial license.

Cl **176D** *SC* **176D.6.3** *P* **727** *L* **14** # 272

Ran, Adee Cisco

Comment Type **T** *Comment Status* **R** *DC common-mode*

Host output (Table 176D-2) and input (Table 176D-4) do not have DC common mode tolerance specifications.
Although the module is assumed to include AC caps, difference between host and module common mode can cause inrush current that the host needs to tolerate.

Having a defined DC common mode tolerance specification would also facilitate operation with modules that do not include AC coupling caps, which may become the norm at 200 Gb/s per lane.

SuggestedRemedy

Add host input/output DC common mode tolerance specifications, aligned with those of the module (which may be modified by another comment).

Response *Response Status* **C**

REJECT.
Host output tolerance is not required, since the module input is assumed to be AC coupled (possibly internal to its chip) and have high DC impedance.
Host input tolerance specification may be required to enable modules without external AC coupling at their output.

Host input tolerance specification could be considered to enable modules without AC coupling at their output. However, this module feature has not been proposed, and is not required for technical completeness.

Cl **176D** *SC* **176D.6.3** *P* **727** *L* **38** # 138

Calvin, John Keysight Technologies

Comment Type **T** *Comment Status* **R** *Jitter*

JRMS value of .023 UI is below the value of most 212G silicon. Recommend making this .026 UI.

SuggestedRemedy

.023 is un-realistically tight and has 0 margin, recommend making this value 0.026

Response *Response Status* **C**

REJECT.
The definition of JRMS has changed in D1.4. Insufficient evidence has been provided to support the proposed change.
Changes to transmitter specifications can affect the COM parameters and receiver specifications.
It is recommended to provide data and explore this topic further during Working Group Ballot.

Cl **176D** *SC* **176D.6.4** *P* **728** *L* **13** # 273

Ran, Adee Cisco

Comment Type **T** *Comment Status* **R** *DC common-mode*

Module output (Table 176D-3) and input (Table 176D-5) do not have DC common mode specifications.

Although the module is assumed to include AC caps, difference between host and module common mode can cause inrush current that the host needs to tolerate.

Having a defined DC common mode specification would also facilitate operation with modules that do not include AC coupling caps, which may become the norm at 200 Gb/s per lane.

It may be argued that when a module includes AC caps (as specified) the common mode may not be as easy to measure as it is for DC-coupled input/output - but there are ways to do it.

SuggestedRemedy

Add module input/output DC common mode specifications, aligned with those of the host (which may be modified by another comment).

Response *Response Status* **C**

REJECT.
Module input specification is not required, since the module input is assumed to be AC coupled (possibly internal to its chip) and have high DC impedance.

Module output specification could be considered to enable modules without AC coupling at their output. However, this module feature has not been proposed, and is not required for technical completeness.

Cl **176D** *SC* **176D.7.2** *P* **730** *L* **51** # 180

Swenson, Norman Point2; Infinera

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

"The parameters in Table 176D-7" is ambiguous, because the table includes host and module parameters.

SuggestedRemedy

Change "The parameters in Table 176D-7" to "The host parameters in Table 176D-7"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
It is assumed that the comment refers to the third paragraph of 176D.7.2 (which points to Table 176D-6, rather than Table 176D-7).

Change "The parameters in Table 176D-6" to "The host parameters in Table 176D-6".

Cl **176D** *SC* **176D.7.2** *P* **731** *L* **18** # 181

Swenson, Norman Point2; Infinera

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

The terminology in the table should align with the terminology in 178A for clarity. Per 178A.1.4, the blocks comprising the Tx and Rx S-parameter model are: Device termination, Device Package and Partial host channel (optional).

SuggestedRemedy

Change "Device model" to "Device termination model for Host and Module"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In Table 176D-6, Change "Device model" to "Device termination model".
Implement similarly in Table 178-12, Table 179-16, and Table 176C-7.

Apply the corresponding changes in all references to these tables, with editorial license.
[CC 178, 179, 176C, 176D]

Cl **176D** *SC* **176D.7.2** *P* **731** *L* **25** # 182

Swenson, Norman Point2; Infinera

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

The terminology in the table should align with the terminology in 178A for clarity.

SuggestedRemedy

Change "Host package model" to "Device package model for Host"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment identifies an inconsistency that should be addressed.
Change all instances of "package" referring to the device package model in 178A.1.4, where necessary, to "device package".
Implement throughout the draft with editorial license.
[CC 178, 179, 176C, 176D, 178A, 179A]

Cl **176D** *SC* **176D.7.2** *P* **731** *L* **37** # 183

Swenson, Norman Point2; Infinera

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

The terminology in the table should align with the terminology in 178A for clarity.

SuggestedRemedy

Change "Module package model" to "Device package model for Module"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #182.

Cl **176D** *SC* **176D.7.2** *P* **731** *L* **46** # 184

Swenson, Norman Point2; Infinera

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

The terminology in the table should align with the terminology in 178A for clarity. Per subclause 178A.1.4 and 178A1.4.2, C_p is part of the Device package.

SuggestedRemedy

There should be two lines for C_p, one under Device package model for Host, and one under Device package model for Module

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **176D** *SC* **176D.7.2** *P* **731** *L* **51** # 151

Ghiasi, Ali Ghiasi Qunatum/Marvell

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

The partial channel is only needed for cable assembly CR and not for C2M which has the complete S-Parameters

SuggestedRemedy

Partial channel not need for C2M COM and should be removed

Response *Response Status* **C**

REJECT.
The host channel model is used in dSNDR (176D.8.7) and in host interference tolerance test calibration (176D.8.12.2). This channel includes the partial channel (subject of this comment) and physical MCB and HCB, see, e.g., Figure 176D-7b).
The partial host channel constitutes most of the 32 dB IL which is the consenus IL budget for the C2M channel.

Cl **176D** *SC* **176D.8.12** *P* **738** *L* **12** # 153

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *ITOL*

Interferecne tolerance test parameters in table only applicable at TP1 module input and not for host input

SuggestedRemedy

The current test in tbale should be labled TP1 Module Input Interference Tolerance. Add 2nd row Interferecne Tolerance at TP4 host input test channel insertion loss will be zero.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to #134.

Cl **176D** *SC* **176D.8.12** *P* **738** *L* **13** # 134

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *ITOL*

For the module test 1 the footnote a says that this is with the mated MCB and HCB with no frequency dependent attenuator which should be the correct set up, approximately equivalent to the minimum loss the host will see. However the values for min and max attenuation have only 1dB variation which is less than is being considered for the specification for the mated compliance boards.

SuggestedRemedy

Update the min and max values to match the adopted values for the mated test fixture (expected to be adopted at the March meeting).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed slides 18-20 of the editorial presentation https://www.ieee802.org/3/dj/public/25_03/ran_3dj_01_2503.pdf.

Implement the changes shown on slide 20 of ran_3dj_01_2503 with editorial license, including possible changes to the ILdd ranges based on the resolution of comment #139.

Cl **176D** *SC* **176D.8.12.2** *P* **740** *L* **41** # 274

Ran, Adee Cisco

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

The noise calibration procedure in Annex 176D is not aligned with that of clause 179, both editorially and technically.
Specifically, item f) refers to calibrating the noise using SNR_TX, while the procedure in 179.9.5.3.3 uses a separate parameter sigma_ns, which is preferable.

Also, the equations and notes are identical to those in 179.9.5.3.3.

The procedure should be aligned to that of 179.9.5.3.3, with the additions required to address testing modules (items a and b). The equations there can be referenced.

SuggestedRemedy

Align items c through f with the corresponding items in 179.9.5.3.3, and replace duplicate equations with references.
Implement with editorial license.

Response *Response Status* **C**

ACCEPT.

Cl **176D** *SC* **176D.8.12.2** *P* **741** *L* **18** # 185

Swenson, Norman Point2; Infinera

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

"approximated solution" is awkward or typo.

SuggestedRemedy

Change to "approximate solution"

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **176D** *SC* **176D.8.12.2** *P* **741** *L* **19** # 186

Swenson, Norman Point2; Infinera

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

"pose a negative discriminant" is obscure.

SuggestedRemedy

Change to "lead to a negative argument of the square root function"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
"pose a negative discriminant" appears 2 times in the draft, and is consistent with similar instances in existing 802.3 text, in 162.9.5.3.3 and 163.9.3.5. The current text is not incorrect.

However, there are other places in the base standard where a different phrasing is used, which would improve the clarity of this requirement.

Align the text with the first sentence of NOTE 2 in 136.9.4.2.3.

Implement with editorial license.

Cl **177** *SC* **177.3** *P* **315** *L* **43** # 204

Slavick, Jeff Broadcom

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

The behavior of the tx_symbol and rx_symbol is specified in 182.3 but the behavior of SIGNAL_OK is defined 177.3.

SuggestedRemedy

In 182.3 make the 3rd paragraph a sub-section titled "PMD service interface UNITDATA" and the last two paragraphs a sub-section "PMD service interface SIGNAL_OK". In 177.3 add the following to the end of the first sentence "with the exception that the SIGNAL_OK behavior is defined in 177.3.1.

Make a new sub-heading named PMD service interface SIGNAL_OK that contains the everything in 177.3 but the first paragraph.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **177** *SC* **177.4.1** *P* **316** *L* **30** # 189

Slavick, Jeff Broadcom

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

Why do we call out that 200/400G don't alter the data stream? That is also possible for 800G/1.6T if no deskew of the data is needed.

SuggestedRemedy

Change ", the data stream is not altered" to "only the identification of the RS-symbol boundary is necessary.

Response *Response Status* **C**

REJECT.
For 200G/400G, the data stream is not altered under any circumstances.

Cl **177** *SC* **177.4.1** *P* **316** *L* **35** # 172

Opsasnick, Eugene Broadcom

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

177.4.1 text refers to the figure 177-3 as an illustration and has a short introduction for the the first few blocks in theis figure but does not say anthing abou the "Symbol multiplexing" sub-bock.

SuggestedRemedy

Add a short description of the Symbol multiplexing block at the end of the last paragraph in 177.4.1. Something ilke: "After deskew, the PCS lanes are recombined by the symbol multiplexing function.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.1.2** *P* **317** *L* **31** # 124

Dudek, Mike Marvell

Comment Type **E** *Comment Status* **A** *Skew Value*

The thought is "as defined in 175.2.5.1 except that ..."

SuggestedRemedy

Move the comma's so that "For 800GBASE-R PHYs, after alignment marker lock is achieved on each of the eight PCSLs in an input stream, Skew between PCSLs is removed as defined in 172.2.5.1, except that a maximum Skew of 25 ns is supported between PCS lanes" becomes "For 800GBASE-R PHYs, after alignment marker lock is achieved on each of the eight PCSLs in an input stream Skew between PCSLs is removed, as defined in 172.2.5.1 except that a maximum Skew of 25 ns is supported between PCS lanes.
Make an equivalent change for 1.6T in the following paragraph.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #77.

Cl **177** *SC* **177.4.1.2** *P* **317** *L* **36** # 77

Huang, Kechao Huawei

Comment Type **T** *Comment Status* **A** *Skew value*

The maximum skew of 25ns for 1.6TBASE-R PHYs is not included in Table 174-5, should refer to sub-clause "182.4.2.2 Skew constraints for 800GBASE-DR4-2 and 1.6TBASE-DR8-2"

SuggestedRemedy

Change "see Table 174-5" to "see 182.4.2.2"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

SP2 and SP5 are only applicable if there is a physically instantiated interface at the PMD service interface. There are no physically instantiated PMD service interfaces defined for 1.6TBASE-R PHYs at this time, nor any other PHYs defined in the 802.3dj project.

Therefore, the values for SP2 and SP5 are undefined for both 800GBASE-R and 1.6TBASE-R PHYs. The 25ns skew limitation came from table 169-5 as a conservative value, but is not applicable to PHYs using the Inner FEC sublayer.

Change the first paragraph of 177.4.2.1 as follows:

From:
"For 800GBASE-R PHYs, after alignment marker lock is achieved on each of the eight PCSLs in an input stream, Skew between PCSLs is removed as defined in 172.2.5.1, except that a maximum Skew of 25 ns is supported between PCS lanes (see Table 169-5)."

To:
"For 800GBASE-R PHYs, after alignment marker lock is achieved on each of the eight PCSLs in an input stream, Skew between PCSLs is removed as defined in 172.2.5.1, with the exception that the maximum Skew to be removed is the Skew at SP1 plus the Skew added by the PMA above the Inner FEC."

Change the second paragraph of 177.4.2.1 as follows:

From:
"For 1.6TBASE-R PHYs, after alignment marker lock is achieved on each of the two PCSLs in an input stream, Skew between PCSLs is removed as defined in 175.2.5.1, except that a maximum Skew of 25 ns is supported between PCS lanes (see Table 174-5)."

To:
"For 1.6TBASE-R PHYs, after alignment marker lock is achieved on each of the two PCSLs in an input stream, Skew between PCSLs is removed as defined in 175.2.5.1, with the exception that the maximum Skew to be removed is the Skew at SP1 plus the Skew added by the PMA above the Inner FEC."

Cl **177** *SC* **177.4.1.4** *P* **317** *L* **53** # 174

Opsasnick, Eugene Broadcom

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

This NOTE is kind of true but not real reason the function is not required for 200G/400G -- the 800G and 1.6T PMAs above the Inner FEC also output lanes with 4-way interleaving. The real reason is that 200/400G PHYs do not require additional deskew between PCS lanes.

SuggestedRemedy

Remove this NOTE from 177.4.1.4 and add a NOTE to the end of 177.4.1.2 that mentions that dekew is not required for the 200/400GBASE-R PHYs because the SM-PMA above the Inner FEC already deskews the PCS lanes within PMA lane to a 4-codeword boundary.

Response *Response Status* **C**

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

Cl **177** *SC* **177.4.2** *P* **318** *L* **6** # 78

Huang, Kechao Huawei

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

The title of subclause 177.4.1 has been changed to "Symbol demultiplexing and deskew"

SuggestedRemedy

Change "alignment lock and deskew process (see 177.4.1)" to "symbol demultiplexing and deskew process (see 177.4.1)"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.2** *P* **318** *L* **7** # 203

Slavick, Jeff Broadcom

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

Add note that when PRBS31 payload mode is enabled the data boundary fed into the covolutioner interleaver is chosen by implementation

SuggestedRemedy

At the end of the first paragraph add "When using PRBS31 encoded by the Inner FEC test mode (see 177.4.9.1), the selection of the RS-FEC symbol-quartet boundary position is unspecified."

Response *Response Status* **C**

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

Cl **177** *SC* **177.4.2** *P* **318** *L* **9** # 191

Slavick, Jeff Broadcom

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

The position of Q in the equation runs in to the RS-FEC symbols so it seems like we're talking about a Q RS-FEC potentially. Plus then it's the length "4 * Q" of the line times 2 or 1 or 0

SuggestedRemedy

Make Q the second operand in the equations so it's 4 x Q x 2 and 4 x Q x 1 RS-FEC symbols

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The number '3' should be spelled out and the suggested remedy also makes the description more clear.

