

Cl 45 SC 45.2.1.192 P34 L10 # 1 [REDACTED]  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status D EZ  
 Inconsistent text - it is not necessary to say "writes ignored" for RO bits  
 SuggestedRemedy  
 Change: Value always 0, writes ignored  
 To: Value always 0  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 104 SC 104.1 P57 L8 # 2 [REDACTED]  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status D EZ  
 Editor's note that is to be removed for D1.2 that is still in the spec.  
 SuggestedRemedy  
 Delete Editor's note.  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 125 SC 125.1.2 P61 L8 # 3 [REDACTED]  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status D EZ  
 Editor's instruction should only be for text change.  
 SuggestedRemedy  
 Move: Replace Figure 125-1 (as modified by IEEE Std 802.3cb-2018) with the figure found below, which adds 2.5GBASE-T1 and 5GBASE-T1. to be just before Figure 125-1.  
 Also, move the Figure to be after 125.1.3 text.  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 125 SC 125.1.2 P62 L44 # 4 [REDACTED]  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status D EZ  
 Missing Abbreviation expansion  
 SuggestedRemedy  
 Add PMA = PHYSICAL MEDIUM ATTACHMENT  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 125 SC 125.1.2 P62 L46 # 5 [REDACTED]  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status D EZ  
 Missing Abbreviation expansion  
 SuggestedRemedy  
 Add XGMII = 10 GIGABIT MEDIA INDEPENDENT INTERFACE  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 44 SC 44.1.3 P27 L48 # 6 [REDACTED]  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status D EZ  
 Missing Abbreviation expansion  
 SuggestedRemedy  
 Add MAC = MEDIA ACCESS CONTROL  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 MAC doesn't need expanding because it is spelled out in the block on lines 12 & 32, but editorial license to clean up the figure, remove the floating "WIS" definition at line 42 and make labels consistent with existing clause 44.

Cl 44 SC 44.1.3 P27 L 50 # 7

Wienckowski, Natalie General Motors

Comment Type E Comment Status D EZ

Incorrect font

SuggestedRemedy

Change: AUTO-NEGOTIATION IS OPTIONAL to the same font as the rest of the text.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Changes Notes to NOTE style here and anywhere else needed in the Figures.

Cl 125 SC 125.3 P65 L 31 # 8

Wienckowski, Natalie General Motors

Comment Type E Comment Status D EZ

The bit time is based on the data rate, not the PHY type.

SuggestedRemedy

Remove highlighting from text in notes a and b below table 125-3.

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 45 SC 45.5 P51 L 6 # 9

Wienckowski, Natalie General Motors

Comment Type E Comment Status D PICS

Editor's note to be removed prior to draft 2.0. Remove now so it isn't a change in D1.4 when WG ballot requested.

SuggestedRemedy

Delete Editor's note.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Review at end of comment resolution and determine whether PICS are still needed.

Cl 149 SC 149.3.8.2.5 P117 L 5 # 10

Wienckowski, Natalie General Motors

Comment Type E Comment Status D EEE

Editor's note to be removed prior to draft 1.3.

SuggestedRemedy

Delete Editor's note.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Review at end of comment resolution and determine whether work on the OAM request to exit LPI text is still needed.

Cl 149 SC 149.4.2.4.6 P138 L 52 # 11

Wienckowski, Natalie General Motors

Comment Type E Comment Status D SEND\_S

Editor's note to be removed prior to draft 1.3.

SuggestedRemedy

Delete Editor's note.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Review at end of comment resolution and determine whether work on the SEND\_S text is still needed.

Cl 149 SC 149.5.3.2 P156 L 9 # 12

Wienckowski, Natalie General Motors

Comment Type E Comment Status D Link Segment

Editor's note to be removed prior to draft 1.3.

SuggestedRemedy

Delete Editor's note.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Review at end of comment resolution and determine whether work on the Alien Crosstalk spec is still needed.

Cl 149 SC 149.10 P165 L41 # 13

Wienckowski, Natalie General Motors

Comment Type E Comment Status D Delay

Editor's note to be removed prior to draft 2.0. Remove now so it isn't a change in D1.4 when WG ballot requested.

SuggestedRemedy Delete Editor's note.

Proposed Response Response Status W PROPOSED ACCEPT IN PRINCIPLE.

Review at end of comment resolution and determine whether work on the Delay constraint is still needed.

Cl 149 SC 149.2.2.3.1 P76 L46 # 14

Wienckowski, Natalie General Motors

Comment Type E Comment Status D EZ

There is no space between the number and the text.

SuggestedRemedy Add a tab in the paragraph format to space the text over from the number.

Proposed Response Response Status W PROPOSED ACCEPT.

Cl 149 SC 149.3.2.2.15 P89 L38 # 15

Wienckowski, Natalie General Motors

Comment Type E Comment Status D EZ

Equation is cut off at top.

SuggestedRemedy Equation 149-1 -> Unwrap then shrink wrap equation.

Proposed Response Response Status W PROPOSED ACCEPT.

Cl 149 SC 149.3.6.2.2 P102 L8 # 16

Wienckowski, Natalie General Motors

Comment Type E Comment Status D EZ

Missing period at end of sentence.

SuggestedRemedy Add period after rx\_raw<71:40>

Proposed Response Response Status W PROPOSED ACCEPT.

Cl 149 SC 149.3.6.2.3 P103 L30 # 17

Wienckowski, Natalie General Motors

Comment Type E Comment Status D PCS

Missing period at end of sentence.

SuggestedRemedy Add period after rfer\_timer\_done = TRUE

Proposed Response Response Status W PROPOSED ACCEPT IN PRINCIPLE.

Delete sentence "When the timer reaches its terminal count rfer\_timer\_done = TRUE". This functionality is in the definition of timers, isn't normally stated, and doesn't need to be stated.

Cl 149 SC 149.3.8.3 P120 L53 # 18

Wienckowski, Natalie General Motors

Comment Type E Comment Status D EZ

Reorder references to be in numerical order.

SuggestedRemedy Swap references to Figure 149-23 and Figure 149-22.

Proposed Response Response Status W PROPOSED ACCEPT.

Cl 149 SC 149.3.8.4.6 P133 L1 # 19  
 Wienckowski, Natalie General Motors  
 Comment Type T Comment Status D OAM  
 Correct Clear REC state diagram. It will continuously loop as drawn in D1.2.  
 SuggestedRemedy  
 See wienckowski\_3ch\_01\_0419.  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Implement proposal in wienckowski\_3ch\_01a\_0419.pdf.

Cl 149 SC 149.3.8.4.3 P126 L16 # 20  
 Wienckowski, Natalie General Motors  
 Comment Type T Comment Status D OAM  
 Move all REC associated content to 149B. Currently, some of the definition is in 149.3.8.4 and some is in 149B.  
 SuggestedRemedy  
 See wienckowski\_3ch\_02\_0419.  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 149 SC 149.5.2.3 P154 L21 # 21  
 Farjadrad, Ramin Aquantia  
 Comment Type T Comment Status D Test Modes  
 Modify transmit timing jitter in Master mode to include EOJ and DJ spec  
 SuggestedRemedy  
 Refer to page 5 of ad hoc presentation (farjadrad\_3ch\_adhoc01b\_0419)  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Add section 149.5.2.3.1 (named 149.5.2.3.2) in farjadrad\_3ch\_adhoc01b\_0419.pdf.

