Cl **151** *SC* **151.8.5** *P* **6126** *L* **29** # 1

Murty, Ramana Broadcom Inc.

Comment Type **T** *Comment Status* **D**

The bandwidth of the Bessel-Thomson response filter should be half the baud rate, 26.5625 GHz, not 25.5625 GHz.

SuggestedRemedy

Fix the typo and note it's the 3 dB bandwidth. Change to "The normalized noise power density spectrum, N(f) in Equation (121-9), is equivalent to white noise filtered by a fourth-order Bessel-Thomson response filter with a 3 dB bandwidth of 26.5625 GHz."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: Comment type changed from "TR" to "T" because it was submitted with an "APPROVE WITH COMMENTS" ballot.]

This comment does not apply to the changes between Draft 2.1 and Draft 2.0 or an unresolved negative comment. It is not within the scope of this recirculation ballot. However, the comment highlights an obvious error that should be corrected.

Change "25.5625 GHz" to "26.5625 GHz".

Note that the form of the filter definition in this exception is consistent with the definition of N(f) for Equation (121-9) which this exception references. Both are defined to be "bandwidth" and not "3 dB bandwidth".

Cl **30** *SC* **30.5.1.1.16** *P* **1108** *L* **36** # 2

Marris, Arthur Cadence Design Systems

Comment Type **E** *Comment Status* **D**

The final paragraph of 30.5.1.1.16 is a bit cumbersome and could be simplified.

SuggestedRemedy

Change text to: "If a Clause 45 MDIO Interface is present, then this attribute maps to the appropriate enable bit in the appropriate FEC control register based upon the PHY type and the FEC operating mode (see 45.2.10.3, 45.2.1.108 and 45.2.1.116).;"

Note this proposed remedy differs from the proposed remedy in a comment against the last draft that was rejected in the bucket

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: Changed page from 455 to 1108.]

45.2.10.3 has a "FEC enable" bit, 45.2.1.108 has a "FEC enable" bit, and 45.2.1.116 has an “RS-FEC enable” bit, but there are other "enable" bits in two of these registers. Therefore the suggested remedy may cause some ambiguity.

Change the final paragraph of 30.5.1.1.16 to "If a Clause 45 MDIO Interface is present, then this attribute maps to the FEC enable bit or to the RS-FEC enable bit in the appropriate FEC control register based upon the PHY type and the FEC operating mode (see 45.2.10.3, 45.2.1.108, and 45.2.1.116).;"

Cl **33** *SC* **33.4.9.1** *P* **1370** *L* **12** # 3

Jones, Chad Cisco

Comment Type **E** *Comment Status* **D**

mispelled "telecommuications", forgot the 'n'

SuggestedRemedy

replace with telecommunications

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **104** *SC* **104.8.1** *P* **4425** *L* **7** # 4

Jones, Chad Cisco

Comment Type **E** *Comment Status* **D**

Not sure why the date is highlighted in red. I'm sure it's because the date is incomplete, saying 20XX, but this same change was made in 33.7.1 and 145.6.1 and the date wasn't highlighted iin those instances. Only looking for consistency. Either we should highlight the other instances of 20XX or we don't highlight any.

SuggestedRemedy

remove the highlight

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **104** *SC* **104.9.4.8** *P* **4437** *L* **41** # 5

Jones, Chad Cisco

Comment Type **E** *Comment Status* **D**

again, a red highlighted date. This wasn't done in the Clause 33 or Clause 145 PICS. Looking for consistency (see previous comment from me)

SuggestedRemedy

remove the highlight

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **FM** *SC* **FM** *P* **18** *L* **11** # 6

Grow, Robert RMG Consulting

Comment Type **E** *Comment Status* **D**

I think I am the first and only Robert Grow to vote on 802.3 and its revisions and don't need two listings. I note there is a Law, David and Law, David J., and a Thompson, Geoffrey and Thompson, Geoffrey O. , etc. But Jain, Raj
and Jain, Rajeev are a bit more difficult to conclude are the same person, (let alone those that might ballot with a nickname totally unlike their given name). Though I am a fan of recognizing historical participants and argued in the past for this list (rather than replacing the list with each revision) name variations for the same person do create a challenge.

