

CI **FM** SC P1 L13 # 96

Marris, Arthur

Cadence Design Systems

Comment Type **T** Comment Status **A** EZ2

I think the name of the amendment could be improved from "Physical Layer Specifications and Management Parameters for Greater Than 1 Gb/s Automotive Ethernet".

This is an amendment for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s PHYs and the title should state that.

Also there is likely to be a project for a 25G automotive PHY in the future and this would also be greater than 1G.

*SuggestedRemedy*

Change the title of the amendment to:  
"Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Automotive Ethernet"

Response Response Status **C**

ACCEPT IN PRINCIPLE.

Change: "Draft Standard for Ethernet Amendment:Physical Layer Specifications and Management Parameters for Greater Than 1 Gb/s Automotive Ethernet"

To: Draft Standard for Ethernet Amendment:Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s and 10 Gb/s Automotive Electrical Ethernet."

CI **FM** SC **FM** P1 L8 # 122

Carlson, Steven

High Speed Design, Inc; Marvell; Robert Bosch

Comment Type **E** Comment Status **A** EZ2

The amendment title may cause confusion now that IEEE 802.3 has a study group focused on 10 Gb/s and greater automotive electrical PHYS. Amendment titles must be within the scope of the PAR. See [1] Subclause 4.2.3.2 'Review of draft standards' of the IEEE-SA Standards Board Operations Manual <[https://standards.ieee.org/develop/policies/opman/sb\\_om.pdf](https://standards.ieee.org/develop/policies/opman/sb_om.pdf)> states 'Title of Document. The title on the draft document and submittal form shall be within the scope as stated on the most recently approved PAR, or action(s) shall be taken to ensure this.'

[2] The IEEE-SA 2014 Style manual <<https://development.standards.ieee.org/myproject/Public/mytools/draft/styleman.pdf>> has similar text in subclause 9.2 'Title' that reads 'Per 4.2.3.2 of the IEEE-SA Standards Board Operations Manual, the title on the draft document shall be within the scope as stated on the most recently approved PAR.'. The proposed change is within the scope of the PAR.

[3] Item 2 Of the RevCom check list <<https://development.standards.ieee.org/myproject/Public/mytools/approve/subchklist.pdf>> reads 'Is the Title of the submitted draft within the Scope of the PAR?'. The proposed change is within the scope of the PAR.

*SuggestedRemedy*

Change: "Draft Standard for Ethernet Amendment:Physical Layer Specifications and Management Parameters for Greater Than 1 Gb/s Automotive Ethernet" To: Draft Standard for Ethernet Amendment:Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s and 10 Gb/s Automotive Ethernet."

Response Response Status **C**

ACCEPT IN PRINCIPLE.

Change: "Draft Standard for Ethernet Amendment:Physical Layer Specifications and Management Parameters for Greater Than 1 Gb/s Automotive Ethernet"

To: Draft Standard for Ethernet Amendment:Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s and 10 Gb/s Automotive Electrical Ethernet."

**CI FM SC FM P2 L2 # 259**  
 den Besten, Gerrit NXP Semiconductors  
**Comment Type E Comment Status A EZ**  
 "operation on automotive cabling in an automotive application". Other definitions in the spec refer to "single balanced pair". It seems useful to make the abstract consistent with that.  
**SuggestedRemedy**  
 Change to: "operation over single balanced pair cabling and suitable for automotive applications."  
**Response Response Status C**  
 ACCEPT IN PRINCIPLE.  
 Change: on automotive cabling in an automotive application.  
 To: on a single balanced pair of conductors suitable for automotive applications.

**CI FM SC FM P1 L18 # 88**  
 Trowbridge, Steve Nokia  
**Comment Type E Comment Status A EZ**  
 Now that there is another effort that will likely become a project for greater than 10 Gb/s operation, the title may not be sufficiently unique  
**SuggestedRemedy**  
 Consider a title listing 2.5 Gb/s, 5 Gb/s, 10 Gb/s operation to make it clear that the >10 Gb/s interfaces are not included  
**Response Response Status C**  
 ACCEPT IN PRINCIPLE.  
 Change: "Draft Standard for Ethernet Amendment:Physical Layer Specifications and Management Parameters for Greater Than 1 Gb/s Automotive Ethernet"  
 To: Draft Standard for Ethernet Amendment:Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s and 10 Gb/s Automotive Electrical Ethernet."

**CI FM SC FM P10 L52 # 82**  
 Maguire, Valerie The Siemon Company  
**Comment Type E Comment Status A EZ**  
 802.3cg is specified for operation over a single balanced pair of conductors.  
**SuggestedRemedy**  
 Replace, "operation on a single balanced pair copper cable" with "operation over a single balanced pair of conductors".  
**Response Response Status C**  
 ACCEPT.

**CI FM SC FM P19 L34 # 89**  
 Trowbridge, Steve Nokia  
**Comment Type E Comment Status A EZ**  
 In the ToC, 3rd level headings from 149.11.1 onwards run together with the text. This may be the first time 6 digits appeared in a 3rd level heading.  
**SuggestedRemedy**  
 Adjust the ToC format to provide space between the number and the text for these headings.  
**Response Response Status C**  
 ACCEPT IN PRINCIPLE.  
 Perform instructions provided by Pete: Take a fresh copy of the latest 802.3 template and with your latest P802.3ch book open, open the TOC file from the template. In the left hand pane, highlight the TOC file from your book. File, Import, Formats, Deselect all, check Paragraph Formats, Import, OK.

**CI FM SC FM P10 L50 # 83**  
 Maguire, Valerie The Siemon Company  
**Comment Type E Comment Status A EZ**  
 Extraneous comma.  
**SuggestedRemedy**  
 Replace, "amendments, and adds" with "amendments and adds".  
**Response Response Status C**  
 ACCEPT.

CI 1 SC 1.5 P23 L44 # 3  
 Hajduczenia, Marek Charter Communications  
 Comment Type E Comment Status A EZ  
 Empty section 1.5  
 SuggestedRemedy  
 Please remove, no content  
 Response Response Status C  
 ACCEPT.

CI 1 SC 1.5 P23 L44 # 95  
 Marris, Arthur Cadence Design Systems  
 Comment Type E Comment Status A EZ  
 Delete 1.5 if no new abbreviations are being added  
 SuggestedRemedy  
 Delete 1.5  
 Response Response Status C  
 ACCEPT.

CI 1 SC 1.5 P23 L44 # 10  
 Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ  
 As no new abbreviations are being added, remove 1.5  
 SuggestedRemedy  
 Remove 1.5 from the draft  
 Response Response Status C  
 ACCEPT.

CI 30 SC 30.5.1.1.2 P25 L12 # 236  
 Zimmerman, George ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S  
 Comment Type E Comment Status A EZ  
 It appears that the entry "Single balanced pair of conductors..." is a smaller font size (9pt) than the "2.5GBASE-T1"(10pt) - it should be the same. Same comment for 5GBASE-T1 and 10GBASE-T1 entries  
 SuggestedRemedy  
 fix the font size/style of "Single balanced pair of conductors" in the three entries to match the name of the aMAUType.  
 Response Response Status C  
 ACCEPT.

CI 44 SC 44.1.4.4 P30 L7 # 97  
 Lo, William Axonne Inc.  
 Comment Type TR Comment Status R Auto-Negotiation  
 Autonegotiation column is not in table 44-1.  
 In Table 125-2 (page 67) there is a column 98 showing Auto-Negotiation is optional for both 2.5GBASE-T1 and 5GBASE-T1.  
 However there isn't one for 10GBASE-T1.  
 Also note that autonegotiation is missing for 10GBASE-T as well.  
 SuggestedRemedy  
 Add column for clause 98 Auto-Negotiation to table 44-1 and put O in the 10GBASE-T1 row.  
 Add to the footnote  
 O = Optional  
 As a service to humanity we can optionally fix this for 10GBASE-T by putting a column for clause 28 Auto-Negotiation and put M in the 10GBASE-T row.  
 Response Response Status C  
 REJECT.

Clause 125 also has 125.2.4 which summarizes Auto-Neogotiation for 2.5G and 5G PHYs. Clause 44 does not have this. If we add the Auto-Negotiation Clauses to the table we'll also need to add a subcaluse in Clause 44 for this.  
 The commenter is encouraged to submit a comment to Maintenance to add this to Clause 44. If this is approved, a new comment can be submitted to ch to add this.

**CI 44**    **SC 44.1.4.4**    **P30**    **L7**    # **204**

Dawe, Piers    Mellanox

**Comment Type T**    **Comment Status R**    **Auto-Negotiation**

Need to add 10GBASE-T1 and Clause 98 Auto-Negotiation to Table 44-1, Nomenclature and clause correlation

**SuggestedRemedy**  
Add 10GBASE-T1 and Clause 98 Auto-Negotiation to Table 44-1, Nomenclature and clause correlation

**Response**    **Response Status C**

REJECT.

Clause 125 also has 125.2.4 which summarizes Auto-Negotiation for 2.5G and 5G PHYs. Clause 44 does not have this. If we add the Auto-Negotiation Clauses to the table we'll also need to add a subclause in Clause 44 for this.  
The commenter is encouraged to submit a comment to Maintenance to add this to Clause 44. If this is approved, a new comment can be submitted to ch to add this.

**CI 44**    **SC 44.3**    **P31**    **L3**    # **237**

Zimmerman, George    ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S

**Comment Type E**    **Comment Status A**    **EZ**

Editing instruction says to insert "a" row - three rows are inserted. Also, the row for 2x interleave is overly tall.

**SuggestedRemedy**  
Change "a row" to "new rows" in editing instruction, and adjust the height of the row for 2x interleave to match the others.

**Response**    **Response Status C**

ACCEPT.

**CI 45**    **SC 45.2.1.7.4**    **P33**    **L54**    # **239**

Zimmerman, George    ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S

**Comment Type T**    **Comment Status A**    **Registers**

Transmit fault descriptions are in 45.2.1.7.4, Table 45-9, and Receive fault descriptions are in 45.2.1.7.5, Table 45-10. These need to be brought into the draft and updated to include the clause 149 references for 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1.  
Additionally, I cannot find the reference to Transmit and Receive Faults in clause 149, although the abilities are referenced in 1.2310.

**SuggestedRemedy**  
Bring 45.2.1.7.4 and Table 45-9, adding rows for 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1 referencing the appropriate section of clause 149 for transmit faults.  
Bring 45.2.1.7.5 and Table 45-10, adding rows for 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1 referencing the appropriate section of clause 149.

Add text, if necessary, for transmit and receive faults to clause 149.

**Response**    **Response Status C**

ACCEPT IN PRINCIPLE.

Make the changes and additions as defined in zimmerman\_3ch\_03a\_0719.pdf.

**CI 45**    **SC 45.2.1.16**    **P32**    **L47**    # **34**

Remein, Duane    Futurewei Technologies, Inc.

**Comment Type ER**    **Comment Status A**    **Formatting**

Given this is a change to Table 45-19 the new rows should be underlined and the Editing Instruction should not be "Change ... and insert ...".  
Same issue Table 45-21.  
I note that other tables (ex 45-176) are marked properly.

**SuggestedRemedy**  
per comment

**Response**    **Response Status C**

ACCEPT IN PRINCIPLE.

Do the following for Table 45-19 and Table 45-21.  
Keep the Editing instruction as is, this is the same as the example given. Underline the text in the added rows.

CI 45 SC 45.2.1.18 P33 L12 # 98

Lo, William Axonne Inc.

Comment Type TR Comment Status A Registers

The 2 bits 1.21.5 and 1.21.4 are redundant since they are already defined in 1.18.5 and 1.18.4. Note that 1.11.11 states register 1.18 is for BASE-T1 ability.

Note that register 1.21 causes some issues in that it is for 2.5G/5G abilities and 2.5/5GBASE-T1 fits the criteria for both 1.18 and 1.21.

Nevertheless I don't think any other PHY capabilities are advertised twice and I think it is best if we advertise only in one location instead of 2.

*SuggestedRemedy*

Delete content in page 33 lines 11 to 48

Response Response Status C

ACCEPT IN PRINCIPLE.

Remove the duplicate BASE-T1 abilities from register 1.21. In addition, add a note below Register 1.21 that the BASE-T1 abilities can be found in register 1.18.

In addition, move 45.2.1.18.ab & 45.2.1.18.ab to 45.2.1.16.xy and 45.2.1.16.xz changing 1.21.x to 1.18.x and add 45.2.1.16.xx

When read as a one, bit 1.18.6 indicates that the PMA/PMD is able to operate as a 10GBASE-T1 PMA type.

When read as a zero, bit 1.18.6 indicates that the PMA/PMD is not able to operate as a 10GBASE-T1 PMA type.

CI 45 SC 45.2.1.18 P33 L24 # 260

den Besten, Gerrit NXP Semiconductors

Comment Type T Comment Status A Registers

What's the purpose to duplicate BASE-T1 abilities to register 21, as these are already covered by the BASE-T1 extended ability register 18. Register 11 indicates whether there are BASE-T1 extended abilities or 2.5G/5G extended abilities. Why would a 2.5G/5GBASE-T1 need to indicate 2.5G/5G extended abilities next to BASE-T1 extended abilities?

*SuggestedRemedy*

Propose to remove BASE-T1 abilities from register 21.

Response Response Status C

ACCEPT IN PRINCIPLE.

Remove the duplicate BASE-T1 abilities from register 1.21. In addition, add a note below Register 1.21 that the BASE-T1 abilities can be found in register 1.18.

In addition, move 45.2.1.18.ab & 45.2.1.18.ab to 45.2.1.16.xy and 45.2.1.16.xz changing 1.21.x to 1.18.x and add 45.2.1.16.xx

When read as a one, bit 1.18.6 indicates that the PMA/PMD is able to operate as a 10GBASE-T1 PMA type.

When read as a zero, bit 1.18.6 indicates that the PMA/PMD is not able to operate as a 10GBASE-T1 PMA type.

CI 45 SC 45.2.1.18.aa P33 L37 # 169

Regev, Alon Keysight Technologies

Comment Type E Comment Status A EZ

ability misspelled as "abilitiy" in 4 places: titles of clause 45.2.1.18.aa and 45.2.1.18.ab as well as the two related entries in the Table of Contents

*SuggestedRemedy*

change all occurrences of "abilitiy" to "ability"

Response Response Status C

ACCEPT.

CI 45 SC 45.2.1.18.aa P33 L37 # 8  
 Kolesar, Paul CommScope  
 Comment Type E Comment Status A EZ  
 typo  
 SuggestedRemedy  
 change abilitiy to ability  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.2.1.18.ab P33 L43 # 9  
 Kolesar, Paul CommScope  
 Comment Type E Comment Status A EZ  
 typo  
 SuggestedRemedy  
 change abilitiy to ability  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.2.1.18aa P33 L36 # 189  
 Brandt, David Rockwell Automation  
 Comment Type E Comment Status A EZ  
 Misspelling  
 SuggestedRemedy  
 Change: "abilitiy", To: "ability"  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.2.1.18ab P33 L43 # 190  
 Brandt, David Rockwell Automation  
 Comment Type E Comment Status A EZ  
 Misspelling  
 SuggestedRemedy  
 Change: "abilitiy", To: "ability"  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.2.1.192 P34 L36 # 261  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type T Comment Status R Registers  
 It might be wise to keep some reserved registers after 2308 for future extension instead of directly abutting the multi-gig register addresses to 1Gbps addresses. Note that for other IEEE 802.3 PHYs there is also some reserved address between PHY types.  
 SuggestedRemedy  
 The 1000BASE-T1 starts at address 2304 which equals 0x0900. Propose to start multi-gig register addresses at 0x0910, which would be 2320 decimal.

Response Response Status C  
 REJECT.  
 This change would require significant changes throughout Clauses 45 and 149.  
 Address spaces are broken up all the time without incidence.

CI 45 SC 45.2.1.192.1 P35 L18 # 114  
 Dudek, Mike Marvell  
 Comment Type T Comment Status A Registers  
 It isn't clear what all MultiGBASE-T1 PMA/PMD resgisters means.  
 SuggestedRemedy  
 Be more specific as to which registers this applies to.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to the same text as 45.2.1.1.1 Reset (1.0.15).  
 Change: This action shall set all MultiGBASE-T1 PMA/PMD registers to their default states.  
 To: This action shall set all PMA/PMD registers to their default states.

CI 45 SC 45.2.1.192.4 P36 L9 # 238  
 Zimmerman, George ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S  
 Comment Type E Comment Status A EZ  
 "Bits 1.2309.10:9 control the current precoder setting of the transmitter," - because "current" can have meaning both as time and as an electrical parameter, this isn't a great way to say this. The rest of the paragraph, particularly the sentence "Setting these bits forces the precoder to the mode set." is clarity enough, and the word "current" is unneeded.  
 SuggestedRemedy  
 Delete "current" on P36 L9  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.2.1.193.5 P37 L28 # 43  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 Missing article.  
 SuggestedRemedy  
 Change: that the polarity of receiver is reversed.  
 To: that the polarity of the receiver is reversed.  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.2.1.194 P38 L13 # 277  
 Souvignier, Tom Broadcom  
 Comment Type TR Comment Status A Precoder  
 In D2.0, the "Precoder requested" bit values are configured by user. The PHY simply reads in these register bit values and sends to the link partner via InfoField. It may be more robust to optionally allow the PHY to choose the precoder on-the-fly based on channel and noise conditions.  
 SuggestedRemedy  
 See page 3 of "tu\_3ch\_01\_0719.pdf".  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Implement the new registers and text, with editorial license, as defined in tu\_3ch\_01a\_0719.pdf.  
 Remove the shall on slide 4 in the register definitions.

CI 45 SC 45.2.1.194.2 P38 L32 # 279  
 Souvignier, Tom Broadcom  
 Comment Type TR Comment Status A Precoder  
 In D2.0, the "Precoder requested" bit values are configured by user. The PHY simply reads in these register bit values and sends to the link partner via InfoField. It may be more robust to optionally allow the PHY to choose the precoder on-the-fly based on channel and noise conditions.  
 SuggestedRemedy  
 See page 4 of "tu\_3ch\_01\_0719.pdf".  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Implement the new registers and text, with editorial license, as defined in tu\_3ch\_01a\_0719.pdf.  
 Remove the shall on slide 4 in the register definitions.

CI 45 SC 45.2.1.194.2 P38 L36 # 245  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type TR Comment Status R EEE  
 Slow wake request is an indication in one direction, which leaves the option open that it would still require to support regular wake-up in the other direction. I think it would be better to specify that if one of the transceivers on a link request slow-wake, that the slow-wake is applied in both directions.  
 SuggestedRemedy  
 Add the sentence to the paragraph:  
 If either this PHY or its link partner request slow wake, the PHY may only transmit alert immediately following refresh.  
 Response Response Status U  
 REJECT.  
 There was no consensus to make the change. The desire of the TF was to allow these to be different in each direction.

CI 45 SC 45.2.1.194.3 P38 L40 # 278

Souvignier, Tom Broadcom

Comment Type TR Comment Status A Precoder

In D2.0, the "Precoder requested" bit values are configured by user. The PHY simply reads in these register bit values and sends to the link partner via InfoField. It may be more robust to optionally allow the PHY to choose the precoder on-the-fly based on channel and noise conditions.

*SuggestedRemedy*

See page 4 of "tu\_3ch\_01\_0719.pdf".