Cl 149 SC 149.5.1 P151 L40 # 22  
 Farjadrad, Ramin Aquantia  
 Comment Type T Comment Status D Test Modes  
 Modify Test mode 2 to include total DJ and EOJ spec  
 SuggestedRemedy  
 Test mode 2 is for transmitter jitter testing on MDI when transmitter is in MASTER timing mode. When test mode 2 is enabled, the PHY shall transmit a continuous pattern of 16\*S {+1} symbols followed by 16\*S {-1} symbols for Random jitter measurement (RJ), a continuous pattern of JP03A (as specified in Clause 94.2.9.1) for Deterministic jitter measurement (DJ), and JP03B (as specified in Clause 94.2.9.2) for even-odd jitter measurement (EOJ) with the transmitted symbols timed from its local clock source  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Replace current definition of Test mode 2, page 151 lines 41-43 with - Test mode 2 is for transmitter jitter testing on MDI when transmitter is in MASTER timing mode. When test mode 2 is enabled, the PHY shall transmit a continuous pattern of JP03A (as specified in Clause 94.2.9.1) or JP03B (as specified in Clause 94.2.9.2) with the transmitted symbols timed from its local clock source.  
 This needs to be the same solution as comment #84.

Cl 149 SC 149.5.2.4 P173 L48 # 23  
 Kumada, Taketo Yazaki Corporation  
 Comment Type T Comment Status D Variables  
 The coefficient of Frequency which is "S" should be defined.  
 SuggestedRemedy  
 The definition of "S" is the below.  
 S = 0.25 for 2.5GBASE-T1  
 S = 0.5 for 5GBASE-T1  
 S = 1 for 10GBASE-T1  
 It is like the BROADCOM presentation below.  
 Title :Transmitter PSD Masks  
 Speaker :Kadir Dinc, Tom Souvignier  
 Date :November 2018  
 Proposed Response Response Status W  
 PROPOSED REJECT.  
 S is defined in 149.1.1.

Cl 149 SC 149.5.2.4 P174 L1 # 24  
 Kumada, Taketo Yazaki Corporation  
 Comment Type T Comment Status D Variables  
 Like the above  
 SuggestedRemedy  
 Like the above  
 Proposed Response Response Status W  
 PROPOSED REJECT.  
 S is defined in 149.1.1.

Cl 149 SC 149.7.1.1 P177 L29 # 25  
 Kumada, Taketo Yazaki Corporation  
 Comment Type T Comment Status D Variables  
 Like the above  
 SuggestedRemedy  
 Like the above  
 Proposed Response Response Status W  
 PROPOSED REJECT.  
 S is defined in 149.1.1.

Cl 149 SC 149.10 P166 L11 # 26  
 Lo, William Axonne Inc.  
 Comment Type T Comment Status D Delay  
 Adding delay constraints  
 Also applies to clause 44 and 125  
 SuggestedRemedy  
 Implement Lo\_3ch\_01\_0419.pdf slides 2, 3, 4 per sections indicated.  
 Remove yellow highlights in the relevant sections in 44, 125, 149.10.  
 Remove editor's note in 149.10  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 TFTD. Task Force to hear presentation Lo\_3ch\_01\_0419.pdf and decide if these are the correct values or if they should be adjusted.

Cl 149 SC 149.3.4.1 P98 L35 # 27  
 Lo, William Axonne Inc.  
 Comment Type T Comment Status D PCS  
 This is a bunch of changes in many different sections that are related to partial frames. This is clarifying text, table, and figure that makes no technical changes other than one on slide 10.  
 See Lo\_3ch\_02\_0419.pdf for all the justification and remedy.  
 SuggestedRemedy  
 Implement Lo\_3ch\_02\_0419.pdf slides 3, 5, 7, 9, 10, 11, 12, 13  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 TFTD. Task force to hear presentation and consider changes.

Cl 149 SC 149.1.3.1 P68 L28 # 28  
 Lo, William Axonne Inc.  
 Comment Type T Comment Status D EZ  
 Duration missing the L term  
 SuggestedRemedy  
 Change 320 ns to L x 320 ns  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Change: bits (duration 320 ns at 10 Gb/s).  
 To: bits. (The duration of the superframe is L x 320 x S ns.)

Cl 45 SC 45.2.1.194.1 P36 L52 # 29  
 Lo, William Axonne Inc.  
 Comment Type T Comment Status D Registers  
 Clarify that is it the receiver and not the transmitter that is being configured.  
 SuggestedRemedy  
 Change:  
 Reed-Solomon interleave setting  
 To:  
 Reed-Solomon receiver interleave setting  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 45 SC 45.2.1.194.3 P37 L35 # 30

Lo, William Axonne Inc.

Comment Type T Comment Status D Registers

Clarify that is it the receiver and not the transmitter that is being configured.

SuggestedRemedy

Change: precoder setting requested by To: receiver precoder setting of

Proposed Response Response Status W

PROPOSED REJECT.

The receiver doesn't have a precoder. The receiver isn't being configured. The device requests this setting of the link partner's transmitter. The text is clear.

Cl 45 SC 45.2.1.195.1 P38 L35 # 31

Lo, William Axonne Inc.

Comment Type T Comment Status D Registers

Clarify that is it the transmitter and not the receiver that is being configured.

SuggestedRemedy

Insert after first sentence the following clarifying clause: To: , and controls the Reed-Solomon transmitter interleave setting of the PHY

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 45 SC 45.2.1.195.3 P38 L45 # 32

Lo, William Axonne Inc.

Comment Type T Comment Status D Registers

Clarify that is it the transmitter and not the receiver that is being configured.

SuggestedRemedy

Insert after first sentence the following clarifying clause: To: , and controls the transmitter precoder setting of the PHY

Proposed Response Response Status W

PROPOSED REJECT.

Clause 149 makes it clear that only the transmitter implements a precoder. This is unnecessary text.

Cl 45 SC 45.2.1.194.2 P37 L29 # 33

Lo, William Axonne Inc.

Comment Type T Comment Status D Registers

The 7 bit user field does not exist. This is a holdover from 1000BASE-T1. Looking at figure 149-10 octet 10 bits 7 to 1 were not used in 1000BASE-T1 but 4 of the 7 bits are now used for interleave and precode.

SuggestedRemedy

This is the general description what to do and editor has editorial license to make other changes to make the text consistent.

- 1) Move register 1.2311.12:11 to 1.2311.5:4. Search the document to make the register move consistent.
2) 1.2311.8:6 is the 3-bit user defined field
3) 1.2311.15:9 is Reserved
4) Update table 45-155c to match and any other titles/headings.
5) Change the 3 reserved bits in Table 149-10 (page 138) to User Defined Field It should be a single box and not 3 separate boxes.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

For 1.2311.10:4 Change: "User field" to "Reserved", Change: "7-bit user defined field to send to the link partner" to "Value always 0", and Change: "R/W" to "RO".

