Cl **FM** *SC* **FM** *P* **1** *L* **26** # 1
Anslow, Pete Ciena

Comment Type **E** *Comment Status* **D** *EZ*
IEEE Std 802.3cd-2018 is now approved

SuggestedRemedy
Change "IEEE Std 802.3cd-201x" to "IEEE Std 802.3cd-2018"

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

Cl **FM** *SC* **FM** *P* **2** *L* **3** # 2
Anslow, Pete Ciena

Comment Type **E** *Comment Status* **D** *EZ*
The abstract should not contain "Draft D1.1 is prepared for Task Force Review."

SuggestedRemedy
Delete "Draft D1.1 is prepared for Task Force Review."

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

Cl **FM** *SC* **FM** *P* **21** *L* **1** # 3
Anslow, Pete Ciena

Comment Type **E** *Comment Status* **D** *EZ*
"2019Draft Standard for Ethernet" contains a spurious "2019"

SuggestedRemedy
Delete "2019"

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

Cl **00** *SC* **0** *P* **1** *L* **25** # 26
Maguire, Valere The Siemon Company

Comment Type **E** *Comment Status* **D** *EZ*
IEEE Std 802.3cd-201x has published.

SuggestedRemedy
Replace all occurances of "IEEE Std 802.3cd-201x" with "IEEE Std 802.3cd-2018"

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

Cl **00** *SC* **0** *P* **2** *L* **5** # 21
Maguire, Valere The Siemon Company

Comment Type **E** *Comment Status* **D** *EZ*
Incorrect capitalization

SuggestedRemedy
Replace "physical layer" with "Physical Layer"

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

Cl **00** *SC* **0** *P* **2** *L* **5** # 22
Maguire, Valere The Siemon Company

Comment Type **E** *Comment Status* **D** *EZ*
MASTER-SLAVE could be added to the keywords

SuggestedRemedy
Insert " MASTER-SLAVE;" after "IEEE 802.3chTM; "

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

Cl **1** *SC* **1.3** *P* **22** *L* **6** # 131
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
Change wording of Editor's note.

SuggestedRemedy
Change: Insert the following references in 1.3 alphanumeric order as follows:
To: Insert the following references in 1.3 in alphanumeric order as follows:

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

Cl **1** *SC* **1.4** *P* **22** *L* **17** # 280
den Besten, Gerrit NXP Semiconductors

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

"over a single shielded balanced pair of conductors". Signal routing at PCB might not be shielded. Same on lines 23 and 29.

SuggestedRemedy

Replace by: "over a single balanced pair of conductors using shielded cabling."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

This would require a change of the cable name througout the document, not just the two places mentioned by comments 280 and 281.

Cl **1** *SC* **1.4** *P* **22** *L* **26** # 132
Wienckowski, Natalie General Motors

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

Missing space

SuggestedRemedy

Change: 802.3cb-2018)as
To: 802.3cb-2018) as

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **1** *SC* **1.5** *P* **22** *L* **50** # 133
Wienckowski, Natalie General Motors

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

Remove note on the type of paragraph to use for Abbreviations.

SuggestedRemedy

Remove: [abbreviations use paragraph tag AcrList,ac]

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.5.1.1.2** *P* **24** *L* **12** # 281
den Besten, Gerrit NXP Semiconductors

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

"Single shielded balanced pair of conductors PHY". Signal routing at PCB might not be shielded. Same on lines 18 and 23. Recommend to search for "single shielded balanced pair" as this occurs at more places in the spec.

SuggestedRemedy

Replace by: "Single balanced pair of conductors PHY using shielded cabling."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

This would require a change of the cable name througout the document, not just the two places mentioned by comments 280 and 281.

Cl **44** *SC* **44.1.3** *P* **27** *L* **3** # 23
Maguire, Valere The Siemon Company

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

Correct grammatical of the word "which"

SuggestedRemedy

Insert a comma after the last word coming before "which" in these locations: page 27 - line 3, page 35 - line 31, page 61 - line 8, page 69 - line 37, page 70 - line 2, page 80 - line 5, and page 90 - line 51.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **44** *SC* **44.1.3** *P* **27** *L* **41** # 282
den Besten, Gerrit NXP Semiconductors

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

Figure 44.1 shows "WIS = WAN INTERFACE SUBLAYER" inside the lower diagram of the figure, and not in the list below. This is confusing because WIS does not occur in that lower diagram.

SuggestedRemedy

Move the definition: "WIS = WAN INTERFACE SUBLAYER" to the list below the figure.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **44** *SC* **44.1.3** *P* **28** *L* **3** # 4

Anslow, Pete Ciena

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

Item d of 44.1.3 contains five external cross-references that are not in forest green

SuggestedRemedy

Apply character tag "External" to "Clause 53", "Clause 54", "Clause 55", "Clause 68", and "Clause 52"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **44** *SC* **44.1.4.4** *P* **29** *L* **10** # 283

den Besten, Gerrit NXP Semiconductors

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

"1-pair RS–FEC PCS & PMA" Inconsistent with 10GBASE-T.

SuggestedRemedy

Change to "RS-FEC PCS & 1-pair PMA"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This is undoing the change made by comment #128 on D1.0.

Cl **45** *SC* **45..2.3** *P* **40** *L* **23** # 7

Anslow, Pete Ciena

Comment Type **ER** *Comment Status* **D** *EZ*

Part of the suggested remedy for Comment #27 against D1.0 was:
In the editing instruction, change: "1.2318 - 1.2320" to: "1.2318 to 1.2324"
The response was:
ACCEPT
but the text in the editing instruction is "1.2318 to 1.2320" where the second number is still incorrect.

SuggestedRemedy

In the editing instruction, change: "1.2318 to 1.2320" to: "1.2318 to 1.2324"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.18.aa** *P* **32** *L* **33** # 5

Anslow, Pete Ciena

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

In the editing instruction "before 45.2.1.18a (added by IEEE Std 802.3cb-2018)" the reference "45.2.1.18a" should be "45.2.1.18.a"

SuggestedRemedy

In the editing instruction, change "45.2.1.18a" to "45.2.1.18.a"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.192.1** *P* **34** *L* **28** # 146

Wienckowski, Natalie General Motors

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

Remove timing for restoration of normal operation and refer to 149.4.2.1 instead.

SuggestedRemedy

Change: The control and management interface shall be restored to operation within 0.5 s from the setting of bit 1.2309.15.
To: The control and management interface shall be restored to operation within the time specified in 149.4.2.1 from the setting of bit 1.2309.15.

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **45** *SC* **45.2.1.192.1** *P* **34** *L* **29** # 284

den Besten, Gerrit NXP Semiconductors

Comment Type **T** *Comment Status* **D** *Reset / Startup time*

"The control and management interface shall be restored to operation within 0.5 s from the setting of bit 1.2309.15"

SuggestedRemedy

Replace by: "The control and management interface shall be restored to operation within max_reset_time as defined in 149.x.x, starting when bit 1.2309.15 is set."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: The control and management interface shall be restored to operation within 0.5 s from the setting of bit 1.2309.15

To: The control and management interface shall be restored to operation within max_reset_time as defined in 149.3.2.1, starting when bit 1.2309.15 is set.

Cl **45** *SC* **45.2.1.192.3** *P* **35** *L* **13** # 134

Wienckowski, Natalie General Motors

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

typo

SuggestedRemedy

Change: the device shall, as a minimum
To: the device shall, at a minimum

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.192.3** *P* **35** *L* **18** # 293

den Besten, Gerrit NXP Semiconductors

Comment Type **T** *Comment Status* **D** *Reset / Startup time*

"The data path of the MultiGBASE-T1 PMA, depending on type and temperature, may take many seconds to run at optimum error ratio after exiting from reset or lowpower mode."

SuggestedRemedy

"The data path of the MultiGBASE-T1 PMA may take max_startup_time as defined in 149.x.x. to resume operation and achieve the required BER after exiting from reset or low-power mode."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: The data path of the MultiGBASE-T1 PMA, depending on type and temperature, may take many seconds to run at optimum error ratio after exiting from reset or lowpower mode.

To: The data path of the MultiGBASE-T1 PMA may take max_training_time as defined in 149.3.2.1 to resume operation and achieve the optimum BER after exiting from reset or low-power mode.

Cl **45** *SC* **45.2.1.192.4** *P* **35** *L* **25** # 6

Anslow, Pete Ciena

Comment Type **ER** *Comment Status* **D** *EZ*

Comment #16 against D1.0 was:
In the heading of 45.2.1.192.4, "(1.2309.14)" should be "(1.2309.10:9)"
The response was:
ACCEPT IN PRINCIPLE.
This is covered by Comment #85.
but comment #85 made no change to the draft.

SuggestedRemedy

In the heading of 45.2.1.192.4, change "(1.2309.14)" to "(1.2309.10:9)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.192.4** *P* **35** *L* **28** # 135

Wienckowski, Natalie General Motors

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

verb/noun agreement

SuggestedRemedy

Change: Setting these bits force the precoder to the mode set.
To: Setting these bits forces the precoder to the mode set.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.194.4** *P* **38** *L* **9** # 136

Wienckowski, Natalie General Motors

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

We don't need to keep repeating MultiGBASE-T1.

SuggestedRemedy

Change: When set as a one, this bit indicates to the link partner that the MultiGBASE-T1 PHY is advertising MultiGBASE-T1 OAM capability. When set as a zero, this bit indicates to the link partner that the MultiGBASE-T1 PHY is not advertising MultiGBASE-T1 OAM capability. This bit shall be set to zero if the MultiGBASE-T1 PHY does not support MultiGBASE-T1 OAM.
To: When set as a one, this bit indicates to the link partner that the PHY is advertising MultiGBASE-T1 OAM capability. When set as a zero, this bit indicates to the link partner that the 1 PHY is not advertising MultiGBASE-T1 OAM capability. This bit shall be set to zero if the PHY does not support MultiGBASE-T1 OAM.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(to correct cut/paste issue in suggested remedy "1 PHY" changed to "PHY" AND to fix "shall" on the user "this bit shall be set to zero" changed to "this bit should be set to zero...")

Change: When set as a one, this bit indicates to the link partner that the MultiGBASE-T1 PHY is advertising MultiGBASE-T1 OAM capability. When set as a zero, this bit indicates to the link partner that the MultiGBASE-T1 PHY is not advertising MultiGBASE-T1 OAM capability. This bit shall be set to zero if the MultiGBASE-T1 PHY does not support MultiGBASE-T1 OAM.

To: When set as a one, this bit indicates to the link partner that the PHY is advertising MultiGBASE-T1 OAM capability. When set as a zero, this bit indicates to the link partner that the PHY is not advertising MultiGBASE-T1 OAM capability. This bit should be set to zero if the PHY does not support MultiGBASE-T1 OAM.

Cl **45** *SC* **45.2.1.194.5** *P* **38** *L* **16** # 137

Wienckowski, Natalie General Motors

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

We don't need to keep repeating MultiGBASE-T1.

SuggestedRemedy

Change: When set as a one, this bit indicates to the link partner that the MultiGBASE-T1 PHY is advertising EEE capability. When set as a zero, this bit indicates to the link partner that the MultiGBASE-T1 PHY is not advertising EEE capability. This bit shall be set to zero if the MultiGBASE-T1 PHY does not support EEE.
To: When set as a one, this bit indicates to the link partner that the PHY is advertising EEE capability. When set as a zero, this bit indicates to the link partner that the PHY is not advertising EEE capability. This bit shall be set to zero if the PHY does not support EEE.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(to fix "shall" on the user "this bit shall be set to zero" changed to "this bit should be set to zero...")

Change: When set as a one, this bit indicates to the link partner that the MultiGBASE-T1 PHY is advertising EEE capability. When set as a zero, this bit indicates to the link partner that the MultiGBASE-T1 PHY is not advertising EEE capability. This bit shall be set to zero if the MultiGBASE-T1 PHY does not support EEE.

To: When set as a one, this bit indicates to the link partner that the PHY is advertising EEE capability. When set as a zero, this bit indicates to the link partner that the PHY is not advertising EEE capability. This bit should be set to zero if the PHY does not support EEE.

Cl **45** *SC* **45.2.1.197** *P* **40** *L* **10** # 285

den Besten, Gerrit NXP Semiconductors

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

SNR operating margin as currently proposed in the draft is essentially an 8 bit value (255 used values), but it is defined as a 16bit register with 0x8000 as zero dB reference.This is very inefficient as all 16 bits would be toggling between values 0.0dB and -0.1dB.

SuggestedRemedy

Represent the 8-bit SNR margin in bits 7:0 of register 2314, with 0x80 as zero reference for that field.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

It may be desirable to keep a 16-bit register to be consistent with other Clauses.

Cl **45** *SC* **45.2.1.197** *P* **40** *L* **10** # 297

den Besten, Gerrit NXP Semiconductors

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

How is SNR operating margin defined? We currently don't have a pre-FEC (raw) BER target in the spec.The BER < 1e-12 is post-FEC. So what does 0dB mean here?

SuggestedRemedy

I see three possible solutions here:
a) Define a pre-FEC BER target, which will implicilty set a reference SNR level for the SNR margin
b) Define a fixed reference SNR pre-FEC
c) Report the actual SNR pre-FEC and don't talk about 'margin'. In the latter case the SNR register value becomes strictly positive.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Margin is relative to an implementation-dependent number determined by the implementer. It doesn't need to be defined in the standard to be meaningful.

Cl **45** *SC* **45.2.1.198** *P* **40** *L* **13** # 287

den Besten, Gerrit NXP Semiconductors

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

Register 231 is callled minimum margin register, but it is about an SNR valy

SuggestedRemedy

Rename to: minimum SNR margin

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.198** *P* **40** *L* **17** # 286

den Besten, Gerrit NXP Semiconductors

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

minimum SNR margin as currently proposed in the draft is essentially an 8 bit value (255 used values), but it is defined as a 16bit register with 0x8000 as zero dB reference.This is very inefficient as the upper 8 bits would be toggling between values 0.0dB and -0.1dB, but they don't contain information.

SuggestedRemedy

Represent the 8-bit minimum SNR margin in bits 15:8 of register 2314, with 0x80 as zero reference for that field. Free-up register 2315.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

It may be desirable to keep a 16-bit register to be consistent with other Clauses.

Cl **45** *SC* **45.2.3.72.5** *P* **42** *L* **15** # 8

Anslow, Pete Ciena

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

In the second line of text "8 octet" has been changed to "8-octet".
However, the text in the base standard is "8 octet".
If it is intended that this amendment changes "8 octet" to "8-octet" then this has to be shown with strikethrough and underline font, preferably with "8 octet" in strikethrough and "8-octet" in underline for clarity.

SuggestedRemedy

If it is intended that this amendment changes "8 octet" to "8-octet" then this has to be shown with strikethrough and underline font, preferably with "8 octet" in strikethrough and "8-octet" in underline for clarity.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.74** *P* **43** *L* **12** # 9

Anslow, Pete Ciena

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

In the "Description" for bit 3.2313.15, "This bit shall self clear when register 3.2317 is read." has been changed to "See 45.2.3.74.1 for self-clearing behavior".
However, this is text in the base standard being changed via a "Change" editing instruction so this change has to be shown with strikethrough and underline font.

SuggestedRemedy

In the "Description" for bit 3.2313.15:
show "This bit shall self clear when register 3.2317 is read." in strikethrough font.
and show "See 45.2.3.74.1 for self-clearing behavior." in underline font. Note the addition of "." at the end of this.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.74.1** *P* **43** *L* **36** # 299

den Besten, Gerrit NXP Semiconductors

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

"This register shall be cleared when register 3.2317 is read." However, the last OAM byte is in register 2319. So it looks like only the first 8 bytes of the message are handshaked. Furthermore the addition of these extra 4 bytes is a bit messy as they are not directly concatenated to the existing 8 bytes in the register map.

SuggestedRemedy

Refer to register 3.2319 in the quoted sentence

Proposed Response *Response Status* **W**

PROPOSED REJECT.

3.2318 and 2319 are the new MultiGBASE-T1 OAM Status registers. We agreed that these are always current. It is only up to 2317 (the BASE-T1 OAM, common with 1000BASE-T1) which are handshaked. Making this change would break the 1000BASE-T1 handshake.