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement the new registers and text, with editorial license, as defined in tu\_3ch\_01a\_0719.pdf.

Remove the shall on slide 4 in the register definitions.

CI 45 SC 45.2.1.195 P39 L9 # 35

Remein, Duane Futurewei Technologies, Inc.

Comment Type TR Comment Status A EZ

Does the following statement imply that once the device has seen an link up the bits in register 1.2112 are then valid forever? "The values in this register are not valid until link is up."

*SuggestedRemedy*

Change:  
"The values in this register are not valid until link is up." to  
"The values in this register are not valid when the link is down."

Response Response Status C

ACCEPT.

CI 45 SC 45.2.1.195.2 P39 L53 # 246

den Besten, Gerrit NXP Semiconductors

Comment Type T Comment Status R EEE

Link partner slow wake request is an indication in one direction, which leaves the option open that it would still require to support regular wake-up in the other direction. I think it would be better to specify that if one of the transceivers on a link request slow-wake, that the slow-wake is applied in both directions.

*SuggestedRemedy*

Add the sentence to the paragraph:  
If either this PHY or its link partner request slow wake, the PHY may only transmit alert immediately following refresh.

Response Response Status C

REJECT.

The desire was to allow these to be different in each direction.

CI 45 SC 45.2.1.196 P40 L30 # 38

Farjadrad, Ramin Aquantia

Comment Type T Comment Status A Test Modes

[JITTER TEST MODE] The jitter test in 149.5.2.3.1 is designed for the low-frequency square wave signal used in BASE-T PHYs and the test in 149.5.2.3.2 is designed for the at-speed test patterns (JP03A & JP03B) used in backplane phys. A control bit is needed to allow test mode 2 to support both tests, and additional language is needed specifying which signals to use in which tests.

Comments tagged JITTER TEST MODE should be treated as a group.

*SuggestedRemedy*

Table 45-155e: Add new rows after Reserved row, and adjust reserved row to allocate bits 0,1 of register 1.2313 (Test mode control) register based: 1.2313.1:0= 00 (Normal Square Wave), 1.2313.1:0= 01 (JP03A pattern), 1.2313.1:0= 10 (JP03B pattern), 1.2313.1:0= 11 (Reserved),

Insert new subclause 45.2.1.196.2 as follows:

45.2.1.196.2 Jitter test control (1.2313.1:0)

When the transmitter is in test mode 2, bits 1.2313.1:0 control the pattern of the jitter test signal. A value of 0 0 transmits a square wave from the transmitter, a value of 0 1 transmits the JP03A pattern, and a value of 1 0 transmits the JP03B pattern. See 149.5.1 for more information.

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement as proposed but refer to 149.5.2.3 which is where the jitter tests are defined.



CI 45 SC 45.2.1.197 P40 L53 # 196

Dawe, Piers Mellanox

Comment Type TR Comment Status R Registers

This register should contain "the current SNR operating margin measured at the slicer input ... to an accuracy of 0.5 dB", yet there is no indication of what "SNR operating margin" means (is the PHY supposed to measure the noise of the signal!? or infer it from FEC errors? or...) nor is "the slicer input" defined. Trying to set an accuracy on something so vague is not appropriate. Anyway, providing that accuracy at the extremes of the range is probably difficult and unnecessary.

SuggestedRemedy

Delete "to an accuracy of 0.5 dB"

Response Response Status W

REJECT.

This was discussed during a previous meeting and the decision of the group was to keep the accuracy, which matches MultiGBASE-T PHY's.

CI 45 SC 45.2.1.197 P41 L1 # 99

Lo, William Axonne Inc.

Comment Type T Comment Status A Registers

The intent of registers 1.2314 and 1.2315 is to represent -12.7 dB to +12.7dB as an 8 bit number. However the description is a little confusing for the uninitiated in that these registers are described as 16 bits registers.

SuggestedRemedy

- 2 ways to fix this. Pick one. My preference is method 1.
- 1) Define the registers to be 8 bits only. Hence these 2 registers are 1.2314.15:8 and 1.2315.15:8 respectively. Set 1.2314.7:0 and 1.2315.7:0 to reserved.
  - 2) There is an example stating 0.0dB is 0x8000. Add 2 more examples where 12.7dB is 0xFF00 and -12.7dB is 0x0100. Note that this solution is not as clean as in theory bits 7:0 can show more resolution and we are now mixing decimal and binary representations with fractional 0.1dB.

Editor has editorial license to word and format either of the options above.

Response Response Status C

ACCEPT IN PRINCIPLE.

Editor to add 2 more examples where 12.7dB is 0xFF00 and -12.7dB is 0x0100.

CI 45 SC 45.2.1.198 P41 L8 # 36

Rerein, Duane Futurewei Technologies, Inc.

Comment Type TR Comment Status A EZ

It strikes me odd that 1.2314 (SNR) is in "offset binary notation" and Register 1.2315 is in "is in offset two's complement notation". Furthermore I could find no reference for "offset two's complement notation" (hence the "Must Be Satisfied = YES) while offset binary notation is at least informally described in Wikipedia.

SuggestedRemedy

Change "offset two's complement notation" to " offset binary notation"

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.74.4 P44 L50 # 100

Lo, William Axonne Inc.

Comment Type E Comment Status A EZ

There is no change to this clause from 802.3bp so it should not show up in the document.

SuggestedRemedy

Remove clause

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.75 P45 L14 # 123

Nicholl, Shawn Xilinx

Comment Type E Comment Status A EZ

Table 45-244 contains message data received from the link partner, but the description says "transmitted first". Seems mis-leading / inconsistent.

SuggestedRemedy

Replace "transmitted first" with "received first" for all occurrences in the table.

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.76 P45 L50 # 11

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

Table 45-244a is split across two pages with only one body row on the first page.

*SuggestedRemedy*

Increase the Orphan rows setting in Table Designer to 4

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.77 P46 L15 # 12

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

"The Link partner MultiGBASE-T1" should be "The link partner MultiGBASE-T1" (lower case l in link).

*SuggestedRemedy*

Change "Link" to "link"

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.77 P46 L16 # 250

den Besten, Gerrit

NXP Semiconductors

Comment Type E Comment Status A EZ

Missing reference to 149.3.9.2.12 like in sub-clause 45.2.3.76

*SuggestedRemedy*

Add the same reference to 45.2.3.77

Response Response Status C

ACCEPT IN PRINCIPLE.

Add "See 149.3.9.2.12 for details on the OAM status message definition." before " See Table 45-244b."

CI 45 SC 45.2.3.77 P46 L19 # 13

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

"Link Partner" should be "Link partner" (lower case p in partner) in the title of Table 45-244b and also in the Name column (4 instances)

*SuggestedRemedy*

Change "Partner" to "partner" in the title of Table 45-244b and also in the Name column (4 instances)

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.77 P46 L22 # 124

Nicholl, Shawn

Xilinx

Comment Type E Comment Status A EZ

Table 45-244b contains message data received from the link partner, but the description says "transmitted first". Seems mis-leading / inconsistent.

*SuggestedRemedy*

Replace "transmitted first" with "received first" for all occurrences in the table.

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.78 P46 L39 # 4

Hajduczenia, Marek

Charter Communications

Comment Type TR Comment Status A Registers

Is this really intended to be an optional requirement? "The default value for each bit of the MultiGBASE-T1 PCS control register should be chosen so that the initial state of the device upon power up or reset is a normal operational state without management intervention."

*SuggestedRemedy*

Suggest to rewrite as an informative text, which I believe it is.  
There are at least 28 instances of the keyword "should" in the draft (excluding front page), none of which strikes me as intended optional requirement. Each and every instance of the keyword "should" ought to be reviewed and if the given statement is not intended as an optional requirement, text ought to be rewritten as informative instead.

Response Response Status C

ACCEPT IN PRINCIPLE.

Should is not another way to state an optional requirement. Should statements do not need PICS.

Change: The default value for each bit of the MultiGBASE-T1 PCS control register should be chosen so that the initial state of the device upon power up or reset is a normal operational state without management intervention.

To: The default value for each bit of the MultiGBASE-T1 PCS control register is chosen so that the initial state of the device upon power up or reset is a normal operational state without management intervention."

In addition:

P40 L25 and P46 L 39 change "should be" to "is"

P105 L48 change "should be" to "are"

P99 L17-19 there are two "should's" regarding initialization of the precoder. These need to remain "should" as they are not testable. The Editor will add a statement to the effect that "If the precoder is not initialized to zero there may be a short period of errors."

P134 L12 change "should be" to "is". – this is automatic in the state diagram Figure 149-25 p137 L25

The other "shoulds" are in the template, e.g. at the bottom of the PICS tables.

CI 45 SC 45.2.3.80.2 P49 L31 # 44

Wienckowski, Natalie

General Motors

Comment Type E Comment Status A EZ

typo

*SuggestedRemedy*

Change: PCS receiver is detecting is detecting

To: PCS receiver is detecting

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.80.2 P49 L31 # 191

Brandt, David

Rockwell Automation

Comment Type E Comment Status A EZ

Duplicate text

*SuggestedRemedy*

Change: "is detecting is detecting", To: "is detecting"

Response Response Status C

ACCEPT.

CI 45 SC 45.2.3.80.4 P49 L47 # 192

Brandt, David

Rockwell Automation

Comment Type E Comment Status A EZ

Description of non-latched source is wrong.

*SuggestedRemedy*

Change: "...PCS high BER status bit (3.2324.9)."

To: "...PCS high RFER status bit (3.2324.9)."

Response Response Status C

ACCEPT.

CI 45 SC 45.5.3.3 P52 L8 # 14

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

IEEE P802.3cg D3.0 is inserting PICS items MM152 through MM204 so the items being inserted by this draft should start at MM205

*SuggestedRemedy*

Change the editing instruction to:

"Insert PICS Items MM205 through MM227 after MM204 (inserted by IEEE Std 802.3cg-201x) in the table in 45.5.3.3 as follows:"

Renumber the PICS items accordingly.

Response Response Status C

ACCEPT.

CI 45 SC 45.5.3.3 P52 L49 # 15

Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ

When tables split across pages, the bottom ruling of the table on the first page should be "very thin"

*SuggestedRemedy*

Make the bottom ruling "very thin" for:  
 the table in 45.5.3.3 at the foot of page 52  
 the table in 45.5.3.7 at the foot of page 54  
 Table 78-4 on page 57  
 the table in 149.11.4.2.1 at the foot of page 173  
 the table in 149.11.4.3.4 at the foot of page 179  
 the table in 149.11.4.4.3 at the foot of page 184

Response Response Status C  
 ACCEPT.

CI 45 SC 45.5.3.3 P53 L22 # 45

Wienckowski, Natalie General Motors  
 Comment Type T Comment Status A Registers

PICS for 45.2.194.4 when there is no shall.

*SuggestedRemedy*

Do one of the following:  
 On P38L48 Change "should be set to zero" to "shall be set to zero"  
 OR  
 Delete PICS MM222

Response Response Status C  
 ACCEPT IN PRINCIPLE.

On P38L48 Change "should be set to zero" to "shall be set to zero"

CI 45 SC 45.5.3.3 P53 L25 # 46

Wienckowski, Natalie General Motors  
 Comment Type T Comment Status A Registers

PICS for 45.2.194.4 when there is no shall.

*SuggestedRemedy*

Do one of the following:  
 On P39L4 Change "should be set to zero" to "shall be set to zero" AND on P53L25 Change Subclause from 45.2.1.194.4 to 45.2.1.194.5.  
 OR  
 Delete PICS MM223

Response Response Status C  
 ACCEPT IN PRINCIPLE.

On P39L4 Change "should be set to zero" to "shall be set to zero".

CI 45 SC 45.5.3.3 P53 L28 # 47

Wienckowski, Natalie General Motors  
 Comment Type T Comment Status A EZ

Incorrect reference

*SuggestedRemedy*

Change Subclause from 45.2.1.194.5 to 45.2.1.195.4.

Response Response Status C  
 ACCEPT.

CI 45 SC 45.5.3.3 P53 L29 # 170

Regev, Alon Keysight Technologies  
 Comment Type E Comment Status A EZ

advertising misspelled as "advertisingg"

*SuggestedRemedy*

change "advertisingg" to "advertising"

Response Response Status C  
 ACCEPT.

CI 45 SC 45.5.3.3 P53 L31 # 48  
 Wienckowski, Natalie General Motors  
 Comment Type T Comment Status A EZ  
 Incorrect reference  
 SuggestedRemedy  
 Change Subclause from 45.2.1.194.5 to 45.2.1.195.5.  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.5.3.7 P55 L4 # 171  
 Regev, Alon Keysight Technologies  
 Comment Type E Comment Status A EZ  
 "the" is repeated as "the the" in 2 places in the draft  
 SuggestedRemedy  
 change all occurances of "the the" to "the"  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.5.3.7 P54 L7 # 49  
 Wienckowski, Natalie General Motors  
 Comment Type T Comment Status A EZ  
 Incorrect reference. This is not what is in P802.3:2018.  
 SuggestedRemedy  
 Change Subclause from 45.2.3.172.1 to 45.2.3.172.2.  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.5.3.7 P55 L14 # 87  
 Laubach, Mark Broadcom  
 Comment Type E Comment Status A EZ  
 "the the"  
 SuggestedRemedy  
 Change to single "the"  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.5.3.7 P54 L13 # 16  
 Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ  
 In the editing instruction "after Item RM184" should be "after Item RM190"  
 SuggestedRemedy  
 In the editing instruction change "after Item RM184" to "after Item RM190"  
 Response Response Status C  
 ACCEPT.

CI 45 SC 45.5.3.7 P55 L4 # 86  
 Laubach, Mark Broadcom  
 Comment Type E Comment Status A EZ  
 "the the"  
 SuggestedRemedy  
 Change to single "the"  
 Response Response Status C  
 ACCEPT.

CI 78 SC 78.1.4 P56 L7 # 17

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

Comment #65 against P802.3cj D2.0 defined the order of items in Table 78-1. See <http://www.ieee802.org/3/cj/comments/P8023-D2p0-Comments-Final-byID.pdf#page=14>

Sort the result in "speed/reach" order using the following set of rules.

1. Increasing speed.
2. Increasing reach (maximum supported distance over the medium).
3. Decreasing number of lanes

The following supplemental rules address are included to address special cases.

4. PHY "family designations, by convention, are assigned a reach of 0.
5. "Copper" PHYs precede "Fiber" PHYs (all else being equal).
6. Alphanumeric sort (all else being equal).

Applying these rules puts 2.5GBASE-T1 before 2.5GBASE-T, 5GBASE-T1 before 5GBASE-T, and 10GBASE-T1 before 10GBASE-T.

*SuggestedRemedy*

Change the editing instruction to:

"Insert a row for 2.5GBASE-T1 after 2.5GBASE-KX (as inserted by IEEE Std 802.3cb-2018), insert a row for 5GBASE-T1 after 5GBASE-KR (as inserted by IEEE Std 802.3cb-2018), and insert a row for 10GBASE-T1 after 10GBASE-KR in Table 78-1 as follows (unchanged rows not shown):"

Response Response Status C

ACCEPT.

CI 78 SC 78.2 P56 L29 # 18

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

Comment #66 against P802.3cj D2.0 defined the order of items in Table 78-2. See <http://www.ieee802.org/3/cj/comments/P8023-D2p0-Comments-Final-byID.pdf#page=14>

This defined the sort order to be the same as for Table 78-1

Applying these rules puts 2.5GBASE-T1 before 2.5GBASE-T, 5GBASE-T1 before 5GBASE-T, and 10GBASE-T1 before 10GBASE-T.

*SuggestedRemedy*

Change the editing instruction to:

"Insert a row for 2.5GBASE-T1 after 2.5GBASE-KX (as inserted by IEEE Std 802.3cb-2018), insert a row for 5GBASE-T1 after 5GBASE-KR (as inserted by IEEE Std 802.3cb-2018), and insert a row for 10GBASE-T1 after 10GBASE-KR in Table 78-2 as follows (unchanged rows not shown):"

Response Response Status C

ACCEPT.

CI 78 SC 78.2 P56 L49 # 19

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

Table 78-2 is missing an ellipsis row at the bottom after the row for 10GBASE-T1

*SuggestedRemedy*

In Table 78-2 add an ellipsis row with default ruling at the bottom after the row for 10GBASE-T1

Response Response Status C

ACCEPT.

CI 78 SC 78.2 P56 L50 # 50

Wienckowski, Natalie

General Motors

Comment Type E Comment Status A EZ

Missing bottom row

*SuggestedRemedy*

Add row to bottom of table with single column and "..." in the cell.

Response Response Status C

ACCEPT.

CI 78 SC 78.3 P57 L5 # 5

Hajduczenia, Marek

Charter Communications

Comment Type ER Comment Status R PICS

New shall statements were added, PICS were not updated

*SuggestedRemedy*

Add PICS statements to address new "shall" statements in the added text

Response Response Status C

REJECT.

There are currently no PICS for 78.3. If this requires PICS, a Maintenance request should be created to add these for all shall statements, including the existing shalls in this subclause.

CI 78 SC 78.5 P57 L18 # 20

Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ

There are nine paragraphs in 78.5 of the base standard, so the additional paragraph is number 10.  
 Case-1 and Case 2 start with "Case-x of the PHY in the MultiGBASE-T set applies when ..." but cases 3 and 4 start with "Case-x in MultiGBASE-T1 is the same as ..."

*SuggestedRemedy*

Change the editing instruction to:  
 "Insert a 10th paragraph in 78.5 as follows:"  
 For Case-3 and Case-4, change:  
 "Case-x in MultiGBASE-T1 is the same as ..." to:  
 "Case-x of the PHY in the MultiGBASE-T set is the same as ..."

Response Response Status C  
 ACCEPT.

CI 78 SC 78.5 P57 L26 # 21

Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ

Comment #66 against P802.3cj D2.0 defined the order of items in Table 78-4. See <http://www.ieee802.org/3/cj/comments/P8023-D2p0-Comments-Final-byID.pdf#page=14>  
 This defined the sort order to be the same as for Table 78-1  
 Applying these rules puts 2.5GBASE-T1 before 2.5GBASE-T, 5GBASE-T1 before 5GBASE-T, and 10GBASE-T1 before 10GBASE-T.

*SuggestedRemedy*

Change the editing instruction to:  
 "Insert a row for 2.5GBASE-T1 after 2.5GBASE-KX (as inserted by IEEE Std 802.3cb-2018), insert a row for 5GBASE-T1 after 5GBASE-KR (as inserted by IEEE Std 802.3cb-2018), and insert a row for 10GBASE-T1 after 10GBASE-KR in Table 78-4 as follows (unchanged rows not shown):"

Response Response Status C  
 ACCEPT.

CI 78 SC 78.5 P57 L38 # 22

Anslow, Pete Ciena  
 Comment Type T Comment Status A EEE

The cells for Tphy\_shrink\_tx (max) and Tphy\_shrink\_rx (max) in Table 78-4 should not be blank.  
 If the values for these parameters are 0, then these cells should all contain 0

*SuggestedRemedy*

Populate the cells for Tphy\_shrink\_tx (max) and Tphy\_shrink\_rx (max) in Table 78-4 for the new rows with "0"

Response Response Status C  
 ACCEPT IN PRINCIPLE.

Implement changes requested by Graba\_3ch\_01a\_0719.pdf.