SuggestedRemedy

You may delete the Grow, Robert entry if you concur that I'm the only Robert Grow to have participated since the early 1980's initial ballot on IEEE 802.3.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Remove obvious duplicates from the list of historical participants.

Cl **24** *SC* **24.1.4** *P* **836** *L* **40** # 7

Grow, Robert RMG Consulting

Comment Type **E** *Comment Status* **D**

Device should be lower case.

SuggestedRemedy

Davice -> device.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Chang "Device" to "device".

Cl **45** *SC* **45.2.4.30** *P* **2068** *L* **53** # 8

Grow, Robert RMG Consulting

Comment Type **E** *Comment Status* **D**

The merge of the newest amendments highlights a style problem with Clause 45. (Found this using the CMP version, references are to the non-CMP document.) Line 50 capitalizes "Register" while the new text does not capitalize "register" in line 53. A quick scan of other subclauses indicate the inconsistency isn't only with the most recent amendments merged into the document but I would guess existed from the original Clause 45 decades ago.

SuggestedRemedy

If an editor has the time and energy to search and replace "Register" with "register" where appropriate that would increase document consistency. We probably should put something in the 802.3 conventions about this. If "Register" is chosen instead of "register" for such uses, it should probably only be used for reference to a "Register x.y", possibly (???) in a register name, but no capitalization for generic usage of "register". Any 802.3 convention should cover at least these three types of usage if "Register" is chosen.

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **FM** *SC* **FM** *P* **1** *L* **36** # 9

Grow, Robert RMG Consulting

Comment Type **E** *Comment Status* **D**

My compliments to whoever searched our 7k page document for "must" and made edits appropriate for the deprecation of "must" per IEEE Standards Style Manual, clause 9. That said, I find it amusing that the mandated copyright text on the title page violates IEEE Style in its use of "must".

SuggestedRemedy

No changes to the draft requested as this paragraph is mandated, not to be edited text! Perhaps additional highlight of this inconsistency (including from those on the SASB and our IEEE publication editor) might stimulate development of new copyright text that is consistent with the Style Manual and still satisfactory to IEEE legal.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

As the commenter indicates, the word "must" appears in the draft copyright statement which is a required frontmatter element per 11.2 of the 2021 IEEE SA Standards Style Manual (see <https://mentor.ieee.org/myproject/Public/mytools/draft/styleman.pdf>).

As the frontmatter is not officially part of the standard, it is possible that it is not subject to the requirements for "Standard language" defined in clause 9 of the style manual.

The commenter is welcome to share his observations with the IEEE-SA Program Manager.

No change to the draft.

Cl **FM** *SC* **FM** *P* **26** *L* **38** # 10

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **D**

Physical layers

SuggestedRemedy

Physical Layer specifications

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the changes between Draft 2.1 and Draft 2.0 or an unresolved negative comment. It is not within the scope of this recirculation ballot. However, wording of this sentence could be modified to agree with similar wording in other section introductions.

Change:
"Clause 146 through Clause 149 and associated annexes add Physical layers for ..."
to:
"Clause 146 through Clause 149 and associated annexes specify Physical layers for..."

Cl **FM** *SC* **FM** *P* **26** *L* **40** # 11

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **D**

Clause 153 and Clause 154 specify 100 Gb/s operation over DWDM systems.

SuggestedRemedy

Clause 153 and Clause 154 specify 100 Gb/s operation over DWDM channels.
or

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change:
"Clause 153 and Clause 154 specify 100 Gb/s operation over DWDM systems."
to:
"Clause 153 and Clause 154 specify 100 Gb/s operation over DWDM channels."