Cl 45 SC 45.2.1.195.2 P38 L39 # 34

Lo, William Axonne Inc.

Comment Type T Comment Status D Registers

The 7 bit user field does not exist.  
 This is a holdover from 1000BASE-T1.  
 Looking at figure 149-10 octet 10 bits 7 to 1 were not used in 1000BASE-T1 but 4 of the 7 bits are now used for interleave and precode.

*SuggestedRemedy*

This is the general description what to do and editor has editorial license to make other changes to make the text consistent.

- 1) Move register 1.2312.12:11 to 1.2312.5:4. Search the document to make the register move consistent.
- 2) 1.2312.8:6 is the 3-bit user defined field from the link partner
- 3) 1.2312.15:9 is Reserved
- 4) Update table 45-155d to match and any other titles/headings.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

For 1.2312.10:4  
 Change: "Link partner user field" to "Reserved" and  
 Change: "7-bit user defined field from the link partner" to "Value always 0".

Cl 149 SC 149.3.8.4.6 P133 L9 # 35

Lo, William Axonne Inc.

Comment Type T Comment Status D OAM

The loops around figure 149-24 are running at infinite speed and is not paced. I think the intention is to check the loop once per RS Frame. If we don't do this then tx\_rec will keep incrementing once rf\_valid is false.

*SuggestedRemedy*

Change all 3 instances of UCT to RX\_FRAME

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

These are corrected in the proposal for Comment #19. This is only needed if Comment #19 is not accepted.

Cl 149 SC 149.5.1 P151 L39 # 36

Lo, William Axonne Inc.

Comment Type T Comment Status D Test Modes

To avoid the possibility of TX\_TCLK\_175 being interpreted as divide by 32 for all speeds, add a clarifying statement.

*SuggestedRemedy*

Change TX\_TCLK\_175 is equal to 5625 MHz divided by 32 to the symbol baud rate divided by 32, 16, and 8 for 10GBASE-T1, 5GBASE-T1, and 2.5GBASE-T1 respectively.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change: TX\_TCLK\_175 is equal to 5625 MHz divided by 32

To: TX\_TCLK\_175 is equal to 5625 x S MHz divided by 32 x S.

Cl 149 SC 149.3.6.2.2 P102 L23 # 37

McClellan, Brett Marvell

Comment Type T Comment Status D EEE

alert\_detect is defined as primitive from the PMA, PMA\_ALERTDETECT.indication(alert\_detect). However, PMA\_ALERTDETECT.indication(alert\_detect) isn't actually a defined PMA primitive.

*SuggestedRemedy*

on page 80 line 26, insert  
 "149.2.2.11 PMA\_ALERTDETECT.indication  
 This primitive is generated by PMA Receive to indicate the status of the receive link at the local PHY when rx\_lpi\_active is TRUE. The parameter alert\_detect conveys to the PCS receive function information regarding the detection of the LPI alert signal by the PMA receive function. The criterion for setting the parameter alert\_detect is left to the implementer.

149.2.2.11.1 Semantics of the primitive  
 PMA\_ALERTDETECT.indication (alert\_detect)  
 The alert\_detect parameter can take on one of two values of the form:  
 TRUE The alert signal has been reliably detected at the local receiver.  
 FALSE The alert signal at the local receiver has not been detected.

149.2.2.11.2 When generated  
 The PMA generates PMA\_ALERTDETECT.indication messages to indicate a change in the alert\_detect status.

149.2.2.11.3 Effect of receipt  
 The effect of receipt of this primitive is specified in 149.3.2.3, Figure 149-17."

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 149 SC 149.3.8.2.5 P117 L6 # 38

McClellan, Brett

Marvell

Comment Type T Comment Status D EEE

"Editor's note to be removed in draft 1.3: The OAM request to exit LPI is unneeded. Commenters are requested to provide text and edits necessary to cleanly remove this function and describe the local fault mechanism for the RS to signal exit from LPI." This function was added in Clause 97 ( 1000BASE-T1) to cause the local device to exit low power idle when the link partner receiver is having trouble tracking the low power idle refresh signaling. However this function may not be necessary in an XGMII based system. Also the mechanism of exiting LPI is not described. An XGMII based PHY could generate Local Fault signals toward the Reconciliation Sublayer in a low SNR condition. The RS would respond by sending Remote Faults to the link partner, causing the link partner to stop sending LPI and start sending Idle until the fault condition is cleared. The downside to this mechanism is that the data link is interrupted in the path from the link partner to the local device. I propose we keep the current mechanism of exiting LPI based on the OAM SNR indication but clarify how the LPI is exited.

SuggestedRemedy

on page 69 line 42  
Change: "When the PHY Health status received from the link partner indicates that LPI is insufficient to maintain PHY SNR, the PHY may temporarily exit LPI mode and send idles."  
To: "When the PHY Health status received from the link partner indicates that LPI is insufficient to maintain PHY SNR, the PHY shall temporarily exit LPI mode and send idles by replacing an LPI symbol group received at the XGMII with Idle symbols until the link partner no longer indicates insufficient SNR."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

TFTD.

149.1.3.3 isn't the right place for this requirement, as it is an overview section.

Consider changes to Figure 149-18 (EEE Transmit State Diagram) which would cause the transmitter to exit quiet-refresh when the PHY-Health status from the link partner requests it.  
(possible late presentation)

CI 149 SC 149.4.2.4.6 P138 L51 # 39

Zimmerman, George

CME Consulting/ADI, APL Group, Aquantia, BMW, Ci

Comment Type T Comment Status D SEND\_S

Editor's note flags need for consistent usage of send\_s. In most cases send\_s is a signal. Confusion comes from the way the input to the PMA transmit comes from the link synchronization machine, and the definition of sync\_tx\_mode, which appears that it should be using the message sync\_tx\_symb (which is not set anywhere).

SuggestedRemedy

Adopt changes in zimmerman\_3ch\_01\_0419.pdf

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Adopt changes in zimmerman\_3ch\_01a\_0419.pdf

CI 149 SC 149.3.2.2.18 P93 L17 # 40

Zimmerman, George

CME Consulting/ADI, APL Group, Aquantia, BMW, Ci

Comment Type T Comment Status D PCS

"For output symbols the PMA transmit process shall map" - the gray mapping is described as a PCS function. Also, the selectable precoder and PAM4 encoding both say PMA when described as a PCS function. (149.3.2.2.19, page 93, line 47 and 149.3.2.2.20 page 94 line 24).

SuggestedRemedy

Change "PMA transmit" to "PCS transmit" on page 93, lines 17 and 47, and page 94 line 24.

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 149 SC 149.7.2 P161 L41 # 41

Zimmerman, George

CME Consulting/ADI, APL Group, Aquantia, BMW, Ci

Comment Type T Comment Status D Link Segment

"The test methodologies are specified in Annex 149A and Annex 97B."  
Annex 149A relates to coupling attenuation, not to test setups for coupling between link segments.