CI 98 SC 98.5.1 P61 L11 # 224

McClellan, Brett Marvell  
 Comment Type T Comment Status A EZ

Figure 149-34 references 'mGigT1'.  
 10GigT1, 5GigT1, and 2.5GigT1 are never referenced.

*SuggestedRemedy*

change:  
 "— 2.5GigT1;represents that the 2.5GBASE-T1 PMA is the signal source.  
 — 5GigT1; represents that the 5GBASE-T1 PMA is the signal source.  
 — 10GigT1; represents that the 10GBASE-T1 PMA is the signal source. "  
 to  
 "— mGigT1;represents that the 10/5/2.5GBASE-T1 PMA is the signal source."

Response Response Status C  
 ACCEPT.

CI 104 SC 104.1.3 P62 L10 # 240

Zimmerman, George ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S  
 Comment Type E Comment Status A EZ

Capitalization of "type F PSE" is missing

*SuggestedRemedy*

Change "type F PSE" to "Type F PSE"

Response Response Status C  
 ACCEPT.

CI 104 SC 104.4.6.3 P62 L54 # 266

Stewart, Heath Analog Devices  
 Comment Type TR Comment Status A PoDL

Type F systems include a NGAUTO PHY. The PSE power supply ripple currently in the standard was reused from 1000BASE-T1 (Type B) systems. This needs to be changed for the higher data transmission speed.

*SuggestedRemedy*

See "stewart\_3ch\_01\_0719" Slides 5,6, and 7

Response Response Status C

ACCEPT IN PRINCIPLE.

Make changes defined in stewart\_3ch\_01a\_0719 slides 5 & 6.

CI 104 SC 104.5.6.4 P63 L27 # 241

Zimmerman, George ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S  
 Comment Type E Comment Status A EZ

All the "VPD", "PPD" references should have the "PD" in subscript.

*SuggestedRemedy*

Editor to check and make "PD" and "PSE" subscript where appropriate. (I think it's just PD)

Response Response Status C

ACCEPT.

CI 104 SC 104.5.6.4 P63 L40 # 267

Stewart, Heath Analog Devices  
 Comment Type TR Comment Status A PoDL

Type F systems include a NGAUTO PHY. The PD ripple currently in the standard was reused from 1000BASE-T1 (Type B) systems. This needs to be changed for the higher data transmission speed.

*SuggestedRemedy*

See "stewart\_3ch\_01\_0719" Slides 8 and 9

Response Response Status C

ACCEPT IN PRINCIPLE.

Make changes defined in stewart\_3ch\_01a\_0719 slides 5 & 6.

CI 104 SC 104.6 P64 L8 # 6

Hajduczenia, Marek Charter Communications  
 Comment Type ER Comment Status A PICS

Multiple "shall" statements were revised (extended) and one new was added, but the text of PICS was not updated

*SuggestedRemedy*

Per comment

Response Response Status C

ACCEPT IN PRINCIPLE.

In 104.9.3 add PICS for PSETF and PDTF.  
 In 104.9.4.3 add PICS for Type F PD ripple and transients  
 In 104.9.3 add PICS for Type F PD measured ripple voltage post-processing  
 In 104.9.4.4 add Type F to COMEL1

CI 125 SC 125.1.4 P67 L33 # 42

Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ

Incorrect table border on cell "149"

*SuggestedRemedy*

Change right side boarder on last cell in 2nd ro to be the wider outside border.

Response Response Status C

ACCEPT.

CI 125 SC 125.1.4 P67 L33 # 23

Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ

The right hand ruling for the second heading row in Table 125-2 should be set to the default.

*SuggestedRemedy*

Change the right hand ruling for the second heading row in Table 125-2 to the default.

Response Response Status C

ACCEPT.



**Cl 125**    **SC 125.2.4.3**    **P68**    **L28**    # **7**

Hajduczenia, Marek                      Charter Communications

**Comment Type**    **ER**            **Comment Status**    **A**                      **PICS**

New shall statements were added, PICS were not updated

**SuggestedRemedy**  
Per comment

**Response**                      **Response Status**    **C**

ACCEPT IN PRINCIPLE.

P68 L27 Delete: If Auto- Negotiation is implemented, it shall meet the requirements of Clause 98.  
This text is not needed here as it is in Clause 149.

**Cl 125**    **SC 125.3**                      **P68**    **L30**    # **133**

Grau, Olaf                                      Robert Bosch GmbH

**Comment Type**    **E**                      **Comment Status**    **A**                      **Formatting**

Titel on pg 68, Tabel on pg. 69

**SuggestedRemedy**  
Headline and Table shouldn't be separated by a page break

**Response**                      **Response Status**    **C**

ACCEPT IN PRINCIPLE.

The editor will try to move the Heading for 125-3 to the next page with Table 125-3.

**Cl 125**    **SC 125.3**                      **P68**    **L33**    # **77**

Wienckowski, Natalie                      General Motors

**Comment Type**    **E**                      **Comment Status**    **A**                      **EZ**

Table 125-3 does not match IEEE802.3's 2018 guideline for "Presentation of numbers".

**SuggestedRemedy**  
Change Editorial instruction to be" Replace Table 125-3 (as modified by IEEE Std 802.3cb-2018) with the updated table, which adds 2.5GBASE-T1 and 5GBASE-T1 and corrects the number format and alignment to match IEEE 802.3 WG editorial guidelines, as follows:"  
Correct Table 125-3 to match latest IEEE 802.3 WG editorial guidelines.

**Response**                      **Response Status**    **C**

ACCEPT.

**Cl 125**    **SC 125.3**                      **P69**    **L8**    # **90**

Trowbridge, Steve                              Nokia

**Comment Type**    **E**                      **Comment Status**    **A**                      **EZ**

Other clauses have the pause quanta centered in the 3rd column. In the 4th column, some of the ns numbers are left aligned and some are centered

**SuggestedRemedy**  
Use consistent alignment in the columns of Table 125-3

**Response**                      **Response Status**    **C**

ACCEPT IN PRINCIPLE.

Same as comment #77.

Change Editorial instruction to be "Replace Table 125-3 (as modified by IEEE Std 802.3cb-2018) with the updated table, which adds 2.5GBASE-T1 and 5GBASE-T1 and corrects the number format and alignment to match IEEE 802.3 WG editorial guidelines, as follows:"  
Correct Table 125-3 to match latest IEEE 802.3 WG editorial guidelines.

**Cl 149**    **SC**                                      **P**    **L**    # **138**

DiMinico, Christopher                              MC Communications

**Comment Type**    **T**                      **Comment Status**    **A**                      **Channel**

The transmission characteristics between the Tx Function and Rx Function including the host PCB are not defined.

**SuggestedRemedy**  
Create an annex to provide information on channel transmission characteristics defined between the Tx function to Rx function inclusive of the host PCB, MDI and link segment that might not be testable in an implemented system. ide

Commentor to provide draft annex.

**Response**                      **Response Status**    **C**

ACCEPT IN PRINCIPLE.

Add Informative Annex 149C with the contents of diminico\_3ch\_02\_0719.pdf with editorial license to format correctly.

CI 149 SC 149.11.4.2.1 P173 L5 # 139

Donahue, Curtis UNH-IOL

Comment Type E Comment Status A EZ

Shall statement missing associated PICS item

SuggestedRemedy

Insert new PICS entry before PCT1 of Draft 2.0, with the following content:

Feature: PCS Reset

Subclause: 149.3.2.1

Value/Comment: Described in 149.3.2.1

Status: M

Support: Yes[] N/A[]

Response Response Status C

ACCEPT.

CI 149 SC 149.11.4.2.2 P175 L10 # 140

Donahue, Curtis UNH-IOL

Comment Type E Comment Status A EZ

Shall statement missing associated PICS item

SuggestedRemedy

Insert new PICS entry after PCR2 of Draft 2.0, with the following content:

Feature: Frame and block synchronization

Subclause: 149.3.2.3.1

Value/Comment: Described in 149.3.2.3.1

Status: M

Support: Yes[] N/A[]

Response Response Status C

ACCEPT.

CI 149 SC 149.11.4.2.2 P175 L17 # 141

Donahue, Curtis UNH-IOL

Comment Type E Comment Status A EZ

Incorrect subclause reference.

SuggestedRemedy

Change '149.3.2.3.2' to '149.3.2.3.3'.

Response Response Status C

ACCEPT.

CI 149 SC 149.11.4.2.7 P177 L16 # 142

Donahue, Curtis UNH-IOL

Comment Type E Comment Status A EZ

Typo.

SuggestedRemedy

Capitalize the 'i' in 'ignore' in the Value/Comment field of PCSL4.

Response Response Status C

ACCEPT.

CI 149 SC 149.11.4.2.8 P177 L33 # 143

Donahue, Curtis UNH-IOL

Comment Type E Comment Status A EZ

Shall statement missing associated PICS item

SuggestedRemedy

Insert new PICS entry before OAM2 of Draft 2.0, with the following content:

Feature: Partially transmitted OAM frame

Subclause: 149.3.9.2.1

Value/Comment: Described in 149.3.9.2.1

Status: M

Support: Yes[] N/A[]

Response Response Status C

ACCEPT.

CI 149 SC 149.11.4.3.2 P178 L15 # 144

Donahue, Curtis UNH-IOL

Comment Type E Comment Status A EZ

Duplicate PICS entry.

SuggestedRemedy

Remove PMAT1.

Response Response Status C

ACCEPT.

CI 149 SC 149.11.4.3.10 P182 L35 # 145  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Typo.  
 SuggestedRemedy  
 Change 'Expire s97.5' to 'Expires 97.5'  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.4.3 P184 L35 # 146  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Update subclause reference  
 SuggestedRemedy  
 Change the subclause reference in the Subclause column from '149.5.2.3' to '149.5.2.3.1' for TES12, TES13, TES14, and TES15.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.4.3 P185 L1 # 147  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Shall statement missing associated PICS item  
 SuggestedRemedy  
 Insert new PICS entry after TSE15 of Draft 2.0, with the following content:  
 Feature: DJpk-pk Jitter  
 Subclause: 149.5.2.3.2  
 Value/Comment: Less than 9/S ps  
 Status: M  
 Support: Yes[] N/A[]  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.4.3 P185 L1 # 148  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ2  
 Shall statement missing associated PICS item  
 SuggestedRemedy  
 Insert new PICS entry after TSE15 of Draft 2.0, with the following content:  
 Feature: EOJpk-pk Jitter  
 Subclause: 149.5.2.3.2  
 Value/Comment: Less than 4/S ps  
 Status: M  
 Support: Yes[] N/A[]

Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.4.3 P185 L3 # 149  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status D PSD  
 Incorrect dBm values in TSE16.  
 SuggestedRemedy  
 Change '-1 dBm' to '-1.5 dBm', and change '2 dBm' to '1.5 dBm'  
 Proposed Response Response Status C  
 REJECT.  
 This comment was WITHDRAWN by the commenter.

CI 149 SC 149.11.4.5 P186 L18 # 150  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Typo.  
 SuggestedRemedy  
 Change '2.5G return loss' to '2.5GBASE-T1 return loss'  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.5 P186 L20 # 151  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Typo  
 SuggestedRemedy  
 Change '5G return loss' to '5GBASE-T1 return loss'  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.5 P186 L22 # 152  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Typo.  
 SuggestedRemedy  
 Change '10G return loss' to '10GBASE-T1 return loss'  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.5 P186 L22 # 153  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Typo.  
 SuggestedRemedy  
 Change "Equation (149-21)" to 'Equation (149-22)'  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.5 P186 L29 # 155  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Shall statement missing associated PICS item  
 SuggestedRemedy  
 Insert new PICS entry after LSC6 of Draft 2.0, with the following content:  
 Feature: PSAACR-F  
 Subclause: 149.7.2.2  
 Value/Comment: See Equation (149-26)  
 Status: M  
 Support: Yes[] N/A[]

Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.5 P186 L29 # 154  
 Donahue, Curtis UNH-IOL  
 Comment Type E Comment Status A EZ  
 Shall statement missing associated PICS item  
 SuggestedRemedy  
 Insert new PICS entry after LSC6 of Draft 2.0, with the following content:  
 Feature: PSANEXT  
 Subclause: 149.7.2.1  
 Value/Comment: See Equation (149-25)  
 Status: M  
 Support: Yes[] N/A[]

Response Response Status C  
 ACCEPT.

CI 149 SC 149 P70 L1 # 37  
 Remein, Duane Futurewei Technologies, Inc.  
 Comment Type E Comment Status A EZ  
 It is customary to include an editing Instruction prior to new clauses as noted in the WG Template v3.9.  
 SuggestedRemedy  
 Insert before Clause 149  
 "Insert new clauses and corresponding annexes as follows:"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1 P70 L12 # 251  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type E Comment Status A EZ  
 The word 'type' seems strange and unnecessary in this sentence.  
 SuggestedRemedy  
 Remove the word 'type'  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1.1 P70 L32 # 175  
 Baggett, Tim Microchip  
 Comment Type E Comment Status A EZ  
 "PHYs" should be possessive as "PHY's"  
 SuggestedRemedy  
 Change "...PHYs data rate..." to "...PHY's data rate..."  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1.1 P70 L37 # 93  
 D'Ambrosia, John Futurewei, U.S. Subsidiary of Huawei  
 Comment Type ER Comment Status R Scaling  
 The use of "S" to represent scaling parameter is not advisable. Trying to see where this comes into play throughout the document on a search of "S" reveals so many instances that it is useless.  
 SuggestedRemedy  
 Change "S" to "Scale"  
 Response Response Status C  
 REJECT.

The use of S to represent the scaling parameter is consistent with the use in 802.3bq-2016 and 802.3bz-2016. This is where we got it. It's used in all Multi-Gig BASE-T PHYS.

#### 113.1.1 Nomenclature

The 25GBASE-T and 40GBASE-T PHYs described in Clause 113 represent two distinct PHY types that share the same PCS, PMA, and MDI specifications subject to frequency scaling, and differences between the 25GMII and the XLGMII specifications. In order to efficiently describe the two PHYs, the nomenclature 25G/40GBASE-T is used to describe specifications that apply to both the 25GBASE-T and 40GBASE-T PHYs. Additionally, for parameters that scale with the PHYs data rate, the parameter S is used for scaling.

For 25GBASE-T, S = 0.625 and for 40GBASE-T, S = 1.

#### 126.1.1 Nomenclature

The 2.5GBASE-T and 5GBASE-T PHYs described in this clause represent two distinct PHY types that share the same PCS, PMA, and MDI specifications subject to frequency scaling. In order to efficiently describe the two PHYs, the nomenclature 2.5G/5GBASE-T is used to describe specifications that apply to both the 2.5GBASE-T and 5GBASE-T PHYs. Additionally, for parameters that scale with the PHYs data rate, the parameter S is used for scaling.

For 2.5GBASE-T, S = 0.5 and for 5GBASE-T, S = 1.

CI 149 SC 149.1.3 P71 L27 # 242  
 Zimmerman, George ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S  
 Comment Type E Comment Status A EZ  
 In other diagrams the PCS is referred to as 64B/65B RS-FEC PCS. Here it is just RS-FEC PCS. We should be consistent.  
 SuggestedRemedy  
 Change "RS-FEC PCS" to "64B/65B RS-FEC PCS" in Figure 149-1.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1.3 P71 L27 # 193

Brandt, David Rockwell Automation

Comment Type E Comment Status A EZ

PCS layer label is inconsistent with Figure 44-1 and Figure 125-1.

*SuggestedRemedy*

Change: "RS-FEC PCS"  
To: "64B/65B RS-FEC PCS"

Response Response Status C

ACCEPT.

CI 149 SC 149.1.3 P72 L3 # 243

Zimmerman, George ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S

Comment Type T Comment Status A EZ

"The MASTER and SLAVE are synchronized by the PHY Link Synchronization function in the PHY (see 149.4.2.6)." - this sentence stands alone from the previous sentence, and needs to be qualified or linked - else it is incorrect (149.4.2.6 only applies in FORCE mode). It is only true when Auto-Negotiation is not used.

*SuggestedRemedy*

Change "PHYS. The MASTER and SLAVE are..." to "PHYS, and the MASTER and SLAVE are..."

Response Response Status C

ACCEPT.

CI 149 SC 149.1.3 P72 L14 # 105

Lo, William Axonne Inc.

Comment Type TR Comment Status A OAM

Contradicting statement whether OAM in-band or out-of-band:  
page 72 line 14 says "out-of-band", page 120 line 12 says "in-band"

*SuggestedRemedy*

Change page 72 line 14 from out-of-band to in-band.

Response Response Status C

ACCEPT IN PRINCIPLE.  
OAM is "out-of-band"  
P120 L120 change "in-band" to "out-of-band".

The Editor will enter a Maintenance request for Clause 97 as 97.3.8 states " The 1000BASE-T1 OAM information is exchanged in-band between two PHYs", this should be "out-of-band".

CI 149 SC 149.1.3 P149 L27 # 92

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

Comment Type E Comment Status A EZ

The naming of the PCS block in Fig 149-1 is inconsistent with the naming of the PCS block in Fig 44-1 (PDF Page 28, Line 37), which includes "64B/65B", and PCS Blocks in Fig 125-1 (PDF Page 66, Line 14) which also includes the "64B/65B" text

*SuggestedRemedy*

Change the naming of the PCS block in Fig 149--1 to read "64B/65B RS-FEC PCS"

Response Response Status C

ACCEPT.

CI 149 SC 149.1.3.1 P72 L30 # 225

McClellan, Brett Marvell

Comment Type E Comment Status R EZ

text in this section appears to be a different font size than other text.

*SuggestedRemedy*

adjust font

Response Response Status C

REJECT.

I checked the text in FrameMaker and it is the same as the rest of the text. This must be due to the pdf creation or your viewer.

CI 149 SC 149.1.3.1 P72 L38 # 184

Brandt, David Rockwell Automation

Comment Type E Comment Status A EZ

Missing dashes.

*SuggestedRemedy*

Change: "3260 bit block"  
To: "3260-bit block", in 2 locations

Response Response Status C

ACCEPT.

CI 149 SC 149.1.3.1 P72 L41 # 176  
 Baggett, Tim Microchip  
 Comment Type E Comment Status A Scaling  
 The scale factor "S" looks like units (Siemens)  
 SuggestedRemedy  
 Change "L x 320 S ns" to "L x 320 x S ns" (add the multiply operator 'x') as done in other areas of the draft (including line 54 of the same page)  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 "L x 320 S ns" should be corrected as "L x 320 / S ns"

CI 149 SC 149.1.3.1 P72 L41 # 104  
 Lo, William Axonne Inc.  
 Comment Type TR Comment Status A Scaling  
 "L x 320 S ns" should be corrected as "L x 320 / S ns"  
 SuggestedRemedy  
 "L x 320 S ns" should be corrected as "L x 320 / S ns"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1.3.1 P72 L48 # 226  
 McClellan, Brett Marvell  
 Comment Type E Comment Status A EZ  
 The PMA interface is defined in 149.2, not 149.4.  
 SuggestedRemedy  
 change '149.4' to '149.2'  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1.3.3 P73 L24 # 252  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type T Comment Status R EEE  
 It is stated here that the the LPI transmit mode starts when there is an LPI character in the last 64B/65B block of the RS-frame. In contrast to how to exist LPI, it interestingly doesn't say how this is initiated by XGMII.  
 SuggestedRemedy  
 Propose to add a sentence before the referred one:  
 A request for LPI mode starts with LPI characters on the XGMII.  
 Response Response Status C  
 REJECT.  
 The text that is questioned by this comment is removed by comment #227. This may need to be revisited if the resolution to comment #227 changes.