Change:
"The convolutional interleaver is composed of 3 delay lines. The first line (Delay Line 0) delays the data by 4 × 2 × Q RS-FEC symbols, the second line (Delay Line 1) by 4 × 1 × Q RS-FEC symbols, and the last line (Delay Line 2) adds no delay."

To:
"The convolutional interleaver contains three delay lines. The first line (Delay Line 0) delays the data by 2 × Q × 4 RS-FEC symbols, the second line (Delay Line 1) by 1 × Q × 4 RS-FEC symbols, and the last line (Delay Line 2) adds no delay."

Cl **177** *SC* **177.4.2** *P* **318** *L* **34** # 47

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *convolutional interleaver*

The relationship between the position of the input and output switches in Figure 177-4 is not defined.

SuggestedRemedy

Add the following sentence at the end of the paragraph: "The input and output switches are always aligned to the same row."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **177** *SC* **177.4.4** *P* **319** *L* **4** # 79

Huang, Kechao Huawei

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

The word "Shift" should be changed to "shift"

SuggestedRemedy

Change it as suggested

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.7** *P* **321** *L* **29** # 48

Bruckman, Leon Nvidia

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

The sentence: "The first pad insertion will happen right at the beginning of Inner FEC codewords" is not clear, which "Inner FEC codewords" ? Which is "the first pad insertion" ?

SuggestedRemedy

Specify what "first pad insertion" means and which "Inner FEC codewords" you are referring to.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The referenced sentence is not necessary to accurately specify the behavior.
Delete the following sentence: "The first pad insertion will happen right at the beginning of Inner FEC codewords."

Cl **177** *SC* **177.4.7** *P* **321** *L* **32** # 252

Ran, Adee Cisco

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

The ratio listed here is between the line rate (including pad) and the nominal data rate after inner FEC encoding (excluding pad). The ratio holds not only for the nominal rates but also for the actual rate.

Comment #285 against D1.3 requested to add a ratio, but the intent was the ratio between bit rates at the input and output (in the transmit direction) of the inner FEC sublayer. This ratio has practical importance for implementations.

The inner FEC addition of parity bits results in a ratio of 128/120. The addition of pad bits multiplies this ratio by 1089/1088. The total ratio is the product of these ratios, which is 363/340.

SuggestedRemedy

Append the following sentence:
"The bit rate after pad insertion is 363/340 of the bit rate of the tx_symbol stream at the Inner FEC service interface."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The suggested remedy is an improvement. But the previous sentence should not refer to "nominal rate".

Change: "The ratio between the nominal rate before and after pad insertion is 1088/1089."
To: "The ratio between the rate before and after pad insertion is 1088/1089. The bit rate after pad insertion is 363/340 of the bit rate of the tx_symbol stream at the Inner FEC service interface."

Implement with editorial license.

Cl **177** *SC* **177.4.9.2** *P* **323** *L* **50** # 49

Bruckman, Leon Nvidia

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

Text shall indicate how the test pattern is enabled.

SuggestedRemedy

Add the following sentence to the end of the section: "If supported the PRBS13Q test pattern generator is enabled by the PRBS13Q_pattern_enable i control variable."
Add similar sentences to sections 177.4.9.3 to 177.4.9.5

Response *Response Status* **C**

REJECT.
This is already covered in 120.5.11.2.1.

Cl **177** *SC* **177.4.9.4** *P* **324** *L* **8** # 253

Ran, Adee Cisco

Comment Type **T** *Comment Status* **A** *PRBS requirements*

SSPRQ generation is defined as optional.
Due to the inner FEC encoder, there is no way to have SSPRQ at the PMD output with an external generator.
Currently, per Table 183-13, several optical parameters require SSPRQ generation with no other option. Since this pattern can only be generated by the inner FEC, its implementation must be mandatory. An implementation that does not include it cannot be tested.

Alternatively, the optical tests for TDECQ, TECQ, overshoot/undershoot, and transmitter power excursion could be redefined with other test patterns; however, this will likely require a lot of work and is not a low-hanging fruit.

SuggestedRemedy

Change
"The Inner FEC may optionally include a short stress pattern random quaternary (SSPRQ) test-pattern generator"
to
"The Inner FEC shall include a short stress pattern random quaternary (SSPRQ) test-pattern generator".

Response *Response Status* **C**

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

Cl **177** *SC* **177.5.2** *P* **324** *L* **49** # 202

Slavick, Jeff Broadcom

Comment Type **T** *Comment Status* **A** *L 177 structure - test patterns*

Test pattern functions are traditionally placed at the end of the process after all the mission mode operations.

SuggestedRemedy

Move Test pattern checker setion to last sub-clause of receive path.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The consensus of the CRG is that the test pattern generator/checker descriptions should be moved to a separate subclause out of the functional Tx and Rx descriptions.

Move the test pattern generator and checker descriptions to their own subclause outside the normal dataflow description.

Make a similar change in clause 184.

Implement with editorial license.

Cl **177** *SC* **177.5.3** *P* **325** *L* **35** # 50

Bruckman, Leon Nvidia

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

Wrong singular in sentence

SuggestedRemedy

Change: "The Inner FEC codeword boundaries found by synchronization is used"
To: "The Inner FEC codeword boundaries found by synchronization are used"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.6** *P* **326** *L* **34** # 125

Dudek, Mike Marvell

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

one bit errors" should be "one bit error"

SuggestedRemedy

Correct it.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.6** *P* **327** *L* **6** # 51

Bruckman, Leon Nvidia

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

Bin counters are 0 to 3, not 1 to 3

SuggestedRemedy

Change: "(k = 1 to 3)" to: "(k = 0 to 3)"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #24.

Cl **177** *SC* **177.5.6** *P* **327** *L* **7** # 24

Brown, Matt — Alphawave Semi

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

A counter to count codewords with no corrected errors is required since there is no other way to derive this bin.

SuggestedRemedy

Change "k = 1 to 3" to "k = 0 to 3" and update Table 177-8 and Clause 45 accordingly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Although bin 0 could be derived from the other bins and Inner_FEC_total_bits_counter, the suggested approach is cleaner.
Implement the suggested remedy.
Also, change "A set of three 32-bit counters" to "A set of four 32-bit counters" on line 5.

Cl **177** *SC* **177.5.6** *P* **327** *L* **9** # 25

Brown, Matt — Alphawave Semi

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

For Inner_FEC_codeword_error_bin_k and Inner_FEC_uncorrected_cw_counter, to ensure that all codewords are accounted and only once each, add statement for each codeword processed exactly one of these bins is incremented.

SuggestedRemedy

Add a new sentence "For each codeword processed, exactly one counter in Inner_FEC_codeword_error_bin_k or Inner_FEC_uncorrected_cw_counter is incremented." Add a similar statement in 184.5.7.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.6.2** *P* **327** *L* **34** # 190

Slavick, Jeff — Broadcom

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

Missing that ++ means increment by 1

SuggestedRemedy

Add the following the sentence to first paragraph "The notation ++ after a counter or integer variable indicates that its value is to be incremented by 1."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **177** *SC* **177.9** *P* **333** *L* **16** # 52

Bruckman, Leon — Nvidia

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

Precoding control variables are missing from the MDIO tables

SuggestedRemedy

Add precoder_tx_out_enable_i to Table 177-7

Response *Response Status* **C**

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

Cl **177** *SC* **177.9** *P* **333** *L* **40** # 53

Bruckman, Leon — Nvidia

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

In Table 177-8, there are 4 bin counters (0 to 3), last bin is missing. Also, it is hard to understand how the bin counters 0 to 3 are assigned.

SuggestedRemedy

Add reference to 1.2430 and 1.2431, update references for each of the other 7 lanes. Consider having a row for each bin counter, similar to the way they are refernces in Table 184-5

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The suggested remedy is a good improvement. This also means that the MDIO register numbers for all FEC counters for lanes 1 to 7 in Table 177-8 are shifted/incorrect. Note that the MDIO register numbers for Inner_FEC_corrected_cw_counter (lane1) should be 1.2434 and 1.2435 (not 1.2430 and 1.2431).

Add reference to 1.2430 and 1.2431, update references for each of the other 7 lanes. Make a row for each bin counter, similar to the way they are references in Table 184-5.

Fix the register reference for Inner_FEC_corrected_cw_counter (lane1) and all following MDIO register numbers for Inner FEC counters for lanes 1 to 7 as appropriate.

Implement with editorial license.

Cl **178** *SC* **178.1** *P* **340** *L* **29** # 254

Ran, Adee Cisco

Comment Type **T** *Comment Status* **A** *AN differential swing*

As indicated in Table 178-1, A 200GBASE-KR1 PHY is required to support Clause 73 AN. In normal operation this PHY has a maximum peak-to-peak specification that is lower than what is allowed in AN signaling. The same requirement should apply when the PHY generates the AN signal.

Similarly in Tables 178-2 through 178-4.

SuggestedRemedy

Add the following footnote to the "73-AN" row:
"For a device that advertises 200GBASE-KR1 ability, the DME transmission (See 73.5) has a maximum Transmit differential peak-to-peak output voltage of 1000 mV".

Add similar footnotes to the same item in Tables 178-2 through 178-4 with the corresponding abilities.

Implement with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #261.

Cl **178** *SC* **178.2** *P* **344** *L* **1** # 132

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *error ratio*

It is very convoluted to find what the block error ratio specification is from the reference to 174A.7

SuggestedRemedy

Change "A PMD receiver is expected to meet the block error ratio specifications in 174A.7, measured at the PMA adjacent to the PMD, with BERadded equal to 1.6 × 10-5." to A PMD receiver is expected to meet the block error ratio of 1.45e-11 as described in 174A.7, measured at the PMA adjacent to the PMD, with BERadded equal to 1.6 × 10-5." Make the equivalent change in clauses 179 to 183 and annexes 176C and 176D. (Note the required block error ratio is the same value of 1.45e-11 for all these clauses and annexes)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #155.

Cl **178** *SC* **178.2** *P* **344** *L* **4** # 133

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *error ratio*

It is convoluted to find what the block error ratio specification is from the reference to 174A.8

SuggestedRemedy

Change the reference from 174A.8 to 174.8A.8.1.4. Make the equivalent change in clauses 179 to 183

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: CC: 178 to 183]

Resolve using the response to comment #155.

Cl **178** *SC* **178.6** *P* **344** *L* **53** # 178

Swenson, Norman Point2; Infinera

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

Fix typo

SuggestedRemedy

Change 1.6TGBASE to 1.6TBASE

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The typo mentioned in the comment appears 7 times in the draft.
In addition, 400GBSE-KR2 should be changed to 400GBASE-KR2.

Implement the suggested remedy across all instances, and change 400GBSE-KR2 to 400GBASE-KR2.

Cl **178** *SC* **178.8** *P* **347** *L* **29** # 175

Opsasnick, Eugene Broadcom

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

The PMD reset function subclause is missing from the 178.8 set of PMD funtions.

SuggestedRemedy

Subclause 178.8.10 "PMD reset function" should be added to describe the PMD reset functionality with same title and text as 179.8.10

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.8.2** *P* **346** *L* **44** # 187

Swenson, Norman Point2; Infinera

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

With the comma after MDI, this sentence reads like the electrical signals from the PMD transmit function of 179.8.2 are not delivered to the MDI. I believe the exception is that here they are delivered to the MDI according to the 178.9.2.7.

SuggestedRemedy

Remove the comma after MDI.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #255.

Cl **178** *SC* **178.8.2** *P* **346** *L* **44** # 255

Ran, Adee Cisco

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

In "are delivered to the MDI, according to the transmit electrical specifications in" The comma is out of place. "according" is linked to "delivered".

Also in 178.8.3.

SuggestedRemedy

Delete the commas in both places.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.8.3** *P* **346** *L* **49** # 256

Ran, Adee Cisco

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

Incorrect reference to 178.9.2.7

SuggestedRemedy

Change to 178.9.3.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.8.9** *P* **387** *L* **40** # 129

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **R** *ILT defaults*

Annex 178B has been written generically so that the PMD clauses and AUI annexes specificy the details however these clauses and annexes are not specifying the initial bring up defaults.

SuggestedRemedy

Add to the ILT function sub clauses for clauses 178 and 179 and annexes 176C and 176D. "The default settings used after reset or power up is free running PRBS31 with PAM2 encoding and the Initialize coefficient initial conditions" For clauses 180 to 184 add to the ILT function subclauses "The default settings used after reset or power up is free running PRBS31 with PAM4 encoding without precoding"

Response *Response Status* **C**

REJECT.
The default state for training pattern is defined explicitly in 178B.6.3.
"The training pattern selector is set to synchronous PRBS13 and the modulation to PAM2 upon entry to the QUIET state of the Training control state diagram (see Figure 178B-8)."
For electrical interfaces, the transmitter FIR state is initialized in the OUT_OF_SYNC state in Figure 178B-10 (Coefficient update state diagram).

Cl **178** *SC* **178.9.2** *P* **348** *L* **9** # 225

Dawe, Piers Nvidia

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

Inconsistency

SuggestedRemedy

Change "Differential pk-pk voltage" to "Differential peak-to-peak voltage"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
There are 3 instances of "pk-pk" in the draft, but for clarity, it is preferable to use "peak-to-peak" consistently.
Change "pk-pk" to "peak-to-peak" in Table 178-6, Table 179-12, and Table 176D-11.
[CC 178, 179, 176D]

Cl **178** *SC* **178.9.2** *P* **348** *L* **13** # 257

Ran, Adee Cisco

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

In Table 178-6, DC common-mode voltage has max and min in separate rows. In Table 176D-1 it is a range, which is more readable.

SuggestedRemedy

Change to a range in a single row as in Table 176D-1.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.2** *P* **348** *L* **22** # 258

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *Steady-state voltage*

In Table 178-6, the transmitter steady-state voltage is only defined in terms of a minimum dv_f of 0 V. This corresponds to a minimum v_f spec (0.4 V with A_v=0.385 V) but there is no maximum.
With the current specs v_f can be anywhere above 0.4 V (and above 0.5 0V, which would contradict the COM assumption about NEXT; A_ne=0.481 V).
Compare to CR specifications in Table 179-7 where the v_f specification is a range.

SuggestedRemedy

Change the dv_f specification from min to range, from 0 to 0.1 V, corresponding to v_f between 0.4 and 0.5 V.
Implement with editorial license, considering responses to other comments (which may change the v_f range).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment addresses a gap in the specification. The proposed change addresses the gap and is consistent with the adopted transmitter specification.

Implement the suggested remedy with editorial license.