SuggestedRemedy

delete "Annex 149A and" on P161 L41

Proposed Response Response Status W

PROPOSED ACCEPT.



Cl 149 SC 149.7.2.1 P161 L 51 # 42  
 Zimmerman, George CME Consulting/ADI, APL Group, Aquantia, BMW, Ci  
 Comment Type E Comment Status D Link Segment

This subclause which is supposed to define PSANEXT stops short and is intertwined with the subclause for PSAACR-F. There are also references to the "type A" link segment of clause 97 which need to be removed, and there should be 2 figures, one for PSANEXT and one for PSAACR-F, where there is currently only one figure - referenced in the text as for PSANEXT, and entitled as for PSAACR-F.  
 (NOTE - THIS COMMENT DOES NOT ASSIGN THE VALUES FOR ALIEN CROSSTALK, BUT JUST FIXES THE EDITORIAL ISSUES)

*SuggestedRemedy*

Move P162 lines 1 through 12 to be after "PSANEXT is illustrated in Figure 149-45." (P 162 line 26), changing the reference to "NEXT" currently on lines 3 and 7 (equation 149-25) to "ACR-F".  
 Change title of Figure 149-45 from "PSAACR-F calculated using Equation (149-26)" to "PSANEXT loss calculated using Equation 149-25"  
 At the end of the (new) PSAACR-F) description, add "PSAACR-F is illustrated in Figure 149-46." and insert new figure "PSAACR-F loss loss calculated using Equation 149-26" (figure will be autonumbered)  
 Delete all references to "type A" (currently 2 occurrences on page 162)

*Proposed Response* Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.

Implement the suggested remedy with Editorial license to implement with the correct format and style.

Cl 149 SC 149.7.2.1 P161 L 7 # 43  
 Zimmerman, George CME Consulting/ADI, APL Group, Aquantia, BMW, Ci  
 Comment Type T Comment Status D Link Segment

PSANEXT and PSAFEXT need to be set. Levels based both on phy analysis and 10 dB margin from cabling measurements in mueller\_3ch\_05\_0319.pdf are proposed. Models for PSANEXT and PSAFEXT are based on clause 113, the closest model for PSANEXT and PSAFEXT in IEEE STd 802.3, which go out to 2 GHz. Measurement limits of 75 dB loss are incorporated to allow for repeatable measurements PHY noise impacts are to be presented in and sederat\_3ch\_01\_0419.pdf, and zimmerman\_3ch\_02\_0419 along with a spreadsheet for computations.

*SuggestedRemedy*

Make equation 149-25 (PSANEXT) loss, and text below it (lines 10 & 11) with:  
 "PSANEXTloss(f) >= min (75, 80-15log10(f/100)) dB, 1 <= f <= FMax (149-25)  
 , where f is the frequency in MHz.  
 Replace equation 149-26 (PSAACRF loss), with "PSAACR-F loss (f) >= min( 75, 86-20log10(f/100)) dB, 1<=f<=FMax (149-26)"  
 (text already has f is the frequency in MHz)

*Proposed Response* Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.

Implement the suggested remedy with Editorial license to implement with the correct format and style.

CI 98 SC 98 P56 L1 # 44

LEE, JUHO Hanyang University and Hyundai Motor Company

Comment Type T Comment Status D EEE

The latest asymmetric transmission proposals have following problems. 1. The EEE mode should be used for low speed transmission. 2. Even if data traffic at low speed have to increase, the data traffic should be transmitted only in a predetermined period. This may cause a buffer overflow. 3. There is a delay time when sleep mode is switched on. During this delay time, PHY can not cover the traffic coming from the MAC layer. In this situation, frame loss or collision problems can occur.

#### SuggestedRemedy

We would like to suggest a way to use AN(Auto-negotiation) for asymmetric transmission. Generally, traditional AN is self-configuring to use the highest speed that can be supported by the common links between end devices. For asymmetric transmission, a new AN mode is proposed, which supports the lowest common link speed (or a specific link rate like 10 Mbps) between end devices. This can reduce the BER and increase the energy saving and the reliability of low-speed data. In order to add the new AN mode, providing either one of the uplink and downlink directions at a low speed in AN for asymmetric data transmission mode. And power saving in some cases while using AN. Because the AN can exchange information with the MAC layer, the MAC measures the queue characteristics and frequency of use to determine the trigger for the asymmetric transmission and instructs the AN to set the asymmetric uplink / downlink rate. As the queue changes, it can be switched to a symmetric or asymmetric transmission, and this decision is made entirely by the MAC.

Proposed Response Response Status W

PROPOSED REJECT.

The comment description does not contain sufficient detail so that the TF can understand the specific changes requested by the commenter. In addition, the suggested remedy in the comment does not contain sufficient detail so that the TF can understand the specific changes requested by the commenter.

CI 149 SC 149.1.3.3 P69 L37 # 45

Kim, Taehyoung Hanyang University and Hyundai Motor Company

Comment Type T Comment Status D EEE

The LPI mode is a method for implementing EEE. However, when small data is periodically transmitted with a gap, the PHY repeatedly enters and leaves the LPI mode, resulting in energy loss. Also, the refresh signal in LPI mode only maintains a connection between the sender and the receiver, but does not transmit any data. In order to solve this frequent LPI transition problem, part of the unused OAM fields can be used to adjust the transmission speed depending on the change of data amount in buffers. If PHY transmit quiet time block after the our proposed OAM field, PHY can transmit PAM4 data block with information and operate various speeds. Therefore we propose OAM transmission for various speed transmission.

#### SuggestedRemedy

Our proposed solution uses the D9 bit field of the previously transmitted OAM frame (figure 149-17) to monitor the buffer accumulated in the PHY and adjust the transmission rate. When D9 = 0, this defines no change in the amount of data to be transmitted and the PHY transmits at the same rate at the next data transmission. When D9 = 1, this indicates that there is a change in the amount of data and that the PHY immediately transmits OAM symbol 0 after parity bit transmission. OAM symbol 0 is determined to configure the link speed at either 5 Gbps or 2.5 Gbps speed on 10 Gbps link based on the bit combinations of D4 and D5.

1. <D4, D5> = <0, 0> 10 Gbps
2. <D4, D5> = <0, 1> 5 Gbps
3. <D4, D5> = <1, 0> 2.5 Gbps

In case of 5 Gbps, the link mode of PHY will be on the quiet time of 64 bits, which is equal in bit length one PAM4 data block. The quiet time is a time period with no data transmission.

In case of 2.5 Gbps, the link mode of PHY will be on the quiet time of 192 (64 x 3) bits, which is equal to one data block. And the length and frequency of quiet time and PAM4 data blocks are equal for both cases.

Proposed Response Response Status W

PROPOSED REJECT.

The comment description does not contain sufficient detail so that the TF can understand the specific changes requested by the commenter. In addition, the suggested remedy in the comment does not contain sufficient detail so that the TF can understand the specific changes requested by the commenter.

Cl 149 SC 149.3.2.2.21 P95 L9 # 46

Tu, Mike Broadcom

Comment Type E Comment Status D PCS

There is no "PCS\_Data" state. It probably meant the "SEND\_DATA" state. However "PCS\_Data" might be a better name for this state.