CI 149 SC 149.1.3.3 P73 L24 # 227  
 McClellan, Brett Marvell  
 Comment Type ER Comment Status A EEE  
 This section has too much detail for a non-normative summary sections and is prone to have conflicts with the normative sections. The section sounds normative but has no 'shall' statements. It should provide a brief summary and refer to section 149.3.2.2.21 for normative details.  
 SuggestedRemedy  
 delete the two paragraphs starting with:  
 "In the transmit direction the transition to the LPI transmit mode begins..."  
 and  
 "In the receive direction the transition to the LPI mode is triggered when .."  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1.3.3 P73 L34 # 228

McClellan, Brett

Marvell

Comment Type TR Comment Status A EEE

"The quiet-refresh cycle continues until the PCS function detects IDLE characters on the XGMII."

This statement is in conflict with normative text in 149.3.2.2.21 which states that any non-LPI symbol will trigger an exit from LPI.

This section has too much detail for a non-normative summary sections and is prone to have conflicts with the normative sections.

#### SuggestedRemedy

delete the two paragraphs starting with:

"In the transmit direction the transition to the LPI transmit mode begins..."

and

"In the receive direction the transition to the LPI mode is triggered when .."

Response Response Status C

ACCEPT.

CI 149 SC 149.1.3.4 P74 L8 # 229

McClellan, Brett

Marvell

Comment Type ER Comment Status A Auto-Negotiation

This section has too much detail for a non-normative summary sections and is prone to have conflicts with the normative sections. The section sounds normative but has no 'shall' statements. It should provide only a summary and refer to section 149.4.2.6 for normative details.

#### SuggestedRemedy

change text to:

"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. Link Synchronization operates in a half-duplex fashion. The MASTER PHY sends a synchronization sequence. If there is no response from the SLAVE, the MASTER repeats sending a synchronization sequence. If the slave detects the sequence, it responds with a synchronization sequence. If no other detection happens after the SLAVE response then Link Synchronization is successfully complete, link monitor timers are started, and the PHY Control state machine starts Training. Link synchronization is defined in 149.4.2.6."

Response Response Status C

ACCEPT IN PRINCIPLE.

To accomodate comment 85 change text to:

"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. Link Synchronization operates in a half-duplex fashion. The MASTER PHY sends a synchronization sequence. If there is no response from the SLAVE, the MASTER repeats sending a synchronization sequence. If the slave detects the sequence, it responds with a synchronization sequence. If no other detection happens after the SLAVE response then Link Synchronization is successfully complete, link monitor timers are started, and the PHY Control state diagram starts Training. Link synchronization is defined in 149.4.2.6."

CI 149 SC 149.1.3.4 P74 L15 # 85

Maguire, Valerie

The Siemon Company

Comment Type E Comment Status A State Diagrams

Use preferred terminology for state diagrams.

#### SuggestedRemedy

Replace "state machine" with "state diagram" in the following locations: P74-L15, P126-L35, P132-L4, P132-L5, P132-L6, P133-L3, P133-L10, and P144-L43 and replace "state machines" with "state diagrams" on P74-L15.

Response Response Status C

ACCEPT.



CI 149 SC 149.1.3.4 P75 L13 # 51  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 fix crooked line  
 SuggestedRemedy  
 Make the horizontal line under "tx\_mode" straight.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1.3.4 P75 L23 # 230  
 McClellan, Brett Marvell  
 Comment Type E Comment Status A State Diagrams  
 Figure 149–2 has superfluous arrow heads pointing to a signal line that continues along the same path as the arrow.  
 SuggestedRemedy  
 replace arrows with lines at line 23 and line 29  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.1.4 P76 L13 # 231  
 McClellan, Brett Marvell  
 Comment Type T Comment Status D PCS  
 "Ability to signal the status of the local receiver to the remote PHY to indicate that the local receiver is not operating reliably and requires retraining."  
 I don't think the signaling can convey the need for a retraining.  
 SuggestedRemedy  
 delete item g  
 Proposed Response Response Status C  
 REJECT.  
 This comment was WITHDRAWN by the commenter.

CI 149 SC 149.1.6 P76 L43 # 197  
 Dawe, Piers Mellanox  
 Comment Type TR Comment Status A Terminology  
 This is not a test specification.

Implementers (or testers) take responsibility for the accuracy of their test equipment. If someone wants to use 2%-accurate equipment and apply appropriate guard bands, that's OK.  
 In "The values of all components in test circuits shall be accurate to within  $\pm 1\%$  unless otherwise stated", the "shall" is inappropriate.

Remarks about % tolerance muddy the water: Does 1 V mean 1 V any more? If asked for e.g.  $<1 V$ , and measured with 0.1%-accurate equipment, is 1.008 V acceptable?

Anyway, this topic does not fit with "conventions in this clause", and does not relate to the PCS.

SuggestedRemedy

Delete this sentence from here. If any substitute is needed, put it within 149.5 PMA electrical specifications, and use the language of a parameter definition, not a test requirement.

Response Response Status W  
 ACCEPT IN PRINCIPLE.

Delete ""The values of all components in test circuits shall be accurate to within  $\pm 1\%$  unless otherwise stated"

A Maintenance request is required to remove this through 802.3. It is in Clause 97 and may be in others.

CI 149 SC 149.2.1 P77 L9 # 198

Dawe, Piers

Mellanox

Comment Type **TR** Comment Status **A** Terminology

According to Table 125-2, Nomenclature and clause correlation, Clause 98 Auto-Negotiation is optional. The Technology Dependent Interface is used to communicate with Auto-Negotiation - I don't think it has any other purpose.

*SuggestedRemedy*

Say that the Technology Dependent Interface is required if Auto-Negotiation is implements (so, not if it's not)

Response Response Status **W**

ACCEPT IN PRINCIPLE.

Change: MultiGBASE-T1 uses the following service primitives to exchange status indications and control signals across the Technology Dependent Interface as specified in 98.4:

To: MultiGBASE-T1 uses the following service primitives to exchange status indications and control signals across the Technology Dependent Interface, required in PHYs that implement Auto-Negotiation, as specified in 98.4:

CI 149 SC 149.2.2 P76 L50 # 94

D'Ambrosia, John

Futurewei, U.S. Subsidiary of Huawei

Comment Type **E** Comment Status **R** Terminology

The following statement is incorrect:

MultiGBASE-T1 transfers data and control information across the following four service interfaces:

- a) 10 Gigabit Media Independent Interface (XGMII)
- b) Technology Dependent Interface
- c) PMA service interface
- d) Medium dependent interface (MDI)

MDI is not a service interface See definition 1.4.324.

*SuggestedRemedy*

Reword

MultiGBASE-T1 transfers data and control information across the following three service interfaces:

- a) 10 Gigabit Media Independent Interface (XGMII)
- b) Technology Dependent Interface
- c) PMA service interface

Response Response Status **C**

REJECT.

This is not consistent throughtout 802.3.

MDI is included in Service Primitives and Interfaces in Clauses 55, 97, 113, 126, etc. Commenter may want to consider creating a Maintenance request to remove this throughout 802.3.

CI 149 SC 149.2.2 P78 L23 # 232

McClellan, Brett

Marvell

Comment Type TR Comment Status A State Diagrams

"send\_s\_sigdet" appears in Figure 149-2 as a service interface (apparently for EEE alert detection), but does not appear in 149.2.2.

PMA\_ALERTDETECT.indication(alert\_detect) is a defined service interface for EEE alert detection, but does not appear in 149.2.2.

#### SuggestedRemedy

delete "send\_s\_sigdet" from Figure 149-2.

add "alert\_detect" as a dotted line service interface from the PMA receiver in Figure 149-2 and Figure 149-3

add "PMA\_ALERTDETECT.indication(alert\_detect)" to the list in 149.2.2.

change " to "alert\_detect" in 149.3.2.3 on page 101 line 45.

Response Response Status C

ACCEPT IN PRINCIPLE.

Make the following set of changes (same as comment 101)

1. Figure 149-2 (P75 L30) remove "send\_s\_sigdet" and associated line
2. Figure 149-2 (P75 L33) add dotted arrow line from PMA RECEIVE to PCS RECEIVE labeled "alert\_detect"
3. Figure 149-3 (P79 L28) add dotted arrow line from PMA to PCS labeled "PMA\_ALERTDETECT.indication"
4. P78 L32 add "PMA\_ALERTDETECT.indication(alert\_detect)" to the list in 149.2.2.
5. Figure 149-4 (P86) add dotted up arrow from PMA SERVICE INTERFACE dotted line to PCA RECEIVE box labeled "alert\_detect"
6. P101 L 45 change: "send\_s\_sigdet" to "alert\_detect"

CI 149 SC 149.2.2 P78 L32 # 101

Lo, William

Axonon Inc.

Comment Type TR Comment Status A State Diagrams

Clause 149.2.2.12 talks about PMA\_ALERTDETECT.indication but it is not mentioned in 4 places.

#### SuggestedRemedy

1) Page 78 line 32 add

PMA\_ALERTDETECT.indication(alert\_detect)

2) Page 79 line 28

Draw left dotted arrow labeled PMA\_ALERTDETECT.indication

3) Page 75 figure 149-2.

Need a left dotted line from PMA RECEIVE to PCS RECEIVE, line is labeled alert\_detect. (I'm not sure about this change. Ask for feedback from the group)

4) Page 86 line 12

Need a up dotted line to PCS RECEIVE labeled alert\_detect

Response Response Status C

ACCEPT IN PRINCIPLE.

Make the following set of changes (same as comment 232)

1. Figure 149-2 (P75 L30) remove "send\_s\_sigdet" and associated line
2. Figure 149-2 (P75 L33) add dotted arrow line from PMA RECEIVE to PCS RECEIVE labeled "alert\_detect"
3. Figure 149-3 (P79 L28) add dotted arrow line from PMA to PCS labeled "PMA\_ALERTDETECT.indication"
4. P78 L32 add "PMA\_ALERTDETECT.indication(alert\_detect)" to the list in 149.2.2.
5. Figure 149-4 (P86) add dotted up arrow from PMA SERVICE INTERFACE dotted line to PCA RECEIVE box labeled "alert\_detect"
6. P101 L 45 change: "send\_s\_sigdet" to "alert\_detect"

CI 149 SC 149.2.2.12.3 P85 L17 # 24

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

"149.3.2.3" and "Figure 149-17" should be cross-references.

#### SuggestedRemedy

Make "149.3.2.3" and "Figure 149-17" cross-references.

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2 P87 L14 # 209  
 McClellan, Brett Marvell  
 Comment Type E Comment Status A EZ  
 "RS\_FEC" is inconsistent with other text using "RS-FEC"  
 SuggestedRemedy  
 change "RS\_FEC" to "RS-FEC"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2 P87 L38 # 178  
 Baggett, Tim Microchip  
 Comment Type E Comment Status A EZ  
 Misspelling "fame"  
 SuggestedRemedy  
 Change "FEC fame" to " FEC frame"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2 P87 L39 # 177  
 Baggett, Tim Microchip  
 Comment Type E Comment Status A EZ  
 I think it would be useful to indicate that the block of 3600 bits are encoded into a block of 1800 PAM4 symbols.  
 SuggestedRemedy  
 Change:  
 "The 3600 bits in this frame are then encoded into PAM4 symbols and transferred to the PMA."  
 to:  
 "The 3600 bits in this frame are then encoded into 1800 PAM4 symbols and transferred sequentially to the PMA."  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2 P87 L48 # 81  
 Slavick, Jeff Broadcom  
 Comment Type TR Comment Status A Interleaver  
 How the number of interleave frames is decided upon is not defined anywhere. So for 10G if one side requests 2-way, other 4-way which do you do? The shall in this line implies theres some definition on how to resolve that but I don't see any text for that (which is where the shall should be).  
 SuggestedRemedy  
 Change the text from "which shall be determined" to "which is determined".  
 Add a sub-clause in the appropriate place which defines the priority resolution of the interleave request fields for 5G and 10G operations.  
 Change PCT6 to refer to new sub-clause  
 Response Response Status W  
 ACCEPT IN PRINCIPLE.

P87 L48, Change "L is called the interleaving depth, and the possible choices of L are 1, 2, and 4, which shall be determined during the PAM2 training mode InfoField exchange." To "L is called the interleaving depth, and the possible choices of L are 1, 2, and 4. The interleaver settings requested in each direction of transmission may be different, and the value of L used by the transmitter is determined by the link partner and signaled during the PAM2 training mode InfoField exchange. "

P 95 L45 in 149.3.2.2.16 RS-FEC superframe and round robin interleaving, add new first paragraph: "The interleaver depth L of the transmitter shall be set to the InterleaverDepth requested by the link partner during InfoField exchange, as specified in 149.4.2.4.5."

Add new PICS item PCT16 and renumber subsequent PICS:  
 Feature : Interleaver set to depth setting  
 Subclause: 149.3.2.2.16  
 Value: Interleaver depth set to value requested by link partner during infofield exchange  
 Status: M

PICS Editor to update PICS as necessary.

CI 149 SC 149.3.2.2.2 P88 L40 # 210  
 McClellan, Brett Marvell  
 Comment Type T Comment Status A EZ  
 "In addition, the code enables the receiver to achieve PCS synchronization alignment on the incoming PHY bit stream."  
 This text is not correct. Alignment is found during training.  
 SuggestedRemedy  
 delete this sentence.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.2 P90 L38 # 211  
 McClellan, Brett Marvell  
 Comment Type TR Comment Status A Interleaver  
 Figure 149–7 does not show how the receive path works with de-interleaving.  
 SuggestedRemedy  
 Either change to the figure to include de-interleaving or add a note indicating that this figure only applies to L=1.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change the text in 149.3.2.2 as shown in zimmerman\_3ch\_02\_0719.pdf.  
 Change fig 149-6:  
 change the block name "RS-FEC (360,326) encoder" to "Interleaver and RS-FEC (360,326) encoder"  
 Editor to add note to Figure that the case shown is L=1.  
 change the encoded block after the encoder to show the L interleaved encoded blocks  
 change the RS-FEC frame at the end to an RS-FEC superframe showing L x 1800 symbols  
 and change fig 149-7:  
 change the output of frame sync from an RS-FEC frame to an RS-FEC superframe showing L x 1800 symbols  
 Editor to add note to Figure that the case shown is L=1.  
 change the block name "RS-FEC decoder" to "De-interleaver and RS-FEC decoder"  
 change the RS-FEC Decoded frame to show the L interleaved encoded blocks

CI 149 SC 149.3.2.2.3 P89 L8 # 52

Wienckowski, Natalie General Motors

Comment Type E Comment Status A EZ

Missing Oxford comma.

SuggestedRemedy

Change: Contents of block type fields, data octets and control characters are shown as hexadecimal values.

To: Contents of block type fields, data octets, and control characters are shown as hexadecimal values.

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.4 P89 L24 # 185

Brandt, David Rockwell Automation

Comment Type E Comment Status A EZ

Figure 149-6 lacks arrow ends on TXD<32> and TXD<63>.

SuggestedRemedy

Add arrow ends on TXD<32> and TXD<63>.

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.4 P89 L44 # 136

Wu, Peter Marvell

Comment Type E Comment Status A EZ

Some arrows in the diagram are too long

SuggestedRemedy

Need to be aligned

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.4 P90 L43 # 91

Trowbridge, Steve Nokia

Comment Type E Comment Status A EZ

Many elements of Figure 149-7 don't quite line up

SuggestedRemedy

Use the recommended Pete Anslow tricks of exact pixel position and size to get everything to align

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.13 P94 L13 # 212

McClellan, Brett Marvell

Comment Type E Comment Status A EZ

change "transcoder/scrambler" to "transcoder and scrambler"

SuggestedRemedy

change "transcoder/scrambler" to "transcoder and scrambler"

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.14 P94 L23 # 213

McClellan, Brett Marvell

Comment Type E Comment Status A EZ

"For both x and c the encoder shall follow the notation described in 149.3.2.2.2 where the LSB (leftmost element of the vectors x and c) is the first bit into the RS-FEC encoder and the first transmitted bit."

x and c are not yet defined and need a reference. Notation is defined in 149.3.2.2.3, not 149.3.2.2.2.

SuggestedRemedy

change "149.3.2.2" to "149.3.2.2.3"

change "For both x and c" to "For both x and c (in 149.3.2.2.15)"

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.15 P94 L41 # 214  
 McClellan, Brett Marvell  
 Comment Type E Comment Status A EZ  
 page 94 line 41  
 alpha does not appear in equation 149-3.  
 SuggestedRemedy  
 change "In Equation (149-3)," to "In Equation (149-1),"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.15 P94 L41 # 179  
 Baggett, Tim Microchip  
 Comment Type E Comment Status A EZ  
 Reference to equation 149-3 is incorrect. The referenced equation does not have an alpha term.  
 SuggestedRemedy  
 reference "Equation (149-1)"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.15 P94 L41 # 53  
 Wienckowski, Natalie General Motors  
 Comment Type T Comment Status A EZ  
 Incorrect reference  
 SuggestedRemedy  
 Change: In Equation (149-3)  
 To: In Equation (149-1)  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.15 P94 L51 # 137  
 Wu, Peter Marvell  
 Comment Type T Comment Status A EZ  
 The equation is wrong  
 $m_{i,j} = tx\_RSmessage <(359 - i) 10 + j>$ ,  $i = 0$  to 325,  $j = 0$  to 9. index out of range  
 SuggestedRemedy  
 It should be changed to:  
 $m_{i,j} = tx\_RSmessage <(325 - i) 10 + j>$ ,  $i = 0$  to 325,  $j = 0$  to 9.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.15 P94 L52 # 180  
 Baggett, Tim Microchip  
 Comment Type E Comment Status A EZ  
 Equation  $m_{sub(i,j)}$  could be written a bit more clear.  
 SuggestedRemedy  
 Change:  
 $tx\_RSmessage <(359-i) 10 +j>$ ,  $i = 0$  to 325,  $j = 0$  to 9."  
 To:  
 $tx\_RSmessage <(359-i) x 10 +j>$ , for  $i = 0$  to 325, and  $j = 0$  to 9."  
 (Add multiply operator "x", "for", and "and")  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Make the suggested editorial changes, but don't overwrite the technical change made by Comment #137 changing the first "359" to "325".

CI 149 SC 149.3.2.2.15 P95 L6 # 125  
 Nicholl, Shawn Xilinx  
 Comment Type E Comment Status A EZ  
 There is an orphan statement containing that mentions tx\_scrambled, but makes no other mention to tx\_scrambled in the sub-clause. Also, the cross-reference is wrong since 149.3.2.2.14 says nothing about tx\_scrambled.  
 SuggestedRemedy  
 Remove the statement "tx\_scrambled<3599:0> is defined in 149.3.2.2.14."  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.15 P95 L28 # 287

Tu, Mike Broadcom

Comment Type T Comment Status A PCS

Figure 149-9 shows a multiplier associated with coefficient g\_34. This is mathematically incorrect (although g\_34=1 based on Equation 149-1). It can only cause confusions and mis-interpretations in the future when people look at this figure.