Cl **1** *SC* **1.4.298** *P* **208** *L* **27** # 12

Dawe, Piers Nvidia

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

This says "DWDM channel: The transmission path from a transmitting DWDM PHY (TP2) to a receiving DWDM PHY (TP3)". But it is explicit in 154.5.1 that there is a "patch cord between 2 m and 5 m in length" between the MDI and TP2. This is the same as all optical clauses from 1000BASE-X. So "transmitting DWDM PHY (TP2)" is not correct.

It is important not to mislead test engineers in a definitions section that should be used by test engineers working on all optical PMD types.

SuggestedRemedy

As the 1.4 definitions should be brief rather than addressing all details, this can be simplified to:
The transmission path from a transmitting DWDM PHY to a receiving DWDM PHY
or
The transmission path from TP2 to a receiving DWDM PHY (TP3) in a DWDM Physical Layer

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The draft is consistent in defining the “DWDM channel” to be from TP2 to TP3. See:
1.4.216 black link approach
Figure 154-2-Block diagram for 100GBASE-ZR transmit/receive paths
154.6 DWDM channel over a DWDM black link
Annex 154A Examples of 100GBASE-ZR compliant DWDM black links

Consequently, the definition of DWDM channel in 1.4.298 makes it clear that this is the case by being explicit regarding the DWDM channel starting at TP2.

The first option in the suggested remedy loses the information that the channel starts at TP2.

The second option is not an improvement on the draft in that it is less clear that this is TP2 associated with the transmitting DWDM PHY.

Cl **154** *SC* **154.1** *P* *L* # 13

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **D**

Another comment proposes a fix to the contradiction in 1.4.298 "DWDM channel: The transmission path from a transmitting DWDM PHY (TP2) to a receiving DWDM PHY (TP3)". Clause 154 is inconsistent as to where the ends of the medium, DWDM channel and DWDM black link are. With good optical connectors, this won't make much difference in the context of the expected DWDM channel lengths and losses, but the spec should at least be self-consistent, and it would be preferable to use a definition of (DWDM) "channel" consistent with other optical clauses (but bearing in mind that there are multiple inputs and outputs to the medium in this kind of DWDM).

SuggestedRemedy

The straightforward solution is to do it the same way as all other optical clauses from 1000BASE-X onwards:
The medium or channel both extend between MDIs, TP2 is a 2-5 m patch cord away from the Tx MDI, and;
The patch cord in Figure 154-2, Block diagram for 100GBASE-ZR transmit/receive paths, like that in Figure 151-2, Block diagram for 400GBASE-FR4 and 400GBASE-LR4-6 transmit/receive paths, and so many others, is for testing. It is not the same as the patch cord in e.g. Figure 151-7, Fiber optic cabling model, which shows the usual definition of Fiber optic cabling (channel). Note that these figures are called "Block diagram for ... transmit/receive paths", and there are other figures to show the channel.

In Figure 154-2, extend the dashed box "DWDM channel" so that it goes from MDI to MDI (or remove the words "DWDM channel"). The patch cord to TP2 can be left inside the channel, as is traditional in these block diagrams. The placement of TP3s and the boundaries of the DWDM black link could be refined in figures 154-3, DWDM black link example configuration for specifying n DWDM channels, and 154A-1 and 2, DWDM black link examples.

Alternatively, 154 can make a clear distinction between the boundaries of the medium or "DWDM black link medium" (the MDI, the clue is in the name), and the boundaries of the DWDM channel and DWDM black link (TP2, TP3). Then, statements such as these would need to be refined:

154.1 Overview
This clause specifies ... together with the associated medium, which is a single-mode fiber-based dense wavelength division multiplexing (DWDM) channel ...
could change to
This clause specifies the 100GBASE-ZR PMD together with the associated single-mode fiber-based dense wavelength division multiplexing (DWDM) channel ...
and
154.6 DWDM channel over a DWDM black link
... The medium associated with the 100GBASE-ZR PMD is also referred to as a DWDM channel.