*SuggestedRemedy*

- Option 1. Replace this "PCS\_Data" by "SEND\_DATA"
- Option 2. Replace all "SEND\_DATA" and "SEND DATA" by "PCS\_Data" and "PCS DATA" respectively throughout D1.2

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Replace this "PCS\_Data" by "SEND\_DATA"

Cl 149 SC 149.1.3 P68 L4 # 47

Tu, Mike Broadcom

Comment Type T Comment Status D OAM

The OAM capability is advertised via InfoField in 149.4.2.4.5

*SuggestedRemedy*

- Change from: "...PHY advertises its MultiGBASE-T1 OAM capability as described in 149.3.8."
- To: "...PHY advertises its MultiGBASE-T1 OAM capability as described in 149.4.2.4.5".

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 149 SC 149.1.3 P71 L12 # 48

Tu, Mike Broadcom

Comment Type T Comment Status D pcs\_data\_mode

In Figure 149-2, "pcs\_data\_mode" is missing

*SuggestedRemedy*

- In Figure 149-2:
- 1. Add an arrowed line for "pcs\_data\_mode", coming out of the "PHY CONTROL" block, and going into the "PCS\_TRANSMIT" block.
- 2. If proposal in "tu\_3ch\_02\_0419.pdf" to make pcs\_data\_mode available even without EEE is adopted, then make this a SOLID line. Otherwise make this a DASHED line.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Final implementation depends on outcome of comments #57 & #58.

Cl 149 SC 149.2.2 P74 L22 # 49

Tu, Mike Broadcom

Comment Type T Comment Status D pcs\_data\_mode

PMA\_PCSDATAMODE should be added

*SuggestedRemedy*

If we make "pcs\_data\_mode" available even without EEE, then insert "PMA\_PCSDATAMODE.indication (pcs\_data\_mode)" at line 22. Otherwise insert it at line 30.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Final implementation depends on outcome of comments #57 & #58.

Cl 149 SC 149.2.2 P75 L23 # 50

Tu, Mike Broadcom

Comment Type T Comment Status D pcs\_data\_mode

PMA\_PCSDATAMODE.indication should be added

*SuggestedRemedy*

- In Figure 149-3:
- 1. Add an arrowed line for "PMA\_PCSDATAMODE.indication" from the PMA block into the PCS block.
- 2. If pcs\_data\_mode is made available for non-EEE mode as well, then make this a SOLID line. Otherwise make this a DASHED line.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Final implementation depends on outcome of comments #57 & #58.

Cl 149 SC 149.2.2.9 P79 L22 # 51

Tu, Mike Broadcom

Comment Type T Comment Status D pcs\_data\_mode

Insert PMA\_PCSDATAMODE.indication before 149.2.2.9

*SuggestedRemedy*

Before 149.2.2.9, insert the following (based on 55.2.2.11):

149.2.2.8a PMA\_PCSDATAMODE.indication

–This primitive indicates whether or not the PCS state diagrams are able to transition from their initialization states. The pcs\_data\_mode variable is generated by the PMA PHY Control function. It is passed to the PCS Control function via the PMA\_PCSDATAMODE.indication primitive.

–149.2.2.8a.1 Semantics of the primitive

–PMA\_PCSDATAMODE.indication (pcs\_data\_mode)

–149.2.2.8a.2 When generated

–The PMA PHY Control function generates PMA\_PCSDATAMODE.indication messages continuously.

–149.2.2.8a.3 Effect of receipt

–Upon receipt of this primitive, the PCS performs its transmit function as described in 149.3.2.2.

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 149 SC 149.3.2 P81 L27 # 52

Tu, Mike Broadcom

Comment Type T Comment Status D pcs\_data\_mode

In Figure 149-4, "pcs\_data\_mode" is missing

*SuggestedRemedy*

In Figure 149-4:

1. Add an arrowed line coming in from below the "PMA SERVICE INTERFACE" into the PCS TRANSMIT block.

2. If pcs\_data\_mode is made available for non-EEE mode as well, then make this a SOLID line. Otherwise make this a DASHED line.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Final implementation depends on outcome of comments #57 & #58.

Cl 149 SC 149.3.6.2.2 P102 L37 # 53

Tu, Mike Broadcom

Comment Type T Comment Status D pcs\_data\_mode

pcs\_data\_mode already defined in 149.4.4.1

*SuggestedRemedy*

Delete line 37 to line 41.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Delete page 102 lines 37 to 41.

Add to page 101 line 49:

Variable set by the PMA PHY Control function. See 149.4.4.1.

This depends on disposition of other pcs\_data\_mode comments, especially #57 & #58.

Cl 149 SC 149.4.2 P134 L19 # 54

Tu, Mike Broadcom

Comment Type T Comment Status D pcs\_data\_mode

In Figure 149-26, "pcs\_data\_mode" is missing

*SuggestedRemedy*

In Figure 149-26:

1. Add an arrowed line coming out of the PHY CONTROL block, going up toward the PMA SERVICE INTERFACE.

2. If pcs\_data\_mode is made available for non-EEE mode as well, then make this a SOLID line. Otherwise make this a DASHED line.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Final implementation depends on outcome of comments #57 & #58.

Cl 149 SC 149.4.4.1 P147 L 20 # 55  
 Tu, Mike Broadcom  
 Comment Type T Comment Status D pcs\_data\_mode  
 Make "pcs\_data\_mode" available even without optional EEE. See "tu\_3ch\_02\_0419.pdf" for the motivation.  
 SuggestedRemedy  
 1. Delete line 20.  
 2. Delete the last sentence, starting at the end of line 24: "In the absence of the optional EEE capability, the PHY operates as if the value of this variable is TRUE."  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Final implementation depends on outcome of comments #57 & #58.

Cl 149 SC 149.3.7.1 P106 L 23 # 56  
 Tu, Mike Broadcom  
 Comment Type T Comment Status D pcs\_data\_mode  
 Make sure "pcs\_status" is only set to TRUE after entering data mode.  
 SuggestedRemedy  
 Change the second sentence to: "It is only true if pcs\_data\_mode is true, block\_lock is true, and hi\_rfer is false."  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 149 SC 149.4.5 P149 L 6 # 57  
 Tu, Mike Broadcom  
 Comment Type T Comment Status D pcs\_data\_mode  
 The PHY Control state diagram and the Link Monitor state diagram will result in conflicted state machines. Also if the link is interrupted after entering the SEND\_DATA state, the PHY will falsely report the link status=OK for 100msec while the data connection had already been lost.  
 SuggestedRemedy  
 Adopt the changes as proposed in ""tu\_3ch\_02\_0419.pdf"  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 TFTD. Task Force to hear presentation tu\_3ch\_02\_0419.pdf and decide which, if any, of these changes should be made and if there are additional changes required.