Cl **178** *SC* **178.9.2.4** *P* **350** *L* **33** # 259

Ran, Adee Cisco

Comment Type **ER** *Comment Status* **A** *Steady-state voltage*

The procedure in 163A.3.2.1 refers to 163A.3.1.1 for calculation of the reference voltage. This calculation depends on parameters that should be provided by the invoking clause. The texts refers to Table 178-12 but some required parameters (T_r, f_r, A_v, f_b) are in Table 178-13.
Also, the parameters M and D_p are not defined anywhere in this clause.

SuggestedRemedy

Change from
"with Nv = 400 and other parameter values specified in Table 178-12"
to
"with Nv = 400, M=32, D_p=4, and other parameter values specified in Table 178-12 and Table 178-13".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **178** *SC* **178.9.2.7** *P* **351** *L* **12** # 152

Ghiasi, Ali — Ghiasi Qunatum/Marvell

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

The reference pacakge A and B SDNR are known specific value

SuggestedRemedy

I belive these are the value in https://www.ieee802.org/3/dj/public/24_11/healey_3dj_01_2411.pdf page 5 at least for package A, for service to community reference SNDR should be provided

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The changes requested by the comment would be examples of a fully specified calculation (with example test fixtures, rather than the actual test fixtures used in the test as required), and as such are not required for technical completeness.
Multiple values would be required, depending on package class and equalization setting.
The suggested remedy does not provide sufficient information for the editors to implement.

During the discussion it was pointed out that the text in 179.9.4.5 includes the phrase "initial presets" when referring to Table 179-8, but the correct term is "presets". In addition, the term "Difference signal-to-noise-and-distortion ratio" is defined per specific transmitter equalization preset (and denoted Delta SNDR), but in Table 179-7 it is referred to as "dSNDR" (which is the minimum across equalization settings). This should be corrected.

Make the corrections to the issues identified above, in clause 179 and other places referencing it, with editorial license.

Cl **178** *SC* **178.9.3** *P* **351** *L* **38** # 260

Ran, Adee — Cisco

Comment Type **ER** *Comment Status* **A** *Steady-state voltage*

Footnote a of Table 178-9 says "Specified as the steady-state voltage (as defined in 178.9.2.4) measured at the test transmitter's output"
But 178.9.2.4 currently defines only the difference steady-state voltage, not the measured steady-state voltage, which is needed here.

Table 176C-4 has the same issue, since it also refers to 178.9.2.4.

SuggestedRemedy

In 178.9.2.4, change from
"The difference steady-state voltage of the transmitter at TP0v is computed using the procedure in 163A.3.2.1"
to
The measured steady-state voltage v_f^(meas) of the transmitter at TP0v and the difference steady-state voltage dv_f are computed using the procedure in 163A.3.2.1".

In Table 178-9 and Table 176C-4, change the footnote text to
"Specified as the measured steady-state voltage v_f^(meas) (as defined in 178.9.2.4) at the test transmitter's output".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment addresses a technical gap in the draft.

Implement the suggested remedy with editorial license.
[CC 176C, 178]

Cl **178** *SC* **178.9.3.4.3** *P* **354** *L* **25** # 54

Bruckman, Leon — Nvidia

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

Missing space

SuggestedRemedy

Change: "174A.7.1or" to: "174A.7.1 or"

Response *Response Status* **C**

ACCEPT.

Cl **178A** *SC* **178A.1.7** *P* **758** *L* **24** # 179

Swenson, Norman Point2; Infinera

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

Formula for normalized frequency is wrong

SuggestedRemedy

Change \pi=f_b/2 to \theta=2\pi f/f_b

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "is normalized frequency in the range [-pi, pi) where pi = fb/2" to "is normalized frequency 2*pi*f/fb with range [-pi, pi)" with editorial license.
Note that the two definitions are functionally equivalent but this change is expected to more clearly show the relationship between normalized and absolute frequency.

Cl **178B** *SC* **178B** *P* **769** *L* **18** # 223

Dawe, Piers Nvidia

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

This annex does not mention Auto-Negotiation at all!

SuggestedRemedy

Explain the interaction between this annex and Clause 73 AN

Response *Response Status* **C**

REJECT.
There is no direct interaction between AN and ILT. AN determines which HCD PHY type to use then management configures the HCD PHY. If the PHY fails to achieve PCS_status = OK before the link_fail_inhibit_timer expires then then AN restarts the whole process. This is all captured in the AN arbitration state diagram Figure 73-11.

Cl **178B** *SC* **178B.4** *P* **769** *L* **50** # 127

Dudek, Mike Marvell

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

The PMA adjacent to a PCS still has 2 interfaces, it is just that only one is exposed.

SuggestedRemedy

Change "one or two interfaces" to "one or two exposed interfaces." At the end of the paragraph add "Only exposed interfaces participate in ILT".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "Devices in a path may include one or two interfaces. An example of the former is a PMA adjacent to a PCS or to a PHY XS with a single AUI-C2M (Annex 176D) or AUI-C2C (Annex 176C) interface (the interface with the PCS or PHY XS is never exposed)."
To: "Devices in a path may include one or two physically-instantiated interfaces, specifically PMD or AUI components. An example of the former is a PMA adjacent to a PCS or to a PHY XS with a single AUI-C2M (Annex 176D) or AUI-C2C (Annex 176C) interface (the interface with the PCS or PHY XS is never physically-instrantiated)."
At the beginning of the first paragraph in 178B.x add the following sentence:
"The ILT function is used by the AUI component or PMD at each end of a physically-instantiated interface."
Implement with editorial license.

Cl **178B** *SC* **178B.5.2** *P* **772** *L* **24** # 74

Bruckman, Leon Nvidia

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

In Figure 178B-2 missing parenthesys closing in USE_TX_CLOCK(recovered

SuggestedRemedy

Change : "USE_TX_CLOCK(recovered" to: "USE_TX_CLOCK(recovered)" twice in Figure 178B-2

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.6.3.1** *P* **776** *L* **1** # 277

Ran, Adee Cisco

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

"The last two symbols of the training pattern are "0" symbols"

The length of the training pattern is not mentioned in this subclause (synchronous PRBS13 function), so "the last two symbols" are not defined properly (understanding it requires going back to the training frame structure).
A similar requirement is stated in the third paragraph of the parent subclause 178B.6.3. It is more detailed and well-defined, and it makes this statement redundant.

SuggestedRemedy

Delete the quoted sentence.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.6.3.2** *P* **776** *L* **6** # 278

Ran, Adee Cisco

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

Comma before "during ILT" is not required.
Also, ILT is a function, not a period or a state. It could be "during training" or "during transmission of training frames".

SuggestedRemedy

Delete the comma, and change "during ILT" to "during training" or another appropriate term, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Delete the comma, and change "during ILT" to "during training", with editorial license.

Cl **178B** *SC* **178B.7** *P* **778** *L* **27** # 275

Ran, Adee Cisco

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

Stray space in "free -running PRBS31"
4 instances

SuggestedRemedy

Change to "free-running PRBS31", 4 times

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "free -running PRBS31" to: "free-running PRBS31" in Tables 178B-2, 178B-3, 178B-4 and 178B-5.

Cl **178B** *SC* **178B.11** *P* **785** *L* **27** # 128

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *References*

The reference to 179.9.4.1.5 leads to a specific set of ranges that are different for different AUI's.

SuggestedRemedy

Change "(see 179.9.4.1.5)" to " see e.g. 179.9.4.1.5"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
change "(see 179.9.4.1.5)"
to "(see 179.9.4.1.5 as an example)"

Cl **178B** *SC* **178B.14.2.1** *P* **786** *L* **43** # 276

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *Variables*

The definitions of adjacent_remote_rts and adjacent_isl_ready refer to "the other interface", which is not defined.
The definitions include SIGNAL_OK, but the primitive from which this parameter is taken depends on where the ILT is. The NOTE under the definition helps somewhat, but it is not sufficiently clear.

SuggestedRemedy

A detailed presentation was given in the ad hoc teleconferemce, see https://www.ieee802.org/3/dj/public/adhoc/optics/0225_OPTX/ran_3dj_adhoc_01a_250220.pdf .
Implement the proposal in slide 8 of 3dj_adhoc_01a_250220, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the proposal in slide 8 of the following contribution with editorial license.
https://www.ieee802.org/3/dj/public/adhoc/optics/0225_OPTX/ran_3dj_adhoc_01a_250220.pdf

[Editor's note: Changed page from 768 to 786.]

Cl **178B** *SC* **178B.14.2.1** *P* **787** *L* **8** # 222

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *AN/LT timers*

This says "There is no specified time limit for the ILT protocol", which is misleading because it seems the Clause 73 link_fail_inhibit_timer will override it.

SuggestedRemedy

Correct the misinformation.
Also in 178B.5.1.

Response *Response Status* **C**

REJECT.

The comment is referring to the following note:
"NOTE - There is no specified time limit for the ILT protocol. To avoid live-lock situations, ILT should only be restarted if there is an indication of an unrecoverable fault. The definition of unrecoverable fault is beyond the scope of
this annex."

The suggested remedy does not provide sufficient detail to implement. There is no consensus to make the proposed changes.

[Editor's note: The page was changed from 783 to 787.]

Cl **178B** *SC* **178B.14.2.1** *P* **787** *L* **22** # 18

Brown, Matt Alphawave Semi

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

reset is defined as "Boolean variable that controls the resetting of the device. It is true whenever a reset is necessary including when initiated by PMA_reset for AUI components, PMD_reset for PMDs and during power on." When initiated by PMA_reset; does that mean when PMA_reset is true? Would that be the management variable or the state variable? I think the latter. For PMD_reset, does that mean when it is true?

SuggestedRemedy

Reword as follows: "Boolean variable that controls the resetting of the device. It is true whenever a reset is necessary including when PMA_reset management variable is 1 for AUI components, when PMD_reset management variable is 1 for PMDs, and during power on."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178B** *SC* **178B.14.3** *P* **789** *L* **10** # 279

Ran, Adee Cisco

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

Missing period at the end of the last paragraph of the subclause (after "precoding").

SuggestedRemedy

Add a period.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.3.1** *P* **789** *L* **53** # 280

Ran, Adee Cisco

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

local_rx_ready should be conditional on receiving a PAM4 signal (otherwise it can be set to true with the initial PAM2 modulated signal).
This is currently mentioned in 178B.6.3 but only in a NOTE (making it informative).

SuggestedRemedy

Change from
"when the receiver on a lane of the interface has determined that the ISL partner's transmitter is not disabled <...>"
to
"when the receiver on a lane of the interface has determined that the ISL partner's transmitter is transmitting a PAM4 signal <...>"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **178B** *SC* **178B.14.3.5** *P* **793** *L* **5** # 281

Ran, Adee Cisco

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

The text in 178B.6.3 (P774 L26) says:
"The training pattern selector is set to synchronous PRBS13 and the modulation to PAM2 upon entry to the QUIET state of the Training control state diagram (see Figure 178B-8)."
These settings have management variables associated with them, but assignments of these variables do not appear in the state diagram.
For completeness of the diagram, It is preferable to add them here too.

SuggestedRemedy

In the QUIET state of Figure 178B-8, add the assignments:
local_tp_mode <= synchronous PRBS13
local_mc_mode <= PAM2

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **178B** *SC* **178B.14.3.5** *P* **793** *L* **20** # 282

Ran, Adee Cisco

Comment Type **T** *Comment Status* **R** *AN/LT timers*

There may be a desire to limit the time consumed by the adaptation part of ILT. This can be done by adding a timer that would be accessible by management.
Since a local device does not control the timing of the link partner, the timer should be active only during the TRAIN_LOCAL state.
The timer period should be set by the invoking clause, and should be a configurable by management, with perhaps a recommendation in the standard.

SuggestedRemedy

Modify Figure 178B-8, adding a timer, as follows:
In the Train Local state, add "start training_timer".
In the Train Remote state, add "stop training_timer".

Add a new timer definition in 178B.14.3.3:
training_timer
This timer is started when the training control state diagram on a lane enters the TRAIN_LOCAL state (see Figure 178B-8). The terminal count of this timer is controlled by the management variable training_timer_duration. The effect of expiration of this timer is implementation dependent.

Add a new variable definition in 178B.14.3.1:
training_timer_duration
Variable that controls the terminal count of training_timer. The default value of this variable is defined by the PMD or AUI component specification.

Add a statement in each PMD clause (e.g., in 179.8.9) setting the default value of training_timer_duration to 60 seconds (matching the adopted link_fail_inhibit_timer).

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #234.

Cl **178B** *SC* **178B.15** *P* **796** *L* **26** # 9

Marris, Arthur Cadence Design Systems

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

Preset selction requires three bits

SuggestedRemedy

In Table 178B-6 for ic_req change "1.1120.13:12" to "1.1120.13:11"

Response *Response Status* **C**

ACCEPT.

Cl **179** *SC* **179.1** *P* **370** *L* **5** # 261

Ran, Adee Cisco

Comment Type **T** *Comment Status* **A** *AN differential swing*

As indicated in Table 179-1, A 200GBASE-CR1 PHY is required to support Clause 73 AN. In normal operation this PHY has a maximum peak-to-peak specification that is lower than what is allowed in AN signaling. The same requirement should apply when the PHY generates the AN signal.

Similarly in Tables 179-2 through 179-4.

SuggestedRemedy

Add the following footnote to the 73-AN row:
"For a device that advertises 200GBASE-CR1 ability, the DME transmission (See 73.5) has a maximum Transmit differential peak-to-peak output voltage of 1000 mV".

Add similar footnotes to the same item in Tables 179-2 through 179-4 with the corresponding abilities.

Implement with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_03/simms_3dj_01a_2503.pdf

Slides 9 to 12 of the following contribution were review by the CRG:https://www.ieee802.org/3/dj/public/25_03/ran_3dj_01_2503.pdf

There is consensus to limit the AN DME transmitted voltage to 1000 mV maximum when advertising a 200 Gb/s per lane PHY.

Add new AN DME transmitted output maximum voltage per simms_3dj_01a_2503 slide 6, except using a list of PHY types rather than referring to the Extended Technology Ability field.

Implement with editorial license.

Straw poll TF-5 (pick one) (directional) taken on Tuesday March 11
I support reducing the AN "receive differential peak-to-peak input voltage" maximum value to 1000 mV when only 200 Gb/s per lane PHY(s) is advertised:
A: Yes
B: No
C: Abstain
A: 30 B: 12 C: 26

Straw poll TF-6 was taken after the CRG had some time to discuss offline and some members indicated they would now change their vote.

Straw poll TF-6 (pick one) (decision) taken on Thursday March 13
I support reducing the AN "receive differential peak-to-peak input voltage" maximum value to 1000 mV when only 200 Gb/s per lane PHY(s) is advertised:
Yes: 12
No: 51
Abstain: 22

Cl **179** *SC* **179.9.4** *P* **380** *L* **13** # 262

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **A** *DC common-mode*

In Table 179-7 the DC common-mode voltage for CR has maximum of 1.9 V.
This is higher than all other interfaces, without justification, and these values are irrelevant for modern processes. Also, there is no minimum.