Cl **45** *SC* **45.2.3.74.2** *P* **43** *L* **41** # 298

den Besten, Gerrit NXP Semiconductors

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

asociate: missing d

SuggestedRemedy

asociated

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.75** *P* **44** *L* **3** # 10

Anslow, Pete Ciena

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

While the addition of the hyphen in "8-octet" is shown with underline, the removal of the space is not shown with strikethrough.

SuggestedRemedy

Show "8 octet" in strikethrough and "8-octet" in underline for clarity.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.76** *P* **44** *L* **42** # 138

Wienckowski, Natalie General Motors

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

The details on the OAM Status bytes are defined in 149.3.8.2.12. Refer to that section for these bytes.

SuggestedRemedy

Replace: The message data is user defined and its definition is outside the scope of this standard.
With: See 149.3.8.2.12 for details on the OAM status message definition.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.76** *P* **44** *L* **50** # 57

Lo, William — Axonne Inc.

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

OAM status message.
It is not clear whether registers 3.2319 and 3.2319 shouldbe R/W or RO.
Referring to page 117 (159.3.8.2.12)
I think 3.2318.7:2,0 and 3.2319 should be RO since the status is from somewhere else.
3.2318.1 should be R/W since the user will go in to make a request to clear.

Is the intent that these registers are automatic, or is the expectation that the user has to manually write in all these statuses?

SuggestedRemedy

If the intent is these registers are automatic then
3.2318 and 3.2319 should all be changed to RO with the exception of 3.2318.1.
Also the footnote should be changed to include RO.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

If these are made RO we must clearly define how the PHY sets and clears each bit. We wanted to keep these definitions flexible for the PHY vendors to chose the implementation.

Cl **45** *SC* **45.2.3.77** *P* **45** *L* **23** # 58

Lo, William — Axonne Inc.

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

3.2320 and 2.2321 should be RO since these are statuses from the link partner.

SuggestedRemedy

Change R/W to RO for 3.2320 and 2.2321
Change the footnote from R/W to RO

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.78.1** *P* **46** *L* **1** # 11

Anslow, Pete — Ciena

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

Extra ")" at the end of "45.2.3.78.1 PCS reset (3.2322.15))"

SuggestedRemedy

Delete the extra ")"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.78.1** *P* **46** *L* **14** # 300

den Besten, Gerrit — NXP Semiconductors

Comment Type **T** *Comment Status* **D** *Reset / Startup time*

"The control and management interface shall be restored to operation within 0.5 s from the setting of bit 3.2322.15."

SuggestedRemedy

Replace by: ""The control and management interface shall be restored to operation within max_reset_time as defined in 149.x.x, starting when bit 3.2322.15 is set."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: The control and management interface shall be restored to operation within 0.5 s from the setting of bit 3.2322.15.

To: The control and management interface shall be restored to operation within max_reset_time as defined in 149.3.2.1, starting when bit 3.2322.15 is set.

Cl **45** *SC* **45.2.3.80.2** *P* **48** *L* **36** # 301

den Besten, Gerrit — NXP Semiconductors

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

"PCS high BER": The way it is currently defined is not a BER but a RFER (reed-solomon frame-error-rate) as only frames which cannot be corrected are counted.

SuggestedRemedy

Rename to Frame Error Rate (FER)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

Rename to "PCS High RFER". (Frame error rates can be confused with Ethernet frames, and this is calculated based on the RS-FEC Frames.)

Cl **45** *SC* **45.2.3.80.2** *P* **48** *L* **38** # 218

Zimmerman, George CME:ADI,Aquantia,AP

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

"When read as a one, bit 3.2324.9 indicates that the MultiGBASE-T1 PCS receiver is detecting a BER of > 4 × 10–4. When read as a zero, bit 3.2324.9 indicates that the MultiGBASE-T1 PCS is not detecting a BER of > 4 × 10–4."
hi_rfer doesn't really correspond well to a BER and this isn't the place to specify it. What BER hi_rfer corresponds to will depend on the interleaving. Better to rewrite this in terms of the definition of hi_rfer.

SuggestedRemedy

Change "is detecting a BER of > 4 × 10–4" to "is detecting more than 16 or more RS-FEC errored blocks in 312 500 bit times (one rfer_timer interval)"
Change "is not detecting a BER of > 4 × 10–4." to "is detecting fewer than 16 RS-FEC errored blocks in 312 500 bit times."
Delete editor's note at line 42

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Either accept this proposal or the one in comment #302.

Cl **45** *SC* **45.2.3.80.2** *P* **48** *L* **39** # 302

den Besten, Gerrit NXP Semiconductors

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

The spec text "detecting a BER of > 4e-4" is ambiguous, because actually the frame errors are counted here, not bit errors. Furthermore this number seems way too high. Bit errors at PMA level will mostly be successfully corrected by the RS-FEC, or corrupt a whole RS frame. Counting the number of erroneous RS frames seems the correct approach, but why would we express this as BER instead of RFER? Note that the RFER counter is only 6 bits so apparently this not supposed to happen very often. For a RFER<1e-9 the packet level performance is similar to a transmission scheme without RS-FEC and a PMA BER of about 3e-11.

SuggestedRemedy

Propose to change into: "detecting a RFER > 1e-9

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Either accept this proposal or the one in comment #218.

Cl **45** *SC* **45.2.3.80.5** *P* **49** *L* **13** # 139

Wienckowski, Natalie General Motors

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

There is a carriage return that shouldn't be there. This section should be a single paragraph.

SuggestedRemedy

Remove the carriage return after "behavior." to bring the following line into the same paragraph.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

In the BASE-T1 bits which are copies, the statement that the bit is a copy is set off by being its own paragraph for readability. See 45.2.3.69.1 and 45.2.3.69.2

Cl **45** *SC* **45.2.9.2.7** *P* **49** *L* **51** # 12

Anslow, Pete Ciena

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

As noted in Comment #38 against D1.0, space missing before "(" in the editing instruction.

SuggestedRemedy

Add the space.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.9.3.2** *P* **50** *L* **30** # 13

Anslow, Pete Ciena

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

As noted in Comment #39 against D1.0, space missing before "(" in the editing instruction.

SuggestedRemedy

Add the space.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.2.4** *P* **155** *L* **38** # 246
Wei, Dong — Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Format*
Typo

SuggestedRemedy
Change "f is the" to "f is the"

Proposed Response *Response Status* **W**
PROPOSED REJECT.

This matches the formatting of existing 802.3 clauses.

Cl **149** *SC* **149.5.2.4** *P* **155** *L* **41** # 247
Wei, Dong — Futurewei Technologie

Comment Type **TR** *Comment Status* **D** *Format*
There is no definition of variable S in equation (149-16).

SuggestedRemedy
Need to define or make a statement about the meaning of variable S meaning

Proposed Response *Response Status* **W**
PROPOSED REJECT.

S is defined in 149.1.1.

Cl **78** *SC* **78.2** *P* **52** *L* **42** # 73
Graba, Jim — Broadcom

Comment Type **TR** *Comment Status* **D** *EEE*
Tq is 95 frames.

SuggestedRemedy
Change Tq from [126.72, 63.36, 31.68] us to [121.6, 60.8, 30.4] us for 2.5G/5G/10G respectively in Table 78-2..

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

Cl **98** *SC* **98.5.1** *P* **56** *L* **8** # 83
Tu, Mike — Broadcom

Comment Type **ER** *Comment Status* **D** *EZ*
The editor note should refer to 98.5.1, not 98.1.5.

SuggestedRemedy
Change the editor note from "… dashed list of 98.1.5 after …"
to
"… dashed list of 98.5.1 after …"

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

Cl **98B** *SC* **98B.3** *P* **168** *L* **24** # 259
Wei, Dong — Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*
Typo

SuggestedRemedy
Change "A6through" to "A6 through"

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

Cl **104** *SC* **104.5.6.4** *P* **59** *L* **15** # 303
den Besten, Gerrit — NXP Semiconductors

Comment Type **T** *Comment Status* **D** *PoDL*
Type F has been added to the sub-clause, but there is no reference to clause 149 in there. Especially in this sentence that was apparently there for 1000BASE-T1 with reference to the MDI return loss, it seems that just adding Type F in there is not sufficient.

SuggestedRemedy
Change:
"The ripple and transient specifications for a Type B or Type F PD shall be met for all operating voltages in the range of VPD sourced through a dc bias coupling network with MDI return loss as specified by Clause 97, and over the range of PPD."
into:
"The ripple and transient specifications for a Type B PD shall be met for all operating voltages in the range of VPD sourced through a dc bias coupling network with MDI return loss as specified by Clause 97, and over the range of PPD..... The ripple and transient specifications for a Type F PD shall be met for all operating voltages in the range of VPD sourced through a dc bias coupling network with MDI return loss as specified by Clause 149, and over the range of PPD."

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

Cl **104** *SC* **104.7.2.4** *P* **60** *L* **1** # 14
Anslow, Pete Ciena

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

The heading for Table 104-9 has a grey background.

SuggestedRemedy

Make it white.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **125** *SC* **125.1.2** *P* **61** *L* **12** # 147
Wienckowski, Natalie General Motors

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

Incorrect wording for MDI

SuggestedRemedy

Change: Media Dependent Interface (MDI)
To: Medium Dependent Interface (MDI)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **125** *SC* **125.1.2** *P* **62** *L* **14** # 84
Tu, Mike Broadcom

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

Change the name of the PCS layer to be consistent with the other 5G/2.5G standards.

SuggestedRemedy

For 2.5GBASE-T1, change "64B/65B RS-FEC PCS" to "2.5GBASE-T1 PCS".
For 5GBASE-T1, change "64B/65B RS-FEC PCS" to "5GBASE-T1 PCS".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This was changed by comment 151 on D1.0 for Figure 149-1. This same text was then used for Figure 125-1 and 44-1. These names should remain consistent between the three figures.

D1.1 comment 151 rationale.
If we name the PCS (say, e.g., "RS-FEC PCS") we can collapse all of the 3 stacks into 1 and make the figure much simpler, with a single stack showing the commonality of all 3 PHYs.

Cl **125** *SC* **125.1.2** *P* **62** *L* **17** # 140
Wienckowski, Natalie General Motors

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

alignment of figure elements

SuggestedRemedy

Need to align MDI box of 5GBASE-T which overlaps the AN box.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Align MDI and AN boxes, and editorial license to align other boxes and lines in Figure 125-1 to fix overlaps.

Cl **149** *SC* **149** *P* **66** *L* **2** # 141
Wienckowski, Natalie General Motors

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

missing comma

SuggestedRemedy

Change: (PMA) sublayer and
To: (PMA) sublayer, and

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.1.3** *P* **66** *L* **49** # 142
Wienckowski, Natalie General Motors

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

missing space

SuggestedRemedy

Change: at least 15 m.The
To: at least 15 m. The

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.1.3** *P* **67** *L* **54** # 143
Wienckowski, Natalie General Motors

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

We agreed to call the OAM "MultiGBASE-T1 OAM".

SuggestedRemedy

Change: 2.5G/5G/10GBASE-T1 OAM
To: MultiGBASE-T1 OAM throughout this section and the document.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change 2.5G/5G/10GBASE-T1 to "MultiGBASE-T1" everywhere in the draft (not just for OAM). (note most references refer to "MultiGBASE-T1 PCS or PMA/PMD", whereas Clause 149 refers to 2.5G/5G/10GBASE-T1 links, PCS, operation, link segment, and OAM.

(TFTD - Is there a difference here?)

Cl **149** *SC* **149.1.3** *P* **68** *L* **7** # 144
Wienckowski, Natalie General Motors

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

Use common abreviation for the combined PHY types.

SuggestedRemedy

Change: The 2.5GBASE-T1, 5GBASE-T1, or 10GBASE-T1 PMA
To: 2.5G/5G/10GBASE-T1 PMA

Proposed Response *Response Status* **W**

PROPOSED REJECT.

When "2.5GBASE-T1, 5GBASE-T1, or 10GBASE-T1 PMA" (or PCS or PHY) is used, we are talking about behavior of a single-speed, single-instance of a PMA (or PCS or PHY). When we use "MultiGBASE-T1" PMA we are talking about the specification, or the name of a functionality associated with all 3 (such as OAM).

Cl **149** *SC* **149.1.3.3** *P* **69** *L* **15** # 112
Chen, Steven Broadcom

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

The transmit transition to the LPI transmit mode is based on the TXD[31:0] of the XGMII, not in the last 64B/64B block of a RS frame.

SuggestedRemedy

Change "… an LPI control character in the last 64B/65B block of a Reed-Solomon frame." to "… an LPI control character in all four lanes of two consecutive transfers of TXD[31:0] that will be mapped into a single 64B/65B block."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.1.3.3** *P* **69** *L* **20** # 148
Wienckowski, Natalie General Motors

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

missing comma

SuggestedRemedy

Change: Periodically the transmit
To: Periodically, the transmit

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(rewrite, removing need for the comma and improving clarity)
Change: Periodically the transmit function of the local PHY transmits refresh frames that are used by the link partner to update adaptive filters and timing circuits in order to maintain link integrity.

To: The transmit function of the local PHY periodically transmits refresh frames. These are used by the link partner to update adaptive filters and timing circuits in order to maintain link integrity.

Cl **149** *SC* **149.1.3.3** *P* **69** *L* **25** # 149
Wienckowski, Natalie General Motors

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

Duplicate sentence.

SuggestedRemedy

Remove one instance of: The PMA Transmit function in the PHY then sends an alert message to the link partner.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.1.3.3** *P* **69** *L* **25** # 262

Wei, Dong — Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*

Repeat statement

SuggestedRemedy

Delete the sentence:"The PMA Transmit function in the PHY then sends an alert message to the link partner" in line 25~26

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.1.3.3** *P* **69** *L* **43** # 150

Wienckowski, Natalie — General Motors

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

Origianal OAM bytes are now named "BASE-T1 OAM".

SuggestedRemedy

Change: 2.5G/5G/10GBASE-T1 OAM
To: BASE-T1 OAM

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The entire phrase is "2.5G/5G/10GBASE-T1 OAM SNR settings" - there are no other references to this - it is called the "PHY Health Indicator" in 149.3.8.2.5 and 149.3.8.2.15 (why it is repeated, with different information is for discussion, and probably another comment - this is what was in Clause 97. First there was a description of the bits, then later the functions. These are all in the same subsection due to the 5 level heading limit. The MultiG-BASET1 specific definitions are all in 149.3.8.2.12 instead of putting each item in a separate section.).

Change: 2.5G/5G/10GBASE-T1 OAM SNR settings indicate

To: PHY Health status received from the link partner indicates

Cl **149** *SC* **149.1.3.3** *P* **69** *L* **46** # 113

Chen, Steven — Broadcom

Comment Type **ER** *Comment Status* **D** *EEE*

L46~L49
Need to refer to the appropriate Figures.

SuggestedRemedy

Replace "126-14" with the cross-reference to the figure captioned "PCS 64B/65B Transmit state diagram, part a" currently labelled "149-13".
Replace "126-15" with the cross-reference to the figure captioned "PCS 64B/65B Transmit state diagram, part b" currently labelled "149-14".
Replace "126-16" with the cross-reference to the figure captioned "PCS 64B/65B Receive state diagram, part a" currently labelled "149-15".
Replace "126-17" with the cross-reference to the figure captioned "PCS 64B/65B Receive state diagram, part a" currently labelled "149-16".
Replace "126-18" with the cross-reference to the figure captioned "EEE transmit state diagram"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement suggested solution with editorial lisence to correct references as needed.

Cl **149** *SC* **149.1.3.4** *P* **69** *L* **53** # 151

Wienckowski, Natalie — General Motors

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

missing comma

SuggestedRemedy

Change: The Link Synchronization function is used when Auto-Negotiation is disabled to synchronize between the …
To: The Link Synchronization function is used when Auto-Negotiation is disabled, to synchronize between the …

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Repeating that "link synchronization" is to "synchronize" has no value, and actually isn't what this function does. It doesn't control the link_status timer (that's maxwait_timer in the phy control diagram) - also the case where autoneg is not implemented is left out. Combine the first and second sentences of 149.1.3.4 as follows:

Replace: The Link Synchronization function is used when Auto-Negotiation is disabled to synchronize between the MASTER PHY and SLAVE PHY before training starts. Link Synchronization provides a fast and reliable mechanism for link partners to detect the presence of each other and start the timers used by the link monitor which determines link_status.

