Cl **45** *SC* **45.2.1.192.1** *P* **35** *L* **44** # 15

Tu, Mike Broadcom

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

Register bit 1.2309.15 is PMA/PMD reset. But this statement referes to 149.3.2.1, which is PCS reset.

SuggestedRemedy

On page 35, line 44, change the reference from 149.3.2.1 to 149.4.2.1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a substantive change which fixes the cross reference to point to the correct subclause.

Cl **45** *SC* **45.2.1.195.3** *P* **39** *L* **50** # 1

Wienckowski, Natalie General Motors

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

The Precoder registers and text were modified in D2.2, but there is still a reference in D2.2 to register bits that were deleted.

SuggestedRemedy

Delete: In normal operation, this value shall mirror the value in the MultiGBASE-T1 PMA control register bits 1.2309.10:9.
P57 L17: Also, delete PICS MM227 as the "shall" has been removed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.195.3** *P* **39** *L* **51** # 4

Tu, Mike Broadcom

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

Control register bits 1.2309.10:9 do not exist.

SuggestedRemedy

Delete the last sentence of this paragraph.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.196** *P* **41** *L* **17** # 5

Tu, Mike Broadcom

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

Table 45-155e defines the test mode control register bits. The test mode 3 transmit precoder setting is always controlled by register bits 1.2313.10:9. There is no need to define a "Local transmitter precoder override" bit.

Also change the name from "Local transmit precoder setting" to "Test mode transmit precoder setting" to clarify the purpose of these control register bits.

SuggestedRemedy

1. In Table 45-155e, delete the row "1.2313.11".
2. In Table 45-155e, change the first column of the row "1.2313.12" from "1.2313.12" to "1.2313.12:11".
3. In Table 45-155e, change the Name of 1.2313.10:9 to "Test mode transmit precoder setting".
4. Delete 45.2.1.196.2.

5. Change page 41 line 39 to 45 to the following:
"45.2.1.196.3 Test mode transmit precoder setting (1.2313.10:9)
In Test mode 3, bits 1.2313.10:9 control the precoder setting of the local transmitter, as defined in 149.3.2.2.20. During normal operation, the precoder is set according to the value of PrecodeSel received from the link partner, and bits 1.2313.10:9 are ignored."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The ability to locally override the transmitted precoder was left in on purpose. If you do not have access to the remote PHY, because link doesn't come up, you may need it for troubleshooting. When the link doesn't come up, it could, for example, be because of an error in how precoder settings are controlled. Requiring that they be set by the remote PHY in all cases limits debuggability.

If these changes are made, the ability to locally control the transmitter will be linked to the very limited and specialized transmit sequences in test mode 3. The ability to locally control the precoder is needed for any more extensive debug. Stripping out this control serves no useful purpose, hides functionality, and reduces debug control for interoperability.

Cl **45** *SC* **45.2.1.196.4** *P* **41** *L* **51** # 6

Tu, Mike Broadcom

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

The transmit jitter tests are specified in both 149.5.2.3.1 and 149.5.2.3.2. Recommend to refer to both, or simply refer to 149.5.2.3.

SuggestedRemedy

Option 1. Change "149.5.2.3.1" to "149.5.2.3".
Option 2. Change "See 149.5.2.3.1 for more information." to "See 149.5.2.3.1 and 149.5.2.3.2 for more information."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "149.5.2.3.1" to "149.5.2.3".

Cl **45** *SC* **45.2.1.197** *P* **42** *L* **4** # 7

Tu, Mike Broadcom

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

Use "MultiGBASE-T1", instead of "MultiGBASE-T1 set". According to 149.1.1, "the nomenclature MultiGBASE-T1 is used to describe specifications that apply to the 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1 PHYs."

SuggestedRemedy

1. Page 42, line 3:
Change from: "… at the slicer input for the PMAs in the MultiGBASE-T1 set."
To: "… at the slicer input for the MultiGBASE-T1 PMAs."

2. Page 62, Clause 78.5, line 18 to 25:
Change all occurrences of "... the PHY in the MultiGBASE-T1 set …" to "... the MultiGBASE-T1 PHY ...".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from D2.0. Hence it is not within the scope of the recirculation ballot. In addition, this proposal does not fix an error in the draft.

In addition, the nomenclature defined locally in clause 149 doesn't apply to clause 45, while that shorthand is convenient for clause 149 specifications which apply to all three PHYs in that clause, the global definition in clause 1.4 applies generally, and the existing text is consistent with that usage.