Clause 178 and Annex 176C define a range of 0.2 to 1 V. It is expected that similar devices will be used in CR, KR, and C2C.

SuggestedRemedy

Change to DC common-mode voltage (range), 0.2 to 1 V.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
During the discussion there was general agreement to reducing the maximum to 1 V.

Straw poll #E4 (choose one) #E5 (Chicago rules) (directional)
For comment #262 I prefer
A: Change DC common mode range to min: 0.2 V, max: 1 V
B: Change DC common mode range to min: 0 V, max: 1 V
C: No change
#E4: A: 12, B: 9, C: 16
#E5: A: 15, B: 13, C: 21
There is no consensus to add a minimum specification for DC common mode.

Straw poll #E6 (choose one) (decision)
I support changing the value of "DC common-mode voltage (max)" to 1 V.
Y: 26 N: 5 A: 12

In Table 179-7, change the value of "DC common-mode voltage (max)" to 1 V.

Cl **179** *SC* **179.9.4.1.3** *P* **383** *L* **31** # 263

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **R** *Max swing & initial ILT setting*

The "initialize" values adopted in D1.4 are different for CR and for C2M.

This requires different initialization in the transmitter and, very likely, a different algorithm in the receiver, depending on the mode chosen for the port (whether a module or a copper cable is plugged). These create an unnecessary burden for firmware developers, possibly increasing the code size and development/debugging time.

The motivation for choosing preset 6 for the initial setting was to limit the initial swing reaching the receiver input. The maximum transmitter swing with preset 6 is 0.75 V. In comparison, CR initial setting is preset 1, which has a maximum transmitter swing of 1 V.

It is reasonable to assume that CR receivers can handle 1 V output swing of the transmitter (which will be attenuated by the channel, assumed to have considerable loss at frequencies present in the ILT signal).

If preset 6 is used as the initial value for CR too, the transmitter's v_f (measured near the transmitter with preset 1) for these PMDs can be allowed to be as high as 0.6 V; If a device has v_f at this maximum value, then with preset 6, the transmitter swing will be 0.9 V, lower than the 1 V currently allowed. If a device has v_f of 0.5 (the maximum in D1.4) its maximum will be 0.8 V. Either way, the receiver will see an even lower swing.

This will enable using a higher output swing for CR, potentially increasing their reach (if the transmitter is capable), and using the same adaptation algorithms in the receiver.

This change does not require increasing A_ne in COM; having transmitter swing at the maximum on one end of the cable and at the minimum on the other is not a likely situation and can be excluded from cable compliance assumptions. Devices should work with cables that meet the existing specifications.

A similar argument can be made for KR vs. C2C.

SuggestedRemedy

In Table 179-7, change the Transmitter steady-state voltage v_f range from "0.4 to 0.5" to "0.4 to 0.6", and change "differential peak-to-peak voltage (max) , transmitter enabled" from "1" to "1.2".

In Table 179-8, change the "initialize" setting to match preset 6, and delete "and initialize" in the footnote.

In Table 179-10, change the "Amplitude tolerance" value from "0.5" to "0.6".

in 179.9.5.2, add an informative note as follows:
"NOTE--The steady-state voltage in Table 179-10 corresponds to preset 1. It is not initially generated by a transmitter, due to the initialize setting in Table 179-8. The receiver is not required to tolerate preset 1 unless it specifically requests for it."

Optionally, apply the corresponding changes in clause 178.

Response *Response Status* **C**

REJECT.
The CRG reviewed presentation
https://www.ieee802.org/3/dj/public/25_03/ran_3dj_03_2503.pdf.

The proposed changes in the presentation are not required for technical completeness of the draft, and can therefore be deferred to a future draft. The commenter is encouraged to work on a complete proposal and build consensus.

There is no consensus to make the changes at this time.

Cl **179** *SC* **179.9.4.1.3** *P* **383** *L* **31** # 218

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *Max swing & initial ILT setting*

Transmitters are supposed to start Training at medium amplitude (preset 6) now, not the loudest, to avoid possible crosstalk and linearity issues. A receiver that prefers a louder signal on a particular channel can ask for it.

SuggestedRemedy

In Table 179-8, for "initialize", change 1 to 0.75, add the tolerances, and delete "and initialize" in the table footnotes. As in Table 176D-9 (which applies to 176C).

Response *Response Status* **C**

REJECT.
The suggeted change in this comment is not required for technical completeness of the draft, and can therefore be deferred to a future draft.

There is no consensus to implement the suggested change at this time.

Cl **179** *SC* **179.9.4.6** *P* **387** *L* **47** # 131

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *Jitter*

Crosstalk from the output stage of a driver could affect the Phase only jitter, and this should be included in the measurement of Jrms. The amplitude crosstalk has been shown not to affect the Phase Only Jitter measurement.

SuggestedRemedy

Change "Lanes not under test transmit either PRBS31Q or scrambled idle, with transmitter output disabled." to "Lanes not under test transmit either PRBS31Q or scrambled idle. For testing J4u03 abd EOJ03 the transmitter output is disabled."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement with editorial license.

Cl **179** *SC* **179.9.4.6.1** *P* **388** *L* **12** # 136

Calvin, John — Keysight Technologies

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

The text at the end of this sentence "(e.g., it is preferable to measure jitter around points with high slope)." is missleading. The building of the jrms -vs- slewrate model depends on all edges to build an accurate model.

SuggestedRemedy

remove the example text "(e.g., it is preferable to measure jitter around points with high slope)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment states that the transitions selected should include multiple transitions; while the text that emphasizes the 03 and 30 transitions.
The suggested remedy addresses this claim only partly. The recommended choice of transitions should be changed.
The parenthesized text was meant to recommend that per transition, the threshold should be set to have the highest slope. However, this is not necessarily the right choice, and it was not included in the original proposal, so it should be removed.

Change from: "The set A should include multiple transitions from the symbol 0 to the symbol 3 and multiple transitions from the symbol 3 to the symbol 0. Other transitions may also be included"
To: "The set A should include multiple transitions between different PAM4 levels".

Delete "(e.g., it is preferable to measure jitter around points with high slope)".

Implement with editorial license.

Cl **179** *SC* **179.9.4.6.2** *P* **388** *L* **50** # 135

Calvin, John — Keysight Technologies

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

Equation 179-17 was intended to track the concensus reached with last sentence of page-5 of : https://www.ieee802.org/3/dj/public/25_01/calvin_3dj_01b_2501.pdf which cites the Root Mean Squared value would be used. We are missing the "Mean" from the equation 179-17. it needs to read Jnu03 = sqrt(1/2(jnu1^2 + jnu2^2).

SuggestedRemedy

edit the radicand to include a sqrt(1/2 (jnu1^2 + jnu2^2)) or alternatly remove the equation. The concept of RMS is broadly understood in the field of mathmatics and likely does not need an IEEE definition.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The equation is provided to prevent confusion between the RMS used here and JRMS. However, the comment identifies an error that needs to be be corrected.

Add the missing 1/2 factor inside the square root.

Cl **179** *SC* **179.9.4.6.3** *P* **389** *L* **4** # 137

Calvin, John — Keysight Technologies

Comment Type **T** *Comment Status* **A** *Jitter*

From January 25'th interim session:
https://www.ieee802.org/3/dj/public/25_01/calvin_3dj_01b_2501.pdf page-10 we had come to a concensus to not use composite methods and to use individual RMS of the EOJ03 results.

SuggestedRemedy

Revise the EOJ03 text to assert "...even-odd jitter, except that only the transitions R03 and F30 defined in 179.9.4.6.2 are used." to instead assert "..even-odd jitter, except that only the RMS values of the transitions R03 and F30, defined in 179.9.4.6.2 are used."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The existing definition of EOJ_03, based on 162.9.4.7 and 120D.3.1.8.2 with the listed exception, means that the maximum of measurements of EOJ on two edges, R03 and F30, is taken.
The editor interprets the suggested remedy as a request that EOJ be defined as the RMS, instead of the maximum, of these two measurements, as proposed in the quoted contribution.

Implement this proposal with editorial license.

Cl **179** *SC* **179.9.5.3** *P* **392** *L* **40** # 264

Ran, Adee Cisco

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

Footnote c of Table 179-11 states that
"The COM value is the target value for the SNRTX calibration defined in 179.9.5.3.3 item g). The SNRTX value
measured at the Tx test reference should be as close as practical to the value needed to produce the target COM." etc.
This statement is technically incorrect - the value measured is SNDR, and it is not changed to calibrate COM.
This footnote is only intended to state that passing the test with lower COM demonstrates margin.

SuggestedRemedy

Change the footnote text to:
"COM is calculated as defined in 179.9.5.3.3. Meeting the test requirements with a lower value of COM demonstrates margin to the specification but is not required for compliance."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment identifies an error that needs to be corrected.
Implement the suggested remedy with editorial license.

Cl **179** *SC* **179.11.2** *P* **398** *L* **52** # 226

Dawe, Piers Nvidia

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

If Ildd > limit is unacceptable at 53.125 GHz it's even more unacceptable at 53 GHz.
Usually we measure at 10 MHz steps; don't want to do another measurement just for this.

SuggestedRemedy

Change "at 53.125 GHz" to "from 50 GHz to 53.13 GHz". Make similar changes in other clauses.

Response *Response Status* **C**

REJECT.
The specification is consistent with several existing cable assembly and other IL specifications that are defined at the (possibly not fully accurate) Nyquist frequency.
As examples, the cable assembly ILdd is specified at 25.65 GHz in Table 162-18, at 1.5625 GHz in Table 54-6, at 12.8906 GHz in Table 92-10, and at 5.15625 GHz (5-digit decimal part) in Table 85-9.
The specified frequency was never an issue. Compliance testing may be performed in different ways, e.g., measurements at a 10 MHz frequency grid that includes the desired frequency.

There is no consensus to make the suggested change.

[Editor's note: Changed page from 399 to 398]

Cl **179A** *SC* **179A.2** *P* **801** *L* **23** # 283

Ran, Adee Cisco

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

Incorrect reference to 178.8.2

SuggestedRemedy

Change to 178.9.2

Response *Response Status* **C**

ACCEPT.

Cl **179A** *SC* **179A.2** *P* **801** *L* **23** # 188

Swenson, Norman Point2; Infinera

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

178.8.2 is, I believe, a typo. It should be 178.9.2.

SuggestedRemedy

Change 178.8.2 to 178.9.2

Response *Response Status* **C**

ACCEPT.

Cl **179A** *SC* **179A.3** *P* **801** *L* **29** # 284

Ran, Adee Cisco

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

Incorrect reference to 178.8.3

SuggestedRemedy

Change to 178.9.3

Response *Response Status* **C**

ACCEPT.

Cl **179A** *SC* **179A-1** *P* **804** *L* **23** # 140

Sekel, Steve — Wilder Technologies

Comment Type **T** *Comment Status* **A** *Test fixtures ILdd*

Informative ILdd for MCB now includes the module connector, and PCB only losses are no longer referenced

SuggestedRemedy

In Figure 179A-1 Mated test fixture, remove loss dimension lines labled "3.5 dB" and "2.7 dB". Move the right side of the 3.5 dB dimension line to the inner edge of the MCB connector and relabel the value to 5.95 dB

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed the presentation https://www.ieee802.org/3/dj/public/25_03/sekel_3dj_01_2503.pdf.

Implement the changes to Figure 179A-1 as shown on slide 4 of sekel_3dj_01_2503, except that instead of deleting the note, change it to:
"NOTE--The MCB and HCB ILdd allocations includes the RF connector (up to the RF connector reference plane)".

Cl **179B** *SC* **179B.2.1** *P* **806** *L* **41** # 130

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *Test fixtures ILdd*

Equation 179B-1 is the reference test fixture insertion loss this is not measured and therefore should not have frequency limits associated with it. (particularly as it has been shown that anomolies above 67GHz can affect performance)

SuggestedRemedy

Remove the frequency range. Also for equations 179B-2 and 179B-5

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following straw polls were taken:

Straw poll #E-1 (choose one) and #E-2 (Chicago rules) (direction)
For comment #130 I prefer:
A: Removing the frequency range from equations 179B-1 (reference HCB), 179B-2 (reference MCB), and 179B-5 (reference MTF)
B: Removing the frequency range from equation 179B-5 (reference MTF)
C: No change
#E-1: A: 11 B: 7 C: 10
#E-2: A: 15 B: 13 C: 15

Straw poll #E-3 (choose one) (decision)
For comment #130 I prefer:
A: Removing the frequency range from equations 179B-1 (reference HCB), 179B-2 (reference MCB), and 179B-5 (reference MTF)
B: No change
#E-3: A: 17 B: 15

Remove the frequency range from equations 179B-1, 179B-2, and 179B-5.

Cl **179B** *SC* **179B.3.1** *P* **807** *L* **21** # 141

Sekel, Steve — Wilder Technologies

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

Figure 179B-1 is labled "Test fixtures PCB reference insertion losses", however the text for the cable assemble test fixture (MCB) states that the loss include the PCB, connector and associated vias, so the "PCB" in the figure description caption is not valid

SuggestedRemedy

Delete the word "PCB" from Figure 179B-1 caption

Response *Response Status* **C**

ACCEPT.

Cl **179B** *SC* **179B.4.1** *P* **808** *L* **9** # 1

Lusted, Kent — Synopsys

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

The mated test fixture insertion loss is TBD

SuggestedRemedy

Adopt the proposal in https://www.ieee802.org/3/dj/public/adhoc/optics/0225_OPTX/kocsis_3dj_adhoc_01_250206.pdf

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179B** *SC* **179B.4.1** *P* **808** *L* **15** # 139

Sekel, Steve — Wilder Technologies

Comment Type **T** *Comment Status* **A** *Test fixtures ILdd*

MTF ILdd max and min limit lines are TBD

SuggestedRemedy

Insert upper and lower MTF ILdd limit lines in figure 197B-2 and equations 179B-3 & 179B.4 using values presented in contribuion given in March plenary

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed the presentation https://www.ieee802.org/3/dj/public/25_03/sekel_3dj_01_2503.pdf (which refers to contributed MTF data in https://www.ieee802.org/3/dj/public/tools/MTF/sekel_3dj_02_2503.zip), and slide 14 of the editorial presentation https://www.ieee802.org/3/dj/public/25_03/ran_3dj_01_2503.pdf.

Implement the changes to equations 179B-3 and 179B-4 shown on slide 8 of sekel_3dj_01_2503, except that the free term in equation 179B-3 is -0.03 instead of +0.03.

Implement with editorial license.