With: The Link Synchronization function is used when Auto-Negotiation is disabled or not implemented to detect the presence of the link partner, time and control link failure, and act as the data source for the PHY control state diagram.

Cl **149** *SC* **149.1.3.4** *P* **70** *L* **11** # 27

Benyamin, Saied — Aquantia

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

We are using link synchronization as Alert, add a paragraph to end of the link synchronization description to mention this

SuggestedRemedy

Add the following paragraph:
When EEE is active, the same link synchronization pattern is used as an alert sequence. When rx_lpi_active is true, the send_s_sigdet variable which detects the SEND_S pattern is used as alert detect.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.1.3.4** *P* **71** *L* **1** # 43

Benyamin, Saied — Aquantia

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

link synchronization detect needs to be added to PCS since it is used as ALERT detect now

SuggestedRemedy

Functional block diagram 149-2 in the attached word document, errneously numbered 149-3 because I looked at the wrong document

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Update Figure 149-2 (number in D1.1) with the changes indicated on page 2 of Benyamin_3ch_1_0319.pdf.

Cl **149** *SC* **149.1.4** *P* **72** *L* **16** # 152

Wienckowski, Natalie — General Motors

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

missing comma before and

SuggestedRemedy

Change: refresh, quiet and alert signaling
To: refresh, quiet, and alert signaling

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.1.4** *P* **72** *L* **23** # 153

Wienckowski, Natalie — General Motors

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

subject/verb agreement

SuggestedRemedy

Change: which enable the receiver
To: which enables the receiver

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

PAM2 doesn't "enable" the receiver, it might aide it, but best to leave implementation detail out. Also, figure 149-4 isn't really relevant to this statement. 149-31 is.

Change: generate only PAM2 symbols for transmission by the PMA, which enable the receiver at the other end to train until it is ready to operate in normal mode. (See Figure 149–4.)

To: generate only PAM2 symbols for transmission by the PMA for the initial phases of training. (See Figure 149–31.)

Cl **149** *SC* **149.2** *P* **73** *L* **5** # 15

Anslow, Pete — Ciena

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

"Clause 98.4" should be just "98.4"

SuggestedRemedy

Change "Clause 98.4" to "98.4"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.2.2** *P* **74** *L* **26** # 130

Chen, Steven — Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

variable loc_phy_ready is not used.

SuggestedRemedy

1. Remove "PMA_PHYREADY.indication(loc_phy_ready)".
2. In page 71 line26, renove "loc_phy_ready" in Figure 149-2.
3. In page 79, remove lines from 1 to 22.
4. In page 82 line 26, remove "loc_phy_ready" in Figure 149-4.
5. In page 134 line 8, remove "loc_phy_ready" in Figire 149-24.
6. In page 147, remove lines from 19 to 26.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Comments 130, 94, 274, 276, 273 all discuss removing loc_phy_ready and/or rem_phy_ready. Need to determine a coherent solution for these comments.

Cl **149** *SC* **149.2.2** *P* **74** *L* **28** # 94

Tu, Mike — Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

Variable "rem_phy_ready" is no longer used

SuggestedRemedy

1. Delete line 28 "PMA_REMPHYREADY.request(rem_phy_ready)"
2. Delete references to "rem_phy_ready" at the following location:
2.1 Page 71, line 34, Figure 149-2, change from "rem_rcvr_status / rem_phy_ready" to "rem_rcvr_status".
2.2 Page 80, delete 149.2.2.10, 149.2.2.10.1, 149.2.2.10.2, and 149.2.2.10.3.
2.3 Page 82, line 24, Figure 149-4, change from "rem_rcvr_status / rem_phy_ready" to "rem_rcvr_status".
2.4 Page 134, line 11, Figure 149-24, change from "rem_rcvr_status / rem_phy_ready" to "rem_rcvr_status".
2.5 Page 148, delete line 14 to line 20.
2.6 Page 75, line 26, delete "PMA_REMPHYREADY.request" and the associated ARROW.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Comments 130, 94, 274, 276, 273 all discuss removing loc_phy_ready and/or rem_phy_ready. Need to determine a coherent solution for these comments.

Cl **149** *SC* **149.2.2** *P* **80** *L* **3** # 276

McClellan, Brett Marvell

Comment Type **T** *Comment Status* **D** *State diagrams*

I believe this editor's note refers to a special GMII codeword defined and used in Clause 97 only for the purpose of signaling PMA_PHYREADY.indication (loc_phy_ready) to the link partner.
For Clause 97, Idle was split into two different codewords, one for loc_phy_ready = NOT_OK and one for loc_phy_ready = OK.
This points out a problem in the current CH draft.
149.2.2.8 PMA_PHYREADY.indication definition states that "loc_phy_ready is conveyed to the link partner by the PCS as defined in 149.4.4.1."
149.4.4.1 then points back to Table 149-1, "This variable is conveyed to the link partner by the PCS as defined in Table 149–1."
However, Table 149-1 has no codeword to convey loc_phy_ready. loc_phy_ready was created in BP to prevent either side from transmitting frames until both sides are ready. loc_phy_ready is unnecessary for XGMII based PHYs and currently it isn't used in the PMA PHY control state machine. Normal ordered sets of Local Fault and Remote Fault from the Reconciliation Sublayer perform the function of holding off frames until both PHYs are ready.

SuggestedRemedy

Remove the editor's note.
Remove the primitive PMA_PHYREADY.indication and any text and figure references related to loc_phy_ready.
Remove the primitive PMA_REMPHYREADY.request and any text and figure references related to rem_phy_ready.
Remove loc_phy_ready definition from 149.4.4.1 State diagram variables.
Remove rem_phy_ready definition from 149.4.4.1 State diagram variables.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Comments 130, 94, 274, 276, 273 all discuss removing loc_phy_ready and/or rem_phy_ready. Need to determine a coherent solution for these comments.

Cl **149** *SC* **149.2.2.1.1** *P* **74** *L* **48** # 154

Wienckowski, Natalie General Motors

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

We removed SEND_I, but didn't change the number of values to "three" from "four" in the text.

SuggestedRemedy

Change: four
To: three

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: can take on one of the following four values of the form:

To: can take on one of the following values:

Cl **149** *SC* **149.2.2.3** *P* **76** *L* **34** # 114

Chen, Steven Broadcom

Comment Type **ER** *Comment Status* **D** *Editorial*

Using XGMII instead.

SuggestedRemedy

Change "to represent GMII data and ..." to "to represent XGMII data and ..."
Suggest to search and replace it globally.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Make the suggested change and also make this change on P148 L34.

Cl **149** *SC* **149.2.2.3.1** *P* **76** *L* **44** # 155

Wienckowski, Natalie General Motors

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

Formatting of text under SYMB and ALERT does not match the rest of the document.

SuggestedRemedy

Fix the paragraph formatting.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.2.2.9** *P* **79** *L* **27** # 274

Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *State diagrams*

Delete references to unused loc_phy_ready and rem_phy_ready in in the primitives section, in Figures 149-2, 149-4, and 149-24, and in the variables of PHY Control 149.4.4.1. PHY control uses loc_rcvr_status instead of loc_phy_ready and rem_phy_ready

SuggestedRemedy

In Figure 149-2 (P71): Delete loc_phy_ready from PMA RECEIVE to PCS TRANSMIT, and rem_phy_ready (just the label, not the arc) from PCS RECEIVE to PHY CONTROL (this arc also has the label rem_rcvr_status, which should remain)

149.2.2 P74 L26, Delete primitives PMA_PHYREADY.indication(loc_phy_ready) and on P74 L28 delete PMA_REMPHYREADY.request (rem_phy_ready)

149.2.2.8 Delete 149.2.2.8 and subclauses 149.2.2.8.1 and 149.2.2.8.2 (P79 L1-22)

149.2.2.10 Delete P80 L1 - 28, Editor's note and 149.2.2.10 PMA_REMPHYREADY.request and subclauses.

In Figure 149-4 (PCS reference diagram, P82 L23), Delete loc_phy_ready input to PCS TRANSMIT from PMA SERVICE INTERFACE. Change label on output from PCS RECEIVE to PMA SERVICE INTERFACE from "rem_rcvr_status/rem_phy_ready" to "rem_rcvr_status".

In Figure 149-24 (PMA reference diagram, P134 L7) delete the first solid line output from PMA RECEVE to PMA SERVICE INTERFACE and label "loc_phy_ready", and change able on rightmost input (2nd from right line) to PHY CONTROL from PMA SERVICE INTERFACE from "rem_rcvr_status/rem_phy_ready" to "rem_rcvr_status"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Comments 130, 94, 274, 276, 273 all discuss removing loc_phy_ready and/or rem_phy_ready. Need to determine a coherent solution for these comments.

Cl **149** *SC* **149.3.2.1** *P* **82** *L* **45** # 296

den Besten, Gerrit NXP Semiconductors

Comment Type **T** *Comment Status* **D** *Reset / Startup time*

Timing specs for PCS reset are missing.

SuggestedRemedy

Insert the following paragraph:
The reset shall take less than 10ms (=max_reset_time), and register access shall be available again after that. The link shall resume operation and achieve the required BER within 100ms (=max_training_time)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2** *P* **83** *L* **10** # 156

Wienckowski, Natalie General Motors

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

Add commas for readability.

SuggestedRemedy

Change: These bits are then mapped two at a time into a PAM4 symbol.
To: These bits are then mapped, two at a time, into a PAM4 symbol.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2** *P* **83** *L* **22** # 157

Wienckowski, Natalie General Motors

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

Missing open parenthesis

SuggestedRemedy

Change: Tn)
To: (Tn)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2** *P* **83** *L* **23** # 158
Wienckowski, Natalie General Motors

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

Change signal value to +1 for consistency.

SuggestedRemedy

Change: {-1, 1}
To: {-1, +1}

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: {-1, 1}
To: {–1, +1}

Cl **149** *SC* **149.3.2.2** *P* **83** *L* **37** # 232
Zimmerman, George CME:ADI,Aquantia,AP

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

aggregation into a superframe is not an option - it is written as if it were.

SuggestedRemedy

Change "In order to improve error correction capability, the PHY may aggregate L RS-FEC input frames into an interleaved RS-FEC input superframe."
to
"The PHY aggregates L RS-FEC input frames into an L-interleaved (L=1, 2, or 4) RS-FEC input superframe."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.1** *P* **84** *L* **4** # 159
Wienckowski, Natalie General Motors

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

typo

SuggestedRemedy

Change: 65B-RS_FEC
To: 65B RS-FEC

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.2** *P* **85** *L* **31** # 161
Wienckowski, Natalie General Motors

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

extraneous word

SuggestedRemedy

Remove the word "pair" from Figure 149-6. This is left from the 4-pair figure and ins't needed here.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.3** *P* **85** *L* **37** # 185
Wienckowski, Natalie General Motors

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

Need to keep this paragraph with the one before it instead of allowing them to be separated by the Figures or the statement "The subscript in the above labels" is out of context.

SuggestedRemedy

Keep paragraphs together through formatting.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.11** *P* **89** *L* **37** # 25
Maguire, Valere The Siemon Company

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

Correct grammatical of the word "which"

SuggestedRemedy

Replace "(which is reserved)" with ", which is reserved"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.15** *P* **90** *L* **39** # 265
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*

Just shows half g of g(x), and half 0 of g0 in Equation (149-1)

SuggestedRemedy

Zoom out a little bit for the equation (149-1) to show the full equation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.15** *P* **90** *L* **39** # 16
Anslow, Pete Ciena

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

Equation (149-1) is truncated
Is this a "Medium" equation?

SuggestedRemedy

If it is not already, make this a "Medium" equation.
"Shrink-wrap" the equation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.15** *P* **91** *L* **15** # 233
Zimmerman, George CME:ADI,Aquantia,AP

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

"This may be computed". "may" is a special word for "is permitted to". In this case, it is describing an implementation.

SuggestedRemedy

Change "may" to "can"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.16** *P* **93** *L* **33** # 95
Tu, Mike Broadcom

Comment Type **ER** *Comment Status* **D** *EZ*

Line 33 to line 37 are the same as line 27 to line 31.

SuggestedRemedy

Delete line 33 to line 37.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.16** *P* **93** *L* **33** # 263
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*

Repeat statement

SuggestedRemedy

Delete the repeat statement of line 33-37, which are the same as line 27-31

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.16** *P* **93** *L* **33** # 116
Chen, Steven Broadcom

Comment Type **ER** *Comment Status* **D** *EZ*

The L33~L37 seems being a duplicated copy of the L27~L31.

SuggestedRemedy

Remove L33~L37.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.16** *P* **93** *L* **36** # 186
Wienckowski, Natalie General Motors

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

i,r should be subscripts

SuggestedRemedy

For pi,r, change i,r to a subscript of p.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.16** *P* **94** *L* **19** # 96
Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *Editorial*
Wrong indices. "m_L" should be "m_0" at both the input and the output of the Lth encoder.

SuggestedRemedy
Change "m_L" to "m_0" at bot the input and the output of the Lth RS Encoder.

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

Cl **149** *SC* **149.3.2.2.16** *P* **94** *L* **19** # 266
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Editorial*
Typo

SuggestedRemedy
Change "mL" to "m0"; Figure 149-10, at the RS Encoder #L, the input and output mL should be m0.

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

Cl **149** *SC* **149.3.2.2.16** *P* **94** *L* **19** # 117
Chen, Steven Broadcom

Comment Type **TR** *Comment Status* **D** *Editorial*
The last message symbol of the input message symbols should be m0, not mL.

SuggestedRemedy
In the input message symbols, change "mL" to "m0".

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

Cl **149** *SC* **149.3.2.2.18** *P* **95** *L* **1** # 97
Tu, Mike Broadcom

Comment Type **ER** *Comment Status* **D** *PCS*
This paragraph seems to be the redundant. Keep line 4 and 5.

SuggestedRemedy
Delete Line 1 and line 2.

Proposed Response *Response Status* **W**
PROPOSED REJECT.

This is not redundant as G(j) and {A,B} are both used elsewhere in the document and are the names for the different parts of the mapping.

If this comment is accepted, we would also need to delete P94, L42&43 to be consistent.

Cl **149** *SC* **149.3.2.2.19** *P* **95** *L* **41** # 63
Lo, William Axonne Inc.

Comment Type **TR** *Comment Status* **D** *State diagrams*
The first PAM4 state entered is TX SWITCH

SuggestedRemedy
Change PAM4 PCS Test to
TX SWITCH state

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

Cl **149** *SC* **149.3.2.2.19** *P* **95** *L* **43** # 304
den Besten, Gerrit NXP Semiconductors

Comment Type **T** *Comment Status* **D** *EEE*
PAM2 versus PAM4 during refreshes

SuggestedRemedy
In order to keep things as simple as possible in EEE mode, I would recommend to go for PAM2 here, so no pre-coder during refreshes.

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

Comment #48 deletes these hilighted lines.

Cl **149** *SC* **149.3.2.2.20** *P* **95** *L* **43** # 48
Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *EEE*

Refresh is PAM2 so we can delete highlightd paragraph.

SuggestedRemedy

delete highlightd paragraph.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.20** *P* **96** *L* **3** # 98
Tu, Mike Broadcom

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

"P(r,t)" probably should be "P(u)"

SuggestedRemedy

Replace "P(r,t)" on line 3 and line 6 by "P(u)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.21** *P* **96** *L* **18** # 82
Graba, Jim Broadcom

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

Update TBD

SuggestedRemedy

Point to figure containing EEE transmit state diagram

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Remove hilighting on "Figure 149-TBD".

Change: Figure 149-TBD

To: The correct Figure reference for the figure added by comment #78.

Cl **149** *SC* **149.3.2.2.21** *P* **96** *L* **23** # 64
Lo, William Axonne Inc.