Cl 149 SC 149.4.5. P150 L 18 # 58  
 Tu, Mike Broadcom  
 Comment Type T Comment Status D pcs\_data\_mode  
 The PHY Control state diagram and the Link Monitor state diagram will result in conflicted state machines. Also if the link is interrupted after entering the SEND\_DATA state, the PHY will falsely report the link status=OK for 100msec while the data connection had already been lost.  
 SuggestedRemedy  
 Adopt the changes as proposed in ""tu\_3ch\_02\_0419.pdf"  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Task Force to hear presentation tu\_3ch\_02\_0419.pdf and decide which, if any, of these changes should be made and if there are additional changes required.

Cl 149 SC 149.5.2.4 P154 L 24 # 59  
 Tu, Mike Broadcom  
 Comment Type T Comment Status D Transmit power  
 The minimum transmit power should be reduce to -2 dBm, in order to account for potential implementation losses.  
 SuggestedRemedy  
 Change from: "the transmit power shall be in the range of -1 dBm to 2 dBm ..."  
 To: "the transmit power shall be in the range of -2 dBm to 2 dBm ..."

Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Needs to have the same solution as comment #73.

Cl 149 SC 149.1.3.3 P69 L 25 # 60  
 Graba, Jim Broadcom  
 Comment Type T Comment Status D EEE  
 Alert isn't low frequency. See 149.4.2.2, page 135, lines 19-20.  
 SuggestedRemedy  
 Replace "low frequency" with "PN sequence".  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Delete: The Alert signal is a low frequency PAM2 signal.

Cl 149 SC 149.1.3.3 P69 L15 # 61

Graba, Jim Broadcom

Comment Type T Comment Status D EZ

It isn't clear in this line that Sleep is aligned with a super frame. In 149.3.2.2.21, page 94, line 49-53 the alignment is clear.

*SuggestedRemedy*

Clarify the Sleep alignment in 149.1.3.3. Replace "Following this event a sleep signal is transmitted by the PMA" with "Following this event the PMA transmits the sleep signal starting at the beginning of the next superframe."

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 149 SC 149.4.2.6 P141 L29 # 62

Benjamin, Saied Aquantia

Comment Type T Comment Status D PMA

Alert Sequence generator can start at a random PN sequence seed when alert starts. This can add a random delay to the correlator trigger. I propose that we reset the sequence to a known value at the start of alert

*SuggestedRemedy*

Change from:  
The PN sequence generator shift registers shall be reset to a non-zero value upon entering into the TRANSMIT\_DISABLE state (see Figure 149–31).  
to:  
The PN sequence generator shift registers shall be reset to a value of S[7:0]=0000001 upon entering into the TRANSMIT\_DISABLE state (see Figure 149–31) or on the transmission of first symbol of alert sequence. The receiver may not necessarily receive a continuous PN sequence between separate periods of SEND\_S.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change: The PN sequence generator shift registers shall be reset to a non-zero value upon entering into the TRANSMIT\_DISABLE state (see Figure 149–31).  
To: The PN sequence generator shift registers shall be reset to a value of S[7:0]=0000001 upon entering into the TRANSMIT\_DISABLE state (see Figure 149–31) or on the transmission of first symbol of alert sequence.

Cl 149 SC 149.4.2.4.3 P137 L19 # 63

Benjamin, Saied Aquantia

Comment Type T Comment Status D PMA

Pratial phy frame count (PFC24) rolls over after 2^24. Because the EEE uses 96\*4 partial phy frames per QR cycle, we have to make sure that the PFC24 rolls over at a multiple of this count.

*SuggestedRemedy*

Add the following paragraph:  
The PFC24 count must roll over to 0 after the count of 16776959 to align with EEE QR cycle.

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 149 SC 149.3.5.1 P100 L8 # 64

Benjamin, Saied Aquantia

Comment Type E Comment Status D EZ

The sentence seems to be missing some words

*SuggestedRemedy*

Change from:  
ALERT, a four RS-FEC frame, shall start at the beginning of any eighth PHY frame boundary starting at the beginning of the frame following a refresh PHY frame.  
To:  
ALERT, a four RS-FEC frame long sequence, shall start at the beginning of any eighth PHY frame boundary starting at the beginning of the frame following a refresh PHY frame.

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 149 SC 149.3.5.1 P100 L16 # 65

Benjamin, Saied Aquantia

Comment Type T Comment Status D EEE

We use tx\_alert\_start to indicate the frame numbers where alert should start, it is more aligned with other variables to use tx\_alert\_active

*SuggestedRemedy*

See Presentation Benjamin\_3ch\_02\_041619 slide 2

Proposed Response Response Status Z

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl 149 SC 149.3.5.1 P100 L16 # 66  
 Benyamin, Saied Aquantia  
 Comment Type T Comment Status D EEE  
 Mechanism to prevent partial refresh is not necessary since refresh is only one frame long.  
 SuggestedRemedy  
 See presentation Benyamin\_3ch\_02\_041619 slide 4 for changes to table 149-4 and 149-5 where calculations of tx\_lpi\_full\_refresh are taken out  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 149 SC 149.3.6.2.2 P103 L8 # 67  
 Benyamin, Saied Aquantia  
 Comment Type T Comment Status D EEE  
 Mechanism to prevent partial refresh is not necessary since refresh is only one frame long.  
 SuggestedRemedy  
 Take out definition of tx\_lpi\_full\_refresh  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 149 SC 149.3.6.2.2 P103 L10 # 68  
 Benyamin, Saied Aquantia  
 Comment Type T Comment Status D EEE  
 Mechanism to prevent partial refresh is not necessary since refresh is only one frame long.  
 SuggestedRemedy  
 Take out definition of tx\_lpi\_initial\_quiet  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 149 SC 149.3.6.2.2 P102 L35 # 69  
 Benyamin, Saied Aquantia  
 Comment Type T Comment Status D EEE  
 Mechanism to prevent partial refresh is not necessary since refresh is only one frame long.  
 SuggestedRemedy  
 change lpi\_tx\_mode from:  
 The variable is set to QUIET when (tx\_lpi\_qr\_active \* (!tx\_refresh\_active + tx\_lpi\_initial\_quiet))  
 to:  
 The variable is set to QUIET when (tx\_lpi\_qr\_active \* !tx\_refresh\_active)  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 149 SC 149.3.7.2 P113 L2 # 70  
 Benyamin, Saied Aquantia  
 Comment Type T Comment Status D EEE  
 Mechanism to prevent partial refresh is not necessary since refresh is only one frame long.  
 SuggestedRemedy  
 See Benyamin\_3ch\_02\_041619 slide 6 for changes to EEE state machine figure 149-18  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

CI 149 SC 149.2.2.3.1 P76 L35 # 71

Benjamin, Saied

Aquantia

Comment Type T Comment Status D PMA

Changes submitted in VanCouver modified the text so that link synchronization PN sequence for Alert is sent directly to PMA rather than via tx\_symb, as such we need to remove ALERT from this primitive

*SuggestedRemedy*

Change definition of PMA\_UNITDATA.request(tx\_symb) to the following:  
During transmission, the PMA\_UNITDATA.request simultaneously conveys to the PMA via the parameter tx\_symb the value of the symbols to be sent over the MDI. The tx\_symb may take on one of the following values:

{-1, -1/3, +1/3, +1} in normal operation  
0 when zeros are to be transmitted in the following two cases:  
1)when PMA\_TXMODE.indication is SEND\_Z during PMA training,

and

2)after data mode is reached, the transmit function is in the LPI transmit mode, and lpi\_tx\_mode is QUIET.