Cl **179B** *SC* **179B.4.1** *P* **808** *L* **27** # 142

Sekel, Steve — Wilder Technologies

Comment Type **T** *Comment Status* **R** *Test fixtures ILdd*

Mated Test Fixture nominal ILdd reference line and equation are based on early prototype data not representative of fixutres built with updated connectors

SuggestedRemedy

Replace ILdd reference line for MTF in figure 197B-2 and equation 197B-5 with values presented in contribution to be presented during March plenary

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179B** *SC* **179B.4.6** *P* **812** *L* **37** # 154

Ghiasi, Ali — Ghiasi Qunatum/Marvell

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

Remove extra space after 58.x

SuggestedRemedy

Remove extra space after 58.x

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.2** *P* **418** *L* **37** # 155

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **TR** *Comment Status* **A** *Block error ratio*

In this revision, the block error ratio spec is said to define the PMD receiver or the PHY receiver spec. I am having second thought about this.

The error ratio of an optical PMD/PHY is not met or defined by a receiver only. It must have a transmitter or receiver input signal. It seems odd to say " a PMD receiver is expected to meet the block error ratio...", without specifying the PMD/PHY transmitter condition.

The same applies to all other optical PMD clauses.

SuggestedRemedy

This reference of receiver seems meant to relate to the testing setup and definition in CL174A. A possible easy way to make the text more clear is to add some text describing the input signal condition. For example,"under optical transmitter signal compliant to this specification".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed slides 3 to 7 of the following contribution:
https://www.ieee802.org/3/dj/public/25_03/brown_3dj_03_2503.pdf

Implement the changes on slide 7 of brown_3dj_03_2503.

Implement with editorial.

Cl **180** *SC* **180.4.2** *P* **419** *L* **40** # 55

Bruckman, Leon — Nvidia

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

"Skew constraints for 200GBASE-DR1 and 400GBASE-DR2" seems to be the header of a section, but it is not formatted as that

SuggestedRemedy

Make: "Skew constraints for 200GBASE-DR1 and 400GBASE-DR2" a subsection of 180.4.2. Same for "Skew constraints for 800GBASE-DR4 and 1.6TBASE-DR8" in the next page line 6. Consistent with 182.4.2

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **180** *SC* **180.5.1** *P* **420** *L* **47** # 56

Bruckman, Leon — Nvidia

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

Not clear why the reference is to ILT section 178B.14.2.1 that defines the state diagram variables.

SuggestedRemedy

Change the reference from: "178B.14.2.1" to: "Annex 178B".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **180** *SC* **180.5.1** *P* **421** *L* **24** # 221

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **R** *signal detect*

180.5.4-5, like all IMDD clauses, says "180.5.4 PMD global signal detect function
The variable Global_PMD_signal_detect is a global indicator of the presence of optical signals on all n lanes." and "The PMD lane-by-lane signal detect function is used by the PMD to indicate sufficient optical power is detected at the receiver input on each lane."
See Figure 44A-7, Signal Detect handling across sublayers. It allows a receiver to sleep in very low power until there is an optical signal. There is no AN with "the additional objective of supporting a digital signal detect to ensure that the device is attached to a link partner rather than detecting signal due to crosstalk" (from 73.1) which is a traditional objective of signal detect too. Yet it seems that signal detect has been broken in this draft. It appears to go nowhere but management, when it should feed into ILT.

SuggestedRemedy

In the block diagram, show that global_PMD_signal_detect feeds into ILT.
In 178B (ILT), show global_PMD_signal_detect as an input, so that ILT doesn't waste power and cause confusion trying to lock onto a grossly invalid "signal" (far too weak, or crosstalk).
However, once the link is up and running, there is less reason to bring it down if SD says the signal is bad but the PCS does go out of AM lock - but maybe no change to 178B is needed for this point.
In 180.5.5, give a recommendation that SD should be 1 (good) when the signal is above this receiver's sensitivity for typical signals (considering penalties) so that a usable signal is declared as too weak, but a weak signal (still enough to override crosstalk) might be declared as a candidate for ILT to try.
Apply to other optical clauses.

Response *Response Status* **C**

REJECT.

After CRG discussion there was no consensus to make the proposed changes.

Cl **180** *SC* **180.7.3** *P* **427** *L* **46** # 143

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *MPI*

MPI/DGP penalty of 0.1 dB would be too small for 200GBASE-DR1 unless one uses method of CL124 to trade off channel loss with MPI penalty

SuggestedRemedy

If one tries to calcualte 200GBASE-DR MPI penalty as fixed penalty then it would 0.4 dB plus 0.18 dB for DGD then total penalty for this PMD is 0.58 dB
400GBASE-DR2/800GBASE-DR4/800GBASE-DR8 MPI penalty is 0.12 dB with 0.18 dB DGD the total penalty for this PMD is 0.3 dB. Need to use method in CL 140 as in tabel 140-12 to trade off number of discrete reflectances and max channel loss. The BS/CD MPI penalty were evaluated with ER of 5 dB which is too high for 200G Si MZM. In addition need revisit the BER and confidence level. see ghiasi_3dj_01_2503

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed the following presentations:
https://www.ieee802.org/3/dj/public/25_03/johnson_3dj_01a_2503.pdf
https://www.ieee802.org/3/dj/public/25_03/ghiasi_3dj_01a_2503.pdf

After CRG discussion replace Table 180-12 with the contents of Table 140-13. With editorial license.

Cl **180** *SC* **180.9.1** *P* **431** *L* **34** # 96

Johnson, John — Broadcom

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

Table 180-13 has an extra, empty line

SuggestedRemedy

Remove the extra line in Table 180-13

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #22.

Cl **180** *SC* **180.9.1** *P* **431** *L* **34** # 57

Bruckman, Leon — Nvidia

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

Empty row in table 180-13

SuggestedRemedy

Remove empty row from Table 180-13

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #22.

Cl **180** *SC* **180.9.1** *P* **431** *L* **34** # 22

Brown, Matt — Alphawave Semi

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

For Clause 182 and 183, pattern 7 is defined as valid xBASE-R signal with Inner FEC. A similar pattern should be defined for Clause 180 and 181, but without Inner FEC.

SuggestedRemedy

In Table 180-13 add new pattern 7 "Valid 200GBASE-R, 400GBASE-R, 800GBASE-R, or 1.6TBASE-R signal" and update Table 180-14 accordingly.
In Table 181-11, add new pattern 7 "Valid 800GBASE-R signal" and update Table 181-12 accordingly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **180** *SC* **180.9.5** *P* **433** *L* **21** # 144

Ghiasi, Ali — Ghiasi Qunatum/Marvell

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

Agreed conunter propagating crosstalk source per D1.3 comment 140

SuggestedRemedy

please implement comment 140 counter-propagating text agreed to the condition of TDECQ measurement.
Counter-propagating asynchronous optical signals (crosstalk) as specified for the aggressor used in receiver stress tests is applied to all the PMD receive inputs at TP3. For Clause 180/181, the crosstalk test pattern can be pattern 3, 5, or 7. For Clause 182/183, the crosstalk pattern can be pattern 5 or 7.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.9.5** *P* **433** *L* **26** # 97

Johnson, John Broadcom

Comment Type **E** *Comment Status* **A** *TDECQ*

The sentence describing the counter-propagating signal requirements is overly long and difficult to parse.

SuggestedRemedy

Replace the sentence,
"TDECQ is defined with all receive lanes in operation using test pattern 3 or 5 (see Table 180-13) with the patterns asynchronous to the pattern used to test the transmitter and the receive lanes have power levels specified for the aggressor lanes under stressed receiver sensitivity in Table 180-8."

with the following sentences:
"TDECQ is defined with all receive lanes in operation using test pattern 3 or 5 (see Table 180-13). The received test patterns shall be asynchronous to the pattern used to test the transmitter, and shall have power levels as specified in Table 180-8 for the aggressor lanes in the stressed receiver sensitivity test."

This remedy should also be applied to clauses 181.9.5, 182.9.5 and 183.9.5, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license

Cl **180** *SC* **180.9.5** *P* **433** *L* **31** # 23

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *TDECQ*

For TDECQ, why does AUI need to be "accessible". The clock should be derived from the AUI input regardless of whether it is accessible or not.
This also applies to clauses 181, 182, 183.

SuggestedRemedy

Change:
"For those cases where the xAUI-n chip-to-chip (C2C) or chip-to-module (C2M) interface (see Table 180-1 through Table 180-4) is accessible,"

To:
"For those cases where there is an xAUI-n chip-to-chip (C2C) or chip-to-module (C2M) interface (see Table 180-1 through Table 180-4),"
Make a similar change in 181.9.4, 182.9.5, and 183.9.4.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license

Cl **180** *SC* **180.9.5.1** *P* **434** *L* **43** # 86

Johnson, John Broadcom

Comment Type **T** *Comment Status* **A** *DGD*

Max mean DGD value of 0.8ps is inconsistent with previous 500m PMDs. Max mean DGD for 500m is 0.5ps in Cl. 121, 124 and 140. Because of the short reach, this tighter spec imposes no burden.

SuggestedRemedy

Change Max mean DGD in Table 180-16 from 0.8ps to 0.5ps.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.5.1** *P* **434** *L* **45** # 87

Johnson, John Broadcom

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

First word of Table 180-16, footnote (a), should be capitalized

SuggestedRemedy

Capitalize the first word of Table 180-16, footnote (a): "Dispersion ."

Response *Response Status* **C**

ACCEPT.

Cl **180A** *SC* **180A** *P* **833** *L* # 19

Brown, Matt — Alphawave Semi

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

The title of this annex is very long and not future-proof. Instead make title generic define the scope in a scope clause to limit to 3dj PHYs. Note that a similar approach is used in Annex 174A.

SuggestedRemedy

Change Annex title to: "MDIs for optical PHYs"
Change the title of 180A.1 to "Scope".
Add the following new subclause heading after the the first paragraph: "180A.2 Overview" encompassing the second paragraph and Table 180A-1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **180A** *SC* **180A.1** *P* **833** *L* **22** # 17

Brown, Matt — Alphawave Semi

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

Big sentence. Break into two. Also, should be "Clause 180" and "Clause 182".

SuggestedRemedy

Change to: "The PMDs for 200GBASE-DR1, 400GBASE-DR2, 800GBASE-DR4, and 1.6TBASE-DR8 are specified in Clause 180. PMDs for 200GBASE-DR1-2, 400GBASE-DR2-2, 800GBASE-DR4-2, and 1.6TBASE-DR8-2 are specified in Clause 182."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **181** *SC* **181.1** *P* **442** *L* **13** # 34

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

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

As the 800GBASE-ER1/ER1-20 now uses the same PCS as other 800GBASE-R PHYs, it is inconsistent to call out the full name of the sublayer 800GBASE-R PCS

SuggestedRemedy

Replace "800GBASE-R PCS" with "PCS"

Response *Response Status* **C**

REJECT.
Clauses 181, 183, 184, 186, and 187 all specify sublayers that can only be used with the 800GBASE-R PCS. As such the existing "800GBASE-R PCS" label in these figures is not incorrect, and serves to remind the reader that the sublayer is specific to that rate based on the MII being specifically the 800GMII. This is consistent with other clauses (including 95, 119, 120A, 120F, 120G, 121, 123, 124, 150, 151, 154, 162, 163, 169, 172, 175) that similarly are limited to one specific rate. The generic "PCS" is only used when the generic xGMII is connected to the PCS, for example, in figures 1-1, 143-1, 176-1, 177-1, 178-1, 179-1 and 180-2. If a future task force extends any of these clauses to other rates, the figures can be made generic at that time.

Cl **181** *SC* **181.5.1** *P* **443** *L* **53** # 58

Bruckman, Leon — Nvidia

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

Not clear why the reference is to ILT section 178B.14.2.1 that defines the state diagram variables.

SuggestedRemedy

Change the reference from: "178B.14.2.1" to: "Annex 178B".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **181** *SC* **181.7.1** *P* **448** *L* **36** # 88

Johnson, John — Broadcom

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

RIN17.1OMA should have been changed to RINxxOMA per D1.3 comment #343 resolution.

SuggestedRemedy

Change "RIN17.1OMA" to "RINxxOMA" in Table 181-6.

Response *Response Status* **C**

ACCEPT.

Cl **181** *SC* **181.7.3** *P* **448** *L* **48** # 145

Ghiasi, Ali — Ghiasi Qunatum/Marvell

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

MPI/DGP penalty of 0.5 dB maybe to small for this PMD type

SuggestedRemedy

The MPI penalty is 0.41 dB and DGD penalty is 0.18 the total penalty is 0.59 dB if we use fixed penalty and ER of 3.5 dB as the origonal MPI analysis in the 802.3bs assumed ER of 5 dB which is too high for 200G Si MZM. Revisiting MPI penalty also for CL181 would worthwhile. See Ghiasi_3dj_01_2503

Response *Response Status* **C**

REJECT.

The CRG reviewed the following presentations:
https://www.ieee802.org/3/dj/public/25_03/johnson_3dj_01a_2503.pdf
https://www.ieee802.org/3/dj/public/25_03/ghiasi_3dj_01a_2503.pdf

After CRG discussion there was no consensus to make a change in this clause a at this time.

Cl **181** *SC* **181.8** *P* **452** *L* **43** # 89

Johnson, John — Broadcom

Comment Type **T** *Comment Status* **A** *fiber model*

The description of the generic fiber cabling model should be the same for all PMDs.

SuggestedRemedy

Use the same description in 181.8 as in 180.8, which was improved in D1.4.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license with the following exception.

In 180-8 change
"Insertion loss measurements of installed fiber cables are made in accordance with IEC 61280-4-2 one-cord reference method."

to
"Insertion loss measurements of installed fiber cables are made in accordance with IEC 61280-4 series one-cord reference method."

Also make this change in 182.8.

Cl **181** *SC* **181.9.1** *P* **455** *L* **42** # 265

Ran, Adee — Cisco

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

Table 181-12 has a row labeled "Over/under-shoot", which is a shorthand we should not use. The referenced subclause 181.9.7 is titled "Transmitter overshoot and undershoot" (and unfortunately has "over/under-shoot" in the text).
Also in the corresponding places in Clause 183.

Compare with Clause 180 which has "Transmitter overshoot and undershoot" consistently in the corresponding places.

SuggestedRemedy

Change "Over/under-shoot" to "Overshoot and undershoot" across the draft.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **181** *SC* **181.9.5** *P* **456** *L* **52** # 146

Ghiasi, Ali — Ghiasi Qunatum/Marvell

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

Agreed conunter propagating crosstalk source per D1.3 comment 140

SuggestedRemedy

please implement comment 140 counter-propagating text agreed to the condition of TDECQ measurement.
Counter-propagating asynchronous optical signals (crosstalk) as specified for the aggressor used in receiver stress tests is applied to all the PMD receive inputs at TP3. For Clause 180/181, the crosstalk test pattern can be pattern 3, 5, or 7. For Clause 182/183, the crosstalk pattern can be pattern 5 or 7.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **181** *SC* **181.9.5.1** *P* **458** *L* **12** # 90

Johnson, John Broadcom

Comment Type **T** *Comment Status* **A** *DGD*

Max mean DGD value of 0.8ps is inconsistent with previous 500m PMDs. Max mean DGD for 500m is 0.5ps in Cl. 121, 124 and 140. Because of the short reach, this tighter spec imposes no burden.