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

Data are processed in units of superframes.
It makes no sense if the 8 RS-FEC partially fill the final superframe.
A related issue is once the LP_IDLE is sent, the transmitter is committed to sending the complete sleep signal (8 RS-FEC frames worth) and not abort early.

Add the sentences below to clarify how the 8 RS-FEC frames of LP_IDLE are packed at the end of line 23.

SuggestedRemedy

The 8 RS-FEC frames of LP_IDLE completely fill two superframes in L=4 interleave or four superframes in L=2 interleave. Once initiated, the complete sleep signal consisting of 8 RS-FEC frames of LP_IDLE shall be transmitted.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.21** *P* **96** *L* **27** # 187
Wienckowski, Natalie General Motors

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

Add comma for readability.

SuggestedRemedy

Change: After the sleep signal is transmitted LPI control characters shall be
To: After the sleep signal is transmitted, LPI control characters shall be

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.21** *P* **96** *L* **46** # 28

Benyamin, Saied Aquantia

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

Alert description is yellowed out, and needs to mention that we use link sycnrhonization.
Current paragraph:
When the lpi_tx_mode variable takes the value <TBD: ALERT and the PMA asserts SEND_N, the PCS passes the ALERT vector to the PMA.>

SuggestedRemedy

When the lpi_tx_mode variable takes the value ALERT, the PMA transmits the link synchronization sequence onto the MDI as provided by the link synchronization block via sync_tx_symb

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Remove highlighting and

Change: When the lpi_tx_mode variable takes the value <TBD: ALERT and the PMA asserts SEND_N, the PCS passes the ALERT vector to the PMA.>

To: When the lpi_tx_mode variable takes the value ALERT, the PMA transmits the link synchronization sequence onto the MDI as provided by the link synchronization block via sync_tx_symb.

Cl **149** *SC* **149.3.2.2.21** *P* **96** *L* **51** # 29

Benyamin, Saied Aquantia

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

Alert has a yellow tag around it <TBD Alert>

SuggestedRemedy

remove yellow and <TBD> and change to upper case ALERT

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.2.21** *P* **97** *L* **4** # 30

Benyamin, Saied Aquantia

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

There is a yellow tag on this line awaiting some description

SuggestedRemedy

Please add the following:
After the alert signal, the PCS completes the transition from LPI mode to normal mode by sending a wake signal containing lpi_wake_time RS-FEC frames composed of IDLE 64B/65B blocks.

Lpi_wake_time is a fixed parameter that is defined in Table 149-1000. Please see attached word doc

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Delete: <TBD Alert>

Replace with: After the alert signal, the PCS completes the transition from LPI mode to normal mode by sending a wake signal containing lpi_wake_time RS-FEC frames composed of IDLE 64B/65B blocks.

Lpi_wake_time is a fixed parameter that is defined in Table 149-1000.

Add the table on page 3 of Benyamin_3ch_1_0319.pdf after the text being added by this comment.

Editorial license to use the appropriate table number.

Cl **149** *SC* **149.3.2.3** *P* **97** *L* **14** # 99

Tu, Mike Broadcom

Comment Type **ER** *Comment Status* **D** *EZ*

Change "65B-RS-FEC" to "65B RS-FEC", same as the convention used in 149.3.2.2.2

SuggestedRemedy

Change "65B-RS-FEC" on line 14 and line 15 to "65B RS-FEC".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.3** *P* **97** *L* **14** # 160
Wienckowski, Natalie General Motors

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

typo

SuggestedRemedy

Change: 65B-RS-FEC
To: 65B RS-FEC
Also page 97 line 15 and page 140 line 46.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.3** *P* **97** *L* **28** # 188
Wienckowski, Natalie General Motors

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

Add comma for readability.

SuggestedRemedy

Change: monitors the signal quality asserting hi_rfer if excessive
To: monitors the signal quality, asserting hi_rfer if excessive

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: monitors the signal quality asserting hi_rfer if excessive RS-FEC frame errors are detected.

To: monitors the signal quality and asserts hi_rfer to indicate excessive RS-FEC frame errors.

Cl **149** *SC* **149.3.2.3** *P* **97** *L* **38** # 277
McClellan, Brett Marvell

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

according to 149.3.4.1, alignment bits are placed every 450 symbols.

SuggestedRemedy

Change 80 to 450.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: 180

To: 450

Changing 80 to 450 would yield 1450 which is not what is desired here.

Cl **149** *SC* **149.3.2.3** *P* **97** *L* **38** # 86
Tu, Mike Broadcom

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

There are 450 PAM2 symbols per partial frame.

SuggestedRemedy

Within the highlighted text, change "180" to "450". Then remove the highlights.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.3** *P* **97** *L* **51** # 189
Wienckowski, Natalie General Motors

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

Add comma for readability.

SuggestedRemedy

Change: After these frames the link partner
To: After these frames, the link partner

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.3** *P* **98** *L* **2** # 31
Benyamin, Saied Aquantia

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

There is a yellow TBD as follows
The quiet-refresh cycle continues until the PMA asserts <TBD Alert> .

SuggestedRemedy

The quiet-refresh cycle continues until the link synchronization detect asserts send_s_sigdet to indicate that the alert (link synchronization) sequence has been reliably detected. After the alert sequence the link partner transmits repeated /I/ characters, representing a wake signal. The PHY receive function sends /I/ to the XGMII for 8 RS-Frame periods (wake duration) and then resumes normal operation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Remove yellow highlighting.

Change: PMA asserts <TBD Alert> .

To: link synchronization detect asserts send_s_sigdet to indicate that the alert (link synchronization) sequence has been reliably detected. After the alert sequence the link partner transmits repeated /I/ characters, representing a wake signal. The PHY receive function sends /I/ to the XGMII for 8 RS-Frame periods (wake duration) and then resumes normal operation.

Cl **149** *SC* **149.3.2.3.2** *P* **98** *L* **16** # 190
Wienckowski, Natalie General Motors

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

The equation references are swapped. The Master receive function should use the Slave transmit scrambler to descramble and the Slave receiver should use the Master transmit scrambler to descramble.

SuggestedRemedy

Swap the references to Equation (149-5) and Equation (149-6) in the following text: For side-stream descrambling, the MASTER PHY shall employ the receiver descrambler generator polynomial per Equation (149–5) and the SLAVE PHY shall employ the receiver descrambler generator polynomial per Equation (149–6).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.2.3.3** *P* **98** *L* **24** # 17
Anslow, Pete Ciena

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

Two instances of "Table 149–1" (in b) and c)) should be cross-references.

SuggestedRemedy

Make the two instances of "Table 149–1" cross-references.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.3** *P* **98** *L* **43** # 234
Zimmerman, George CME:ADI,Aquantia,AP

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

"however there is the possibility that the RS-FEC decoder may have corrected some errors." "may" is a special word for "is permitted to" in this case a fact is being described.

SuggestedRemedy

Change "however there is
the possibility that the RS-FEC decoder may have corrected some errors." to
"however there is
the possibility that the RS-FEC decoder corrected some errors."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.4** *P* **98** *L* **47** # 237
Zimmerman, George CME:ADI,Aquantia,AP

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

"PMA training side-stream scrambler polynomials" - these are also used in data mode. They're not just for breakfast anymore.

SuggestedRemedy

Delete "PMA Training" so that the header for 149.3.4 reads "Side-stream scrambler polynomials"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.4.1** *P* **99** *L* **37** # 305

den Besten, Gerrit NXP Semiconductors

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

"alignment to the RS-FEC block and the 16 partial PHY frames that comprise the block" "block" is confusing here as block is used in the context of 64B/65B block encoding. What is meant here is PAM2 training sequence with the length of 4 RS frames. I think this is called super-frame.

SuggestedRemedy

Replace by: "alignment to the RS-FEC super-frame comprising 16 partial PHY frames"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: alignment to the RS-FEC block and the 16 partial PHY frames that comprise the block

To: alignment to the RS-FEC super-frame comprised of 16 partial PHY frames

Cl **149** *SC* **149.3.4.4** *P* **100** *L* **8** # 191

Wienckowski, Natalie General Motors

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

This is a duplicate of 149.3.4.3.

SuggestedRemedy

Delete 149.3.4.4.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.4.4** *P* **100** *L* **8** # 49

Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *EZ*

Section duplicated

SuggestedRemedy

Delete section.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.5** *P* **100** *L* **25** # 192

Wienckowski, Natalie General Motors

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

Add comma for readability.

SuggestedRemedy

Change: Within the LPI mode PHYs use a repeating quiet-refresh cycle
To: Within the LPI mode, PHYs use a repeating quiet-refresh cycle

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.5** *P* **100** *L* **29** # 194

Wienckowski, Natalie General Motors

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

grammer - the letter L is "el" which requires an in front of it

SuggestedRemedy

Change: a LPI
To: an LPI

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.5** *P* **100** *L* **30** # 193

Wienckowski, Natalie General Motors

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

Add comma for readability.

SuggestedRemedy

Change: lpi_qr_time equal to 96 RS-FEC frame periods.
To: lpi_qr_time, equal to 96 RS-FEC frame periods.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.5** *P* **100** *L* **34** # 32

Benyamin, Saied Aquantia

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

We space alerts so they do not overlap by forcing their start times. It is more clear to refer to alert start time as opposed to alert signal. Also in the same sentence we refert to the link partner. See following text and changes in bold on the right
lpi_offset is a fixed value equal to lpi_qr_time / 2 + 4 (52 RS-FEC frame periods) that is used to ensure refresh signals and alert signals are appropriately offset by the link partner's.

SuggestedRemedy

lpi_offset is a fixed value equal to lpi_qr_time / 2 + 4 (52 RS-FEC frame periods) that is used to ensure refresh signals and alert start times are appropriately offset from the link partner's.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "alert signals" to "alert start times" on P100 L34.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **4** # 65

Lo, William Axonne Inc.

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

The method to synchronize the master as slave as described in this section defeats the entire purpose of partial frame count during training as shown in Figure 149-12 and introduces uncertainity in the timing.

SuggestedRemedy

Delete:
The transition to PCS_Test is used as a fixed timing reference for the link partners. Refresh signaling is derived by counting RS-FEC frames from the transition to PCS_Test. At the Master RS-FEC frame count of zero and all multiples of 96 RS-FEC frames thereafter denote the start of the cycle.

Replace with:
Refresh signaling is derived by tracking the partial frame count as shown in Figure 149-12.

Delete (lines 16, 17):

Following the transition to PAM4, the PCS continues to count transmitted RS-FEC frames (tx_rsfc), and uses the counter to generate refresh, ALERT, and wake control signals for the transmit functions.

Replace with:
Following the transition to PAM4, the PCS continues to count partial frames and uses the count to generate refresh, ALERT, and wake control signals for the transmit functions.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Delete all text in Clause 149.3.5.1.

Editorial license to format correctly.

Replace with: To maximize power savings, maintain link integrity, and ensure interoperability, EEE-capable PHYs must synchronize refresh intervals during the LPI mode. An EEE-capable PHY in SLAVE mode is responsible for synchronizing its Partial PHY frame Count (PFC24) to the MASTER's PFC24 during PAM2 training. For 10GBASE-T1, 5GBASE-T1, and 2.5GBASE-T1 the SLAVE's PFC24 should be +0/-4, +0/-2, and +0/-1 partial frames respectively with respect to the MASTER's PFC24.

Refresh signaling is derived by tracking the RS-FEC frame count as shown in Figure 149-12, where:
RS-FEC frame count = (PFC24 / 4) mod 96.

The start of the SLAVE quiet-refresh cycle is delayed from the MASTER by 52 RS-FEC frames. This offset ensures that the MASTER and SLAVE ALERT windows are offset from each other and that the refresh periods are close to half cycle offset.

Following the transition to PAM4, the PCS continues with the RS-FEC frame count and uses the count to generate refresh, ALERT, and wake control signals for the transmit functions.

Also resolves Comment #33.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **6** # 195

Wienckowski, Natalie General Motors

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

Add commas for readability.

SuggestedRemedy

Change: At the Master RS-FEC frame count of zero and all multiples of 96 RS-FEC frames thereafter denote the start of the cycle.
To: At the Master, a RS-FEC frame count of zero, and all multiples of 96 RS-FEC frames thereafter, denote the start of the cycle.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This text may be deleted if Comment 65 is implemented.

(should be "an RS-FEC frame count")
Change: At the Master RS-FEC frame count of zero and all multiples of 96 RS-FEC frames thereafter denote the start of the cycle.

To: At the Master, an RS-FEC frame count of zero, and all multiples of 96 RS-FEC frames thereafter, denote the start of the cycle.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **10** # 33

Benyamin, Saied Aquantia

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

Frame counts are based on RS-Frames, not partial frames

SuggestedRemedy

Remove the word partial in three places on line 10 and line 11

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Not needed if comment #65 implemented as proposed.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **13** # 196

Wienckowski, Natalie General Motors

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

The refresh signals are not exactly a half cycle off since one is at 52 and the other is at 96 RS-FEC frames.

SuggestedRemedy

Change: the refresh periods are a half cycle offset.
To: the refresh periods are about a half cycle offset.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Not needed if comment #65 implemented as proposed.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **13** # 34

Benyamin, Saied Aquantia

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

The offset between two link partners is not exactly half cycle, it is 4 frames more than half cycle, change the wording

SuggestedRemedy

Replace the word "half cycle" with "properly"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change to " the refresh periods are about a half cycle offset." per comment 196.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **19** # 72

Graba, Jim
Broadcom

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

Establish a limitation for alert starts so that it does not overlap with the link partner's alert.

SuggestedRemedy

Insert the following paragraph:
The four RS-Frame long Alert shall start at the beginning of any eighth PHY frame boundary starting at the beginning of the frame following the efresh PHY frame. This offsets the master and slave alert start times by alert_period/2 = 4 PHY frames and provides the following two benefits: The MASTER and SLAVE allowable alert transmissions do not overlap and Alert does not overlap device's own refresh. The MASTER and SLAVE shall derive the tx_refresh_active and tx_alert_start signals from the transmitted PHY frames (tx_rsfc) as shown in Table 149-3 and Table 149-4.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Insert on page 101 line 19.

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. This offsets the MASTER and SLAVE ALERT start times by alert_period/2 = 4 PHY frames and provides the following two benefits: The MASTER and SLAVE allowable ALERT transmissions do not overlap and ALERT does not overlap the device's own refresh. The MASTER and SLAVE shall derive the tx_refresh_active and tx_alert_start signals from the transmitted PHY frames (tx_rsfc) as shown in Table 149-3 and Table 149-4.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **19** # 35

Benyamin, Saied
Aquantia

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

We need to establish limitation for alert starts so that it does not overlap with the link partner's alert.

SuggestedRemedy

Add the following paragraph:
The four RS-Frame long Alert may start at the beginning of every eighth PHY frame boundary starting at the beginning of the frame following the refresh PHY frame. This sets alert_period to 4 PHY frames and provides the following two benefits: The MASTER and SLAVE allowable alert transmissions do not overlap and Alert does not overlap device's own refresh. The MASTER and SLAVE shall derive the tx_refresh_active and tx_alert_start signals from the transmitted PHY frames (tx_rsfc) as shown in Table 149-5 and Table 149-6.

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **27** # 36

Benyamin, Saied
Aquantia

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

The table is errneously referring to wake_period for alert calculation

SuggestedRemedy

Change wake_period to alert_period

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **28** # 70

Graba, Jim
Broadcom

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

Need tx_lpi_full_refresh condition in Table 149-3

SuggestedRemedy

Add row to Table 149-3. First column: tx_lpi_full_refresh=true. Second column: mod(u, lpi_qr_time) = lpi_offset - lpi_refresh_time

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **36** # 37
Benyamin, Saied Aquantia

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

The table is errneously referring to wake_period for alert calculation

SuggestedRemedy

Change wake_period to alert_period

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.5.1** *P* **101** *L* **38** # 71
Graba, Jim Broadcom

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

Need tx_lpi_full_refresh condition in Table 149-4

SuggestedRemedy

Add row to Table 149-4. First column: tx_lpi_full_refresh=true. Second column: mod(v,lpi_qr_time) = lpi_quiet_time

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.5.3** *P* **101** *L* **47** # 38
Benyamin, Saied Aquantia

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

During LPI, we still need to send the OAM, the following text does not include this, it only mentions that we do not send any infofield data during refresh
with the exception that the infofield consists of a sequence of 128 zeros.