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 45 SC 45.2.1.197 P39 L43 # 72

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Registers

"The number is in offset two's complement notation, with 0.0 dB represented by 0x8000." I'm not aware of a format called 'offset two's complement'. I know "two's complement" and "offset binary". From the context it is clear that the latter is meant.

*SuggestedRemedy*

Propose to replace "offset two's complement" with "offset binary"

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 149 SC 149.5.2.4 P154 L24 # 73

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Transmit power

Transmit power limits are currently by accident set to -1 to 2dBm. My proposal during the last F2F was -0.5 to 2.5dBm, with support from multiple silicon suppliers. Mike indicated that he preferred to keep a +/-2dB range instead of a +/-1.5dB range, but nobody intended to shift the nominal power level

*SuggestedRemedy*

Change range into -0.5 to 2.5dBm

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Needs to have the same solution as comment #59.

CI 149 SC 149.8.2.1 P163 L20 # 74

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D MDI

There is currently only one MDI return loss template for all speeds. I think we should differentiate requirements for different speeds to allow looser spec for 2.5Gbps and 5Gbps. The easiest way to achieve this is by scaling all frequency values by S except for the 1MHz lower bound.

*SuggestedRemedy*

Change:  
10 --> 10S  
500 --> 500S  
3000 --> 3000S  
4000 --> Fmax

Remove:

For 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1, the maximum applicable frequency for the MDI return loss is  $4000 \times S$  MHz.

Proposed Response Response Status W

PROPOSED REJECT.

Most PHYs don't scale the return loss template with speed. It's a function of the cable's insertion loss.



CI 149 SC 149.8.2.1 P163 L23 # 75

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D MDI

The MDI curve is discontinuous at 500: 20dB versus 19.78dB.

*SuggestedRemedy*

Implicitly fixed by proposal to relax MDI return loss a bit. See next item.

Proposed Response Response Status W

PROPOSED REJECT.

It is not necessary for the limit line to be continuous.

CI 149 SC 149.8.2.1 P163 L20 # 76

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D MDI

The MDI return loss at high frequency is tighter than necessary IMO. The MDI is far-end return loss which gets twice attenuated by insertion loss. This return loss component therefore doesn't worsen the RL/IL ratio. I think the currently specified link segment return loss and MDI return loss are not well balanced for a cost optimal solution. I would like to propose to relax the MDI return loss and if possible tighten the link segment return loss.

*SuggestedRemedy*

Formula  $12-10\log(f/3000)$  change into  $10-10*\log(f/3000S)$  for  $300S < f < 3000S$   
 Formula  $12-20*\log(f/3000)$  change into  $10-20*\log(f/3000S)$  for  $3000S < f < F_{max}$

Proposed Response Response Status W

PROPOSED REJECT.

Need data to show this, not opinion.

The commenter may choose to provide a presentation at a future meeting with data to support this and may choose to submit a comment at WG ballot.

CI 149 SC 149.5.2.1 P153 L38 # 77

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Test Modes

Current the droop requirement is specified as "the magnitude of both the positive and negative droop shall be less than 15%, measured with respect to an initial value at 4 ns after the zero crossing and a final value at 16 ns after the zero crossing (12 ns period)". This spec is currently independent of the speed, which makes this period contain 4x more symbols at 10Gbps than at 2.5Gbps. This implies a significantly larger BLW at 2.5Gbps which increases the peak differential amplitude. If the measurement period is made a fixed number of symbols or a period length scaling by 1/S, the signal impact of droop is equivalent for all rates.

*SuggestedRemedy*

Propose to scale the droop measurement period with the speed, so replace 4, 16 and 12, by  $4/S$  ns to  $16/S$  ns ( $12/S$  ns period). Alternatively, this measurement period can be specified as "initial value 24 symbol periods after the zero-crossing and a final value 96 symbol periods after a zero-crossing (72 symbol periods)"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change: initial value at 4 ns after the zero crossing and a final value at 16 ns after the zero crossing (12 ns period).

To: initial value of 24 symbol periods after the zero-crossing and a final value of 96 symbol periods after the zero-crossing (72 symbol periods).

CI 149 SC 149.7.1.4 P160 L42 # 78

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Link Segment

Maximum specified frequency for coupling attenuation has been adapted to  $F_{max}$ , which make perfect sense for a single-speed transceiver. For multi-speed transceivers, it might not be desirable to mandate the need for frequency-scaling anti-aliasing filters in the design. In order to circumvent that and not overspecify channels generally, a good solution could be to require that the link segment shall meet the requirements of the highest supported rate at that port.

*SuggestedRemedy*

Insert after line 42:

For multi-speed transceivers the link segment shall meet the coupling attenuation requirements for highest supported rate on the MDI.

Proposed Response Response Status W

PROPOSED REJECT.

IEEE802.3 does not specify implementation requirements.

CI 149 SC 149.7.1.4 P160 L36 # 79

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Link Segment

The current coupling attenuation spec, originating from contribution mueller\_3ch\_02a\_0518.pdf might be insufficient to ensure signal integrity. On slide 4 it states that "With existing cables and connectors an introduced differential noise level of a few mV (4mV or less) is achievable in a BCI test with 200mA interfering current." which seems based on ... Note that the suggested templates in that ppt don't seem to have a 6dB/octave slope. Which BCI level is assumed achievable by these transceivers? And is this 4mV safeguarded by the coupling attenuation template or is this just these actual cables showed that result? Note that these cables are apparently better than the specified template. The differential signal magnitude at Nyquist can be about the same level of a few mV. I think we should ensure that the injected interfering differential signal component (due to coupling attenuation) should be at least 6dB below the signal level. Therefore it seems that the coupling attenuation spec needs to be tightened. Looking at the more recently measured coupling attenuation curves the corner can be shifted without problem to 1GHz, but that might not yet be sufficient.

*SuggestedRemedy*

Replace:  
750 MHz --> 1000 MHz  
70 dB for  $f < 1000$  MHz  
 $70 - 20 * \log(f/1000)$  for  $1000 < f < F_{max}$  Mhz

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Participants are requested to review this proposal and determine if they agree with this proposal.

CI 149 SC 149.7.1.5 P161 L28 # 80

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Link Segment

Maximum specified frequency for screening attenuation has been adapted to  $F_{max}$ , which make sense for a single-speed transceiver. However, for multi-speed transceivers, it might not be desirable to implicitly mandate the need for frequency-scaling anti-aliasing filters in the design. In order to circumvent that and not overspecify channels generally, a good solution could be to require that the link segment shall meet the requirements of the highest supported rate at that port.

*SuggestedRemedy*

Insert after first sentence in this sub-section:

For multi-speed transceivers the link segment shall meet the screening attenuation requirements up to  $F_{max}$  for the highest supported rate on the MDI.

Proposed Response Response Status W

PROPOSED REJECT.

IEEE802.3 does not specify implementation requirements.