SuggestedRemedy

Change Max mean DGD in Table 181-14 from 0.8ps to 0.5ps.

Response *Response Status* **C**

ACCEPT.

Cl **181** *SC* **181.9.9** *P* **459** *L* **17** # 91

Johnson, John Broadcom

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

A sentence should have been added to this sub-clause based on D1.3 comment #333 resolution.

SuggestedRemedy

Add the following sentence to the end of the paragraph:
"The extinction ratio is measured using waveforms captured at the output of the reference receiver defined in 181.9.5, before the reference equalizer."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **181** *SC* **181.9.11** *P* **459** *L* **36** # 92

Johnson, John Broadcom

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

Remove extra "the"

SuggestedRemedy

Change
"RINxxOMA of each lane, with "xx" referring to the 17.1, ."
to
"RINxxOMA of each lane, with "xx" referring to 17.1, ."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **182** *SC* **182.5.1** *P* **471** *L* **10** # 59

Bruckman, Leon Nvidia

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

Not clear why the reference is to ILT section 178B.14.2.1 that defines the state diagram variables.

SuggestedRemedy

Change the reference from: "178B.14.2.1" to: "Annex 178B".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **182** *SC* **182.7.3** *P* **477** *L* **46** # 147

Ghiasi, Ali Ghiasi Qunatum/Marvell

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

With fixed MPI/DGP penalty of 0.4 dB would not be sufficent for 200GBASE-DR-2 but too much for 400GBASE-DR2-2, 800GBASE-DR4-2, and 1.6TBASE-DR8-2. If we use method of CL124 to trade off channel loss with MPI penalty then we can reconcile these difference

SuggestedRemedy

If one tries to calcualte 200GBASE-DR-2 MPI penalty as fixed penalty then it would 0.5 dB plus 0.18 dB for DGD then total penalty for this PMD is 0.63 dB
400GBASE-DR2/800GBASE-DR4/800GBASE-DR8 MPI penalty is 0.1 dB with 0.18 dB DGD the total penalty for this PMD is 0.28 dB. Need to use method in CL 140 as in tabel 140-12 to trade off number of discrete reflectances and max channel loss. The BS/CD MPI penalty were evaluated with ER of 5 dB which is too high for 200G Si MZM. In addition need revisit the BER and confidence level. see ghiasi_3dj_01_2503

Response *Response Status* **C**

REJECT.

The CRG reviewed the following presentations:
https://www.ieee802.org/3/dj/public/25_03/johnson_3dj_01a_2503.pdf
https://www.ieee802.org/3/dj/public/25_03/ghiasi_3dj_01a_2503.pdf

After CRG discussion there was no consensus to make a change in this clause a at this time.

Cl **182** *SC* **182.8** *P* **478** *L* **23** # 93

Johnson, John Broadcom

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

The 182.8 sub-clause heading should be capitalized

SuggestedRemedy

Change "182.8 optical channel characteristics" to "182.8 Optical channel characteristics"

Response *Response Status* **C**

ACCEPT.

Cl **182** *SC* **182.9.5** *P* **483** *L* **35** # 148

Ghiasi, Ali Ghiasi Qunatum/Marvell

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

Agreed conunter propagating crosstalk source per D1.3 comment 140

SuggestedRemedy

please implement comment 140 counter-propagating text agreed to the condition of TDECQ measurement.
Counter-propagating asynchronous optical signals (crosstalk) as specified for the aggressor used in receiver stress tests is applied to all the PMD receive inputs at TP3. For Clause 180/181, the crosstalk test pattern can be pattern 3, 5, or 7. For Clause 182/183, the crosstalk pattern can be pattern 5 or 7.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **182** *SC* **182.9.9** *P* **485** *L* **47** # 94

Johnson, John Broadcom

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

A sentence should have been added to this sub-clause based on D1.3 comment #333 resolution.

SuggestedRemedy

Add the following sentence to the end of the paragraph:
"The extinction ratio is measured using waveforms captured at the output of the reference receiver defined in 182.9.5, before the reference equalizer."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license

Cl **183** *SC* **183.1** *P* **492** *L* **13** # 35

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

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

As the 800GBASE-ER1/ER1-20 now uses the same PCS as other 800GBASE-R PHYs, it is inconsistent to call out the full name of the sublayer 800GBASE-R PCS

SuggestedRemedy

Replace "800GBASE-R PCS" with "PCS"

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #34.

Cl **183** *SC* **183.5.1** *P* **494** *L* **5** # 60

Bruckman, Leon Nvidia

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

Not clear why the reference is to ILT section 178B.14.2.1 that defines the state diagram variables.

SuggestedRemedy

Change the reference from: "178B.14.2.1" to: "Annex 178B".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change 178B.14.2.1 to 178B.4 in 180.5.1, 181.5.1, 182.5.1, and 183.5.1.

Cl **183** *SC* **183.7.3** *P* **501** *L* **51** # 149

Ghiasi, Ali Ghiasi Qunatum/Marvell

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

MPI/DGP penalty of 0.5 dB is larger than needed for 800GBASE-LR4

SuggestedRemedy

MPI/DGD can be reduced to 0.3 dB then link budget increased by 0.1 dB or allocated to DGD. See Ghiasi_3dj_01_2503

Response *Response Status* **C**

REJECT.

The CRG reviewed the following presentations:
https://www.ieee802.org/3/dj/public/25_03/johnson_3dj_01a_2503.pdf
https://www.ieee802.org/3/dj/public/25_03/ghiasi_3dj_01a_2503.pdf

After CRG discussion there was no consensus to make a change in this clause a at this time.

Cl **183** *SC* **183.8** *P* **503** *L* **18** # 95

Johnson, John — Broadcom

Comment Type **T** *Comment Status* **A** *fiber model*

The description of the generic fiber cabling model should be the same for all PMDs.

SuggestedRemedy

Use the same description in 183.8 as in 180.8, which was improved in D1.4.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license with the following exception.

In 180-8 change
"Insertion loss measurements of installed fiber cables are made in accordance with IEC 61280-4-2 one-cord reference method."

to
"Insertion loss measurements of installed fiber cables are made in accordance with IEC 61280-4 series one-cord reference method."

Cl **183** *SC* **183.9.5** *P* **507** *L* **52** # 150

Ghiasi, Ali — Ghiasi Qunatum/Marvell

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

Agreed conunter propagating crosstalk source per D1.3 comment 140

SuggestedRemedy

please implement comment 140 counter-propagating text agreed to the condition of TDECQ measurement.
Counter-propagating asynchronous optical signals (crosstalk) as specified for the aggressor used in receiver stress tests is applied to all the PMD receive inputs at TP3. For Clause 180/181, the crosstalk test pattern can be pattern 3, 5, or 7. For Clause 182/183, the crosstalk pattern can be pattern 5 or 7.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **184** *SC* **184.1.2** *P* **516** *L* **30** # 36

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

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

As the 800GBASE-ER1/ER1-20 now uses the same PCS as other 800GBASE-R PHYs, it is inconsistent to call out the full name of the sublayer 800GBASE-R PCS

SuggestedRemedy

Replace "800GBASE-R PCS" with "PCS"

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #34.

Cl **184** *SC* **184.2** *P* **518** *L* **3** # 99

Huber, Thomas — Nokia

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

The PHY 800GXS cannot be a client of the Inner FEC. By definition the PHY_XS goes all the way back to the MII, so it must connect to a PCS.

SuggestedRemedy

Remove "PHY 800GXS" from the block at the top of Figure 184-2

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.3** *P* **519** *L* **24** # 100

Huber, Thomas — Nokia

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

The PHY 800GXS cannot be a client of the Inner FEC. By definition the PHY_XS goes all the way back to the MII, so it must connect to a PCS.

SuggestedRemedy

Remove "PHY 800GXS" from the first sentence of 184.3

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.3** *P* **519** *L* **25** # 176

Opsasnick, Eugene Broadcom

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

The CL 184 Inner FEC requires 32 PCS lanes (for 800GE) as input at the Inner FEC service interface. Therefore the client sublayer above this Inner FEC cannot be a PHY 800GXS whose lower interface is an 800GMII.

SuggestedRemedy

Remove "PHY 800GXS" from this list of possible client sublayers. Also remove it from Figure 184-2 on page 518, line 3.

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.3** *P* **519** *L* **38** # 101

Huber, Thomas Nokia

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

It is not clear what is meant by the statements that FEC:IS_UNITDATA_i.request is the same as PMA:IS_UNITDATA_i.indication for the PMA 32:8, and FEC:IS_UNITDATA_i.indication is the same as PMA:IS_UNITDATA_i.request for the PMA 32:8. PMA:IS_UNITDATA_i.indication is a signal that comes from the sublayer below a PMA into the PMA, while FEC:IS_UNITDATA_i.request is a signal that the FEC sublayer sends to the sublayer below it. How can those be the same thing?

SuggestedRemedy

Rewrite these sentences to more clearly state what was intended.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: "FEC:IS_UNITDATA_i.request is the same as PMA:IS_UNITDATA_i.indication for the PMA 32:8 defined in 173.3.
FEC:IS_UNITDATA_i.indication is the same as PMA:IS_UNITDATA_i.request for the PMA 32:8 defined in 173.3."

To: "FEC:IS_UNITDATA_i.request is the same as PMA:IS_UNITDATA_i.request for the PMA 32:8 defined in 173.2.
FEC:IS_UNITDATA_i.indication is the same as PMA:IS_UNITDATA_i.indication for the PMA 32:8 defined in 173.2."

Cl **184** *SC* **184.4.3** *P* **520** *L* **25** # 118

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *LR1 PRBS*

A PRBS31 test pattern generator was added in D1.4. It is defined as being optional. However, this test pattern can be used for block error ratio measurements as defined for PAM4 PMDs and AUIs.

SuggestedRemedy

Change: "The Inner FEC may optionally include a PRBS31"
To: "The Inner FEC shall include a PRBS31"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #115.

Cl **184** *SC* **184.5.10** *P* **530** *L* **49** # 115

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *LR1 PRBS*

A PRBS31 test pattern checker was added in D1.4. It is defined as being optional. However, this test pattern can be used for block error ratio measurements as defined for PAM4 PMDs and AUIs in 176.7.4.

SuggestedRemedy

Change "The Inner FEC may optionally include"
To "The Inner FEC shall include"
Add the follow text: "The PRBS31 checker includes block error detection and counters as specified in 176.7.4.7."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Part 1 of the following contribution was reviewed by the CRG.
https://www.ieee802.org/3/dj/public/25_03/brown_3dj_04a_2503.pdf

Based on straw polls TF-1 and TF-2 mandatory PRBS31 generator and checker is preferred.

Implement the proposal in slides 7 to 11 of brown_3dj_04a_2503, except change PRBS31Q to PRBS31 on slide 7.

Implement with editorial license.

Straw poll (directional) #TF-1 (Pick one) #TF-2 (Chicago Rules)
I prefer the PRBS31 generator and checker in the 800GBASE-LR1 Inner FEC sublayer as being:
A: mandatory (shall include)
B: optional (may optionally include)
C: mandatory if no colocated PCS (no AUIs between), otherwise optional
D: abstain
TF-1: A: 29 B: 19 C: 9 D: 19
TF-2: A: 34 B: 23 C: 23 D: 19

Cl **185** *SC* **185** *P* **544** *L* **10** # 21

Brown, Matt — Alphawave Semi

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

Figure 185-3 not needed for this PHY. This figure showing an xGMII Extender was included in 802.3cw and in Draft 1.3 Clause 187 because an xGMII extender was always needed to support an AUI. On the other hand, any 800GBASE-R PHYs may include a 800GMII extender. The 800GBASE-LR1 PHY uses a concatentated Inner FEC and supports one or two AUIs. Figure 185-2 should include one AUI to be complete.

SuggestedRemedy

Delete Figure 185-3 and in Figure 185-2 add one 800GAUI-n.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **185** *SC* **185.2** *P* **542** *L* **39** # 117

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *LR1 PRBS*

Other comments propose that with the addition of the PRBS31 generator and checker in the 800GBASE-LR1 Inner FEC it is now possible to assess the quality detected signal using block error counters similar to the method for PAM4 PMDs and AUIs as defined in 174A.7.1.

SuggestedRemedy

Update the specification for a PMD receiver in 185.2 accordingly.
Provide test configuration and method in 174A.
A contribution will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #115.

Cl **185** *SC* **185.3** *P* **544** *L* **20** # 266

Ran, Adee Cisco

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

In Figure 185-3, the PMA above the PHY 800GXS does not have an incoming IS_SIGNAL.INDICATION primitive, which is required for the ILT function of the 800GAUI-n above it.

This primitive is defined implicitly for the PHY XS, through the IS_SIGNAL.request primitive of the PCS (which is defined in 116.3.3.3) and by the text of 171.3.

SuggestedRemedy

Add an upward arrow with label "PCS:IS_SIGNAL.indication" in Figure 185-3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #21.

Cl **185** *SC* **185.6.2** *P* **551** *L* **34** # 108

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *RX sensitivity*

In addition to the Average Receive Power (min) there should be an entry for Receiver Sensitivity. Average Receive power is at TP3 including link optical impairments, while sensitivity (informative) is defined without optical impairments.

SuggestedRemedy

Add an entry in Table 186-6 for Receiver Sensitivity (Average Power, max) with units of dBm as an informative specification. A supporting presentation will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed the following presentations:
https://www.ieee802.org/3/dj/public/25_03/maniloff_3dj_01_2503.pdf
https://www.ieee802.org/3/dj/public/25_03/stassar_3dj_01_2503.pdf

After CRG discussion, add new parameter Receiver sensitivity:

"Receiver sensitivity is an optional specification defined as the lowest average receiver input power at TP3 with no link impairments at which the block error ratio requirement in 185.2 is met. Receiver sensitivity is measured using the patterns listed in Table 185-11.

The conformance test signal meets the requirements for an 800GBASE-LR1 transmitter followed by an optical attenuator.

The ETCC of the transmitter is measured according to Clause 185.9. The ETCC is then used to calculate the maximum receiver sensitivity specified in Table 185-6."

In Table 185-6 add new parameter and a footnote indicating that this is an optional parameter:
Receiver Sensitivity (max)
For ETCC = 1 dB -18 dBm
For 1< ETCC = 3.4 dB -19 + ETCC dBm

In Table 185-11 add a row for Receiver Sensitivity with patterns 5, 7, & 8.

With editorial license.