SuggestedRemedy

with the exception that the infofield consists of a sequence of 128 zeros and, in addition, the 10-bit OAM symbol to be transmitted is XORed with the last 10 bits of the PAM2 refresh transmission

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add the following sentence after …128 zeros.

The 10-bit OAM symbol to be transmitted is XORed with the last 10 bits of the PAM2 refresh transmission.

Cl **149** *SC* **149.3.6.2.2** *P* **102** *L* **49** # 24
Maguire, Valere The Siemon Company

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

Consistency with other text in clause

SuggestedRemedy

Replace "which" with "that"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.2** *P* **103** *L* **29** # 79
Graba, Jim Broadcom

Comment Type **ER** *Comment Status* **D** *EEE*

Yellow highlighting is no longer needed

SuggestedRemedy

Remove highlighting

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.3** *P* **104** *L* **2** # 74
Graba, Jim Broadcom

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

SuggestedRemedy

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **149** *SC* **149.3.6.2.3** *P* **104** *L* **35** # 219
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *State diagrams*

Need to accept rfer_timer so that hi_rfer function (already accepted) works. This is not a EEE variable. The value scales with the bit rate, but not with interleaving, and relates to 312 500 bit times - for monitoring, the variation with interleaving should be acceptable.

SuggestedRemedy

Accept text in yellow at lines 35 through 39 for rfer_timer.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.3** *P* **104** *L* **40** # 80
Graba, Jim Broadcom

Comment Type **ER** *Comment Status* **D** *EEE*

Yellow highlighting is no longer needed

SuggestedRemedy

Remove highlighting from lines 40 - page 105 line 7

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.3** *P* **104** *L* **45** # 81
Graba, Jim Broadcom

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

lpi_tx_sleep_timer is wrong

SuggestedRemedy

Replace 6 RS-FEC with 8 RS-FEC

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.4** *P* **105** *L* **13** # 118
Chen, Steven Broadcom

Comment Type **ER** *Comment Status* **D** *State diagrams*

There's no definition for rx_symb_vector. The rx_symb is defined instead.

SuggestedRemedy

Change "rx_symb_vector" to "rx_symb".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.4** *P* **105** *L* **25** # 199
Wienckowski, Natalie General Motors

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

awkward wording

SuggestedRemedy

Change: belonging to the eight types
To: belonging to one of the eight types
Also on page 106, line 11

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: belonging to the eight types

To: belonging to one or more of the eight types

Also on page 106, line 11

Cl **149** *SC* **149.3.6.2.4** *P* **105** *L* **42** # 197
Wienckowski, Natalie General Motors

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

Hex alphabetic charcters should be capitalized.

SuggestedRemedy

Change: 0x1e
To: 0x1E
Also on page 105, line 45

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.4** *P* **105** *L* **53** # 198
Wienckowski, Natalie General Motors

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

duplicate sentence.

SuggestedRemedy

Delete on instance of: A valid O code is one containing an O code specified in Table 149–1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.5** *P* **107** *L* **1** # 220
Zimmerman, George CME:ADI,Aquantia,AP

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

Accept rfer counter logic for rfer monitor state machine. These are needed, and should not be controversial.

SuggestedRemedy

Accept text in yellow at lines 1 through 6 on page 107, delete editor's note on lines 47 through 51 on page 106.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.2.5** *P* **107** *L* **1** # 102
Tu, Mike Broadcom

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

Remove editorial highlights from line 1 to line 5.

SuggestedRemedy

Remove editorial highlights on line 1 to line 5.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.6.3** *P* **107** *L* **17** # 221
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *State diagrams*

Need RFER monitor state diagram

SuggestedRemedy

Accept text in yellow on P 107 lines 17 & 18. Add figure 97-13 into the draft as the referenced "Figure 149-TBD" in line 17. Editorial license to accept and add any necessary variables, counters, functions or constants for Figure 97-13 from clause 97 into 149.3.6.2, or accept them if missed by other comments (they should all be there in yellow and in other comments)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Need to reconcile comments 101, 221, 222, 103, and 78.

Cl **149** *SC* **149.3.6.3** *P* **107** *L* **17** # 101
Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

The RFER monitor state diagram is missing.

SuggestedRemedy

1. Copy Figure 97-13 as RFER monitor state diagram
2. On line 17, change Figure 149-TBD to the figure number of this inserted figure.
3. Before 149.3.6.3, add "149.3.6.2.6 Messages", with content:
RX_FRAME
A signal sent to PCS Receive indicating that a full Reed-Solomon frame has been decoded and the variable rf_valid is updated.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Need to reconcile comments 101, 221, 222, 103, and 78.

Cl **149** *SC* **149.3.6.3** *P* **107** *L* **19** # 222
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **E** *Comment Status* **D** *State diagrams*
Accept description of state diagrams

SuggestedRemedy
Accept text in yellow on page 107 lines 19 through 36 for PCS state diagrams.

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

Need to reconcile comments 101, 221, 222, 103, and 78.

Cl **149** *SC* **149.3.6.3** *P* **107** *L* **20** # 103
Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*
Remove editorial highlights from line 17 to line 35.

SuggestedRemedy
Remove editorial highlights from line 17 to line 35.

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

Need to reconcile comments 101, 221, 222, 103, and 78.

Cl **149** *SC* **149.3.6.3** *P* **112** *L* **44** # 78
Graba, Jim Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*
Add EEE transmit state diagram

SuggestedRemedy
Insert EEE transmit state diagram with changes as shown in EeeTransmitStateDiagramMarkUp_Graba_20190222.pdf

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

In addition to adding the Figure, on P148 L 37 insert the following text, with editorial license:

The following variable is required only for PHYs that support the EEE capability:
lpi_refresh_detect
Set TRUE when the receiver has reliably detected refresh signaling and FALSE otherwise. The exact criteria left to the implementer.
pcs_data_mode
Generated by the PMA PHY Control function and indicates whether or not the local PHY may transition its PCS state diagrams out of their initialization states. The current value of the pcs_data_mode is passed to the PCS via the PMA_PCSDATAMODE.indicate primitive. In the absence of the optional EEE and fast retrain capabilities, the PHY operates as if the value of this variable is TRUE.

Cl **149** *SC* **149.3.7.1** *P* **107** *L* **46** # 119
Chen, Steven Broadcom

Comment Type **ER** *Comment Status* **D** *EZ*
Change PCS_status to the defined pcs_status for naming consistency.

SuggestedRemedy
Change "PCS_status" to "pcs_status"
Suggest to search and replace it globally.

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

Make suggested change.

Also make change on P150 L46 x2, P151 L12, P151 L18, P48 L35.

Cl **149** *SC* **149.3.7.2** *P* **108** *L* **24** # 223
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *State diagrams*

X-bit counter - this is a 6-bit counter, according to the description in clause 45., and the referenced figure for the RFER monitor state diagram is added by another comment.

SuggestedRemedy

Change x-bit to six bit, and
cross reference to RFER Monitor state diagram if added by the other comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: X-bit counter

To: 6-bit counter

Editorial licesnse to add reference to figure added by comments 101 & 221.

Cl **149** *SC* **149.3.7.2** *P* **108** *L* **24** # 104
Tu, Mike Broadcom

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

There are only 6 bits in MDIO register bits 3.2324.5:0.

SuggestedRemedy

Change from "X-bit counter that …" to "6-bit counter that …".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.7.2** *P* **111** *L* **5** # 120
Chen, Steven Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

The "fr_active" and "fr_sigtype" is not defined and should be removed.

SuggestedRemedy

Change
"if !fr_active
 rx_raw <= LBLOCK_R
 else
 rx_raw <= fr_sigtype
 end"
to
"rx_raw <= LBLOCK_R"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.7.3** *P* **112** *L* **50** # 93
Tu, Mike Broadcom

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

Change "TBD" to "65B RS-FEC"

SuggestedRemedy

Change "TBD" to "65B RS-FEC"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.7.3** *P* **112** *L* **50** # 306
den Besten, Gerrit NXP Semiconductors

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

TBD

SuggestedRemedy

Replace "TBD encoded" with "encoded transmit data"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "TBD" to "65B RS-FEC"

Cl **149** *SC* **149.3.7.3** *P* **112** *L* **50** # 224
Zimmerman, George CME:ADI,Aquantia,AP

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

"a continuous stream of TBD encoded PAM 4 symbols" - the missing word is "RS-FEC"

SuggestedRemedy

Replace "TBD" with "RS-FEC"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "TBD" to "65B RS-FEC"

Cl **149** *SC* **149.3.8** *P* **113** *L* **14** # 121
Chen, Steven Broadcom

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

The OAM10 is not defined.

SuggestedRemedy

Change "the OAM10 field" to "the OAM 10-bit field"
Also replace the same issue in page 113 line 30.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8..17** *P* **120** *L* **16** # 206
Wienckowski, Natalie General Motors

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

It is not required that a user defined OAM message require multiple OAM messages to transmit. It is possible that the user defined OAM message fits within the 8 bytes available.

SuggestedRemedy

Change: the OAM message exchange operates on a per OAM message basis that will occur over many OAM frames.
To: the OAM message exchange operates on a per OAM message basis that may occur over many OAM frames.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.1** *P* **114** *L* # 288
den Besten, Gerrit NXP Semiconductors

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

I understand the benefit of an separate RS code to protect OAM bytes during LPI mode. However it should be noted that EEE is optional. It doesn't make sense to me that the OAM data during normal operation would be double RS encoded as it is already protected by the regular RS-FEC frame. Therefore I propose to make the OAM RS optional for normal operation.

SuggestedRemedy

I propose to only use the (16,14,10) RS coding for OAM during refreshing and not during normal operation. At least this should not be mandated. During normal operation the OAM bytes are already protected by the RS(360,324,10) scheme. We intentionally selected an RS scheme where one byte was left over for OAM. A transceiver with EEE still can double RS encode the OAM all the time, but an PHY that does not support EEE should not be required to add this additional coding without any purpose. In order to keep it simple with a 16 byte scheme, the last two bytes will be reserved in normal operation, and be transmitted as zero.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change as proposed in Comment #56 which provides specific text changes.

Cl **149** *SC* **149.3.8.2.1** *P* **114** *L* **38** # 308
den Besten, Gerrit NXP Semiconductors

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

"full OAM frame can packed into 8 super frames in the 2x interleave mode, and into 4 super frames in the 4x interleave mode"

SuggestedRemedy

"full OAM frame can be packed into 8 super frames in the 2x interleaved mode, and into 4 super frames in the 4x interleaved mode"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.1** *P* **114** *L* **41** # 235
Zimmerman, George CME:ADI,Aquantia,AP

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

"it may be possible". "may" means "it is permitted to" - "it is permitted to be possible" doesn't really make sense. If it is, indeed possible, "it is possible", if we are unsure, let's figure it out! (in 2 places, also on line 44)

SuggestedRemedy

Change "it may be possible" to "it is possible" on lines 41 and 44

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.1** *P* **115** *L* **3** # 50
Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *OAM*

Clarification on the dummy symbol

SuggestedRemedy

Add new paragraph at line 3 as follows:
The dummy OAM symbol is all 0s and its value is ignored at the receiver.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.4** *P* **115** *L* **44** # 200
Wienckowski, Natalie General Motors

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

awkward wording

SuggestedRemedy

Change: This bit is set by the PHY to for the link partner to echo on Ping RX.
To: This bit is set by the PHY for the link partner to echo on Ping RX.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.5** *P* **116** *L* **1** # 128
Chen, Steven Broadcom

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

To exit the LPI would require to change MAC layer.

SuggestedRemedy

Remove "Request link partner to exit LPI and send idles"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This is text copied from 1000BASE-T1 OAM. This is used to force exit from EEE to ensure link is not lost. If this is not the correct way to state this, a different wording needs to be proposed.

Cl **149** *SC* **149.3.8.2.12** *P* **117** *L* **17** # 201
Wienckowski, Natalie General Motors

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

missing period

SuggestedRemedy

Add a period at the end of the sentence.
Also on page 117, lines 24, 30, 36, 42, and 49.
Also on page 118, lines 1 and 6.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.12** *P* **117** *L* **31** # 122
Chen, Steven Broadcom

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

The definition of "not receiving transmit messaged from the MAC" needs to be clarified.

SuggestedRemedy

Change "… not receiving transmit messaged from the MAC" to "… not receiving valid transmit message from the MAC"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.12** *P* **117** *L* **42** # 129

Chen, Steven Broadcom

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

This standard requires single pair cable. There's no pair swap.

SuggestedRemedy

Remove L42 to L47.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

While it is true that pairs cannot be swapped as there is only one pair, the conductors in the pair can be swapped. That is what this says.

Change: Pair swapped

To: Polarity inversion

Also on P117 L46 Change: Pair is not swapped
To: No polarity inversion detected.

P117 L 47 Change: Pair is swapped
To: Polarity inversion detected.

Cl **149** *SC* **149.3.8.2.12** *P* **118** *L* **7** # 127

Chen, Steven Broadcom

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

Unclear which RS-FEC block errors since we have different RS-FEC for both RS-FEC frame and OAM message, respectively.

SuggestedRemedy

Change "… RS-FEC block errors" to "… RS-FEC frame block errors"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.13** *P* **118** *L* **13** # 56

Lo, William Axonne Inc.

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

The RS(16, 14) is unnecessary circuitry for PHYs that does not implement EEE. The following changes allows the simplification to be made.
See Lo_3ch_01_0319.pdf slide 3 for the rationale for this change.

SuggestedRemedy

See Lo_3ch_01_0319.pdf slide 4 for the text changes

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This also resolves comment #288.

Cl **149** *SC* **149.3.8.2.13** *P* **118** *L* **14** # 202

Wienckowski, Natalie General Motors

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

subject/verb agreement

SuggestedRemedy

Change: The RS(16, 14) parity symbols is indicated
To: The RS(16, 14) parity symbols are indicated

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.13** *P* **118** *L* **32** # 203

Wienckowski, Natalie General Motors

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

missing period

SuggestedRemedy

Add a period at the end of the sentence.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.3.8.2.13** *P* **118** *L* **35** # 204
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
missing period

SuggestedRemedy
Change: Figure 149–19 Before calculation
To: Figure 149–19. Before calculation

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

Cl **149** *SC* **149.3.8.2.13** *P* **118** *L* **35** # 307
den Besten, Gerrit NXP Semiconductors

Comment Type **E** *Comment Status* **D** *EZ*
Period missing after "Figure 149–19"

SuggestedRemedy
Add period

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

Implemented by comment 204.

Cl **149** *SC* **149.3.8.2.14** *P* **118** *L* **41** # 205
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *Editorial*
missing periods

SuggestedRemedy
Add periods at the end of the a) and b) statements.

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

(change is on page 119, and a) and b) are not sentences.

Change: a) RS(16, 14) uncorrectable error
b) Uncorrectable PHY frame on any of the 16 symbols

To: a) RS(16, 14) contains an uncorrectable error, or
b) there is an uncorrectable PHY frame on any of the 16 symbols.

Cl **149** *SC* **149.3.8.2.14** *P* **119** *L* **39** # 47
Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *Editorial*
Title heading incorrect

SuggestedRemedy
Delete 1000BASE-T1

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

Change: 1000BASE-T1

To: BASE-T1

Cl **149** *SC* **149.3.8.2.15** *P* **119** *L* **48** # 236
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **E** *Comment Status* **D** *Editorial*
"that may cause the PHY" - it appears "can cause the PHY" would be more appropriate. This is neither permission nor option. Occurs 2 times, also on line 51.

SuggestedRemedy
Change "may" to "can" on lines 48 & 51

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

Cl **149** *SC* **149.3.8.2.17** *P* **120** *L* **22** # 207
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
missing comma

SuggestedRemedy
Change: After the link partner receives the OAM message it transfers it
To: After the link partner receives the OAM message, it transfers it

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

Cl **149** *SC* **149.3.8.2.17** *P* **120** *L* **23** # 208
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
missing comma

SuggestedRemedy
Change: One OAM message can be loaded into the OAM transmit registers while another OAM message is being transmitted by the PHY to the link partner while yet another OAM message is being read out at the link partner's OAM receive registers.
To: One OAM message can be loaded into the OAM transmit registers while another OAM message is being transmitted by the PHY to the link partner, while yet another OAM message is being read out at the link partner's OAM receive registers.