*SuggestedRemedy*

In figure 149-9, remove the multiplier next to g\_34, and replace the arrowed line into that multiplier with a straight line connecting to the output of that multiplier. Also replace the text "g\_34" with "g\_34=1".

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.15 P96 L1 # 78

Slavick, Jeff Broadcom

Comment Type E Comment Status A EZ

Table 149-3 spans over two pages. It'd be useful to have all information on a single page.

*SuggestedRemedy*

Make Table 149-3 have 4 columns so the table can fit on a single page

Response Response Status C

ACCEPT IN PRINCIPLE.

Put in additional columns to fit on one page. See table 119-3 for example.

CI 149 SC 149.3.2.2.16 P95 L45 # 126

Nicholl, Shawn Xilinx

Comment Type E Comment Status A EZ

Sub-clauses 149.3.2.2.13 through 149.3.2.2.20 appear to be walking through the Tx functions in order. However, 149.3.2.2.16 is in the wrong place. The superframe formation and interleaving (if present) occurs before the RS encoder.

*SuggestedRemedy*

Move sub-clause "149.3.2.2.16 RS-FEC superframe and round robin interleaving" before sub-clause "149.3.2.2.15 Reed Solomon encoder"

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.16 P97 L20 # 215

McClellan, Brett Marvell

Comment Type ER Comment Status R Terminology

Using m as the variable for frame message and superframe message bits may be confusing to the reader.  
same issue for p

*SuggestedRemedy*

Define and use another variable for superframe message bits and also for superframe parity bits.

Response Response Status C

REJECT.

The commenter does not explain why this may be confusing. Single letters are regularly used for variables.

There is no specific suggested remedy provided by the commenter.

CI 149 SC 149.3.2.2.16 P97 L21 # 80

Slavick, Jeff Broadcom

Comment Type T Comment Status A RS-FEC

The phrase "Compared to the non-interleaving case," is not very straightforward.

*SuggestedRemedy*

Change "Compared to the non-interleaving case, each RS-FEC encoder receives one out of every L message symbols. Otherwise the RS FEC encoder operates exactly the same as specified in 149.3.2.2.15." to "When L > 1 each RS-FEC encoder receives one out of every L message symbols from the superframe, otherwise the RS FEC encoder operates exactly the same as specified in 149.3.2.2.15."

Response Response Status C

ACCEPT.



CI 149 SC 149.3.2.2.16 P97 L25 # 127

Nicholl, Shawn

Xilinx

Comment Type E Comment Status A RS-FEC

The sentence "The L encoded RS-FEC frames are recombined into an interleaved RS-FEC superframe" and onward talk about functions that happen after RS encoder. I think this text should be in its own section located after RS encoder.

*SuggestedRemedy*

Propose to add a new sub-clause "RS-FEC Recombine" before "149.3.2.2.17 PCS Scrambler". In the new sub-clause put the text "The L encoded RS-FEC frames are recombined ..." and all that follows it, currently found in 149.3.2.2.16

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.16 P97 L49 # 79

Slavick, Jeff

Broadcom

Comment Type TR Comment Status R RS-FEC

In Figure 149-10 the message symbols in and out for RS Encoder #L begins and ends with m325 instead of m326 for both in and out.

*SuggestedRemedy*

Change the m325 and m324 for both the input and output side of RS ENCODER #L to be m326 and m325

Response Response Status W

REJECT.

The current index values are correct as it would be M326xL-L = M325xL.

CI 149 SC 149.3.2.2.17 P98 L3 # 128

Nicholl, Shawn

Xilinx

Comment Type E Comment Status A PCS

The sub-clause talks about the payload of the PCS PHY frame without having yet defined a PCS PHY frame or what constitutes its payload. The sub-clause also mentions tx\_encoded<3599:0> but it is not found anywhere else in the document.

*SuggestedRemedy*

Propose to add tx\_encoded<3599:0> to the output of RS-FEC(360,326) encoder in sub-clause 149.3.2.2.16. Propose to define the term tx\_encoded<3599:0> somewhere after the text "The L encoded RS-FEC frames are recombined into an interleaved RS-FEC superframe". However, it's really "L x tx\_encoded<3599:0>" at that point!

Response Response Status C

ACCEPT IN PRINCIPLE.

P98 L3 Change "The payload of the PCS PHY frame tx\_encoded<3599:0> is scrambled to tx\_scrambled<3599:0> with an additive scrambler. Two scrambler bits per symbol are generated from the side-stream scrambler"

To "The bits of the interleaved RS-FEC superframe are grouped into pairs, and each pair of bits, Dn[0] and Dn[1], is scrambled using an additive scrambler. For each pair of interleaved bits, two scrambler bits are generated from the side-stream scrambler."

CI 149 SC 149.3.2.2.21 P99 L30 # 217

McClellan, Brett

Marvell

Comment Type T Comment Status A EEE

"The PHY also transitions back to the normal operation mode if an error condition occurs. This error condition is defined as the detection of any characters other than LPI or IDLE at the XGMII."  
this statement is redundant if wake is triggered by 'other than LP\_IDLE'

*SuggestedRemedy*

delete "The PHY also transitions back to the normal operation mode if an error condition occurs. This error condition is defined as the detection of any characters other than LPI or IDLE at the XGMII."

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.2.21 P99 L33 # 218  
 McClellan, Brett Marvell  
 Comment Type E Comment Status A EZ  
 "After the alert signal," is unclear  
 SuggestedRemedy  
 change "After the alert signal," to "After transmitting the alert signal,"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.21 P99 L36 # 219  
 McClellan, Brett Marvell  
 Comment Type E Comment Status A EZ  
 "Lpi\_wake\_time" is a variable and should not be capitalized  
 SuggestedRemedy  
 change "Lpi\_wake\_time" to "lpi\_wake\_time"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.21 P99 L41 # 220  
 McClellan, Brett Marvell  
 Comment Type TR Comment Status A EZ  
 "lpi\_wake\_timer" is not a defined variable. Is this supposed to be lpi\_tx\_wake\_timer?  
 SuggestedRemedy  
 change lpi\_wake\_timer to lpi\_tx\_wake\_timer  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.2.2.21 P99 L49 # 216  
 McClellan, Brett Marvell  
 Comment Type TR Comment Status A EEE  
 "When the last 64B/65B block of LPI characters is generated by the PCS transmit function,"  
 This statement is unclear and likely incorrect about when the sleep signal is triggered.

SuggestedRemedy  
 change this paragraph to:  
 "In the transmit direction the transition to the LPI transmit mode begins when the PCS transmit function detects an LPI control character in the last 64B/65B block of a Reed-Solomon frame. Following this event the PMA transmits the sleep signal starting at the beginning of the next superframe to indicate to the link partner that it is transitioning to the LPI transmit mode. The sleep signal is composed of eight Reed-Solomon frames that contain only LP\_IDLE 64B/65B blocks. Once initiated, the complete sleep signal consisting of 8 RS-FEC frames of LP\_IDLE shall be transmitted."

Response Response Status C  
 ACCEPT IN PRINCIPLE.

Change to: In the transmit direction, the transition to the LPI transmit mode begins when the PCS transmit function detects an LPI control character in the last 64B/65B block of a Reed-Solomon frame. Following this event, the PMA transmits the sleep signal starting at the beginning of the next superframe to indicate to the link partner that it is transitioning to the LPI transmit mode. The sleep signal is composed of eight Reed-Solomon frames that contain only LP\_IDLE 64B/65B blocks. Once initiated, the complete sleep signal consisting of 8 RS-FEC frames of LP\_IDLE shall be transmitted.

CI 149 SC 149.3.2.2.1 P99 L49 # 253

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status A EEE

"When the last 64B/65B block of LPI characters is generated by the PCS transmit function, the PHY ..." seems inconsistent with 149.1.3.3

*SuggestedRemedy*

Replace by:

When the PCS transmit function detects an LPI character in the last 64B/65B block of an RS frame, the PHY ...

Response Response Status C

ACCEPT IN PRINCIPLE.

Same resolution as comment 216

Change to: In the transmit direction, the transition to the LPI transmit mode begins when the PCS transmit function detects an LPI control character in the last 64B/65B block of a Reed-Solomon frame. Following this event, the PMA transmits the sleep signal starting at the beginning of the next superframe to indicate to the link partner that it is transitioning to the LPI transmit mode. The sleep signal is composed of eight Reed-Solomon frames that contain only LP\_IDLE 64B/65B blocks. Once initiated, the complete sleep signal consisting of 8 RS-FEC frames of LP\_IDLE shall be transmitted.

CI 149 SC 149.3.2.3 P101 L18 # 221

McClellan, Brett

Marvell

Comment Type T Comment Status A PCS

block\_lock flag de-assertion is described for data mode, but re-assertion is not described.

*SuggestedRemedy*

insert "The block\_lock flag is re-asserted upon detection of a valid RS-FEC frame."

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.3 P101 L27 # 222

McClellan, Brett

Marvell

Comment Type E Comment Status A PCS

"The PMA training frame includes 1 bit pattern every 450 PAM2 symbols, which is aligned with the PCS partial PHY frame boundary" is unclear

*SuggestedRemedy*

change to "The PMA training frame includes an alignment bit every 450 PAM2 symbols, which is aligned with the PCS partial PHY frame boundary"

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.3 P101 L31 # 223

McClellan, Brett

Marvell

Comment Type TR Comment Status A EEE

"PHYs with the EEE capability support transition to the LPI mode when the PHY has successfully completed training and pcs\_data\_mode is TRUE."  
46.1.7 states that LPI will not be asserted until one second after link is up.

*SuggestedRemedy*

change text to "PHYs with the EEE capability support transition to the LPI mode when the PHY has successfully completed training and pcs\_data\_mode is TRUE and subject to the timing requirement of 46.1.7."

Response Response Status C

ACCEPT.

CI 149 SC 149.3.2.3 P118 L23 # 173

Regev, Alon

Keysight Technologies

Comment Type TR Comment Status A EEE

In figure 149-19, the counter lpi\_rwx\_err\_cnt is used which was not previously defined.

*SuggestedRemedy*

In section 149.3.7.2.5 (Counters) add the following definition for lpi\_rwx\_err\_cnt:  
"lpi\_rwx\_err\_cnt  
An integer value that counts the number of receive wake on error conditions.  
lpi\_rwx\_err\_cnt is reset to zero during PCS\_TEST. The counter is reflected in register 3.22 (see 45.2.3.12)."

Response Response Status W

ACCEPT IN PRINCIPLE.

In section 149.3.7.2.5 (Counters) add the following definition for lpi\_rwx\_err\_cnt:  
"lpi\_rwx\_err\_cnt  
An integer value that counts the number of receive wake time faults. lpi\_rwx\_err\_cnt is reset to zero during PCS\_TEST. The counter is reflected in register 3.22 (see 45.2.3.12)."

CI 149 SC 149.3.2.3.3 P102 L12 # 129

Nicholl, Shawn

Xilinx

Comment Type E Comment Status A Interleaver

Sub-clause 149.3.2.3 PCS Receive function is missing section that describe the following:  
 - de-construction of the unscrambled Rx stream into pieces for each RS-FEC decoder  
 - RS-FEC decoder  
 - round robin de-interleaving

SuggestedRemedy

Propose to add sub-clauses before "149.3.2.3.3 Invalid blocks" that are akin to sub-clauses in the Tx direction, but in the opposite order.  
 - Rx De-construction (akin to Tx Recombine)  
 - Rx RS-FEC decoder (akin to Tx FEC encoder)  
 - Rx De-interleaving (akin to Tx Superframe and round robin interleaving)

Response Response Status C

ACCEPT IN PRINCIPLE.

Change the text in 149.3.2.3 as shown in zimmerman\_3ch\_02\_0719.pdf.

Change fig 149-6:

change the block name "RS-FEC (360,326) encoder" to "Interleaver and RS-FEC (360,326) encoder"

change the encoded block after the encoder to show the L interleaved encoded blocks

change the RS-FEC frame at the end to an RS-FEC superframe showing L x 1800 symbols

Editor to add note to Figure that the case shown is L=1.

and change fig 149-7:

change the output of frame sync from an RS-FEC frame to an RS-FEC superframe showing L x 1800 symbols

change the block name "RS-FEC decoder to "De-interleaver and RS-FEC decoder"

change the RS-FEC Decoded frame to show the L interleaved encoded blocks

Editor to add note to Figure that the case shown is L=1.

CI 149 SC 149.3.5 P103 L31 # 54

Wienckowski, Natalie

General Motors

Comment Type E Comment Status A EZ

typo

SuggestedRemedy

Change: among raining frame  
 To: among training frame

Response Response Status C

ACCEPT.

CI 149 SC 149.3.5 P103 L31 # 115

Dudek, Mike

Marvell

Comment Type E Comment Status A EZ

typo

SuggestedRemedy

change "raining" into training"

Response Response Status C

ACCEPT.

CI 149 SC 149.3.5 P103 L31 # 233

McClellan, Brett

Marvell

Comment Type E Comment Status A EZ

typo

SuggestedRemedy

change "raining" to "training"

Response Response Status C

ACCEPT.

CI 149 SC 149.3.5 P103 L31 # 254

den Besten, Gerrit

NXP Semiconductors

Comment Type E Comment Status A EZ

typo: raining

SuggestedRemedy

Replace by: training

Response Response Status C

ACCEPT.

CI 149 SC 149.3.5 P103 L32 # 25  
 Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ  
 "are shown in 149-12" should be "are shown in Figure 149-12"  
 SuggestedRemedy  
 Change the cross-reference format to "FigureNumber"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.5 P103 L48 # 55  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 Subject verb agreement  
 SuggestedRemedy  
 Change: The first 96 bits of the 16th partial PHY frame is  
 To: The first 96 bits of the 16th partial PHY frame are  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.5 P103 L48 # 255  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type E Comment Status A EZ  
 typo: (bits of) PHY frame is  
 SuggestedRemedy  
 Replace by: (bits of) PHY frame are  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.6 P106 L26 # 256  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type T Comment Status A EEE  
 "do not overlap" is not really correct, because the alignment of the link partners is allowed to be non-perfect.  
 SuggestedRemedy  
 Replace by "can only have a small overlap"  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Replace by "may overlap"

CI 149 SC 149.3.6.1 P105 L45 # 84  
 Maguire, Valerie The Siemon Company  
 Comment Type E Comment Status A EZ  
 Use preferred terminology for mandatory criteria.  
 SuggestedRemedy  
 Replace, "EEE-capable PHYs must synchronize" with, "EEE-capable PHYs shall synchronize" and adjust PICS, if necessary.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.7.2.1 P108 L4 # 282  
 Souvignier, Tom Broadcom  
 Comment Type TR Comment Status A RS-FEC  
 RFER\_CNT\_LIMIT and RFRX\_CNT\_LIMIT are not defined  
 SuggestedRemedy  
 See page 2 of "tu\_3ch\_03\_0719.pdf".  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Grant editorial license to format the definitions correctly.

CI 149 SC 149.3.7.2.2 P109 L22 # 174  
 Regev, Alon Keysight Technologies  
 Comment Type TR Comment Status A EZ  
 "rs-fec\_frame\_done" should be "rs\_fec\_frame\_done"  
 SuggestedRemedy  
 change "rs-fec\_frame\_done" to "rs\_fec\_frame\_done"  
 Response Response Status W  
 ACCEPT.

CI 149 SC 149.3.8.2 P113 L42 # 162  
 Law, David Hewlett Packard Enterprise  
 Comment Type E Comment Status A EZ  
 Change the text '... time RFER\_BAD\_RF of the ...' to read '... time the RFER\_BAD\_RF state of the ...'.  
 SuggestedRemedy  
 See comment.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.8.2 P113 L46 # 163  
 Law, David Hewlett Packard Enterprise  
 Comment Type T Comment Status A RS-FEC  
 I'm struggling to find the definition of the RFER\_CNT\_LIMIT and RFRX\_CNT\_LIMIT.  
 SuggestedRemedy  
 Please add a cross-reference to where RFER\_CNT\_LIMIT and RFRX\_CNT\_LIMIT are defined.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Comment 282 adds these definitions.  
 A cross reference should not be needed as these definitions will be a few pages before the state diagram with the other variables.

CI 149 SC 149.3.8.2 P114 L3 # 164  
 Law, David Hewlett Packard Enterprise  
 Comment Type T Comment Status A EZ  
 Subclause 149.3.7.2.2 'Variables' defines pcs\_reset as a Boolean variable with no further definition of the values, which I understand to mean that the two possible values default to true and false. This seems to be confirmed in subclause 149.3.2.1 'PCS Reset function' which states that ' PCS Reset sets pcs\_reset = TRUE while any of the above ...' and its use in the PCS 64B/65B Transmit and receive State diagrams where the open arrow entry is based on ' pcs\_reset + ..'. Based on its use in the open arrow entry to the RFER\_MT\_INIT state in Figure 149-15 'RFER monitor state diagram' needs to be changed from 'pcs\_reset = ON + ...' to 'pcs\_reset + ...'.  
 SuggestedRemedy  
 Change 'pcs\_reset = ON + ...'. to read 'pcs\_reset + ...'.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.8.2 P114 L48 # 165  
 Law, David Hewlett Packard Enterprise  
 Comment Type T Comment Status A RS-FEC  
 There is no transition condition on the transition from the INC\_CNT2 state to the HI\_RFER state in Figure 149-15 'RFER monitor state diagram'.  
 SuggestedRemedy  
 Add a transition condition on the transition from the INC\_CNT2 state to the HI\_RFER state.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Add "UCT" transition condition.

CI 149 SC 149.3.8.2 P115 L5 # 166  
 Law, David Hewlett Packard Enterprise  
 Comment Type E Comment Status A EZ  
 Please vertically and horizontally centre align all state names.  
 SuggestedRemedy  
 See comment.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.8.2 P115 L20 # 102

Lo, William Axonne Inc.

Comment Type TR Comment Status D EEE

Technically this is really clause 149.3.7.3 but for some reason the state diagrams appears after clause 149.3.8.2.

Figure 149-16 (page 115) has 3 L transitions into Figure 149-17 (Page 116).

There is a corner case that makes things behave a little ugly that people may implement slight differently depending on interpretation. This change avoids the corner case.

Scenario:

T\_TYPE(tx\_raw) initially = LI at exactly a time lp\_low\_snr = true.

When this happens the state machine transitions into TX\_L but does absolutely nothing and then immediately transitions into TX\_WM state.

The intent here is to exit LPI when SNR is low.

But why enter LPI in the first place when the PHY already knows SNR is low.

Suggest remedy is to prevent entering Figure 149-17 when the PHY already knows that SNR is low.

#### SuggestedRemedy

Page 115 Figure 149-16.

Change the 3 T\_TYPE(tx\_raw) = LI to

(T\_TYPE(tx\_raw) = LI) \* !lp\_low\_snr

Proposed Response Response Status C

REJECT.

This comment was WITHDRAWN by the commenter.

CI 149 SC 149.3.8.2 P116 L13 # 103

Lo, William Axonne Inc.

Comment Type TR Comment Status A PCS

Technically this is really clause 149.3.7.3 but for some reason the state diagrams appears after clause 149.3.8.2.

The tx\_lpi\_req variable gets stuck true if LPI is presented on XGMII for less than a full RS frame time and then goes to something that is not LPI. This will cause Figures 149-16 and 149-20 to get out of sync.