This subclause provides details of the medium associated with the 100GBASE-ZR PMD,

over which the PHY operates at a single optical frequency (often also referred to by its associated wavelength) on a defined frequency grid. The medium associated with the 100GBASE-ZR PMD is also referred to as a DWDM channel.

to

This subclause provides details of the DWDM channel associated with the 100GBASE-ZR PMD, over which the PHY operates at a single optical frequency (often also referred to by its associated wavelength) on a defined frequency grid.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The draft is consistent in defining the “DWDM channel” (and therefore the DWDM black link) to be from TP2 to TP3. See:
1.4.216 black link approach
Figure 154-2-Block diagram for 100GBASE-ZR transmit/receive paths
154.6 DWDM channel over a DWDM black link
Annex 154A Examples of 100GBASE-ZR compliant DWDM black links

Regarding the loss of the patch cord, the transmitter output power is specified at TP2, so its loss should not be included in the loss of the DWDM channel, otherwise it would be counted twice.

While this is different from most PHYs that do not use a “DWDM channel”, it is the same as 10GBASE-LX4 in Clause 53 that defines the channel insertion loss to be from TP2 to TP3 (See Table 53-13 footnote a).

In 154.1, change:
“This clause specifies the 100GBASE-ZR PMD together with the associated medium, which is a single-mode fiber-based dense wavelength division multiplexing (DWDM) channel that ...” to:
“This clause specifies the 100GBASE-ZR PMD together with the associated single-mode fiber-based dense wavelength division multiplexing (DWDM) channel that ...”

In 154.6, change:
“The medium associated with the 100GBASE-ZR PMD is also referred to as a DWDM channel.” to:
“The medium associated with the 100GBASE-ZR PMD (excluding the patch cord between the MDI and TP2, if present) is also referred to as a DWDM channel.”

Cl **136** *SC* **136.14.4.1** *P* **5362** *L* **32** # 14

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **D**

According to 136.8.11.7.1, the ability to can enter the QUIET state is optional, so a mandatory PICS is confusing.

SuggestedRemedy

As this is adding a new feature to an existing spec, add a PICS option to 136.14.3 or make this one optional. In 2.136.8.2 PMD transmit function, add a NOTE saying that not all PMDs use the QUIET state (see 136.8.11.7.1).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

PICS item PF3 pertains to the behavior required from the PMD transmit function in the QUIET operating mode.

It is true that the PMD control function cannot set the PMD transmit function operating mode to QUIET when the value of the variable use_quiet_in_training is false (see 136.8.11.7.1). This suggests that the implementation of the QUIET operating mode is effectively optional since the PMD control function can be implemented in way such that this mode cannot be used and the behavior in this mode cannot be verified. This could be made explicit.

Add the following sentence to the end of the first paragraph of 136.8.2.
"Support for the QUIET operating mode is only required when the variable use_quiet_in_training (see 136.8.11.7.1) is set to true."

Add the following major capability/option to 136.14.3 (as the penultimate row in the table).
"*QM | QUIET operating mode | 136.8.2 | Device supports QUIET operating mode | O | Yes [] No []"

In 136.14.4.1 item PF3, change Status to “QM:M” and Support to “Yes [] N/A []”.

Cl **120** *SC* **120.5.7.2** *P* **4905** *L* **22** # 15

Dawe, Piers Nvidia

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

In 802.3cd, this said: For PMA lanes connected to the PMD service interface of a *200GBASE-CR4 or 200GBASE-KR4* PMD, the PMA shall / may provide 1/(1+D) mod 4 precoding /decoding capability. So I knew which the PMDs were. Now, it says "If the PMA is connected to the service interface of a PMD that uses the PMD control function (136.8.11)". 136.8.11 itself is short and does not provide that information. Its subclauses are very long, and I did not find the information there. 135.5.7.2 has the same problem.