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

Cl **149** *SC* **149.3.8.2.17** *P* **120** *L* **26** # 209
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
subject/verb agreement

SuggestedRemedy
Change: The exchange of OAM messages are occurring concurrently and bi-directionally.
To: The exchange of OAM messages is occurring concurrently and bi-directionally.

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

Cl **149** *SC* **149.3.8.2.17** *P* **120** *L* **27** # 210
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
missing comma

SuggestedRemedy
Change: On the transmit side mr_tx_valid = 0 indicates that the next OAM message can be written into the OAM transmit registers.
To: On the transmit side, mr_tx_valid = 0 indicates that the next OAM message can be written into the OAM transmit registers.

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

Cl **149** *SC* **149.3.8.2.17** *P* **120** *L* **30** # 211
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
missing comma and subject/verb agreement

SuggestedRemedy
Change: Once the registers are written the management entity sets mr_tx_valid to 1 to indicate that the OAM transmit registers contains a valid OAM message.
To: Once the registers are written, the management entity sets mr_tx_valid to 1 to indicate that the OAM transmit registers contain a valid OAM message.

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

Cl **149** *SC* **149.3.8.2.17** *P* **120** *L* **33** # 212
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
missing comma

SuggestedRemedy
Change: On the receive side mr_rx_lp_valid indicates that valid OAM message can be read from the OAM receive registers.
To: On the receive side, mr_rx_lp_valid indicates that valid OAM message can be read from the OAM receive registers.

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

Cl **149** *SC* **149.3.8.2.17** *P* **120** *L* **35** # 213
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
missing comma

SuggestedRemedy
Change: If mr_rx_lp_valid is not cleared then the OAM
To: If mr_rx_lp_valid is not cleared, then the OAM

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

Cl **149** SC **149.3.8.4.2** P **128** L **16** # 45
Lo, William Axonne Inc.

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

Highlighted sentence is accurate

SuggestedRemedy

Remove highlight

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** SC **149.3.8.4.2** P **129** L **30** # 46
Lo, William Axonne Inc.

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

Highlighted sentence is accurate

SuggestedRemedy

Remove highlight

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** SC **149.3.8.4.3** P **125** L **27** # 123
Chen, Steven Broadcom

Comment Type **ER** *Comment Status* **D** *OAM*

The mr_rx_lp_message[95:0] has 12 Octets.

SuggestedRemedy

Change "Eight octet BASE-T1 OAM from ..." to "Twelve octet BASE-T1 OAM from ..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** SC **149.3.8.4.3** P **126** L **47** # 214
Wienckowski, Natalie General Motors

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

missing periods

SuggestedRemedy

Add period at the end of the 0 and 1 sentences.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: "0: BASE-T1 OAM message not received and read by the link partner
1: BASE-T1 OAM message received by the link partner"
to: "0: BASE-T1 OAM message was not received and read by the link partner.
1: BASE-T1 OAM message was received by the link partner."

Cl **149** SC **149.3.8.4.3** P **127** L **11** # 215
Wienckowski, Natalie General Motors

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

improve wording to match other statements

SuggestedRemedy

Change: Don’t send request to link partner…
To: Don't request link partner...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: false: Don’t send request to link partner to clear their REC counter.

To: false: Don’t request link partner to clear its REC counter.

Cl **149** *SC* **149.3.8.4.3** *P* **127** *L* **12** # 216
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *Editorial*
improve wording to match other statements

SuggestedRemedy
Change: Send request to link partner…
To: Request link partner...

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

Change: true: Send request to link partner to clear their REC counter.

To: true: Request link partner to clear its REC counter.

Cl **149** *SC* **149.3.8.4.3** *P* **127** *L* **17** # 217
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
missing periods

SuggestedRemedy
Add periods at the end of all 4 "Values" sentences.

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

Cl **149** *SC* **149.3.8.4.3** *P* **127** *L* **35** # 162
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
We changed to BASE-T1 OAM

SuggestedRemedy
Change: 1000BASE-T1 OAM
To: BASE-T1 OAM

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

Cl **149** *SC* **149.3.8.4.3** *P* **127** *L* **43** # 163
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *Editorial*
missing periods

SuggestedRemedy
Add periods at the end of both "Values" sentences.

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

Add periods at the end of both values, and editorial license to add periods at the end of other Values in 149.3.8.4.3 which may be lacking and are complete sentences (e.g., P127 L21 & 22)

Cl **149** *SC* **149.3.8.4.3** *P* **127** *L* **49** # 164
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *Editorial*
missing period

SuggestedRemedy
Add period at end of "Good" sentence.

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

This is not a sentence.

Remove period at the end of the "BAD" statement as it is not a sentence.

Cl **149** *SC* **149.3.8.4.3** *P* **128** *L* **16** # 39
Benyamin, Saied Aquantia

Comment Type **T** *Comment Status* **D** *EZ*
rx_boundary description has yellow highligted

SuggestedRemedy
Remove the yellow as the text is correct

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

Cl **149** *SC* **149.3.8.4.3** *P* **128** *L* **19** # 165
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *Editorial*
missing periods

SuggestedRemedy
Add periods at the end of both "Values" sentences.

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

Change: false: transmit stream not at a boundary end
true: transmit stream at a boundary end

To: false: transmit stream is not at a boundary end.
true: transmit stream is at a boundary end.

Cl **149** *SC* **149.3.8.4.3** *P* **129** *L* **20** # 166
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *Editorial*
missing periods

SuggestedRemedy
Add periods at the end of all 4 "Values" sentences.

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

Cl **149** *SC* **149.3.8.4.3** *P* **129** *L* **30** # 40
Benyamin, Saied Aquantia

Comment Type **T** *Comment Status* **D** *EZ*
tx_boundary description has yellow highligted

SuggestedRemedy
Remove the yellow as the text is correct

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

Cl **149** *SC* **149.3.8.4.3** *P* **129** *L* **33** # 167
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *Editorial*
missing periods

SuggestedRemedy
Add periods at the end of both "Values" sentences.

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

Change: false: transmit stream not at a boundary end
true: transmit stream at a boundary end

To: false: transmit stream is not at a boundary end.
true: transmit stream is at a boundary end.

Cl **149** *SC* **149.3.8.4.4** *P* **130** *L* **17** # 51
Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *Editorial*
rx_cnt incorrectly defined

SuggestedRemedy
Change:
A count of received OAM frames
To:
A count of received OAM frame symbols

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

Change:
A count of received OAM frames.
To:
A count of received OAM frame symbols.

Cl **149** *SC* **149.3.8.4.6** *P* **131** *L* **17** # 124

Chen, Steven Broadcom

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

The downward arrow from RECEIVE INIT state to CHECK READ state is missing the transition condition.

SuggestedRemedy

Add conditional label "UCT" for the arrow in the middle.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

If comment #66 is accepted as the response is written, a condition is added to this transition.

Cl **149** *SC* **149.3.8.4.6** *P* **131** *L* **26** # 309

Chen, Steven Broadcom

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

Partially accept William Lo's commentary #66. Suggest additional improvement. Need to identify the OAM symbol based on the OAM framing bit.

SuggestedRemedy

At line 26, change "Parity_Check(rx_oam_field<8:0>) = Even" to "(rx_cnt !=16) * (rx_oam_field<8> = 0)".

At line 31, change "else" to "(rx_cnt !=16) * (rx_oam_field<8> = 1)"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

What you proposed will not work since the final 2 OAM symbols are 10-bit parity symbols and bit 8 can be either 1 or 0.
So we cannot rely on looking only at this bit by itself. That is why we defined frame_boundary variable that looks at the sequence of all 16 rx_oam_field<8> with the final 2 bits being xx.

Cl **149** *SC* **149.3.8.4.6** *P* **131** *L* **26** # 66

Lo, William Axonne Inc.

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

State machine issues:
Typo from modifying from 1000BASE-T1 and missing transitions and not quite correct exit condition

SuggestedRemedy

Change:
Parity_Check(rx_oam_field<8:0>) = Even
To:
frame_boundary = True * (rx_cnt != 16)

Change:
RECEIVE INIT to CHECK READ transition should be
rx_boundary (currently it is blank)

Change:
In the LOAD SYMBOL state change
rx_boundary To:
rx_boundary | (rx_cnt = 16)

Add:
rx_cnt <= 0 at the bottom of the LOAD RECEIVE PAYLOAD state

Delete in 2 places
* (frame_boundary = False)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

P131 L 26 Change: Parity_Check(rx_oam_field<8:0>) = Even

To: frame_boundary = True * (rx_cnt != 16)

P131 L 7 Change: RECEIVE INIT (state name)

To: CHECK READ transition should be

Add transition condition to middle arrow out of RECEIVE INIT: rx_boundary

P131 L 37 Change transition out of LOAD SYMBOL state

From: rx_boundary

To: rx_boundary + (rx_cnt = 16)

P 131 L 30 Add:

rx_cnt <= 0 as the first line in the LOAD RECEIVE PAYLOAD state

Delete in 2 places (P 131 L 27 (on left) & P 131 L 38 (on right):

* (frame_boundary = False)

Cl **149** *SC* **149.4.1** *P* **134** *L* **1** # 44

Benyamin, Saied Aquantia

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

PMA reference diagram shows alert detect, this is replaced by link synchronization

SuggestedRemedy

See attached word document for Figure 149-24 erroneously numbered as 149-34 because I was looking at the wrong pdf

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accept changes as shown on page 3 of Benyamin_3ch_1_0319.pdf with editorial license while modifying the figure.

Cl **149** *SC* **149.4.2** *P* **134** *L* **47** # 168

Wienckowski, Natalie General Motors

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

Incorrect Figure reference

SuggestedRemedy

Change: Figure 149-12
To: Figure 149-24
Make the same change on line 49.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.2.1** *P* **135** *L* **4** # 169

Wienckowski, Natalie General Motors

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

missing space

SuggestedRemedy

Change: hold true.All
To: hold true. All

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.2.1** *P* **135** *L* **4** # 264

Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*

Typo

SuggestedRemedy

Change "true.All" to "true. All", just add one space.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement change as requested in comment 169.

Cl **149** *SC* **149.4.2.1** *P* **135** *L* **4** # 294

den Besten, Gerrit NXP Semiconductors

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

"true.All"

SuggestedRemedy

Add space

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement change as requested in comment 169.

Cl **149** *SC* **149.4.2.1** *P* **135** *L* **7** # 145
Wienckowski, Natalie General Motors

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

Add requirement for time allowed to perform a reset at the end of this section.

SuggestedRemedy

Add a new paragraph at the end of this section: The time for the PMA to resume normal transmit and receive functions after pma_reset transitions to OFF shall not exceed 20 ms.

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **149** *SC* **149.4.2.1** *P* **137** *L* **7** # 295
den Besten, Gerrit NXP Semiconductors

Comment Type **T** *Comment Status* **D** *Reset / Startup time*

Timing specs for PMA reset are missing.

SuggestedRemedy

Insert the following paragraph:
The reset shall take less than 10ms (=max_reset_time), and register access shall be available again after that. The link shall resume operation and achieve the required BER within 100ms (=max_training_time)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Insert the following paragraph:
The reset shall take less than 10ms (=max_reset_time), and register access shall be available immediately after the max_reset_time. The link shall resume operation and achieve the required BER within 100ms (=max_training_time).

Cl **149** *SC* **149.4.2.2** *P* **135** *L* **11** # 170
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *State diagrams*

missing comma

SuggestedRemedy

Change: onto the MDI pulses modulated
To: onto the MDI, pulses modulated

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Sentence is punctuated, correctly, but is confusing - and is incorrect by not covering the autoneg case.

Change: PMA Transmit shall continuously transmit onto the MDI pulses modulated by the symbols given by tx_symb when sync_link_control = ENABLE, or the sync_tx_symb output by the PHY Link Synchronization function when sync_link_control = DISABLE, after processing with optional transmit filtering, digital-to-analog conversion (DAC) and subsequent analog filtering.

To: When the PHY control state diagram (Figure 149-31) is not in the DISABLE_TRANSMITTER state, PMA Transmit shall continuously transmit pulses modulated by the symbols given by tx_symb onto the MDI after processing with optional transmit filtering, digital-to-analog conversion (DAC), and subsequent analog filtering. During Link Synchronization, when sync_link_control = DISABLE and Auto-Negotiation is either not enabled or is not implemented, the sync_tx_symb output by the PHY Link Synchronization function shall be used in place of tx_symb as the data source for PMA Transmit.

Cl **149** *SC* **149.4.2.2** *P* **135** *L* **12** # 41
Benyamin, Saied Aquantia

Comment Type **TR** *Comment Status* **D** *State diagrams*

To allow ALERT to transmit link synchronization, we need to add it to the following statement:
when sync_link_control = ENABLE

SuggestedRemedy

when sync_link_control = ENABLE or lpi_tx_mode = ALERT

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.2.2** *P* **135** *L* **14** # 171
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *State diagrams*

missing comma

SuggestedRemedy

Change: (DAC) and subsequent
To: (DAC), and subsequent

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolved by current Response in 170.
If 170 is not accepted, or if it is accepted but the text in this comment is not changed by 170, change "(DAC) and subsequent" to "(DAC), and subsequent"

Cl **149** *SC* **149.4.2.2.1** *P* **135** *L* **26** # 172
Wienckowski, Natalie General Motors

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

improve wording by removing an extra "transmitter".

SuggestedRemedy

Change: When the PMA_transmit_disable variable is set to true, this function shall turn off the transmitter so that the transmitter Average Launch Power of the Transmitter is less than –53 dBm.
To: When the PMA_transmit_disable variable is set to true, this function shall turn off the transmitter so that the Average Launch Power of the Transmitter is less than –53 dBm.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.2.3** *P* **135** *L* **34** # 289
den Besten, Gerrit NXP Semiconductors

Comment Type **T** *Comment Status* **D** *Error rate*

TBD

SuggestedRemedy

1.00E-09

Proposed Response *Response Status* **W**

PROPOSED REJECT.

TFTD as part of comment 105.

Cl **149** *SC* **149.4.2.3** *P* **135** *L* **34** # 225
Zimmerman, George CME:ADI,Aquantia,AP

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

RS-FEC error rate specification "The quality of these symbols shall allow RFER of less than TBD after RS-FEC decoding"… 10^-12 BER with an RS-FEC frame of 3260 message bits (with the errored frame replaced by error symbols) means an RFER same as the BER, or 10^-12.

SuggestedRemedy

Replace "TBD" with "10^-12" (where ^ indicates superscript)

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **149** *SC* **149.4.2.3** *P* **135** *L* **34** # 105
Tu, Mike Broadcom

Comment Type **T** *Comment Status* **D** *Error rate*

1. For 1000BASE-T1, RFER = BER (<1e-10) * bits/RS-FEC (3600) < 3.6e-7. See 97.4.2.3.
2. For 10GBASE-T, LFER = BER (<1e-12) * bits/LDPC frame (3200) < 3.2e-9. See 55.4.2.4.
3. So it is reasonable for 802.3ch to set RFER = BER (<1e-12) * bits/RS-FEC (3200) < 3.2e-9.

SuggestedRemedy

Change "TBD" to "3.2 x 10^{-9}".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Task force to discuss.

Cl **149** *SC* **149.4.2.3** *P* **135** *L* **44** # 173
Wienckowski, Natalie General Motors

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

subject/verb agreement

SuggestedRemedy

Change: from any other values
To: from any other value

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.2.4** *P* **136** *L* **13** # 18

Anslow, Pete Ciena

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

In the third paragraph of 149.4.2.4, "149.4.2.4.2" and "149.4.2.4.8" should be cross-references and "FFigure 149–27" has a spurious extra "F"

SuggestedRemedy

Make "149.4.2.4.2" and "149.4.2.4.8" cross-references and delete the spurious "F" in "FFigure 149–27".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.2.4** *P* **136** *L* **14** # 174

Wienckowski, Natalie General Motors

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

extra "F"

SuggestedRemedy

Change: Ffigure 149-27
To: Figure 149-27

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Delete leading "F" before cross-reference.