Cl **185** *SC* **185.8.1** *P* **555** *L* **23** # 28

Issenhuth, Tom Huawei

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

The parameters "Tx clock phase noise: total integrated random jitter" and "Tx clock phase noise: total periodic jitter" are in Table 185-5 and listed in 185.8 but are missing in Table 185-11.

SuggestedRemedy

Add the 2 parameters to Table 185-11 with a pattern of 5.

Response *Response Status* **C**

ACCEPT.

Cl **185** *SC* **185.8.9** *P* **556** *L* **13** # 29

Issenhuth, Tom Huawei

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

The parameter defintion includes "mean" in the subclause title and parameter description. Parameters definitions should not include mean/max/min. Multiple places in 185.8 and 187.8.

SuggestedRemedy

Remove all mean/max/min from the subclause titles and paramater descriptions in 185.8 and 187.8. With editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Remove mean/max/min from the subclause titles and paramater descriptions where unnecessary in 185.8 and 187.8. With editorial license.

Cl **185** *SC* **185.8.15** *P* **556** *L* **46** # 109

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *RX average power*

Average receive power as specified in Table 185-6 should include optical impairments, and be specified with the minimum Transmitter OSNR.

SuggestedRemedy

Update the definition for Average receive power in 185.8.15 to specify that is specified at TP3, and includes the Optical Penalties defined in Table 185-7. A supporting presentation will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed the following presentations:
https://www.ieee802.org/3/dj/public/25_03/maniloff_3dj_01_2503.pdf
https://www.ieee802.org/3/dj/public/25_03/stassar_3dj_01_2503.pdf

After CRG discussion it was decided to change the parameter name from "Average receive power" to "Average receive power tolerance" across clause 185 with editorial license. The values in Table 185-6 will remain unchanged.

Change 185.8.15 to
"The average receive power tolerance defines the range of average receiver input power at TP3 over which the block error ratio requirement in 185.2 is met. Average receiver power tolerance is measured using the patterns listed in Table 185-11.

The conformance test signal meets the requirements for an 800GBASE-LR1 transmitter followed by a channel with the impairments: polarization dependent loss and polarization rotation speed as specified in Table 185-6 and differential group delay and dispersion as specified in Table 185-8.

The ETCC of the transmitter is measured according to Clause 185.9. The ETCC is then used to calculate the minimum average receive power tolerance specified in Table 185-6.

The average receive power tolerance shall meet the limits given in Table 185-6."

In Table 185-11 add a row for average receive power tolerance with patterns 5, 7, & 8.

Cl **185** *SC* **185.8.15** *P* **556** *L* **47** # 13

Brown, Matt — Alphawave Semi

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

Should refer to "block error ratio" rather than "codeword error ratio".

SuggestedRemedy

Change "codeword error ratio" to "block error ratio".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Changed page from 557 to 556.]

Resolve using the response to comment #109.

Cl **185** *SC* **185.8.x** *P* **556** *L* **50** # 110

Maniloff, Eric — Ciena

Comment Type **T** *Comment Status* **A** *RX sensitivity*

A definition for Receiver Sensitivity should be provided. Receiver Sensitivity does not include Optical Penalties, and is an informative specification.

SuggestedRemedy

Add a definition for receiver sensitivity in Clause 185.8. A supporting presentation will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #108.

Cl **186** *SC* **186.1.1** *P* **564** *L* **10** # 61

Bruckman, Leon — Nvidia

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

800GBASE-ER1 is separated into two lines

SuggestedRemedy

Make the dash in "800GBASE-ER1" a non braking dash.
Apply the same for the whole clause

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.1.2** *P* **564** *L* **31** # 32

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

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

As the 800GBASE-ER1/ER1-20 now uses the same PCS as other 800GBASE-R PHYs, it is inconsistent to call out the full name of the sublayer 800GBASE-R PCS

SuggestedRemedy

Replace "800GBASE-R PCS" with "PCS"

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #34.

Cl **186** *SC* **186.1.3** *P* **564** *L* **53** # 62

Bruckman, Leon — Nvidia

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

The term "ER1 FEC" is used only in thi paragraph and in one or two more places. Usually it is refered just as "FEC"

SuggestedRemedy

Make consistent use of "ER1 FEC" or just "FEC" throughout the clause

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
186.1.3 uses ER1 FEC to distinguish from RS FEC.

Align later subclauses to this as appropriate.

Cl **186** *SC* **186.2.1** *P* **566** *L* **9** # 160

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *erse RS FEC function names*

In Figure 186-3, the two upper parts of the transmit flow and receive flow both have a dashed box labeled "Inverse RS FEC:". However, each of these alone as currently grouped is really an RS-FEC Decoder and RS-FEC Encoder. Together they make up what could be called an "Inverse RS FEC"

SuggestedRemedy

Change the current two dashed line boxes for the two Inverse FEC blocks and enclose both the transmit and receive portions together in a single dashed box called "Inverse RS-FEC".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Modify Figures 186-2 and 186-3 to replace the transmit direction "Inverse RS FEC" with "Inverse RS FEC Tx", and the receive direction "Inverse RS FEC" with "Inverse RS FEC Rx" Modify headings of 186.2.3.1 and 186.2.4.9 accordingly, as well as related text.

Implement with editorial license

Cl **186** *SC* **186.2.1** *P* **567** *L* **8** # 227

de Koos, Andras Microchip Technology

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

Very minor! The rate of each PCS lane should be 26.5625 Gb/s, not 26.5624 Gb/s
25Gb/s *(257/256)*(544/514) = 26.5625 Gb/s
This seems to be a typo, since the correct value is used later on the same page in section 186.2.2

SuggestedRemedy

replace "26.5624 Gb/s" with "26.5625 Gb/s"

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.1** *P* **567** *L* **15** # 200

Slavick, Jeff Broadcom

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

early . In the first sentence

SuggestedRemedy

Remove the . After flows

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.1** *P* **567** *L* **15** # 63

Bruckman, Leon Nvidia

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

Strange location of dot.

SuggestedRemedy

Remove the dot after "two flows"

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.1** *P* **567** *L* **18** # 201

Slavick, Jeff Broadcom

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

Extra sentence that is not needed as the previous sentence already states this.

SuggestedRemedy

Remove the "The two flows are then merged to form a single stream of 257b blocks."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The current text is not very clear. The apparent repeated instruction is not a repeat; there are two separate interleavings that need to occur. The first within each flow, and the second merges the two flows.

Update the text in 186.2.1 to make the process clear.

Implement with editorial license.

Cl **186** *SC* **186.2.1** *P* **567** *L* **34** # 205

Slavick, Jeff Broadcom

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

extranious .

SuggestedRemedy

Remove the . After "performed."

Response *Response Status* **C**

ACCEPT.

Cl **186** SC **186.2.1** P **567** L **34** # 228

de Koos, Andras — Microchip Technology

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

misplaced period in "The pad bits are removed and the CRC checking is performed. before the 257-bit blocks are distributed to eight lanes."

SuggestedRemedy

remove the period, or replace with a comma.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Delete the period

Cl **186** SC **186.2.1** P **567** L **36** # 206

Slavick, Jeff — Broadcom

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

The , is really more than a comma

SuggestedRemedy

Change the "blocks, distributed" to "blocks and then distributed"

Response *Response Status* **C**

ACCEPT.

Cl **186** SC **186.2.3.1.1** P **568** L **16** # 207

Slavick, Jeff — Broadcom

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

We've been using "identical to that specified" instead of "shall be as specified".

SuggestedRemedy

Change "shall be as specified" to "is identical to that specifid"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "shall be as specified" to "is identical to that specified".

Cl **186** SC **186.2.3.1.2** P **568** L **20** # 208

Slavick, Jeff — Broadcom

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

We've been using "identical to that specified" instead of "shall be as specified".

SuggestedRemedy

Change "shall be as specified" to "is identical to that specifid"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "shall be as specified" to "is identical to that specified".

Cl **186** SC **186.2.3.1.3** P **568** L **24** # 209

Slavick, Jeff — Broadcom

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

We've been using "identical to that specified" instead of "shall be as specified".

SuggestedRemedy

Change "shall be as specified" to "is identical to that specifid"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "shall be as specified" to "is identical to that specified".

Cl **186** SC **186.2.3.1.4** P **568** L **28** # 210

Slavick, Jeff — Broadcom

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

We've been using "identical to that specified" instead of "shall be as specified".

SuggestedRemedy

Change "shall be as specified" to "is identical to that specifid"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "shall be as specified" to "is identical to that specified".
Update wording to say some patterns are required and some are optional.

Cl **186** *SC* **186.2.3.1.5** *P* **568** *L* **32** # 211

Slavick, Jeff — Broadcom

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

We've been using "identical to that specified" instead of "shall be as specified".

SuggestedRemedy

Change "shall be as specified" to "is identical to that specifid"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "shall be as specified" to "is identical to that specified".

Cl **186** *SC* **186.2.3.1.6** *P* **568** *L* **43** # 212

Slavick, Jeff — Broadcom

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

We've been using "identical to that specified" instead of "shall be as specified".

SuggestedRemedy

Change "shall be as specified" to "is identical to that specifid"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.
Update wording to say some patterns are required and some are optional.

Cl **186** *SC* **186.2.3.5.2** *P* **572** *L* **49** # 102

Huber, Thomas — Nokia

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

The STAT byte also includes a field named MNT that is used when the frame is in test pattern mode.

SuggestedRemedy

Add specification for the MNT field, aligned with what is in OIF 800ZR. If 800GBASE-ER1 doesn't need to use it, state that it is always set to zero.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **186** *SC* **186.2.3.5.5** *P* **573** *L* **10** # 103

Huber, Thomas — Nokia

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

The byte numbers for the MAP field are incorrect - per figure 186-6, MAP occupies bytes 6-9 rather than 7-10.

SuggestedRemedy

Correct the byte numbering.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.3.5.10** *P* **574** *L* **8** # 64

Bruckman, Leon — Nvidia

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

Missing "the"

SuggestedRemedy

Change: "were removed by Inverse RS FEC function"
To: "were removed by the Inverse RS FEC function"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change to "were removed by the Inverse RS FEC Tx function"

Cl **186** *SC* **186.2.3.5.10** *P* **574** *L* **8** # 65

Bruckman, Leon — Nvidia

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

257-bit breaks into two lines

SuggestedRemedy

Make the dash in "257-bit" a non braking dash. Same for section 186.2.4.6.5 first paragraph

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.3.5.10** *P* **574** *L* **18** # 214

Slavick, Jeff — Broadcom

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

The value corresponds to the block.

SuggestedRemedy

Change
"The value of this counter corresponding to the first non-stuff 257-bit block that is mapped into the payload area of the 800GBASE-ER1 tributary multi-frame is encoded into the AML field."

To:
"The AML field is encoded with the value of the counter for the first non-stuff 257-bit block that is mapped into the payload area of the 800GBASE-ER1 tributary multi-frame."

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.3.5.10** *P* **575** *L* **47** # 213

Slavick, Jeff — Broadcom

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

When the feature is not supported or disabled the AML is 0.

SuggestedRemedy

Add "or not supported" after disabled.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "If the alignment marker location feature is disabled,"
To: "If the alignment marker location feature is not supported or not enabled,"

Cl **186** *SC* **186.2.3.5.11** *P* **576** *L* **1** # 229

de Koos, Andras — Microchip Technology

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

Is there a reason why the order of the am_sf<2:0> bits are not preserved into CSTAT<8:6>? Looks strange. Is the order intentional or is it an oversight?
Same comment for the receive direction in section 186.2.4.6.6

SuggestedRemedy

Response *Response Status* **C**

REJECT.
The order is intentional, to align with the specifications in ITU-T G.709.1 and OIF 800ZR.

Cl **186** *SC* **186.2.3.8** *P* **577** *L* **10** # 104

Huber, Thomas — Nokia

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

Figure 186-9 is not as clear as it could be. The 1 182 480 bits are indicating the number of bits in the entire shaded area (minus the CRC32 and 64bit pad, i.e., 116x10280).

SuggestedRemedy

Shade the CRC32 and PAD areas differently from the main part of the frame. Make the 1 192 480 bits larger and put it on an angle so it is more clear that it refers to the entire shared area, not the block of 105 rows that are not shown. Add row numbers for the missing rows 5-8 and indicate the larger block in the middle as rows 9...113.

Response *Response Status* **C**

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

Cl **186** *SC* **186.2.4.6.2** *P* **580** *L* **47** # 105

Huber, Thomas — Nokia

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

The STAT byte also includes a field named MNT that is used when the frame is in test pattern mode.

SuggestedRemedy

Add description of the MNT field.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **186** *SC* **186.2.4.6.5** *P* **581** *L* **26** # 215

Slavick, Jeff — Broadcom

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

When the feature is not supported or disabled the AML is ignored.

SuggestedRemedy

Add "or not supported" after disabled.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "When the alignment marker location feature is disabled,"
To: "When the alignment marker location feature is not supported or not enabled,"

[Editor's note: changed page/line from 575/47 to 581/26]

Cl **186** *SC* **186.2.4.9.3** *P* **582** *L* **30** # 66

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *AM location*

Wrong variable name and missing text.

SuggestedRemedy

Change: "If the alignment marker location feature is enabled by the FEC control variable fec_alignment_marker_enable (set to 1),"
To: " If the alignment marker location feature is enabled by fec_alignment_marker_location_ability (set to 1) and enabled by the FEC control variable fec_alignment_marker_location_enable (set to 1),"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to "If the alignment marker location feature is supported (FEC_alignment_marker_location_ability is set to 1) and is enabled by the FEC control variable FEC_alignment_marker_location_enable (set to 1)".

Also add text to 186.2.3.1.5 to introduce the two variables: The alignment marker removal function may optionally provide the ability to record the location of the removed alignment markers using the OH field as described in 186.2.3.5.10. The presence of this option is indicated by the assertion of the FEC_alignment_marker_location_ability status variable. When the option is provided, it is enabled by the assertion of the FEC_alignment_marker_location_enable control variable.

Throughout the clause, capitalize FEC in the names of MDIO variables.

Implement with editorial license.

Cl **186** *SC* **186.2.4.9.3** *P* **582** *L* **32** # 230

de Koos, Andras Microchip Technology

Comment Type **E** *Comment Status* **A** *AM location*

The explanation of the state machine in Figure 186-20 is very light. Most state machines have a written synopsis of their function.

SuggestedRemedy

It might be helpful to add in 186.2.4.9.3 that:
The AMs are inserted at their original position (matching the position from before AMs were removed by far-end transmit function) as indicated by the RAML value. When an unexpected RAML value arrives, the previous position of the AM is maintained (flywheel) until 8 consecutive unexpected RAML values are received, after which the AM position is updated to the new position indicated by the RAML.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy In addition, add similar text to 186.4.3 where the other state machines are introduced.

Implement with editorial license.