CI 149 SC 149.7.1.3 P159 L22 # 81

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Link Segment

For 10Gbps operation the worst-case link segment IL and RL, combined with module-internal losses, driver level tolerance, and termination impedance range, makes that echo magnitude at Nyquist can be  $>40x$  the received the signal magnitude. Scanning through previously presented RL data, the main reasons for the fairly loose link segment RL specs are the issues towards 5.5GHz (which are eliminated now as  $F_{max}$  is always 4GHz or less) and the inclusion of a 'first connector profile'. All cases with the second and third connector profiles (DiBiaso\_3ch\_01\_0518.pdf) pass with much margin. I think we should consider to tighten the link segment return loss spec for 10Gbps at high attenuation and not unnecessarily burden the transceiver.

*SuggestedRemedy*

Propose to add an extra limit curve to 10Gbps\_RL:  
 $N = -1$  for  $IL > 24$ dB  
(brings first corner to 960MHz and HF plateau to 15dB)

Note that this situation does not occurs for cables  $< 12$ m.

Proposed Response Response Status W

PROPOSED REJECT.

Need feedback from cable vendors.

The commenter may choose to provide a presentation at a future meeting with data to support this and may choose to submit a comment at WG ballot.

Cl 149 SC 149.8.2.1 P163 L20 # 82

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D MDI

I would like to make explicit that the low-frequency roll-up is there to enable PoDL, and that without PoDL the RL extends at 20dB down to 1MHz.

*SuggestedRemedy*

Split the low-frequency spec in two options:  
with PoDL: 20-20\*log(f/10S) dB  
without PoDL: 20dB

Proposed Response Response Status W

PROPOSED REJECT.

Need data to show this, not opinion.

The commenter may choose to provide a presentation at a future meeting with data to support this and may choose to submit a comment at WG ballot.

Cl 149 SC 149.1.3 P68 L10 # 83

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D MDI

In reality there is a piece of the channel between the MDI connector and the transceiver which is not accounted for in link segment IL & RL. Although the IEEE PHYs set mandatory specs for the MDI reference point, which makes a lot of sense, I think it would be useful to add informative specs for IL and RL for the part of the channel behind the MDI. IMO, the assumptions for IL & RL for this module-internal channel part, used to define the spec, should be mentioned.

*SuggestedRemedy*

Proposed Response Response Status W

PROPOSED REJECT.

The commenter does not provide any suggested remedy.

This has been done as an informative annex which defines test points and loss budgets for some of the high-speed SERDES specs.

The commenter may choose to submit a comment at WG ballot with a proposal to add an Annex, with the suggested content.

Cl 149 SC 149.5.1 P151 L41 # 84

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Test Modes

Clock jitter specifications are currently defined on a divided clocks. For higher data rates it is strongly recommendable to measure jitter at speed directly from the transmit path and not via a divided pattern or separate test clock as these might mask effects that are important to meet performance.

*SuggestedRemedy*

Propose to change test mode 2 for measuring master transmit jitter on MDI at full speed, using a toggling {+1} {-1} symbol pattern.  
This is technically a divide-by-two clock where both rising and falling zero crossings are taken into account for measurements.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Replace current definition of Test mode 2, page 151 lines 41-43 with - Test mode 2 is for transmitter jitter testing on MDI when transmitter is in MASTER timing mode. When test mode 2 is enabled, the PHY shall transmit a continuous pattern of JP03A (as specified in Clause 94.2.9.1) or JP03B (as specified in Clause 94.2.9.2) with the transmitted symbols timed from its local clock source.

This needs to be the same solution as comment #22.

Cl 149 SC 149.5.2.3 P154 L17 # 85

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Test Modes

"The band-pass bandwidth of the measurement device shall be larger than 200 MHz." This is probably based on a divide-by-32 clock, that would run at 5625/32=175.8MHz, so 200MHz wouldn't be limiting in that case. Note that higher frequency jitter is partly masked in this case.

*SuggestedRemedy*

Propose to adapt test mode 2 to a symbol rate toggling {+1} {-1} pattern and measure jitter with a bandwidth of the measurement device of at least Fmax.

Proposed Response Response Status W

PROPOSED REJECT.

The proposed change in the comment does not contain sufficient detail so that the TF can understand the specific changes requested by the commenter. In addition, the proposed change in the comment does not contain sufficient detail so that the TF can understand the specific changes requested by the commenter.

Cl 149 SC 149.5.2.4 P154 L 30 # 86

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D Transmit PSD

Transmit PSD mask. During the Vancouver meeting I've presented modifications to the Transmit PSD mask. There have been interactive discussion on this with some modifications to the material. The decision on this topic was postponed to the next meeting to give people time to review internally.

*SuggestedRemedy*

Propose to change transmit PSD mask according to the attached presentation.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Task Force to hear presentation DenBesten\_3ch\_01\_0419.pdf and decide.

Cl 149 SC 149.5.3.2 P156 L 12 # 87

Zimmerman, George

CME Consulting/ADI, APL Group, Aquantia, BMW, Ci

Comment Type T Comment Status D Test Modes

Comment 228 from draft 1.1 was implemented incorrectly. Accepted resolution specified the noise level is at the MDI of the DUT. Language also needs editorial clean up. The proposed response is aligned with accepted language in 802.3cg D3p0.

*SuggestedRemedy*

Change: "The test is performed with a noise source consisting of a signal generator with Gaussian distribution, bandwidth of TBD MHz and magnitude of TBD dBm/Hz."  
to: "The test is performed with a noise source such that noise with a Gaussian distribution, bandwidth of TBD MHz, and magnitude of TBD dBm/Hz is present at the MDI of the DUT."  
Editorial license to fill in the TBDs based on other comments.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Need to put final text here with values for TBDs.

Cl 149 SC 149.5.3.2 P156 L 12 # 88

Zimmerman, George

CME Consulting/ADI, APL Group, Aquantia, BMW, Ci

Comment Type T Comment Status D Test Modes

The TBDs need to be filled in, and when doing so, the structure of the sentence needs to be changed to reflect that with a constant alien crosstalk coupling the noise level will shift. Suggest the numbers for 10GBASE-T1 in sederat\_3ch\_0419.pdf, adjusted for 2.5G and 5GBASE-T based purely on the difference in disturbing PSD levels, not on receiver noise tolerance, which would require more work on cabling and different cable specs for these technologies.

*SuggestedRemedy*

Replace "bandwidth of TBD MHz, and magnitude of TBD dBm/Hz" with "bandwidths and magnitudes shown in Table 149-xx"  
Insert Table 149-xx (autonumbered) after Figure 149-41, with entries (commas between columns, semicolons for rows)  
Header row: "PHY Type", "Noise Bandwidth (MHz)", "Added Noise at MDI (dBm/Hz)";  
and body rows:  
10GBASE-T1, 3000 MHz, -152 dBm/Hz;  
5GBASE-T1, 1500 MHz, -149 dBm/Hz;  
2.5GBASE-T1, 750 MHz, -146 dBm/Hz;

Proposed Response Response Status W

PROPOSED ACCEPT.