Cl **149** *SC* **149.4.2.4.2** *P* **137** *L* **3** # 175

Wienckowski, Natalie General Motors

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

The SOF is 3 octets, not 4. Also, fix subject/verb agreement.

SuggestedRemedy

Change: The start of Frame Delimiter consist of 4 octets [Octet 1<7:0>, Octet 2<7:0>, Octet 3<7:0>]
To: The start of Frame Delimiter consists of 3 octets [Octet 1<7:0>, Octet 2<7:0>, Octet 3<7:0>]

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: The start of Frame Delimiter consist of 4 octets [Octet 1<7:0>, Octet 2<7:0>, Octet 3<7:0>]
To: The start of Frame Delimiter consists of three octets [Octet 1<7:0>, Octet 2<7:0>, Octet 3<7:0>]

Cl **149** *SC* **149.4.2.4.4** *P* **137** *L* **15** # 176

Wienckowski, Natalie General Motors

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

Not a sentence

SuggestedRemedy

Change: Message Field (1 octet).
To: The Message Field is 1 octet.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: Message Field (1 octet).
To: The Message Field is one octet.

Cl **149** *SC* **149.4.2.4.5** *P* **138** *L* **17** # 177

Wienckowski, Natalie General Motors

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

Should be the letter "O", not the number "0".

SuggestedRemedy

Change: [0ct8<7:0>, 0ct9<7:0>, 0ct10<7:0>]
To: [Oct8<7:0>, Oct9<7:0>, Oct10<7:0>]

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.2.4.5** *P* **138** *L* **41** # 239
Zimmerman, George CME:ADI,Aquantia,AP

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

The requirements for EEEen and OAM should go here in the description of the fields. These are currently in yellow in the PHY control description.

SuggestedRemedy

Insert new first 2 sentences of paragraph beginning with "Interleaver Depth…" to read ""The optional EEE capability shall be enabled only if both PHYs set the capability bit EEEen = 1. The optional BASE-T1 OAM capability shall be enabled only if both PHYs set the capability bit OAMen = 1."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change: InterleaverDepth indicates the requested data mode interleaving depth and PrecodeSel indicates the
requested data mode precoder.

To: The optional EEE capability shall be enabled only if both PHYs set the capability bit EEEen = 1. The optional BASE-T1 OAM capability shall be enabled only if both PHYs set the capability bit OAMen = 1. InterleaverDepth indicates the requested data mode interleaving depth. PrecodeSel indicates the
requested data mode precoder.

Cl **149** *SC* **149.4.2.4.5** *P* **138** *L* **42** # 238
Zimmerman, George CME:ADI,Aquantia,AP

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

"data mode precoder" - it's used in training as well. It is not just for data mode.

SuggestedRemedy

Change "data mode precoder" to "requested precoder"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.2.4.10** *P* **140** *L* **1** # 231
Zimmerman, George CME:ADI,Aquantia,AP

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

Text rewrite to eliminate requirements in what should be descriptive text.

SuggestedRemedy

Accept zimmerman_3cg_02_0319.pdf (TFTD)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Grant editorial license to correct typos, grammar, etc.

Cl **149** *SC* **149.4.2.4.10** *P* **140** *L* **28** # 87
Tu, Mike Broadcom

Comment Type **ER** *Comment Status* **D** *Startup*

Remove the editorial highlighs

SuggestedRemedy

Remove the editorial highlighs

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Requested changes are accomplished with the proposal in comment 231.

Cl **149** *SC* **149.4.2.4.10** *P* **140** *L* **28** # 59
Lo, William Axonne Inc.

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

Infofield text is corrext.
No more scrambler seed exchange so need to delete sentence.
Section reference

SuggestedRemedy

Line 28) Unhighlight text
Line 29) Delete:
, and the Seed value used by the localdevice for the data mode scrambler initialization
Line 30) Change TBD to 149.4.2.4.5

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Requested changes are accomplished with the proposal in comment 231.

Cl **149** *SC* **149.4.2.4.10** *P* **140** *L* **29** # 88
Tu, Mike Broadcom

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

There is no need to exchange the Seed values. There are no user configurable register bits either. However the PHY shall indicate the precoder and the interleaver selections.

SuggestedRemedy

Change the last sentence to "The PHY Control also sets PMA_state = 00 and sends the PHY capability bits, and select the precoder and the interleaver depth".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Requested changes are accomplished with the proposal in comment 231.

Cl **149** *SC* **149.4.2.4.10** *P* **140** *L* **44** # 178
Wienckowski, Natalie General Motors

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

Add commas for readability.

SuggestedRemedy

Change: In SLAVE mode PHY Control transitions to the TRAINING state only after the SLAVE PHY acquires timing, converges its equalizers, acquires its descrambler state and sets loc_SNR_margin = OK.
To: In SLAVE mode, PHY Control transitions to the TRAINING state only after the SLAVE PHY acquires timing, converges its equalizers, acquires its descrambler state, and sets loc_SNR_margin = OK.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Requested changes are accomplished with the proposal in comment 231.

Cl **149** *SC* **149.4.2.4.10** *P* **140** *L* **46** # 100
Tu, Mike Broadcom

Comment Type **ER** *Comment Status* **D** *Startup*

Change "65B-RS-FEC" to "65B RS-FEC", same as the convention used in 149.3.2.2.2

SuggestedRemedy

Change "65B-RS-FEC" on line 14 and line 15 to "65B RS-FEC".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Make change in existing text or in proposed text of comment 231.

Cl **149** *SC* **149.4.2.4.10** *P* **141** *L* **16** # 89
Tu, Mike Broadcom

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

The paragraph should be revised in order to match Figure 149-31 PHY Control state diagram.

SuggestedRemedy

Change the paragraph to "Upon expiration of the minwait_timer and when the condition loc_rcvr_status = OK and PCS_status = OK is satisfied, PHY control transitions to the SEND_DATA state."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Requested changes are accomplished with the proposal in comment 231.

Cl **149** *SC* **149.4.2.4.10** *P* **141** *L* **16** # 60
Lo, William Axonne Inc.

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

Text modification to conform to state machine.
Rest of highlighted text is correct

SuggestedRemedy

Un highlight lines 16 to 26
Change rem_phy_ready to PCS_status in line 17

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Requested changes are accomplished with the proposal in comment 231.

Cl **149** *SC* **149.4.2.4.10** *P* **141** *L* **19** # 90
Tu, Mike Broadcom

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

This paragraph needs to be revised to match to the PHY Control state diagram.

SuggestedRemedy

Change the paragraph to "Upon entering the SEND_DATA state, PHY Control starts the minwait_timer and stops the maxwait_timer."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Requested changes are accomplished with the proposal in comment 231.

Cl **149** *SC* **149.4.2.4.10** *P* **141** *L* **22** # 91
Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *Startup*
Remove editorial highlights in this paragraph.

SuggestedRemedy
Remove editorial highlights in this paragraph.

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

Requested changes are accomplished with the proposal in comment 231.

Cl **149** *SC* **149.4.2.5** *P* **141** *L* **32** # 125
Chen, Steven Broadcom

Comment Type **ER** *Comment Status* **D** *Editorial*
Use the Link Synchronization when AN is disabled.

SuggestedRemedy
Change the "synchronization ..." to "Link Synchronization ...".

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

Cl **149** *SC* **149.4.2.5** *P* **141** *L* **36** # 179
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
subject/verb agreement

SuggestedRemedy
Change: the Auto-Negotiation function set link_control
To: the Auto-Negotiation function sets link_control

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

Cl **149** *SC* **149.4.2.7** *P* **146** *L* **4** # 61
Lo, William Axonne Inc.

Comment Type **TR** *Comment Status* **D** *State diagrams*
No state diagram so no reference
Update to correct time

SuggestedRemedy
Delete:
The Refresh monitor shall comply with the state diagram of Figure TBD.

Change:
16.384/S ms to 1.536/S ms

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

Do not delete the Figure reference, Comment 77 adds the missing figure.

Remove highlighting on page 146, lines 5 to 7.

Change: 16.384/S ms

To: 1.536/S ms

Cl **149** *SC* **149.4.2.7** *P* **146** *L* **5** # 75
Graba, Jim Broadcom

Comment Type **TR** *Comment Status* **D** *EZ*
Update the moving time window length to be equivalent to 2.5G/5G/10GBASE-T

SuggestedRemedy
Change 50 to 256. Change 16.384/S ms to 7.864/S ms

Proposed Response *Response Status* **Z**
PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **149** *SC* **149.4.2.7** *P* **146** *L* **5** # 77
Graba, Jim Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*
Update TBD

SuggestedRemedy
Point to figure containing EEE Refresh monitor state diagram

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

Point to Figure added by comment 76 as shown in Graba_3ch_1_0319.pdf.

Cl **149** *SC* **149.4.2.8** *P* **146** *L* **13** # 106
Tu, Mike Broadcom

Comment Type **ER** *Comment Status* **D** *EZ*
Remove editorial highlight.

SuggestedRemedy
Remove editorial highlight.

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

Cl **149** *SC* **149.4.3.1** *P* **146** *L* **21** # 180
Wienckowski, Natalie General Motors

Comment Type **T** *Comment Status* **D** *MDI*
there is only 1 pair

SuggestedRemedy
Change: The modulation scheme used over each pair is PAM4.
To: The modulation scheme used is PAM4.

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

P146 L21 Delete the sentence: The modulation scheme used over each pair is PAM4.

P146 L 33
Change: Signals received at the MDI can be expressed for each pair as pulse-amplitude modulated

To: Signals received at the MDI can be expressed as pulse-amplitude modulated

Cl **149** *SC* **149.4.3.1** *P* **146** *L* **27** # 19
Anslow, Pete Ciena

Comment Type **E** *Comment Status* **D** *EZ*
In "{–1, -1/3, 1/3, 1}" the hyphen should be an en dash

SuggestedRemedy
In "{–1, -1/3, 1/3, 1}" change the hyphen to an en dash

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

Change: {–1, -1/3, 1/3, 1}
To: {–1, –1/3, +1/3, +1}

See comment 181

Cl **149** *SC* **149.4.3.1** *P* **146** *L* **27** # 181
Wienckowski, Natalie General Motors

Comment Type **E** *Comment Status* **D** *EZ*
fix "-" and add "+" to be consistent with the rest of the document.

SuggestedRemedy
Change: {–1, -1/3, 1/3, 1}
To: {–1, –1/3, +1/3, +1}

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

Cl **149** *SC* **149.4.4** *P* **148** *L* **1** # 270

WU, Peter Marvell

Comment Type **TR** *Comment Status* **D** *State diagrams*

"PAM3 " are still used in pma_Watchdog_status definiiton text and expiration times should be changed as well

SuggestedRemedy

change "OK: the local device has received sufficient PAM3 transitions□
NOT_OK: the local device has not received sufficient PAM3 transitions□
During normal operation NOT_OK is assigned when:
— PAM3 symbol 0 consecutively seen on the line for longer than 2 µs ± 0.1 µs
— PAM3 symbol +1 consecutively seen on the line for longer than 3.9 µs ± 0.1 µs
— PAM3 symbol –1 consecutively seen on the line for longer than 3.9 µs ± 0.1 µs
During Low Power Idle operation NOT_OK is assigned when:
— PAM3 symbol not togglin g on the line during one full refresh window"
to
"OK: the local device has received sufficient PAM4 transitions□
NOT_OK: the local device has not received sufficient PAM4 transitions□
During normal operation NOT_OK is assigned when:
— PAM4 symbol +3 consecutively seen on the line for longer than 1.9 µs ± 0.1 µs
— PAM4 symbol +1 consecutively seen on the line for longer than 1.9 µs ± 0.1 µs
— PAM4 symbol -1 consecutively seen on the line for longer than 1.9 µs ± 0.1 µs
— PAM4 symbol –3 consecutively seen on the line for longer than 1.9 µs ± 0.1 µs
During Low Power Idle operation NOT_OK is assigned when:
— PAM4 symbol not toggling on the line during one full refresh window"
The timers expire all at 1.9us +/- 0.1us

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Make proposed changes and remove highlighting.

Cl **149** *SC* **149.4.4** *P* **148** *L* **14** # 271

WU, Peter Marvell

Comment Type **ER** *Comment Status* **D** *EZ*

PAM3 stilll used

SuggestedRemedy

change "PAM3" to "PAM4"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.1** *P* **147** *L* **3** # 241

Zimmerman, George CME:ADI,Aquantia,AP

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

Accept variables for en_slave_tx, infofield_complete, loc_phy_ready, loc_countdown_done, PMA_state, rem_countdown_done, rem_phy_ready, and sync_link_control.
Do not accept PMA_watchdog_status, as this is not used.

SuggestedRemedy

Remove highlighting from en_slave_tx, infofield_complete, loc_phy_ready, loc_countdown_done, PMA_state, rem_countdown_done, rem_phy_ready, and sync_link_control.

Delete PMA_watchdog_status at P147 L51- P148 L9

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **149** *SC* **149.4.4.1** *P* **147** *L* **3** # 53

Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *State diagrams*

The following variables are correct and should be un-indented and un highlighted. See list below

SuggestedRemedy

Fix indentation and un-highlighted the text associated with the following variables:
en_slave_tx
infofield_complete
loc_phy_ready
loc_countdown_done
PMA_state
rem_phy_ready
sync_link_control

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accept Suggested Remedy except delete loc_phy_ready and rem_phy_ready as they are not used.

Cl **149** *SC* **149.4.4.1** *P* **147** *L* **3** # 107
Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

Remove editorial highlight.

SuggestedRemedy

Remove editorial highlight from line 3 to line 12.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.1** *P* **147** *L* **3** # 273
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *State diagrams*

Accept variables for en_slave_tx, infofield_complete, loc_countdown_done, PMA_state, rem_countdown_done, and sync_link_control.
Do not accept PMA_watchdog_status, loc_phy_ready, and rem_phy_ready as these are not used.

SuggestedRemedy

Remove highlighting from en_slave_tx, infofield_complete, loc_countdown_done, PMA_state, rem_countdown_done, and sync_link_control.

Delete PMA_watchdog_status at P147 L51- P148 L9
Delete loc_phy_ready at P147 L18-26
Delete rem_phy_ready at P148 L14-21

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.1** *P* **147** *L* **19** # 108
Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

Remove editorial highlight.

SuggestedRemedy

Remove editorial highlight from line 19 to line 30

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Remove highlight from line 27 to 30.

Delete lines 19 to 26 as loc_phy_ready is not used.

Cl **149** *SC* **149.4.4.1** *P* **147** *L* **42** # 52
Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *Refresh*

Incorrect reference

SuggestedRemedy

Change 149.4.3 to 149.4.2.7

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.1** *P* **147** *L* **47** # 109
Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

Remove editorial highlight.

SuggestedRemedy

Remove editorial highlight from line 47 to line 54

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.1** *P* **147** *L* **53** # 69
Lo, William Axonne Inc.

Comment Type **TR** *Comment Status* **D** *State diagrams*

PMA_watchdog_status definition needs updating

SuggestedRemedy

See Lo_3ch_01_0319.pdf slide 2 for text

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.1** *P* **148** *L* **1** # 110
Tu, Mike Broadcom

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

Change "PAM3" to "PAM4"

SuggestedRemedy

On line 1, 2, 4, 5, 7, 9, change "PAM3" to "PAM4".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.1** *P* **148** *L* **13** # 111

Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

Transition is from PAM2 to PAM4. Also it only depends on the received InfoField PFC24 counter.

SuggestedRemedy

Change from "… the receiver has transitioned from PAM2 to PAM3 mode and has received a valid PHY frame containing all IDLEs."
to "… the receiver has transitioned from PAM2 to PAM4."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Make proposed changes and remove highlighting on rem_countdown_done and description.

Cl **149** *SC* **149.4.4.1** *P* **148** *L* **14** # 54

Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *EZ*

rem_countdown_done variable

SuggestedRemedy

Change PAM3 to PAM4

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.1** *P* **148** *L* **37** # 115

Chen, Steven Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

The variable pcs_data_mode is not defined.