Cl **186** *SC* **186.3.1.3** *P* **583** *L* **18** # 80

Huang, Kechao Huawei

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

In the transmit direction of 800GBASE-ER1 PMA functions, "interleaving" after Gray mapping is not required, as shown in Figure 186-12 (also see OIF 800ZR IA).

SuggestedRemedy

Change "Gray mapping, interleaving, and distribution of symbols for transmission" to "Gray mapping and distribution of symbols for transmission"

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.3.1.3** *P* **583** *L* **39** # 81

Huang, Kechao Huawei

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

In the receive direction, symbol deinterleaving is not required.

SuggestedRemedy

Change "Polarization combining and symbol deinterleaving." to "Polarization combining."

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.3.1.3** *P* **584** *L* **11** # 82

Huang, Kechao Huawei

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

In the receive direction of Figure 186-12, symbol deinterleaving is not required.

SuggestedRemedy

Change "Polarization combining and symbol deinterleaving" to "Polarization combining"

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.3.3.1** *P* **586** *L* **39** # 83

Huang, Kechao Huawei

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

The gray mapping details are not the same as the adopted baseline, where even bits of each 8-bit block (c_8i,c_8i+1,c_8i+2,c_8i+3,c_8i+4,c_8i+5,c_8i+6,c_8i+7) should be mapped to X polarization and odd bits should be mapped to Y polarization, see page 16 of https://www.ieee802.org/3/dj/public/23_07/nicholl_3dj_02a_2307.pdf (also see OIF 800ZR IA)

SuggestedRemedy

Chang "(c_8i,c_8i+1)" to "(c_8i,c_8i+2)" in line 39;
chang "(c_8i+2,c_8i+3)" to "(c_8i+4,c_8i+6)" in line 40;
chang "(c_8i+4,c_8i+5)" to "(c_8i+1,c_8i+3)" in line 41;
chang "(c_8i+6,c_8i+7)" to "(c_8i+5,c_8i+7)" in line 42

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.3.3.1** *P* **587** *L* **7** # 84

Huang, Kechao Huawei

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

Even bits should be mapped to X polarization and odd bits should be mapped to Y polarization

SuggestedRemedy

Change "X: (c_8i,c_8i+1,c_8i+2,c_8i+3)" to "X: (c_8i,c_8i+2,c_8i+4,c_8i+6)" in line7, and change "Y: (c_8i+4,c_8i+5,c_8i+6,c_8i+7)" to "Y: (c_8i+1,c_8i+3,c_8i+5,c_8i+7)" in line8

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.3.4.2** *P* **593** *L* **42** # 14

Brown, Matt Alphawave Semi

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

Should refer to "CRC error ratio" rather than "frame loss ratio".

SuggestedRemedy

Change "codeword error ratio" to "CRC error ratio".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change:
"A PHY is required to meet the frame loss ratio specifications in 187.2."
To:
"A PMD in combination with the PMA and FEC is required to meet the CRC error ratio specifications in 187.2."

Cl **186** *SC* **186.4.1** *P* **594** *L* **30** # 216

Slavick, Jeff Broadcom

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

Missing that ++ means increment by 1

SuggestedRemedy

Add the following the sentence to first paragraph "The notation ++ after a counter or integer variable indicates that its value is to be incremented by 1."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **186** *SC* **186.4.2.1** *P* **595** *L* **27** # 67

Bruckman, Leon Nvidia

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

Range of varaible usually indicated using "to" not a dash.

SuggestedRemedy

Change: "0-7" To: "0 to 7".

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.2.3** *P* **599** *L* **36** # 68

Bruckman, Leon Nvidia

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

In the definitions of raml_bad_cnt and zero_aml_cnt 800GBASE-ER1 includes an underscore instead of a dash

SuggestedRemedy

In the definitions of raml_bad_cnt and zero_aml_cnt change: "800GBASE_ER1" to: "800GBASE-ER1"

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.3** *P* **601** *L* **42** # 69

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *ER1 PMA frame alignment*

In Figure 186-2 it is not clear when and where does the pss_pma variable get its value. It is also not clear why we need this variable

SuggestedRemedy

Remove the variable pss_pma and in state 2_GOOD change: "pma_pss_mapping<x> <= pma_pss" to: "pma_pss_mapping<x> <= first_pma_pss""

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed slide 16 of the Logic editorial slides at:
https://www.ieee802.org/3/dj/public/25_03/nicholl_3dj_01a_2503.pdf

Delete the variable definition for pma_pss.

In state 2_GOOD of Figure 186-16,
change: "pma_pss_mapping<x> <= pma_pss"
to: "pma_pss_mapping<x> <= current_pma_pss".

Cl **186** *SC* **186.4.3** *P* **605** *L* **3** # 217

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *AM location*

What is block_rx? Not in variable list for SMs

SuggestedRemedy

Create a definition of block_rx

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
block_rx is intended to indicate a 257b block was received (the top part of figure 186-20 is counting 257b blocks between what the rx thinks is the location to insert AMs; the bottom part of the figure processes the AML overhead and determines if the AM location needs to be modified).

Add a definition in 186.4.2.1:
block_rx Boolean variable that is set to true when the next non-stuff 257b block is demapped by the GMP demapper function.

Implement with editorial license.

Cl **186** *SC* **186.4.3** *P* **605** *L* **10** # 70

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *AM Location*

Some missing arrowheads in Figure 186-20

SuggestedRemedy

Add arrowheads to the line that goes right from the RAML_CNT_INC state and to the line that goes left from the RAML_INVALID state

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed slide 14 of:
https://www.ieee802.org/3/dj/public/25_03/nicholl_3dj_01a_2503.pdf

Implement the suggested remedy.

In addition, add a missing transition from RAML_CNT_ALIGN to RAML_CNT_0, and move the "UCT" label to be next to the transition from RAML_VALID to WAIT_FOR_FRAME as shown on slide 14 of nicholl_3dj_01a_2503.

Implement with editorial license.

Cl **186** *SC* **186.7.1** *P* **607** *L* **25** # 106

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *ER1 MDIO*

In tables 186-7 and 186-8, there are a number of rows that are missing a variable reference. These are all variables that are related to the "Inverse RS FEC" function that is specified by reference to clause 172.

SuggestedRemedy

Determine if all these variables are needed, add references for the ones that are and delete any that are not needed.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed slides 19-22 of the Logic editorial slides at:
https://www.ieee802.org/3/dj/public/25_03/nicholl_3dj_01a_2503.pdf

Update Table 186-7 and Table 186-8 as outlined in nicholl_3dj_01a_2503, slides 20-22 with editorial license.

[Editor's note: CC 45]

Cl **186** *SC* **186.7.1** *P* **607** *L* **25** # 107

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *ER1 MDIO*

In tables 186-7 and 186-8, there are a number of rows that are missing MDIO register/bit numbers and pointers to clause 45.

SuggestedRemedy

Add the missing register/bit numbers and pointers to clause 45.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #106.

Cl **187** *SC* **187.1** *P* **615** *L* **20** # 30

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

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

In the ER / ER-1 PHYs the 800GBASE-R PCS is now used. This means that an AUI can be used optionally between the PCS and FEC sublayers. This is called out in this manner in Table 169-3a. Table 187-1 does not reflect this.

SuggestedRemedy

Add to Table 187-1
120F-800GAUI-8 C2C Optional (note c)
120G-800GAUI-8 C2M Optional (note c)
173-800GBASE-R BM-PMA Conditional (Note d)
176-800GBASE-R SM-PMA Conditional (Note d)
176C-800GAUI-4 C2C Optional (Note c)
176D-800GAUI-4 C2M Optional (Note c)

Note c - One or two 800GAUI-n may be instantiated within a 800GBASE-ER or 800GBASE-ER-1 PHY, as described in 176B.6.1.
Note d - If a 800GAUI-n is implemented in a PHY, additional 800GBASE-R BM-PMA or SM-PMA sublayers are required according to the guidelines in 176B.6.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **187** *SC* **187.1** *P* **616** *L* **13** # 37

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

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

As the 800GBASE-ER1/ER1-20 now uses the same PCS as other 800GBASE-R PHYs, it is inconsistent to call out the full name of the sublayer 800GBASE-R PCS

SuggestedRemedy

Replace "800GBASE-R PCS" with "PCS"

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #34.

Cl **187** *SC* **187.3** *P* **617** *L* **39** # 177

Opsasnick, Eugene Broadcom

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

PHY 800GXS can be removed from the legend in Figure 187-2 since that sublayer is not present in the diagram.

SuggestedRemedy

Remove the PHY 800GXS definiton from the figure legend, DTE and XS can also be removed since they also are not present in the diagram.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **187** *SC* **187.6.1** *P* **623** *L* **51** # 71

Bruckman, Leon Nvidia

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

In Table 187-5 it is not clear which rows correspond to "Tx clock phase noise: phase noise mask frequency (max)"

SuggestedRemedy

Merge all the rows that correspond to "Tx clock phase noise: phase noise mask frequency (max)"

Response *Response Status* **C**

REJECT.
There are 4 rows associated with "Tx clock phase noise: phase noise mask frequency (max)" and they all have different frequencies and associated values in dBc/Hz so they cannot be merged into a single row. The use of a single row in a Table with the parameter name and indented rows following with different values is consistent with similar Tables in 802.3-2022, see Table 121-7 and 140-7, and this draft, see Table 180-7.

Cl **187** *SC* **187.6.2** *P* **624** *L* **33** # 111

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *RX sensitivity*

In addition to the Average Receive Power (min) there should be an entry for Receiver Sensitivity. Average Receive power is at TP3 including link optical impairments, while sensitivity (informative) is defined without optical impairments. A supporting presentation will be provided.

SuggestedRemedy

Add an entry in Table 187-6 for Receiver Sensitivity (Average Power, max) with units of dBm as an informative specification. A supporting presentation will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed the following presentations:
https://www.ieee802.org/3/dj/public/25_03/maniloff_3dj_01_2503.pdf
https://www.ieee802.org/3/dj/public/25_03/stassar_3dj_01_2503.pdf

After CRG discussion it was decided to add a new parameter receiver sensitivity.

"Receiver sensitivity is an optional specification defined as follows: the lowest average receiver input power at TP3 without link impairments at which the CRC error ratio requirement in 187.2 is met . Receiver sensitivity is measured using the patterns listed in Table 187-10.

The conformance test signal meets the requirements for an 800GBASE-ER1 transmitter, with ETCC equal to the maximum value specified in Table 187-5, followed by an optical attenuator."

In Table 187-10 add a row for receiver sensitivity with patterns 5, 7, & 8.

Add a new row in Table 187-6 for Receiver Sensitivity and a footnote indicating that this is an optional parameter

Receiver Sensitivity (max)
800GBASE-ER1-20: -18.5dBm | 800GBASE-ER1: -19 dBm

With editorial license.

Cl **187** *SC* **187.6.3** *P* **625** *L* **18** # 112

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *RX average power*

The Average Receive power defined in Table 187-6 includes 1dB of unallocated loss for 800GBASE-ER1. This isn't included in Table 187-7

SuggestedRemedy

Update the value for Addition insertion loss allowed fir 800GBASE-ER1 to 1dB

Response *Response Status* **C**

ACCEPT.

Cl **187** *SC* **187.8.13** *P* **629** *L* **47** # 12

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *RX average power*

The method to measure average receiver optical power is "This power may be measured per IEC 61280-1-3." Does this mean that any other method is acceptable? Shouldn't this be more definitive?
Same issue in 185.8.16.

SuggestedRemedy

Change to: "Average receive optical power is measured per IEC 61280-1-3."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #113.

Cl **187** *SC* **187.8.16** *P* **629** *L* **45** # 113

Maniloff, Eric Ciena

Comment Type **T** *Comment Status* **A** *RX average power*

Average receive power as specified in Table 187-6 includes optical impairments, and is specified with the minimum Transmitter OSNR.

SuggestedRemedy

Update the definition for Average receive power in 187.8.16 to specify that is specified at TP3, and includes the Optical Penalties defined in Table 187-7. A supporting presentation will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed the following presentations:
https://www.ieee802.org/3/dj/public/25_03/maniloff_3dj_01_2503.pdf
https://www.ieee802.org/3/dj/public/25_03/stassar_3dj_01_2503.pdf

After CRG discussion it was decided to change the parameter name from "Average receive power" to "Average receive power tolerance" across clause 187 with editorial license. The values in Table 187-6 will remain unchanged.

Change 187.8.16 to
"The average receive power tolerance defines the range of average receiver input power at TP3 over which the CRC ratio requirement in 187.2 is met. Average receiver power tolerance is measured using the patterns listed in Table 187-10.

The conformance test signal meets the requirements for an 800GBASE-ER1 transmitter, with ETCC equal to the maximum value specified in Table 187-5, followed by a channel with the following impairments: polarization dependent loss, and polarization rotation speed as specified in Table 187-6 and differential group delay and dispersion as specified in Table 187-8.

The average receive power tolerance shall meet the limits given in Table 187-6."

In Table 187-10 add a row for average receive power tolerance with patterns 5, 7, & 8.

With editorial license.

Cl **187** *SC* **187.8.16** *P* **629** *L* **46** # 11

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *RX average power*

The average power specification (tolerance) is as follows: "The average receive power defines the range of average receiver input power over which the frame loss ratio requirement in 187.2 has to be met at the values of minimum OSNR defined in Table 187-6." What does "has to meet" mean? Is this a requirement or not? OSNR is not defined in Table 187-6; is this intended to be the transmitter OSNR defined in Tablle 187-6? If so, there is only one value in that table. The frame loss ratio is for the entire physical layer. Same issue in 185.8.16.

SuggestedRemedy

Change to the following or similar: "The receiver shall meet the frame loss ratio specified in 187.2 with average receive optical power in the range specifed in Table 187-6 and transmitter OSNR specified in Table 187-5."
Apply same to 185.8.15 as well.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #113.

Cl **187** *SC* **187.8.16** *P* **629** *L* **46** # 20

Brown, Matt — Alphawave Semi

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

In Draft 1.4 the 800GBASE-ER1 PCS was converted to a segmented FEC. There is now a possibility for AUIs within a PHY between the segmented FEC and the PCS. Also, a target CRC error ratio as measured at the receive decoder output, rather than frame loss ratio, may be used to define acceptable receiver performance.

SuggestedRemedy

Change "frame loss ratio requirement in 187.2" to "CRC error ratio in 187.2".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #113.

Cl **187** *SC* **187.8.17** *P* **629** *L* **49** # 114

Maniloff, Eric — Ciena

Comment Type **T** *Comment Status* **A** *RX sensitivity*

A definition for Receiver Sensitivity should be provided. Receiver Sensitivity does not include Optical Penalties, and is an informative specification.

SuggestedRemedy

Add a definition for receiver sensitivity in clause 187-7. A supporting presentation will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #113.