Scenario:

XGMII indicates LPI which causes

T\_TYPE(tx\_raw) = LI, enter TX\_L state (page 116)

XGMII stops sending LPI before end of RS frame which causes

T\_TYPE(tx\_raw) = (C+D+E+S+T), enter TX\_WN state but tx\_lpi\_req never gets set to false because tx\_alert\_start\_next is never set true.

Since RS frame is not complete (rs\_fec\_frame\_done is not asserted page 119)

tx\_lpi\_active remains false hence state machine moves from TX\_WN to TX\_C state.

Meanwhile with tx\_lpi\_req stuck at true, rs\_fec\_frame\_done will trigger eventually and we move to SEND\_SLEEP state and then onto SEND\_QR state (page 119).

We are stuck there forever since tx\_lpi\_req is stuck at true.

Hence the EEE transmit state diagram (page 119) is out of sync with the PCS 64/65B transmit state diagram (page 115).

Remedy is to delay transition into TX\_WN until tx\_lpi\_active is true to keep the 2 state diagrams in sync.

#### SuggestedRemedy

Page 116 Figure 149-17.

Change

lp\_low\_snr + T\_TYPE(tx\_raw) = (C + D + E + S + T)

to

(lp\_low\_snr + T\_TYPE(tx\_raw) = (C + D + E + S + T)) \* tx\_lpi\_active

Response Response Status C

ACCEPT.

CI 149 SC 149.3.8.2 P117 L28 # 167

Law, David Hewlett Packard Enterprise

Comment Type E Comment Status A EZ

Suggest that a font be used for the each symbols in the state diagram to ease any future maintenance on the state diagram.

*SuggestedRemedy*

Suggest that the two instances of the symbol '=' in symbol font be changed to Airal font. They are used in 'R\_TYPE\_NEXT = ...' in the transition from RX\_D to RX\_E and the transition from RX\_E to RX\_E.

Response Response Status C

ACCEPT.

CI 149 SC 149.3.8.2 P117 L41 # 168

Law, David Hewlett Packard Enterprise

Comment Type E Comment Status A EZ

Typo.

*SuggestedRemedy*

Suggests that 'R\_TYPE(rx\_coded)= S' be changed to read 'R\_TYPE(rx\_coded) = S' (add a space between "=" and '=' on the transition from the RX\_T to RX\_D states.

Response Response Status C

ACCEPT.

CI 149 SC 149.3.8.2 P118 L7 # 156

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status A EZ

The LP\_BLOCK\_R constant assigned to rx\_raw in the RX\_L state isn't defined in subclause 149.3.7.2.1 'Constants', there is however a LPBLOCK\_R constant defined in subclause 149.3.7.2. that isn't used.

*SuggestedRemedy*

Either change LP\_BLOCK\_R in the RX\_L state to LPBLOCK\_R, or change LPBLOCK\_R in subclause 149.3.7.2.1 to LP\_BLOCK\_R.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change LPBLOCK\_R in subclause 149.3.7.2.1 to LP\_BLOCK\_R.

CI 149 SC 149.3.8.2 P118 L13 # 157

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status A EZ

The I\_BLOCK\_R constant assigned to rx\_raw in the RX\_W state isn't defined in subclause 149.3.7.2.1 'Constants', there is however an IBLOCK\_R constant defined in subclause 149.3.7.2. that isn't used.

*SuggestedRemedy*

Either change I\_BLOCK\_R in the RX\_R state to IBLOCK\_R, or change IBLOCK\_R in subclause 149.3.7.2.1 to I\_BLOCK\_R.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change IBLOCK\_R in subclause 149.3.7.2.1 to I\_BLOCK\_R.

CI 149 SC 149.3.8.2 P118 L19 # 158

Law, David Hewlett Packard Enterprise

Comment Type E Comment Status A EZ

Typo.

*SuggestedRemedy*

Suggests that 'R\_TYPE(rx\_coded)=I' be changed to read 'R\_TYPE(rx\_coded) = I' (add a space before and after the '=') on both exit conditions from the RX\_W state.

Response Response Status C

ACCEPT.

CI 149 SC 149.3.8.2 P118 L23 # 159

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status A EEE

The lpi\_rwx\_err\_cnt counter incremented in the RX\_WE state of Figure 149-19 'PCS 64B/65B Receive state diagram, part b' is not defined or used anywhere.

*SuggestedRemedy*

Define the lpi\_rwx\_err\_cnt counter and it's use, or delete from the RX\_WE state.

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement solution to comment #173.

In section 149.3.7.2.5 (Counters) add the following definition for lpi\_rwx\_err\_cnt:

"lpi\_rwx\_err\_cnt

An integer value that counts the number of receive wake time faults. lpi\_rwx\_err\_cnt is reset to zero during PCS\_TEST. The counter is reflected in register 3.22 (see 45.2.3.12)."



CI 149 SC 149.3.8.2 P119 L20 # 161  
 Law, David Hewlett Packard Enterprise  
 Comment Type E Comment Status A EZ  
 Delete the spurious AND symbol from the end of the equation for the transition from SEND\_SLEEP to SEND\_QR.  
 SuggestedRemedy  
 Change the text '... \* tx\_lpi\_req\*'. to read ' \* tx\_lpi\_req'.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.1 P121 L2 # 57  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 poor alignment of lines in figure  
 SuggestedRemedy  
 Adjust lines/boxes in figure 149-21 so they are properly aligned and there don't appear to be different line widths.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9 P120 L20 # 194  
 Brandt, David Rockwell Automation  
 Comment Type E Comment Status A EZ  
 Missing space  
 SuggestedRemedy  
 Change: "OAM10-bit"  
 To: "OAM 10-bit"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.1 P121 L38 # 56  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 typo  
 SuggestedRemedy  
 Change: full OAM frame can packed into 8 super frames  
 To: full OAM frame can be packed into 8 super frames  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9 P120 L23 # 58  
 Wienckowski, Natalie General Motors  
 Comment Type T Comment Status A EZ  
 unclear terminology used  
 SuggestedRemedy  
 Change: exchange, at a minimum, the link partner health status.  
 To: exchange, at a minimum, the link partner OAM status.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.1 P121 L38 # 106  
 Lo, William Axonne Inc.  
 Comment Type E Comment Status A EZ  
 Grammar  
 SuggestedRemedy  
 Change "can packed into" to "can be packed into"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.1 P121 L52 # 258  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type E Comment Status A EZ  
 typo: symbol  
 SuggestedRemedy  
 replace by: symbols  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.1 P121 L52 # 257  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type E Comment Status A EZ  
 typo: symbol  
 SuggestedRemedy  
 replace by: symbols  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.1 P122 L13 # 134  
 Grau, Olaf Robert Bosch GmbH  
 Comment Type E Comment Status A EZ  
 Bold OAM Bitfield delimiter  
 SuggestedRemedy  
 Only Bold delimiter for a OAM Superframe field  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.1 P122 L28 # 107  
 Lo, William Axonne Inc.  
 Comment Type TR Comment Status A EZ  
 OAM field no longer has parity  
 SuggestedRemedy  
 Delete the clause  
 " and the symbol parity will not change"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.13 P125 L6 # 288  
 Tu, Mike Broadcom  
 Comment Type T Comment Status A PCS  
 Figure 149-23 shows a multiplier associated with coefficient A<sub>2</sub>. This is mathematically incorrect (although A<sub>2</sub>=1 based on Equation 149-8). It can only cause confusions and mis-interpretations in the future when people look at this figure.  
 SuggestedRemedy  
 In figure 149-23, remove the multiplier next to A<sub>2</sub>, and replace the arrowed line into that multiplier with a straight line connecting to the output of that multiplier. Also replace the text "A<sub>2</sub>" with "A<sub>2</sub>=1".

Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.13 P125 L38 # 59  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 poor wording  
 SuggestedRemedy  
 Change: is required only when the EEE is implemented.  
 To: is required only when EEE is implemented.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.3.9.2.14 P125 L42 # 135  
 Grau, Olaf Robert Bosch GmbH  
 Comment Type E Comment Status A OAM  
 Headline: BASE-T1 OAM Frame Acceptance Criteria: Which Speedgrade is mentioned here ?  
 SuggestedRemedy  
 MultiGBASE-T1 OAM Frame Acceptance Criteria  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change: BASE-T1 OAM Frame Acceptance Criteria  
 To: MultiGBASE-T1 OAM Frame Acceptance Criteria

CI 149 SC 149.3.9.3 P128 L1 # 195

Brandt, David Rockwell Automation  
 Comment Type E Comment Status A OAM

Should this refer to the "State Variables to OAM Register Mapping" that were edited in Clause 97 to be BASE-T1? Why do they need to appear twice?

*SuggestedRemedy*

Refer to the modified Clause 97 Table 97-6 for the BASE-T1 mappings and then define the additional mappings for MultiGBASE-T1.

Response Response Status C

ACCEPT IN PRINCIPLE.

P127 L38

Change: Table 149-9 describes the MDIO register to the state diagrams variable mapping.

To: Table 97-6 and Table 149-9 describe the MDIO register to the state diagrams variable mapping.

P128 L6

Delete rows from "BASE-T1 OAM Message Valid" through "Link Partner BASE-T1 OAM Message 7".

Delete rows for 3.2318.7 through 3.2318.0 and 3.2319.15 through 3.23.19.0.

Add 3 rows (each cell in row is on a separate line due to width restriction of database

row 1, before MultiGBASE-T1 OAM status Message 9:

MultiGBASE-T1 OAM status Message 10  
 MultiGBASE-T1 OAM status register  
 3.2318.7:0  
 mr\_tx\_message[71:64]

row 2, after MultiGBASE-T1 OAM status Message 9:

MultiGBASE-T1 OAM status Message 12  
 MultiGBASE-T1 OAM status register  
 3.2319.7:0  
 mr\_tx\_message[95:88]

row 3, after row 2 above:

MultiGBASE-T1 OAM status Message 11  
 MultiGBASE-T1 OAM status register  
 3.2318.15:8  
 mr\_tx\_message[87:80]

CI 149 SC 149.3.9.4.6 P136 L26 # 270

Tu, Mike Broadcom  
 Comment Type T Comment Status A OAM

In Figure 149-24, the OAM receive state diagram, the entry condition into state "LOAD\_RECEIVE\_PAYLOAD" may cause an erroneous corner case.

*SuggestedRemedy*

See page 4 of "tu\_3ch\_05\_0719.pdf".

Response Response Status C

ACCEPT.

CI 149 SC 149.4.2.1 P139 L16 # 60

Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ

misspelled word, sall -> shall

*SuggestedRemedy*

Change: The MultiGBASE-T1 PMA sall take no longer  
 To: The MultiGBASE-T1 PMA shall take no longer

Response Response Status C

ACCEPT.

CI 149 SC 149.4.2.1 P139 L16 # 172

Regev, Alon Keysight Technologies  
 Comment Type TR Comment Status A EZ

"shall" is misspelled as "sall"

*SuggestedRemedy*

change "sall" to "shall"

Response Response Status W

ACCEPT.

CI 149 SC 149.4.2.1 P139 L16 # 262  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type E Comment Status A EZ  
 typo: sall  
 SuggestedRemedy  
 Replace by: shall  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.1 P139 L16 # 108  
 Lo, William Axonne Inc.  
 Comment Type ER Comment Status A EZ  
 Typo  
 SuggestedRemedy  
 Change "sall" to "shall"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.2 P139 L32 # 61  
 Wienckowski, Natalie General Motors  
 Comment Type T Comment Status A EZ  
 The clock jitter requirements are in 149.5.2.3, not 149.5.2.2.  
 SuggestedRemedy  
 Change: while meeting the transmit jitter requirements of 149.5.2.2.  
 To: while meeting the transmit jitter requirements of 149.5.2.3.  
 Make the same change on line 36.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.3 P139 L48 # 26  
 Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ  
 In "less than 2x10-10" the "x" should be a multiply sign (Ctrl-q 0) and the minus sign should be an en-dash (Ctrl-q Shft-p).  
 Same issue in 149.11.4.3.3 item PMAR1  
 SuggestedRemedy  
 In "less than 2x10-10" change the "x" to a multiply sign (Ctrl-q 0) and change the minus sign to an en-dash (Ctrl-q Shft-p).  
 Make the same changes in 149.11.4.3.3 item PMAR1  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.4.5 P141 L50 # 285

Farjadrad, Ramin Aquantia

Comment Type T Comment Status A Vendor info

[PHY Capability Bits]: PHY Vendors need to communicate vendor specific information between the two link partners. Most previous BASE-T standards provided such capability, but currently 802.3ch does not provide it.

SuggestedRemedy

Replace paragraph on page 141, line 50 with the following: The format of PHY capability bits is Oct10<0> = OAMen, Oct10<2:1> = InterleaverDepth, Oct10<4:3> = PrecodeSel, Oct10<5> = SlowWakeRequest, Oct10<6> = EEEen and Oct10<7> = VendorSpecificMessage. EEEen and OAMen indicate EEE and MultiGBASE-T1 OAM capability enable, respectively. The PHY shall indicate the sup-port of these two optional capabilities by setting the corresponding capability bits. When the VendorSpecificMessage bit is set to 1 then the remaining 23 bits of the MSG24 field is vendor specific data. Otherwise when VendorSpecificMessage=0, the remaining bits shall be reserved and set to 0.

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement the requested changes in Farjadrad\_3ch\_02a\_0719.pdf with editorial license to format, number, correct spelling etc. as needed to fit the draft.

Straw Poll - Chicago Rules

What do you think should be done with Comment 285?

- 1. Reject - 4
- 2. Use the available remaining bits (17) for Vendor Specific communication - 13
- 3. Define additional Capability bits and a new state machine to define how these are implemented for the Vendor Specific communication and how these work with the currently defined bits - 1

CI 149 SC 149.4.2.4.5 P142 L45 # 280

Souvignier, Tom Broadcom

Comment Type TR Comment Status A Precoder

In D2.0, the "Precoder requested" bit values are configured by user. The PHY simply reads in these register bit values and sends to the link partner via InfoField. It may be more robust to optionally allow the PHY to choose the precoder on-the-fly based on channel and noise conditions.

SuggestedRemedy

See page 5 of "tu\_3ch\_01\_0719.pdf".

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement the new registers and text, with editorial license, as defined in tu\_3ch\_01a\_0719.pdf.

Remove the shall on slide 4 in the register definitions.

CI 149 SC 149.4.2.4.7 P143 L6 # 109

Lo, William Axonne Inc.

Comment Type TR Comment Status A EZ

Typo in bit index

SuggestedRemedy

Change "Oct8<1:0>, Oct9<1:0>, Oct10<7:0>" to "Oct8<7:0>, Oct9<7:0>, Oct10<7:0>"

Response Response Status C

ACCEPT.

CI 149 SC 149.4.2.4.8 P143 L14 # 62

Wienckowski, Natalie General Motors

Comment Type E Comment Status A EZ

missing comma

SuggestedRemedy

Add comma after "Afterwards" in: Afterwards Oct4 through Oct10

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: "Afterwards Oct4 through Oct10 are used to compute the CRC16 with the switch connected, which is setting CRCgen in Figure 149-30." to: "After initialization, the switch is set to CRCgen, as shown in Figure 149-30, and Oct4 through Oct10 are used to compute the CRC16 output."

CI 149 SC 149.4.2.4.8 P143 L15 # 63  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 unnecessary article  
 SuggestedRemedy  
 Change: After all the 7 octets  
 To: After all 7 octets  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.4.10 P144 L25 # 64  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 repeated words  
 SuggestedRemedy  
 Change: PHY Control state diagram state diagram  
 To: PHY Control state diagram  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.5 P142 L25 # 286  
 Farjadrad, Ramin Aquantia  
 Comment Type T Comment Status R Vendor info  
 [PHY Capability Bits]: Table 149-12 to be replaced by two tables (149-12a & 149-12b) to demonstrate the change proposed, meaning to include a field to identify the VendorSpecificMessage mode. Also, group all Reserved bits in Octer8 and Octer 9 for more efficient grouping

SuggestedRemedy  
 In Table 149-12a (when VendorSpecificMessage=0)  
 Change Octer9<6> from SlowWakeReques to Reserved  
 Change Octer9<6> from SlowWakeReques to Reserved  
 Change Octer10<5> from Reserved to SlowWakeRequest  
 Change Octer10<6> from Reserved to EEEen  
 Change Octer10<7> from Reserved to VendorSpecificMessage=0  
  
 In Table 149-12b (when VendorSpecificMessage=1)  
 Change Octer8<7:0>, Octer9<7:0>, Octer10<6:0> to Vendor Specific Data  
 Change Octer10<7> VendorSpecificMessage=1

Response Response Status C  
 REJECT.  
  
 Based on the straw poll for comment 285, this comment is not needed as there won't be a second table.

CI 149 SC 149.4.2.5 P144 L42 # 65  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 Subject verb agreement  
 SuggestedRemedy  
 Change: and the Link  
 Monitor state machines begins monitoring  
 To: and the Link  
 Monitor state machine begins monitoring  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.6 P145 L19 # 111  
 Lo, William Axonne Inc.  
 Comment Type E Comment Status A EZ  
 Inconsistent Sn subscript style.  
 Lines 19, 20 does not subscript the n in Sn where everywhere else  
 the n is in subscript.  
 SuggestedRemedy  
 Subscript the n in Sn in lines 19 and 20  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.6 P145 L20 # 110  
 Lo, William Axonne Inc.  
 Comment Type TR Comment Status A EZ  
 Missing subscript  
 SuggestedRemedy  
 Change S[7:0] to Sn[7:0]  
 Note that the n in Sn should be subscripted.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.2.8 P149 L11 # 263  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type E Comment Status A EZ  
 RS FER is called RFER at other places in the spec  
 SuggestedRemedy  
 Replace RS FER by RFER  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.3.1 P149 L27 # 66  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 It appears that in hT(t), "h" and "(t)" are superscripts and "T" is a subscript.  
 SuggestedRemedy  
 Change "h" and "(t)" to normal with "T" as a subscript.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.4.1 P150 L32 # 68  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 Missing return  
 SuggestedRemedy  
 Move "OK:..." to be on the line after "Values:  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.4.1 P150 L38 # 69  
 Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ  
 Missing return  
 SuggestedRemedy  
 Move "OK:..." to be on the line after "Values:  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.4.1 P150 L43 # 27  
 Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ  
 "pcs\_data\_mode" should not be split across two lines  
 SuggestedRemedy  
 Prevent "pcs\_data\_mode" from being split across lines.  
 (Click somewhere within "pcs\_data\_mode" and type Esc n s)  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.4.4.1 P150 L44 # 160

Law, David Hewlett Packard Enterprise

Comment Type E Comment Status A EZ

Typo, 'PCSDATAMODE.indicate' should read 'PCSDATAMODE.indication', see IEEE Std 802.3 subclause 1.2.2.1 'Classification of service primitives'.

*SuggestedRemedy*

See comment.

Response Response Status C

ACCEPT.

CI 149 SC 149.4.4.1 P151 L7 # 112

Lo, William Axonne Inc.

Comment Type TR Comment Status A EZ

The watchdog function is removed from the state diagrams.  
There is no longer a need for the watchdog variable.

*SuggestedRemedy*

Remove the entire paragraph on PMA\_watchdog\_status

Response Response Status C

ACCEPT.