SuggestedRemedy

Copy from Clause 55.4.5.1 and insert here.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add the following, with the proper formatting, after the tx_mode definition.

The following variables are required only for PHYs that support the EEE capability:

pcs_data_mode
Generated by the PMA PHY Control function and indicates whether or not the local PHY may transition its PCS state diagrams out of their initialization states. The current value of the pcs_data_mode is passed to the PCS via the PMA_PCSDATAMODE.indicate primitive. In
the absence of the optional EEE and fast retrain capabilities, the PHY operates as if the value of this variable is TRUE.

Cl **149** *SC* **149.4.4.2** *P* **148** *L* **45** # 67

Lo, William Axonne Inc.

Comment Type **TR** *Comment Status* **D** *State diagrams*

Time way too long for aceptable startup in automotive applications.
Change to match 1000BASE-T1.

SuggestedRemedy

Change:
2000 ms +/- 10ms
To:
97.5 ms +/- 0.5 ms

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.2** *P* **148** *L* **45** # 267
WU, Peter Marvell

Comment Type **TR** *Comment Status* **D** *State diagrams*

Maxwait_timer expiartion period should be much shorten than 2000ms with 100ms link up requirement

SuggestedRemedy

Change "2000ms+/-10ms" to "97.5ms+/-0.5ms"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.4.2** *P* **148** *L* **50** # 55
Lo, William Axonne Inc.

Comment Type **ER** *Comment Status* **D** *State diagrams*

Name of states incorrect for minwait_timer
Timer is ok

SuggestedRemedy

Change:
PMA_Training_Init_S, PCS_Test and PCS_Data
To:
SILENT, TRAINING, PCS TEST, and SEND DATA

Timer value is ok ans should be un-highlighted

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Make proposed change and remove highlighting.

Cl **149** *SC* **149.4.4.2** *P* **148** *L* **50** # 242
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *State diagrams*

States where minwait_timer is used need to be entered and aligned with state diagram.
Delete highlighted "PMA_Training_Init_S," state (this does not exist, and accept "PCS_TEST, and PCS_DATA" currently in yellow, correcting the capitalization

SuggestedRemedy

Delete highlighted "PMA_Training_Init_S," state (this does not exist, and accept "PCS_TEST, and PCS_DATA" currently in yellow, correcting the capitalization

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This change is included in comment #55.

Cl **149** *SC* **149.4.4.2** *P* **148** *L* **50** # 268
WU, Peter Marvell

Comment Type **T** *Comment Status* **D** *State diagrams*

minwait_timer expiartion period changed to the same value used at 802.3bp

SuggestedRemedy

change "1ms+0.1s" to "975us+/-50us"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Make proposed change and remove highlighting.

Cl **149** *SC* **149.4.5** *P* **150** *L* **37** # 240
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *State diagrams*

The minwait_timer is started again in TX_SWITCH, but to no purpose, because it is not checked on exit and is started again in both possible subsequent states

SuggestedRemedy

delete "start minwait_timer" in TX_SWITCH state

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.5** *P* **150** *L* **37** # 126
Chen, Steven Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

The "start minwait_timer" does not seem needed in the TX_SWITCH state.

SuggestedRemedy

Remove "start minwait_timer".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.5** *P* **150** *L* **42** # 92
Tu, Mike Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

The tx_mode has already been set to "SEND_N" in the "TX_SWITCH" state. There is no need to set it again.

SuggestedRemedy

1. In the "PCS_TEST" block, remove "tx_mode <= SEND_N"
2. In the "SEND_DATA" block, remove "tx_mode <= SEND_N"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement the suggeste remedy.

In addition, tx_mode does not need to be set to SEND_T in COUNTDOWN as it was set that way in TRAINING.

3. In the "COUNTDOWN" block, remove "tx_mode <= SEND_T"

Cl **149** *SC* **149.4.5** *P* **151** *L* **18** # 68
Lo, William Axonne Inc.

Comment Type **TR** *Comment Status* **D** *State diagrams*

Missing watchdog conditions and refresh status link down conditions

SuggestedRemedy

See Lo_3ch_01_0319.pdf slide 2 for correct state machine.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.4.5.x** *P* **151** *L* **27** # 76
Graba, Jim Broadcom

Comment Type **TR** *Comment Status* **D** *State diagrams*

Add EEE Refresh monitor state diagram

SuggestedRemedy

Use same EEE Refresh monitor state diagram from 802.3bz (Figure 126-30)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

In addition to adding the Figure, on P148 L 55 insert the following text, with editorial license:

The following timer is required only for PHYs that support the EEE capability:
lpi_refresh_rx_timer
This timer is used to monitor link quality during the LPI receive mode. If the PHY does not reliably
detect reliable refresh signaling before this timer expires then a full retrain is performed.
Values: The condition lpi_refresh_rx_timer_done becomes true upon timer expiration.
Duration: This timer shall have a period equal to 50 complete quiet-refresh signal periods, equivalent to 1.536/S ms.

Cl **149** *SC* **149.5.1** *P* **151** *L* **37** # 182
Wienckowski, Natalie General Motors

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

Add commas for readability.

SuggestedRemedy

Change: If MDIO is implemented these test modes shall be enabled by setting a control register 1.2313.15:13 as
To: If MDIO is implemented, these test modes shall be enabled by setting a control register, 1.2313.15:13, as

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.1** *P* **152** *L* **7** # 243
Zimmerman, George CME:ADI,Aquantia,AP

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

Table 149-12 - the highlighted text is correct,

SuggestedRemedy

Remove highlighting on Test mode descriptions for modes 1, 5 and 7 in Table 149-12

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.1** *P* **152** *L* **28** # 62
Lo, William Axonne Inc.

Comment Type **TR** *Comment Status* **D** *Test modes*

Dividing a clock down does not change the clock jitter.
Recommened divide by 32 or 64 so TX_TCLK_DIV is 175.8 or 87.9MHz.

Note that I am ok with either 32 or 64 depending on what people like.

See Lo_3ch_01_0319.pdf slide 5 for a intuitive diagram.

SuggestedRemedy

Change divided by 16 to divided by 32

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.1** *P* **152** *L* **36** # 183
Wienckowski, Natalie General Motors

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

Remove extraneous comma

SuggestedRemedy

Change: , or,
To: , or

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.1.1** *P* **154** *L* **26** # 184
Wienckowski, Natalie General Motors

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

SuggestedRemedy

Remove "Link Partner" box in Figure 149-36 over the Figure title.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.1.1** *P* **154** *L* **27** # 269
WU, Peter Marvell

Comment Type **ER** *Comment Status* **D** *EZ*

Figure 149-36 with wrong piece copied

SuggestedRemedy

remove the block of " link partner" in the figure

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.2.4** *P* **155** *L* **19** # 226
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *Test Modes*

Transmit power needs to be constrained, not just less than 3 dBm. A 2 dB range has been acceptable for similar PHYs. For this speed of signal, measuring with a power meter is more appropriate. Then we can delete the peak transmit level.

SuggestedRemedy

Change "less than 3 dBm" to "in the range of 1 dBm to 3 dBm".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.2.4** *P* **155** *L* **24** # 290
den Besten, Gerrit NXP Semiconductors

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

The current transmit PSD mask practically not providing any constraint to the signaling. With the current limits this does not add any value except for being a complicated way to define the signal swing.

SuggestedRemedy

I will make a separate presentation with a proposal for an updated mask.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

No Suggested Remedy has been provided.

Cl **149** *SC* **149.5.2.5** *P* **156** *L* **33** # 227
Zimmerman, George CME:ADI,Aquantia,AP

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

Constraining the transmit power, the distortion and the PSD, specifying peak differential output is unneeded.

SuggestedRemedy

Delete 149.5.2.5 and content (lines 32 to 37)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.2.5** *P* **156** *L* **35** # 291
den Besten, Gerrit NXP Semiconductors

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

TBD

SuggestedRemedy

Propose to make this 1.3Vppd, like 1000BASE-T1

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

If comment 227 to remove this section is not accepted, implement 275.

Cl **149** *SC* **149.5.2.5** *P* **156** *L* **35** # 275
Souvignier, Tom Broadcom

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

Max transmitter peak differential output of 1.2V. 20% over nominal to allow for process and design variation.

SuggestedRemedy

Replace “TBD” with “0.2”

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

If comment 227 to remove this section is not accepted, implement this solution.

Cl **149** *SC* **149.5.2.6** *P* **156** *L* **40** # 272
WU, Peter Marvell

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

The clock is still defined for 2.5G-T1,

SuggestedRemedy

change "1406.25 MHz ± 50 ppm"
to "5625*S MHz± 50 ppm"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.5.2.6** *P* **156** *L* **40** # 85
Tu, Mike Broadcom

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

The transmission rate should scale by the factor "S".

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

No suggested remedy provided. Comment 272 is related to this and provides a suggested remedy so implement that.

Cl **149** *SC* **149.5.3.2** *P* **157** *L* **7** # 228
Zimmerman, George CME:ADI,Aquantia,AP

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

Need to rewrite this text so the equivalent noise is added at the MDI. See 802.3cg draft 2.3 or later. Also bandwidth is the bandwidth of the PHY signal, but the noise level will have to be determined when we get a cabling specification.

SuggestedRemedy

Change "-100 dBm/Hz" to "TBD dBm/Hz is present at the MDI of the DUT." Delete "The noise is added at the MDI of the DUT."
Add "Editor's Note - (to be removed prior to Working Group ballot) - the noise level needs to be determined jointly with adding an alien crosstalk coupling specification to the link segment."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** SC **149.5.3.2** P **157** L **12** # 244
Zimmerman, George CME:ADI,Aquantia,AP

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

"frame loss ratio is less than TBD for TBD-octet packets" should be scalable directly from 1000BASE-T1 since the RS-FEC frame lengths are comparable. Since 10^-10 is the BER for 1000BASE-T1 and 10^-12 is for multigig, two orders of magnitude are needed.

SuggestedRemedy

Change "TBD for TBD-octet" to "10^-9 for 125-octet"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** SC **149.6.1** P **157** L **38** # 230
Zimmerman, George CME:ADI,Aquantia,AP

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

Remaining parameters will be communicated via infofields. List is complete at this time.

SuggestedRemedy

Delete editor's note at 157 line 38

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** SC **149.7.1.1** P **158** L **24** # 248
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Format*

Typo

SuggestedRemedy

Change "f is the" to "f is the"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This matches the formatting of existing 802.3 clauses.

Cl **149** SC **149.7.1.1** P **158** L **27** # 249
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Editorial*

Typo

SuggestedRemedy

Delete the unit of "MHz", Fmax is just the number.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** SC **149.7.1.3** P **159** L **44** # 250
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Format*

Typo

SuggestedRemedy

Change "f is the" to "f is the"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This matches the formatting of existing 802.3 clauses.

Cl **149** SC **149.7.1.3** P **160** L **10** # 251
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Format*

Typo

SuggestedRemedy

Change "f is the" to "f is the"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This matches the formatting of existing 802.3 clauses.

Cl **149** *SC* **149.7.1.3** *P* **160** *L* **13** # 252
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*
typo

SuggestedRemedy
Change "N" to "N = " in the equation (149-21)

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

Cl **149** *SC* **149.7.1.3** *P* **160** *L* **30** # 253
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Format*
Typo

SuggestedRemedy
Change "f is the" to "f is the"

Proposed Response *Response Status* **W**
PROPOSED REJECT.

This matches the formatting of existing 802.3 clauses.

Cl **149** *SC* **149.7.1.3** *P* **160** *L* **33** # 254
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*
typo

SuggestedRemedy
Change "N" to "N = " in the equation (149-23)

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

Cl **149** *SC* **149.7.1.3** *P* **160** *L* **38** # 255
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Editorial*
typo

SuggestedRemedy
Change "N=1" to "N=1" in the equation (149-23)

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

Change "N = 1" to "N = 1 curve which is equivalent to equation (149-19)."

Cl **149** *SC* **149.7.1.4** *P* **161** *L* **42** # 245
ITO, HIROAKI Yazaki Corporation

Comment Type **TR** *Comment Status* **D** *Link Segment*
The frequency rage for coupling attenuation is remained up to 5500MHz.

SuggestedRemedy
The frequency range for coupling noise should be changed to up to 4000MHz as well as other parameters like IL, RL.

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

Change: 5500

To: 4000 * S

Cl **149** *SC* **149.7.1.4** *P* **161** *L* **42** # 256
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Format*
Typo

SuggestedRemedy
Change "f is the" to "f is the"

Proposed Response *Response Status* **W**
PROPOSED REJECT.

This matches the formatting of existing 802.3 clauses.

Cl **149** *SC* **149.7.2** *P* **162** *L* **34** # 229
Zimmerman, George CME:ADI,Aquantia,AP

Comment Type **T** *Comment Status* **D** *Link Segement*

(there is no 149.7.2) the draft needs alien crosstalk coupling specs.

SuggestedRemedy

Insert "149.7.2 Coupling parameters between link segments." with 2 subclauses - 149.7.2.1 Power sum alien near-end crosstalk (PSANEXT), and 149.7.2.2 Power sum alien attenuation to crosstalk ratio far-end (PSAACR-F). Contents of all 3 should be "TBD".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.8.2.1** *P* **163** *L* **12** # 257
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Format*

Typo

SuggestedRemedy

Change "f is the" to "f is the"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This matches the formatting of existing 802.3 clauses.

Cl **149** *SC* **149.8.2.1** *P* **163** *L* **15** # 258
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*

Typo

SuggestedRemedy

Change "4000 MHz × S" to "4000 × S MHz"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149** *SC* **149.8.2.2** *P* **163** *L* **46** # 292
den Besten, Gerrit NXP Semiconductors

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

We reached consensus on coupling and shielding attenuation, but the paragraph on the first topic is empty and the paragraph about the second doesn't exist yet.

SuggestedRemedy

Need to add the limit formulas and graph on coupling attenuation to this paragraph. Need to add an paragraph in shielding attenuation. I would be happy to provide editorial assist on the wording.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

No Suggested Remedy has been provided.

Cl **149** *SC* **149.9.1** *P* **164** *L* **5** # 20
Anslow, Pete Ciena

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

This now says "shall conform to IEC 62368–1 (former IEC 60950–1)".
This would be ok if IEC 60950–1 had simply been re-numbered to become IEC 62368–1, but I do not believe that this is the case. I believe that these are different standards with different contents, in which case this text is inappropriate.

SuggestedRemedy

Delete "(former IEC 60950–1)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

Comment 41 on D1.0 changed "IEC 60950-1" to "IEC 62368-1 (former IEC 60950-1)".

Is it okay to remove the reference to the former spec?

Cl **149A** *SC* **149A.2** *P* **169** *L* **26** # 260
Wei, Dong Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *Editorial*

Typo

SuggestedRemedy

Change "23°C ± 5°C" to "23 ± 5°C"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **149A** *SC* **149A.4** *P* **170** *L* **33** # 261

Wei, Dong — Futurewei Technologie

Comment Type **ER** *Comment Status* **D** *EZ*

Typo

SuggestedRemedy

Change "Testfixture" to "Test Fixture"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **Introdu** *SC* **Introduction** *P* **11** *L* **5** # 278

den Besten, Gerrit — NXP Semiconductors

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

"for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s operation on automotive cabling in an automotive application."

SuggestedRemedy

replace by: "for operation at 2.5Gb/s, 5Gb/s, and 10Gb/ over single shielded balanced pair of conductors."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **Page** *SC* **Title page** *P* **21** *L* **1** # 279

den Besten, Gerrit — NXP Semiconductors

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

"2019Draft" The 2019 seems not to belong here.

SuggestedRemedy

Replace by "Draft"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **various** *SC* **various** *P* **0** *L* **0** # 42

Benyamin, Saied — Aquantia

Comment Type **G** *Comment Status* **D** *Editorial*

There are a zillion places where 1000Base-T1 is mentioned; on some, we have crossed out the "1000"

SuggestedRemedy

They all need to change to MGBase-T1

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

OAM registers used for both 1000BASE-T1 and MultiGBASE-T1 are named BASE-T1.

The following are the places where "1000" does not have strikethrough but it should.

P119 L38, P127 L35