SuggestedRemedy

Refer to a statement of which PMDs uses the PMD control function (which I did not find).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment does not apply to the changes between Draft 2.1 and Draft 2.0 or an unresolved negative comment. It is not within the scope of this recirculation ballot.

The first paragraph of 120.5.7.2 states: "For PMA lanes connected to the PMD service interface of a 200GBASE-CR4 or 200GBASE-KR4 PMD, the PMA shall provide 1/(1+D) mod 4 precoding capability on each transmit lane and may optionally provide 1/(1+D) mod 4 decoding capability on each receive lane."

The first paragraph of 135.5.7.2 states: "A PMA shall provide 1/(1+D) mod 4 precoding capability on each output lane that is part of a 50GAUI-1 C2C or 100GAUI-2 C2C link, or connected to the PMD service interface of a 50GBASE-CR, 50GBASE-KR, 100GBASE-CR2, or 100GBASE-KR2 PMD."

Therefore, a list of PMDs that require the precoding capability that is the subject of the referenced paragraph (and a similar paragraph in Clause 135) are included. The referenced paragraph does not define the PMDs that require precoding but how management variables are set for such PMDs.

Cl **158** *SC* **158.8.1.2** *P* **6641** *L* **44** # 16

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **D** *LATE*

Four to eleven ones then zeros at a signalling rate of 10.3125 GBd gives fundamental frequencies between 468.75 MHz (slightly different to Clause 52 because here there is no WAN PHY signalling rate) and 1289.0625 MHz.

SuggestedRemedy

Change:
These patterns have fundamental frequencies at approximately 1289 MHz.
to:
These patterns have fundamental frequencies between approximately 469 MHz and 1289 MHz.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **159** *SC* **159.7.4** *P* **6250** *L* **53** # 17

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **D** *LATE*

In P802.3cp drafts until late on, OMA was defined as for other 25G/lane optical PMDs, but in the process of changing the wording style, it regressed to being defined as for 10G single-lane PMDs (52.9.1.2, square wave with runs of 4 to 11 UI), as in this draft. This is an unnecessary difference between 25GBASE-BR and the other 25GBASE-R optical PMDs.

Compare Clause 95 for 100GBASE-SR4:
Table 95-9--Test patterns
Square wave (8 ones, 8 zeros)
95.8.4 Optical Modulation Amplitude (OMA)
OMA shall be within the limits given in Table 95-6 if measured as defined in 52.9.5 for measurement with a square wave (8 ones, 8 zeros) test pattern or as defined in 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) for measurement with a PRBS9 test pattern, with the exception that each optical lane is tested individually. See 95.8.1 for test pattern information.

Clauses 112 for 25GBASE-SR and 114 for 25GBASE-LR and 25GBASE-ER refers to 95. So does 159.7.1, so we have an inconsistency in this clause (competing definitions of square wave).

The suggested remedy is equivalent to or 112.7.4 and 114.7.4 but keeps the style of wording as it is here.

SuggestedRemedy

Change:
OMA shall meet the requirements in Table 159-6 when measured using the method defined in 52.9.5. See 159.7.1 for test pattern information.
to:
OMA shall meet the requirements in Table 159-6 when measured using the method defined in 52.9.5 with a square wave (8 ones, 8 zeros) test pattern, or in 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) with a PRBS9 test pattern. See 159.7.1 for test pattern information.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **52** *SC* **52.9.9.1** *P* **2411** *L* **32** # 18

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **D** *LATE*

"clean clock of Figure 52-11" but the clean clock is in Figure 52-10

SuggestedRemedy

Change to "clean clock of Figure 52-10"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the changes between Draft 2.1 and Draft 2.0 or an unresolved negative comment. It is not within the scope of this recirculation ballot. However, the comment highlights an obvious error that should be corrected.

Implement the suggested remedy.