CI 149 SC 149.4.4.1 P151 L25 # 67

Wienckowski, Natalie General Motors

Comment Type E Comment Status A EZ

Missing return

*SuggestedRemedy*

Move "OK:..." to be on the line after "Values:

Response Response Status C

ACCEPT.

CI 149 SC 149.4.4.2 P151 L41 # 113

Lo, William Axonne Inc.

Comment Type TR Comment Status A EZ

The maxwait timer was removed in previous drafts but all reference to this was not cleanly removed.

Side note: the maxwait\_timer functionality is actually in the autoneg and Link Synchronization state diagrams so it is redundant here.

*SuggestedRemedy*

Page 151 line 45 - Delete maxwait\_timer paragraph

Page 144 line 21 - Delete ", until maxwait\_timer expires"

Page 144 lines 24 to 27 - Delete paragraph

Page 153 line 13 - Delete INIT\_MAXWAIT\_TIMER state, delete UCT arrow and reconnect arrow from DISABLE\_TRANSMITTER to SILENT

Page 153 line 51 - Delete "stop maxwait\_timer" in box

Page 182 line 35 - Delete maxwait\_timer row

Response Response Status C

ACCEPT.

CI 149 SC 149.4.5 P154 L12 # 281

Souvignier, Tom Broadcom

Comment Type TR Comment Status A State Diagrams

There is a corner case in the Link Monitor state diagram (Figure 149-34) that may cause unnecessary delays in the startup process. This can be fixed by a simple change in the branch condition from the LINK\_DOWN state into the LINK\_UP state.

*SuggestedRemedy*

See page 4 of "tu\_3ch\_02\_0719.pdf".

Response Response Status W

ACCEPT IN PRINCIPLE.

In Figure 149-34, change the transition condition from LINK\_DOWN to LINK\_UP to be pcs\_data\_mode = true.

Also, change the transition condition from LINK\_UP to LINK\_DOWN to be loc\_rcvr\_status = NOT\_OK + PMA\_refresh\_status = FAIL

In Figure 149-33, in State PCS\_DATA, remove start minwait\_timer.



CI 149 SC 149.5.1 P155 L38 # 70

Wienckowski, Natalie

General Motors

Comment Type E

Comment Status R

EZ2

Add non-breaking space in the number per the IEEE-SA Style Manual.

*SuggestedRemedy*

Change: 175.78125 MHz.

To: 175.781 25 MHz.

Response

Response Status C

REJECT.

The current format is correct per 802.3 style for numbers.

CI 149 SC 149.5.1 P155 L40 # 39

Farjadrad, Ramin

Aquantia

Comment Type T

Comment Status A

Test Modes

[JITTER TEST MODE] The description of test mode 2 needs to be expanded to allow the multiple test patterns.

Comments tagged JITTER TEST MODE should be treated as a group.

*SuggestedRemedy*

Change the fourth paragraph of 149.5.1. to read:

Test mode 2 is for transmitter jitter testing on MDI when transmitter is in MASTER timing mode. When test mode 2 is enabled, the PHY shall transmit the pattern controlled by bits 1.2313.1:0, as shown in Table 149-15a, with the transmitted symbols timed from its local clock source

Insert Table 149-15a Jitter test modes after (new) fourth paragraph of 149.5.1 as follows:

Table 149-15a Jitter test modes

Bit 1.2313.1	Bit 1.2313.0	Test Pattern
0	0	Square wave: a continuous pattern of 16*S {+1} symbols followed by 16*S {-1} symbols
0	1	JP03A: a continuous pattern of JP03A (as specified in 94.2.9.1)
1	0	JP03B: a continuous pattern of JP03B (as specified in 94.2.9.2)
1	1	Reserved

Response

Response Status C

ACCEPT IN PRINCIPLE.

Comments 39, 40, 41, 117, 119, 120, 121, and 200 all change the text related to the transmitter linearity and jitter test modes.

Modify the text as defined in wienckowski\_3ch\_02e\_0719.pdf.

CI 149 SC 149.5.1 P155 L41 # 116

Dudek, Mike

Marvell

Comment Type T Comment Status R Test Modes

Further work on PAM4 systems after Clause 94 was completed decided that the JP03A and JP03B signals were too un-representative of normal traffic. Instead the PRBS13Q pattern is used for jitter testing. The dual dirac jitter specification methodology has also been replaced by a more direct measure of jitter at the probability relevant to the clause. (Called J?U where ? is the probability of interest) and the Jrms value. The test methodology is defined in Clause 120D.3.1.8.1

*SuggestedRemedy*

Replace the reference to JP03A and JP03B with a reference to PRBS13Q described in sub-clause 120.5.11.2.1 and change the references in 149.5.2.3.2 as well.

Response Response Status C

REJECT.

In the case of a bidirectional PHY with echo cancellation, the JP03A and JP03B signals are sufficient to check for even/odd jitter. The echo canceller has stricter requirements for other jitter found by the PRBS13Q sequence.

CI 149 SC 149.5.1 P155 L41 # 200

Dawe, Piers

Mellanox

Comment Type TR Comment Status A Test Modes

It's disappointing to see these very artificial test patterns from Clause 94 being brought back when we have moved on to better methods for PAM4 testing in Annex 120D and subsequent clauses such as 136.

*SuggestedRemedy*

Define jitter and linearity with PRBS13Q, following 120D.3.1.8 Output jitter and 120D.3.1.2 Transmitter linearity. Make JP03A and JP03B optional.

Response Response Status W

ACCEPT IN PRINCIPLE.

In the case of a bidirectional PHY with echo cancellation, the JP03A and JP03B signals are sufficient to check for even/odd jitter. The echo canceller has stricter requirements for other jitter found by the PRBS13Q sequence.

Comments 39, 40, 41, 117, 119, 120, 121, and 200 all change the text related to the transmitter linearity and jitter test modes.

Modify the text as defined in wienckowski\_3ch\_02e\_0719.pdf.

CI 149 SC 149.5.1 P155 L44 # 289

Tu, Mike

Broadcom

Comment Type T Comment Status A Test Modes

In test mode 3, the PCS generates continuous pattern of {0,3} symbols into the precoder. The precoder output is then mapped into PAM4. This paragraph should be rephrased to make it clear. The proposed change is based on discussions with George.

*SuggestedRemedy*

Change this paragraph to:

"Test mode 3 is for testing the precoder operation. When test mode 3 is enabled, the PCS shall generate a continuous pattern of {0, 3} symbols to be input to the transmit precoder specified in 149.3.2.2.19, to be precoded according to the Transmit precoder settings as determined by the value set in register 1.2309:10:9, or equivalent functionality if MDIO is not implemented, and transmitted by the PMA timed from its local clock source."

Response Response Status C

ACCEPT.

CI 149 SC 149.5.1 P155 L46 # 264

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status R Test Modes

"continues pattern of {-1,+1} symbols" The meaning of the word 'continuous' is not very clear. Is this referring to toggling pattern or something else?

*SuggestedRemedy*

If this is about a toggline pattern, say toggling instead of continuous. If otherwise, specify more specifically what was meant.

Response Response Status C

REJECT.

The current language is consistent with IEEE802.3 usage.

CI 149 SC 149.5.1 P155 L50 # 120

Sedarat, Hossein Ethernovia

Comment Type T Comment Status A Test Modes

The transmit linearity test, as defined in 149.5.2.2, requires 2 test patterns: a low frequency short pattern to measure the accuracy of the PAM4 levels, and a high-frequency and long PRBS pattern to measure the transmit SNDR. Test mode 4 does not provide a provision to transmit 2 test patterns. Since the nonlinearity of the transmitter can be measured with respect to the ideal PAM4 levels, the short test pattern may not offer additional value. Also, the long high-frequency pattern of QPRBS13, as defined in 94.2.12.7, is constructed in a peculiar way which may be more fitting for a 100G-KP4 transmitter. A simple PRBS13 as the test pattern is as effective, more efficient to implement and less prone to misinterpretation of the specifications in another standard.

*SuggestedRemedy*

Replace "... transmit linearity test pattern defined in 94.29.4" with "... PRBS13 test pattern as defined in equation 94-3 and figure 94-6". And in subclause 149.5.2.2, add the following to the end of first sentence: "using ideal PAM4 level of 1/3 for effective symbol levels of ES1 and ES2."

Response Response Status C

ACCEPT IN PRINCIPLE.

Comments 39, 40, 41, 117, 119, 120, 121, and 200 all change the text related to the transmitter linearity and jitter test modes.

Modify the text as defined in wienckowski\_3ch\_02e\_0719.pdf.

CI 149 SC 149.5.1 P155 L51 # 117

Dudek, Mike Marvell

Comment Type T Comment Status A Test Modes

Further work on PAM4 systems after Clause 94 was completed decided that the transmitter linearity test pattern is too un-representative of normal traffic. Instead the PRBS13Q pattern is used for linearity testing. The test methodology is defined in Clause 120D.3.1.2

*SuggestedRemedy*

Replace the reference to the transmitter linearity test pattern with a reference to PRBS13Q described in sub-clause 120.5.11.2.1

Response Response Status C

ACCEPT IN PRINCIPLE.

Comments 39, 40, 41, 117, 119, 120, 121, and 200 all change the text related to the transmitter linearity and jitter test modes.

Modify the text as defined in wienckowski\_3ch\_02e\_0719.pdf.

CI 149 SC 149.5.1.1 P156 L19 # 208

Dawe, Piers Mellanox

Comment Type TR Comment Status A Test Modes

"1.2.6 Accuracy and resolution of numerical quantities  
Unless otherwise stated, numerical limits in this standard are to be taken as exact, with the number of significant digits and trailing zeros having no significance." Stating otherwise makes life more complicated, and an attempt to enforce test equipment spec is out of scope. Implementers and testers can sort out their measurement accuracy for themselves.

*SuggestedRemedy*

Delete "The tolerance of resistors shall be +/- 0.1%."

Response Response Status W

ACCEPT IN PRINCIPLE.

P156 L19

Delete: The tolerance of resistors shall be +/- 0.1%.

P157 L35

Add to end of current paragraph: Transmitter electrical tests are specified with a load tolerance of ± 0.1%.

CI 149 SC 149.5.1.1 P156 L19 # 201

Dawe, Piers Mellanox

Comment Type TR Comment Status A Test Modes

Not a test spec

*SuggestedRemedy*

Change "shall be used" to "are defined for"

Response Response Status W

ACCEPT.

**CI 149**    **SC 149.5.1.1**                      **P156**                      **L33**                      # 118

Dudek, Mike                                      Marvell

**Comment Type**    **TR**                      **Comment Status**    **A**                      **Test Modes**

1pF is only 50 Ohm at 3GHz. This probe will significantly degrade the performance of the signal

**SuggestedRemedy**  
Delete Figure 149-36 and use Figure 149-38 for these tests.

**Response**                      **Response Status**    **W**

ACCEPT IN PRINCIPLE.

The text above the figure states that "equivalent" fixtures can be used. We will remove the specifics of the probe and leave it up to the implementer to choose the correct probe.

Modify Figure 149-36 and delete "with resistance > 10 kOhm and capacitance < 1 pF"

**CI 149**    **SC 149.5.2**                      **P157**                      **L31**                      # 202

Dawe, Piers                                      Mellanox

**Comment Type**    **TR**                      **Comment Status**    **A**                      **Test Modes**

I don't know what you mean by "The PMA shall operate with AC-coupling to the MDI". Are you saying the transmitter is AC coupled? The receiver? Both? Or that AC coupling is provided to the PMA by something else?

**SuggestedRemedy**  
This text (as modified for this situation) might be useful:  
86A.4.1 nPPI host to module electrical specifications  
The module electrical input shall be AC-coupled, i.e., it shall present a high DC common-mode impedance at TP1. There may be various methods for AC-coupling in actual implementations.

**Response**                      **Response Status**    **W**

ACCEPT IN PRINCIPLE.

From: The PMA shall operate with AC-coupling to the MDI.

To: The electrical input shall be AC-coupled, i.e., it shall present a high DC common-mode impedance at the MDI. There may be various methods for AC-coupling in actual implementations.

**CI 149**    **SC 149.5.2.2**                      **P157**                      **L46**                      # 119

Dudek, Mike                                      Marvell

**Comment Type**    **T**                      **Comment Status**    **A**                      **Test Modes**

Further work on PAM4 systems after Clause 94 was completed improved the methodology for measuring SNDR. The test methodology is defined in Clause 120D.3.1.6. Note also that the existing reference to Clause 94 required a test pattern QPRBS13 which was not listed as a test pattern.

**SuggestedRemedy**  
Replace the test methodology with that from 120D.3.1.6.

**Response**                      **Response Status**    **C**

ACCEPT IN PRINCIPLE.

Comments 39, 40, 41, 117, 119, 120, 121, and 200 all change the text related to the transmitter linearity and jitter test modes.

Modify the text as defined in wienckowski\_3ch\_02e\_0719.pdf.

**CI 149**    **SC 149.5.2.2**                      **P157**                      **L46**                      # 121

Sedarat, Hossein                                      Ethernovia

**Comment Type**    **T**                      **Comment Status**    **A**                      **Test Modes**

A transmitter with an SNDR of 31 dB, as defined in 94.3.12.7, is a significant contributor to the input noise of the far-end receiver with considerable impact on operating margin and major reduction of the noise budget left for the receiver.

**SuggestedRemedy**  
Replace the sentence "The transmitter shall meet the SNDR distortion as specified in 94.3.12.7" with "The transmit SNDR, as defined in 94.3.12.7 shall be greater than 38 dB"

**Response**                      **Response Status**    **C**

ACCEPT IN PRINCIPLE.

Comments 39, 40, 41, 117, 119, 120, 121, and 200 all change the text related to the transmitter linearity and jitter test modes.

Modify the text as defined in wienckowski\_3ch\_02e\_0719.pdf.

CI 149 SC 149.5.2.3.1 P158 L16 # 40

Farjadrad, Ramin Aquantia

Comment Type T Comment Status A Test Modes

[JITTER TEST MODE] Random jitter test description needs to be modified to reflect that there are multiple test patterns available.

Comments tagged JITTER TEST MODE should be treated as a group.

*SuggestedRemedy*

Change first sentence of 149.5.2.3.1 From: In addition to jitter measurement for transmit clock, MDI jitter is measured when in test mode 2 and using test fixture 3 as shown in Figure 149-38.

To: In addition to jitter measurement for transmit clock, MDI jitter is measured when in test mode 2 with the square wave pattern (see Table 149-15a) and using test fixture 3 as shown in Figure 149-38.

Response Response Status C

ACCEPT IN PRINCIPLE.

Comments 39, 40, 41, 117, 119, 120, 121, and 200 all change the text related to the transmitter linearity and jitter test modes.

Modify the text as defined in wienckowski\_3ch\_02e\_0719.pdf.

CI 149 SC 149.5.2.3.2 P158 L26 # 41

Farjadrad, Ramin Aquantia

Comment Type T Comment Status A Test Modes

[JITTER TEST MODE] Deterministic jitter test description needs to be modified to reflect that there are multiple test patterns available.

Comments tagged JITTER TEST MODE should be treated as a group.

*SuggestedRemedy*

Change first sentence of 149.5.2.3.2 from: "Jitter measurements in this subclause are performed with the transmitter enabled in Master timing mode with a local clock."

To: "Jitter measurements in this subclause are performed with the transmitter enabled in Master timing mode in test mode 2, with either the JP03A or JP03B pattern, and timed with a local clock."

Response Response Status C

ACCEPT IN PRINCIPLE.

Comments 39, 40, 41, 117, 119, 120, 121, and 200 all change the text related to the transmitter linearity and jitter test modes.

Modify the text as defined in wienckowski\_3ch\_02e\_0719.pdf.

CI 149 SC 149.5.2.3.2 P158 L29 # 71

Wienckowski, Natalie General Motors

Comment Type E Comment Status A EZ

The word "Clause" doesn't belong before a subclause reference.

*SuggestedRemedy*

Change: Clause 94.3.12.6.1 to 94.3.12.6.1. Also, "1" should be made part of the "External reference".

Response Response Status C

ACCEPT.

CI 149 SC 149.5.2.3.2 P158 L29 # 28

Anslow, Pete

Ciena

Comment Type E Comment Status A EZ

"as specified in Clause 94.3.12.6.1" should be "as specified in 94.3.12.6.1" and the final "1" should be in forest green font.

On line 35 "as specified in Clause 94.3.12.6.2" should be "as specified in 94.3.12.6.2"

*SuggestedRemedy*

Change "as specified in Clause 94.3.12.6.1" to "as specified in 94.3.12.6.1" and apply the character tag External to the final "1".

On line 35 change "as specified in Clause 94.3.12.6.2" to "as specified in 94.3.12.6.2" .

Response Response Status C

ACCEPT.

CI 149 SC 149.5.2.3.2 P158 L35 # 72

Wienckowski, Natalie

General Motors

Comment Type E Comment Status A EZ

The word "Clause" doesn't belong before a subclause reference.

*SuggestedRemedy*

Change: Clause 94.3.12.6.2 to 94.3.12.6.2.

Response Response Status C

ACCEPT.

CI 149 SC 149.5.2.4 P158 L41 # 265

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status A PSD

The transmit power range was shifted from -1dB/+2dB to -1.5dB/+1.5dB based on concerns on the lower limit for 10Gbps operation. However this shift makes the upper limit unnecessarily more critical for lower speed operation.

*SuggestedRemedy*

Change the upper limit back to +2dB.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: the transmit power shall be in the range of -1.5 dBm to 1.5 dBm

To: the transmit power shall be in the range of -1 dBm to 2 dBm

CI 149 SC 149.5.2.4 P158 L42 # 73

Wienckowski, Natalie

General Motors

Comment Type E Comment Status A EZ

unnecessary article

*SuggestedRemedy*

Change: using the test fixture 4

To: using test fixture 4

Response Response Status C

ACCEPT.

CI 149 SC 149.5.3.1 P160 L11 # 186

Brandt, David

Rockwell Automation

Comment Type T Comment Status R Test Modes

I don't see where the frame error ratio comes from. If I assume this is actual MAC data with addresses and FCS, I get FER =  $1e-12 * (800 + 22) * 8 = 6.6e-9$ . I note that 149.5.3.2 does not add any MAC frame overhead.

*SuggestedRemedy*

Please check the math or describe better.

Response Response Status C

REJECT.

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

CI 149 SC 149.5.3.2 P160 L17 # 74

Wienckowski, Natalie

General Motors

Comment Type E Comment Status A EZ

Missing Oxford comma.

*SuggestedRemedy*

Change: Gaussian distribution, bandwidths and magnitudes

To: Gaussian distribution, bandwidths, and magnitudes

Response Response Status C

ACCEPT.

CI 149 SC 149.5.3.2 P160 L20 # 187

Brandt, David

Rockwell Automation

Comment Type T Comment Status R Test Modes

149.5.3.1 seem inconsistent. 149.5.3.1 has "frame error ratio", but wouldn't these frames crossing XGMII also be counted as 149.5.3.2 "frame loss ratio" when they get to the MAC? There should be no further correction after RS-FEC. Both use the same link segment specified in 149.7.

*SuggestedRemedy*

Consider whether the same terminology, packet sizes and measurement points can be used.

Response Response Status C

REJECT.