Cl **45** *SC* **45.2.1.198** *P* **42** *L* **36** # 8

Tu, Mike Broadcom

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

Typos in Table 45-155g. 1.2314 should be 1.2315 on the first column.

SuggestedRemedy

Change the first column of Table 45-155g from "1.2314.xx:yy" to "1.2315.xx:yy".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.199.1** *P* **42** *L* **49** # 9

Tu, Mike Broadcom

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

Title of the subclause should match with the name of register bits.

SuggestedRemedy

Change line 49 to "45.2.1.199.1 MultiGBASE-T1 user defined data (1.2316.15:0)".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.200.1** *P* **43** *L* **25** # 10

Tu, Mike Broadcom

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

Title of the subclause should match with the name of register bits.

SuggestedRemedy

Change line 25 to: "45.2.1.200.1 MultiGBASE-T1 link partner user defined data (1.2317.15:0)".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **104** *SC* **104.4.6.3** *P* **68** *L* **52** # 16

den Besten, Gerrit NXP Semiconductors

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

The PoDL ripple is somewhat ambiguously defined as the text desciptions only talks about measuring ripple with certain high-pass filters. The table mentions 1kHz-10MHz. If this is the measurement bandwidth, the measurement with 10MHz high-pass becomes actually a fairly narrow bandpass measurement around 10MHz. This also implies there is no constraint on the PoDL ripple beyond 10MHz. I've understood that the assumption is that there will no be significant ripple beyond 10MHz, but unfortunately the specification does not constrain that. A ripple at higher frequencies is very undesirable, so a note that PoDL circuitry shall not produce any significant ripple beyond 10MHz seems useful.

SuggestedRemedy

Add a note to this paragraph of the PoDL clause: The induced voltage ripple at the MDI of PoDL circuits beyond 10MHz shall be negligible to avoid degradation of signal reception.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from D2.0. Hence it is not within the scope of the recirculation ballot. In addition, this proposal does not fix an error in the draft.

The Suggested Remedy does not provide a technically complete solution. Notes are informative only and cannot state normative requirements. Additionally" "negligible voltage ripple"" cannot be a normative requirement as it provides no testable metric for voltage ripple.

Commenter may wish to resubmit this comment at Standars Association ballot.

The commenter may also wish to submit a Maintenance request for Clause 104 to add similar requirements for ripple voltage at other communication rates.

Cl **149** *SC* **149.1.3** *P* **80** *L* **11** # 12

Tu, Mike Broadcom

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

The EEE capability advertisation is described in 149.4.2.4.5.

SuggestedRemedy

Change the reference from 149.3.2.2.22 to 149.4.2.4.5.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a substantive change which fixes the cross reference to point to the correct subclause.

Cl **149** *SC* **149.1.3** *P* **80** *L* **25** # 13

Tu, Mike Broadcom

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

PMA functionality is described in 149.4, not 149.2.

SuggestedRemedy

Change the reference from 149.2 to 149.4.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a substantive change which fixes the cross reference to point to the correct subclause

Cl **149** *SC* **149.1.3.3** *P* **81** *L* **30** # 14

Tu, Mike Broadcom

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

EEE capability is embedded in Infofield octet 10 bit 6.

SuggestedRemedy

Change "(Octet 9 bit 7)" to "(Octet 10 bit 6)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a substantive change which fixes the reference to the EEE capability bit which was changed in D2.1.

Cl **149** *SC* **149.3.2.1** *P* **93** *L* **47** # 11

Tu, Mike Broadcom

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

The PCS reset control register bit is 3.2322.15, not 1.2309.15.

SuggestedRemedy

On page 93, 149.3.2.1, line 47, change from "1.2309.15" to "3.2322.15".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a substantive change which fixes the reference to the PCS reset bit which currently refers to the PMA reset bit.

Cl **149** *SC* **149.3.2.2** *P* **94** *L* **40** # 22

McClellan, Brett Marvell Semiconductor

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

grammar

SuggestedRemedy

change 'encoder' to 'encoders'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a non-substantive editorial change which improves clarity.

Cl **149** *SC* **149.3.2.2** *P* **94** *L* **48** # 23

McClellan, Brett Marvell Semiconductor

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

typo

SuggestedRemedy

change "RS-FE" to "RS-FEC"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a non-substantive editorial change which improves clarity.