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

CI 149 SC 149.7.1.4 P164 L32 # 244

Zimmerman, George

ADI, APL Gp, Aquantia, BMW, Cisco, Commscope, S

Comment Type T Comment Status A EZ

"The coupling attenuation is tested... Additional coupling attenuation test methodologies..." seems contradictory - it implies that the annex contains other ways to test the coupling attenuation. I believe we are requiring that the cable pass testing according to the IEC spec, with the parameters specified in Annex 149A. (or else Annex 149A can't be normative)

*SuggestedRemedy*

Change "In order to limit the noise at the receiver as well as emissions, the MultiGBASE-T1 link segment shall meet the coupling attenuation values determined by using Equation (149-24). The coupling attenuation is tested as specified in IEC 62153-4-7 using triaxial tube in tube method. Additional coupling attenuation test methodologies are defined in Annex 149A."

to: "In order to limit the noise at the receiver as well as emissions, when tested using the IEC 62153-4-7 triaxial tube in tube method as specified in Annex 149A, the MultiGBASE-T1 link segment shall meet the coupling attenuation values determined by using Equation (149-24)."

Response Response Status C

ACCEPT.

CI 149 SC 149.8.2.1 P163 L20 # 249

den Besten, Gerrit

NXP Semiconductors

Comment Type TR Comment Status A MDI

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

*SuggestedRemedy*

Formula 12-10 $\log(f/3000)$  change into 10-10 $\log(f/3000S)$  for 300S<f<3000S  
Formula 12-20 $\log(f/3000)$  change into 10-20 $\log(f/3000S)$  for 3000S<f<Fmax

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement changes to Eq. 149-27 as shown on page 3 of DenBesten\_3ch\_03a\_0719.pdf with editorial license to format the equation correctly. In addition, update associated Figure 149-47 to reflect the updated equation.

CI 149 SC 149.8.2.1 P163 L23 # 248

den Besten, Gerrit

NXP Semiconductors

Comment Type T Comment Status D MDI

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

*SuggestedRemedy*

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

Proposed Response Response Status C

REJECT.

This comment was WITHDRAWN by the commenter.

CI 149 SC 149.8.2.1 P168 L1 # 268  
 Stewart, Heath Analog Devices  
 Comment Type TR Comment Status D MDI  
 Transmitter droop was specified considering a 2uH inductance per transmitter output (4uH total). Need to revise the low frequency MDI return loss mask to be in agreement with this value. Otherwise either specification undermines the relevance of the other.  
 SuggestedRemedy  
 See "stewart\_3ch\_01\_0719" Slide 13 and 16  
 Proposed Response Response Status C  
 REJECT.  
 This comment was WITHDRAWN by the commenter.

CI 149 SC 149.8.2.1 P168 L1 # 269  
 Stewart, Heath Analog Devices  
 Comment Type TR Comment Status A MDI  
 High frequency Return Loss was presented considering the best performance of power coupling inductors and MDI connectors. However, to provide additional protection to the PHY, allowance needs to be made for ESD clamping devices. Need to revise the high frequency mask to accommodate for additional capacitive loading due to these devices.  
 SuggestedRemedy  
 See "stewart\_3ch\_01\_0719" Slide 15 and 16  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Implement changes to Eq. 149-27 as shown on page 3 of DenBesten\_3ch\_03a\_0719.pdf with editorial license to format the equation correctly. In addition, update associated Figure 149-47 to reflect the updated equation.

CI 149 SC 149.8.2.1 P168 L2 # 290  
 Tu, Mike Broadcom  
 Comment Type T Comment Status A MDI  
 The MDI return loss specification as shown in Equation 149-27 is unnecessarily restrictive.  
 SuggestedRemedy  
 See the proposal on the last page of "vakilian\_3ch\_01\_0719.pdf".  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Implement changes to Eq. 149-27 as shown on page 3 of DenBesten\_3ch\_03a\_0719.pdf with editorial license to format the equation correctly. In addition, update associated Figure 149-47 to reflect the updated equation.

CI 149 SC 149.8.2.1 P168 L2 # 247  
 den Besten, Gerrit NXP Semiconductors  
 Comment Type TR Comment Status A MDI  
 There is currently only one MDI return loss template for all speeds. I think we should differentiate requirements for different speeds to allow looser spec for 2.5Gbps and 5Gbps. Otherwise these lower speeds will be overspecified. The easiest way to achieve this is by scaling all frequency values by S except for the 1MHz lower bound.  
 SuggestedRemedy  
 Change:  
 10 --> 10S  
 500 --> 500S  
 3000 --> 3000S  
 4000 --> Fmax  
 Remove:  
 For 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1, the maximum applicable frequency for the MDI return loss is 4000 x S MHz.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Implement changes to Eq. 149-27 as shown on page 3 of DenBesten\_3ch\_03a\_0719.pdf with editorial license to format the equation correctly. In addition, update associated Figure 149-47 to reflect the updated equation.



CI 149 SC 149.9.2.2 P169 L41 # 188  
 Brandt, David Rockwell Automation  
 Comment Type T Comment Status R EMC  
 This paragraph has 2 shalls that apply to entire products. The seems out of our scope.  
 SuggestedRemedy  
 Suggest the "shalls" be replaced with text in the spirit of the last sentence of the paragraph.  
 Change1st: "shall", To: "is expected be able to"  
 Change 2nd: "shall be tested", To: "is expected to allow products to be tested"  
 Delete: ES4 and ES5.  
 Response Response Status C  
 REJECT.  
 The devices are required to meet applicable laws. This is a shall in other Clauses.  
 The CISPR 25 test methods are required. It is the specific setup and limit lines that are user specific, not the test methods.

CI 149 SC 149.11.3 P172 L6 # 29  
 Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ  
 "AN" and "EEE" appear in the Status column in 149.11.4.1, so they should be "\*\*AN" and "\*\*EEE" (preceded by "\*\*")  
 SuggestedRemedy  
 Change "AN" and "EEE" to "\*\*AN" and "\*\*EEE"  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.1 P172 L28 # 30  
 Anslow, Pete Ciena  
 Comment Type T Comment Status A EZ  
 The PICS proforma tables in 149.11.4.1 do not have the appropriate entries in the "Support" column.  
 Same issue in every other subclause of the Clause 149 PICS and also the Annex 149A PICS  
 SuggestedRemedy  
 In 149.11.4.1, every other subclause of the Clause 149 PICS and also the Annex 149A PICS for items with status of:  
 "M" change the Support entry to "Yes []"  
 "O" change the Support entry to "Yes [] No []"  
 "Something:M" change the Support entry to "Yes [] N/A []"  
 "Something:O" change the Support entry to "Yes [] No [] N/A []"

Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.2.1 P174 L3 # 31  
 Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ  
 The entries in the subclause column on page 174 wrap across two lines  
 SuggestedRemedy  
 widen the subclause column so that the entries do not wrap across two lines.  
 Response Response Status C  
 ACCEPT.

CI 149 SC 149.11.4.4.3 P184 L6 # 205

Dawe, Piers

Mellanox

Comment Type TR Comment Status A PICS

149.11.4.4.3 Transmitter electrical specifications  
Item Feature Subclause Value/Comment Status Support  
TES1 AC-coupling to the MDI

*SuggestedRemedy*

Means? See another comment

Response Response Status W

ACCEPT IN PRINCIPLE.

PICS Editor to have editorial license to update to match draft.

Change TES1 Feature to "Coupling"  
Change TES1 Value/Comment to "Operate with AC coupling to the MDI"

Change TES2 Feature to "Resistive differential load"  
Change TES2 Value/Comment to "Meet electrical requirements of this clause with a 100 (ohm) resistive differential load connected to transmitter output if load is not specified"

CI 149 SC 149.A.2 P189 L18 # 130

Shariff, Masood

CommScope

Comment Type TR Comment Status A EZ

Incorrect statement. Alien Crosstalk defines coupling between disturbed and disturber link segments and cannot be measured using coupling attenuation test fixtures. Figure 149-41 in Clause 149.7.2 shows an illustration for alien cross talk measurements and also refers to Clause 97B for additional details. There is no reference to Annex 149A

*SuggestedRemedy*

From: Coupling and screening attenuation are the main parameters for a shielded differential link segment to define its alien crosstalk and EMC properties. To: Coupling and screening attenuation are the main parameters for a shielded differential link segment to define its EMC properties.

Response Response Status C

ACCEPT.

CI 149 SC 149.A.4 P191 L8 # 131

Shariff, Masood

CommScope

Comment Type ER Comment Status A EZ

Correct standards specifications avoiding ambiguity.

*SuggestedRemedy*

From: Placing the termination resistors inside the connector, in order to omit the transition to the PCB, is not allowed. To: Termination resistors shall not be placed inside the connector in order to omit the transition to the PCB.

Response Response Status C

ACCEPT.

CI 149A SC 149A.1 P189 L12 # 206

Dawe, Piers

Mellanox

Comment Type TR Comment Status A 149A

"This annex describes the test methodologies that shall be used to measure": not a test spec, no requirement to measure.

*SuggestedRemedy*

Change to "may be used".

Response Response Status W

ACCEPT IN PRINCIPLE.

Change: This annex describes the test methodologies that shall be used to measure

To: This annex describes the test methodologies used to measure

CI 149A SC 149A.2 P189 L26 # 75

Wienckowski, Natalie

General Motors

Comment Type E Comment Status A EZ

Per the IEEE-SA Style Manual, "If tolerances are provided, the unit shall be given with both the basic value and the tolerance"

*SuggestedRemedy*

After 23, add the degree symbol and then "C".

Response Response Status C

ACCEPT.

CI 149A SC 149A.2 P189 L26 # 207

Dawe, Piers Mellanox  
 Comment Type TR Comment Status R 149A

This isn't a test spec. Products have to work over a much wider range than this - how that is assured is up to the implementer.

SuggestedRemedy

Delete "Measurements to be performed at 23 ± 5°C and relative humidity of 25% to 75%."

Response Response Status W

REJECT.

This specification does not use a standardized cable. Instead, it defines the link segment characteristics and testing methodologies for the link segment.

While it is true that products need to work over a much wider range, testing needs to be done under a defined condition to ensure comparable results in different labs.

CI 149A SC 149A.2 P189 L26 # 234

Zimmerman, George ADI, APL Gp, Aquantia, BMW, Cisco, CommScope, S  
 Comment Type E Comment Status A EZ

"Measurements to be performed... 75%" isn't a sentence.

SuggestedRemedy

Change "Measurements to be performed" to "Measurements are performed"

Response Response Status C

ACCEPT.

CI 149A SC 149A.3 P189 L31 # 235

Zimmerman, George ADI, APL Gp, Aquantia, BMW, Cisco, CommScope, S  
 Comment Type E Comment Status A EZ

"The reference cable assembly is intended to be a simplified representation of the components, that are used within a wiring harness, which are cable, PCB connectors, and inline connectors." is grammatically awkward

SuggestedRemedy

Suggest changing to "The reference cable assembly is intended to be a simplified representation of the components used within a wiring harness. These include cable, PCB connectors, and inline connectors."

Response Response Status C

ACCEPT.

CI 149A SC 149A.3 P189 L31 # 76

Wienckowski, Natalie General Motors  
 Comment Type E Comment Status A EZ

unnecessary comma

SuggestedRemedy

Change: simplified representation of the components, that are used  
 To: simplified representation of the components that are used

Response Response Status C

ACCEPT.

CI 149A SC 149A.3 P189 L32 # 132

Shariff, Masood CommScope  
 Comment Type ER Comment Status A EZ

Incomplete and ambiguous statement

SuggestedRemedy

From: This also ensures that connectors and cable are matched in terms of balance and shielding, in order to reach sufficient coupling and screening attenuation. To: This also ensures that connectors and cable are matched in terms of balance and shielding, in order to reach sufficient accuracy to measure coupling and screening attenuation.

Response Response Status C

ACCEPT.

CI 149A SC 149A.5 P192 L2 # 32

Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ

The annex title is quoted in four places in the PICS and each should match the actual annex title.

SuggestedRemedy

In the title of 149A.5, the first sentence of 149A.5.1, the top row of the table in 149A.5.2.2, and the title of 149A.5.4 change:  
 "Coupling attenuation test methodology" to:  
 "Coupling and screening attenuation test methodology"

Response Response Status C

ACCEPT.

CI 149A SC 149A.5.4 P194 L4 # 1 [redacted]  
 Hajduczenia, Marek Charter Communications  
 Comment Type E Comment Status A EZ  
 Text of column Feature seems to be a few points larger than the other columns in the same table.  
 SuggestedRemedy  
 Please align the font size  
 Response Response Status C  
 ACCEPT.

CI 149B SC 149B.1 P196 L12 # 181 [redacted]  
 Baggett, Tim Microchip  
 Comment Type E Comment Status A EZ  
 Misspelling: "MutliGBase-T1"  
 Occurs also on line 46  
 SuggestedRemedy  
 Search document for "MutliGBASE" anre replace with "MultiGBASE"  
 Response Response Status C  
 ACCEPT.

CI 149A SC 149A.5.4 P195 L1 # 33 [redacted]  
 Anslow, Pete Ciena  
 Comment Type E Comment Status A EZ  
 Recent standards published by IEEE (and the 802.3 template) do not force each Clause to start on even or odd pages, so there should be no blank pages between clauses.  
 SuggestedRemedy  
 Remove the blank pages between clauses  
 Response Response Status C  
 ACCEPT.

CI 149B SC 149B.1 P196 L17 # 283 [redacted]  
 Souvignier, Tom Broadcom  
 Comment Type ER Comment Status A EZ  
 There is a typo on line 17.  
 SuggestedRemedy  
 Change from "...is loaded to 3.2318 and 3.23.19 for transmission..."  
 To "...is loaded to 3.2318 and 3.2319 for transmission..."  
 Response Response Status C  
 ACCEPT.

CI 149B SC 149B P196 L4 # 199 [redacted]  
 Dawe, Piers Mellanox  
 Comment Type TR Comment Status A OAM  
 An informative annex with state diagrams - that's crazy!  
 SuggestedRemedy  
 Remove the state diagrams or change the annex's status to normative (but optional, presumably)  
 Response Response Status W  
 ACCEPT IN PRINCIPLE.

CI 149B SC 149B.1 P196 L18 # 284 [redacted]  
 Souvignier, Tom Broadcom  
 Comment Type ER Comment Status A EZ  
 There is a typo on line 18.  
 SuggestedRemedy  
 Change from "...is read from 3.2320 and 3.23.21..."  
 To "...is read from 3.2320 and 3.2321..."  
 Response Response Status C  
 ACCEPT.

Add a new first subclause (149B.1) with all others renumbered after.

149B.1 Purpose

This annex describes a suggested assignment of the OAM status bits for use with the Clause 149 MultiGBASE-T1 PHYs. Suggested bit behaviors, shown in state diagrams, and bit assignments in the OAM frame are detailed in this annex for informative purposes to enable consistent use of the OAM channel. Use of these specific assignments and the behaviors described by the state diagrams is implementation dependent.

CI 149B SC 149B.2.7 P197 L49 # 182

Baggett, Tim Microchip

Comment Type E Comment Status A EZ

REC hasn't been defined yet before this section, and would benefit from being defined in parenthesis.

*SuggestedRemedy*

Change:  
"REC in OAM<13:12><7:0>"  
To:  
"REC (Receive Error Counter) in OAM<13:12><7:0>"

Or: add a line referring the reader to section 149B.2.9

Also on Page 198, Line 4

Response Response Status C

ACCEPT.

CI 149B SC 149B.2.9 P198 L13 # 203

Dawe, Piers Mellanox

Comment Type T Comment Status R OAM

How is the error count loaded into these two bytes?

*SuggestedRemedy*

Which is most significant byte and bit?

Response Response Status C

REJECT.

The details on the arrangement of the bits in these bytes can be found in Table 45-244a. This shows that the 8 MSB are in 3.2319.15:8, the 8 LSB are in 3.2319.7:0, and that the LSB is transmitted first.

CI 149B SC 149B.3.2.1 P199 L1 # 274

Tu, Mike Broadcom

Comment Type T Comment Status A OAM

Variable "mr\_tx\_request\_rec\_clear" does not match to any register bits in Table 149-9. It also looks like a duplicate of the "tx\_clear\_rec".

*SuggestedRemedy*

Propose to delete line 1 to 5

Response Response Status C

ACCEPT.

CI 149B SC 149B.3.2.1 P199 L7 # 271

Tu, Mike Broadcom

Comment Type T Comment Status A OAM

Variable name should be consistent with Table 149-9 PCS control/status variable name

*SuggestedRemedy*

Change variable name from "rx\_clear\_rec" to "mr\_tx\_clear\_rec".

Response Response Status C

ACCEPT IN PRINCIPLE.

Change variable name from "rx\_clear\_rec" to "mr\_rx\_clear\_rec".

CI 149B SC 149B.3.2.1 P199 L13 # 272

Tu, Mike Broadcom

Comment Type T Comment Status A OAM

Variable name should be consistent with Table 149-9 PCS control/status variable name

*SuggestedRemedy*

Change variable name from "tx\_clear\_rec" to "mr\_tx\_clear\_rec".

Response Response Status C

ACCEPT.

CI 149B SC 149B.3.2.1 P199 L21 # 273

Tu, Mike Broadcom

Comment Type T Comment Status A OAM

Variable name should be consistent with Table 149-9 PCS control/status variable name

*SuggestedRemedy*

Change counter name from "tx\_rec" to "mr\_tx\_rec".

Response Response Status C

ACCEPT.

CI 149B SC 149B.3.2.3 P199 L26 # 183

Baggett, Tim Microchip

Comment Type E Comment Status A EZ

Section heading "149B.3.2.3 State Diagrams" is orphaned from the diagrams it contains.  
Move to the next page.

*SuggestedRemedy*

Move heading "149B.3.2.3 State Diagrams" to top of page 200 with diagrams 149B-2 and 149B-3.

Response Response Status C

ACCEPT.

CI 149B SC 149B.3.2.3 P199 L26 # 2

Hajduczenia, Marek Charter Communications

Comment Type TR Comment Status A OAM

I am very confused why an informative annex would have state diagrams that describe the required behavior of the OAM functions needed for the operation of the link

*SuggestedRemedy*

Seems like this annex ought to be normative

Response Response Status C

ACCEPT IN PRINCIPLE.

Add a new first subclause (149B.1) with all others renumbered after.

149B.1 Purpose

This annex describes a suggested assignment of the OAM status bits for use with the Clause 149 MultiGBASE-T1 PHYs. Suggested bit behaviors, shown in state diagrams, and bit assignments in the OAM frame are detailed in this annex for informative purposes to enable consistent use of the OAM channel. Use of these specific assignments and the behaviors described by the state diagrams is implementation dependent.

CI 149B SC 149B.3.2.3 P200 L3 # 275

Tu, Mike Broadcom

Comment Type T Comment Status A OAM

In Figure 149B-2, the variable values and variable names should be consistent with definitions.

*SuggestedRemedy*

See page 4 of "tu\_3ch\_04\_0719.pdf".

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement changes marked in red on page 4 of tu\_3ch\_04\_0719.pdf.

CI 149B SC 149B.3.2.3 P200 L38 # 276

Tu, Mike Broadcom

Comment Type T Comment Status A OAM

In Figure 149B-3, the variable values and variable names should be consistent with definitions.

*SuggestedRemedy*

See page 5 of "tu\_3ch\_04\_0719.pdf".

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement changes on page 5 of tu\_3ch\_04\_0719.pdf.