Cl **149** *SC* **149.3.2.2.3** *P* **96** *L* **17** # 19

McClellan, Brett Marvell Semiconductor

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

Tx_coded should be tx_coded
Rx_coded should be rx_coded

SuggestedRemedy

Change occurences of "Tx_coded" to "tx_coded"
Change occurences of "Rx_coded" to "rx_coded"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.18** *P* **104** *L* **45** # 20

McClellan, Brett Marvell Semiconductor

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

A and B are missing subscript 'n' that was added in 149.3.2.2.19

SuggestedRemedy

change "A" to "A_n"
change "B" to "B_n" with _n indicating a subscript

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.1** *P* **161** *L* **46** # 3

Tu, Mike Broadcom

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

Register bits 1.2309.10:9 do not exist.It should be 1.2313.10:9.

SuggestedRemedy

Change from: "... by the value set in register 1.2309:10:9, ..."
To: "... by the value set in register 1.2313.10:9, ...".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.2.2** *P* **163** *L* **47** # 17

den Besten, Gerrit NXP Semiconductors

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

The linearity test of BASE-T1 PHYs have previously been based on transmission of a sequence in combination with a sinewave signal that is injected from the outside to account for the full-duplex communication on the link. In March it was argued that this method was not useful and there there are better and simpler methods for specifying linearity that could be borrowed from other specs. This resulted into a method borrowed from a unidirectional SERDES spec, which happens to refer to multiple other clauses too. This method is arguably not simpler than the previously used method. But even more importantly this new method does not account for the full-duplex behavior. The received signal significantly extends the signal range on the MDI. When linearity is only measured when the TX is transmitting, but there is no signal received at the same time, such a test is not adequate IMO to address the problem.

SuggestedRemedy

Suggest to use a similar linearity test method as used for 100BASE-T1 and 1000BASE-T1, that is, with an external sinewave superpositioned on top of the transmitted signal. This method ensures that linearity is tested over the appropriate output signal range that can occur for full duplex communication. Alternatively it can be considered if this test can be skipped, because the imposed linearity requirements of the transceiver to ensure reliable data transfer might be tighter than the currently included 'unidirectional SERDES-borrowed' test.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from D2.0. Hence it is not within the scope of the recirculation ballot. In addition, this proposal does not fix an error in the draft.

The Suggested Remedy does not include a specific change the commenter would like to see made to the draft.

Commenter may wish to resubmit this comment at Standards Association ballot.

Cl **149** *SC* **149.5.2.4** *P* **165** *L* **21** # 18

den Besten, Gerrit NXP Semiconductors

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

LPSD: The L seems smaller than the other characters

SuggestedRemedy

Fix the size of the L

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a non-substantive editorial change which improves clarity.

Cl **149** *SC* **149.7.1.3.2** *P* **171** *L* **8** # 21

McClellan, Brett Marvell Semiconductor

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

In Figure 149–54 N=1 and N=0 are not aligned to the associated RL curves.

SuggestedRemedy

In Figure 149–54 move N=1 and N=0 to be aligned to the associated RL curves.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.7.1.4** *P* **172** *L* **36** # 2

DiBiaso, Eric TE Connectivity

Comment Type **T** *Comment Status* **D** *Coupling attenuation*

The coupling attenuation equation (149-24) references Fmax (line 36 & 41) as its maximum Frequency. Fmax is defined as 4000 x S, where S equals 1/4, 1/2, or 1 coressponding to 2.5Gbps, 5.0Gbps, or 10Gbps, respectively. However, Figure 149-45 on page 173 plots the coupling attenuation showing a maximum frequency of 5500MHz.

SuggestedRemedy

Similiar to the crosstalk limits in 149.7.2.1 & 149.7.2.2, I recommend replacing the 2 instances of Fmax with 4000MHz in the coupling attenuation equation.

Frequency limits of equation (149-24) would then be:

30 <= f <= 750 MHz
750 <= f <= 4000 MHz
where f is the frequency in MHz; 30 <= f <= 4000

Figure 149-45 should also be modified to show a max Frequency of 4000MHz instead of 5500MHz.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.1 and D2.2 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

However, the change suggested has identified an error in the draft, and the proposed response is a substantive change which fixes an inconsistency in the draft between the equations and the graph.

This also makes the maximum frequency of the coupling attenuation consistent with that of the coupling parameters between the link segments.

P172 L37 & P172 L41, Change "Fmax" to "4000"

P173 L3, Change Figure 149-45 to have a max frequency of 4000 MHz instead of 5500 MHz.