*Cl* **00** *SC* **0** *P* *L* # 59

Anslow, Pete Ciena

*Comment Type* **E** *Comment Status* **A** *Bucket*

Some tables in clauses that are being amended only show part of the existing table.

*SuggestedRemedy*

Add rows containing just an ellipsis character as was done in the published version of IEE Std 802.3bm Table 80-1

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

ACCEPT.

*Cl* **00** *SC* **0** *P* **152** *L* **52** # 62

Anslow, Pete Ciena

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

121.1.1, 122.1.1 and 123.1.1 all contain a requirement for the FLR to be less than 9.2 x 10^-13 with a BER of less than 2.4 x 10^-4.
The calculation giving 9.2 x 10^-13 was done according to the equations given in:
http://www.ieee802.org/3/bs/public/14_11/anslow_3bs_02_1114.pdf#page=11
with MFC = 8 as per:
http://www.ieee802.org/3/bm/public/mmfadhoc/meetings/nov29_12/anslow_01a_1112_mmf.pdf#page=4
However, the processing specified in 119.2.5.3 now requires the FEC decoder to mark "every 257-bit block within the two associated codewords" as bad. This means that the factor (1 + MFC)/MFC) in equation 4 of anslow_3bs_02_1114.pdf should be replaced by (1 + 2*MFC)/MFC), which changes the FLR from 9.2 x 10^-13 to 1.7 x 10^-12

*SuggestedRemedy*

In 121.1.1, 122.1.1 and 123.1.1 , change 9.2 x 10^-13 to 1.7 x 10^-12 in two places for each subclause.

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

ACCEPT.

*Cl* **1** *SC* **1.1.3.2** *P* **27** *L* **1** # 57

Anslow, Pete Ciena

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

Entries for CDMII and CDAUI-n are missing from 1.1.3.2

*SuggestedRemedy*

Add entries for CDMII and CDAUI-n to 1.1.3.2

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

ACCEPT.

*Cl* **30** *SC* **30.5.1.1.4** *P* **31** *L* **30** # 55

Anslow, Pete Ciena

*Comment Type* **T** *Comment Status* **A** *Bucket*

As the 400GBASE-R PCS does not set the high BER status bit, remove the second change to the "BEHAVIOUR DEFINED AS" section of 30.5.1.1.4 from the draft.

*SuggestedRemedy*

Remove the change to the last sentence of the "BEHAVIOUR DEFINED AS" section of 30.5.1.1.4 from the draft.

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

ACCEPT.

*Cl* **31B** *SC* **31B.3.7** *P* **215** *L* **17** # 56

Anslow, Pete Ciena

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

There are three TBDs in Annex 31B.
The value of TBD pause_quanta in the new paragraph in 31B.3.7 should be equal to the sum of the pause_quanta values of the first four rows of Table 116-3 (since the PMDs are all the same value). This is 905 including 72 in Magenta for the PMA sublayer.
The TBD in the max overrun equation should be equal to the sum of the bit time values of the first four rows of Table 116-3 divided by 8. This evaluates to 57920 bytes including 36864 bit times in Magenta for the PMA sublayer.
The TBD in PICS item TIM10 should be equal to the value of TBD pause_quanta above.

*SuggestedRemedy*

Change the three TBDs to 905, 57920, and 905 as discussed in the comment with appropriate adjustments to the values if any of the sublayer delays in Table 116-3 are changed by other comments.

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

ACCEPT.

*Cl* **116** *SC* **116.3.2** *P* **68** *L* **12** # 60

Anslow, Pete Ciena

*Comment Type* **E** *Comment Status* **A** *Bucket*

[Editor's note: Is a prefix needed for the CDXS?]

*SuggestedRemedy*

Since in Figure 120-5 there is: " inst PMD, PMA, or CDXS, depending on which sublayer is below this PMA", a specific prefix for CDXS is required.
Add a prefix for CDXS and remove the editor's note.

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

ACCEPT.

*Cl* **116** *SC* **116.4** *P* **71** *L* **14** # 5

Trowbridge, Steve Nokia

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

The skew variation numbers for the PAM should be the same as 802.3ba in ns with 4x the bit-rate, so the overall delay in ns is the same with 4x the bits and 4x the pause quanta

*SuggestedRemedy*

Make the numbers in the PMA row in Table 116-3 black

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

ACCEPT.

*Cl* **118** *SC* **118.1** *P* **84** *L* **50** # 11

Trowbridge, Steve Nokia

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

Add management registers for CDXS

*SuggestedRemedy*

Add the corresponding registers and bit numbers to MMD 4 and MMD 5 as currently exist for MMD 3 for the clause 119 PCS to allow CDXS to have the same functions as a clause 119 PCS

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

ACCEPT IN PRINCIPLE.

In Clause 45, add the corresponding registers and bit numbers to MMD 4 and MMD 5 as currently exist for MMD 3 for the Clause 119 PCS to allow CDXS to have the same functions as a clause 119 PCS with editorial license.

In Clause 118 add tables corresponding to Table 119-3 and 119-4 to show the appropriate MMD 4 and MMD 5 bit numbers and also add a diagram to clarify the MMD numbers and naming for "DTE XS" and "PHY XS" with editorial license.

*Cl* **118** *SC* **118.2** *P* **88** *L* **1** # 13

Gustlin, Mark Xilinx

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

There are no PICS populated in clause 118.

*SuggestedRemedy*

Add the PICS as described in gustlin_3bs_02_0516.

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

ACCEPT.

*Cl* **119** *SC* **119.1** *P* **91** *L* **1** # 14

Ofelt, David Juniper Networks

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

Having a PreFEC SER monitoring and signaling mechanism would be a fabulous additon to 802.3bs!

*SuggestedRemedy*

Details to be provided in presentation at May meeting (ofelt_3bs_01_0516.pdf)

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

ACCEPT IN PRINCIPLE.
Make the changes shown in
http://www.ieee802.org/3/bs/public/16_05/ofelt_3bs_02_0516.pdf for Clause 118
and http://www.ieee802.org/3/bs/public/16_05/ofelt_3bs_03_0516.pdf for Clause 119.
Make appropriate changes to Clause 45 to accomodate this new feature with editorial license.

*Cl* **119** *SC* **119.2.4.4** *P* **96** *L* **15** # 16

Dillard, John Microsemi

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

The manner with which free-running prbs9 is used as pad in the alignment markers makes the description seem overly complex. Is it possible that similar performance characteristics (e.g. baseline wander) can be had by selecting a portion of a prbs9 (or similar) sequence and fixing the values of the pad bits to that?

*SuggestedRemedy*

Select a portion of a prbs9 sequence and use it as fixed values in alignment markers

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

ACCEPT IN PRINCIPLE.

See response to comment #48

*Cl* **119** *SC* **119.2.4.4** *P* **96** *L* **50** # 48

Anslow, Pete — Ciena

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

The PRBS9 pad bits shown in Figure 119-4 add complexity to the draft and implementations.

*SuggestedRemedy*

Change to the scheme proposed in anslow_03_0416_logic with editorial license, changing the naming from:
"UM0, UM1, UM2, UM3, UM4, UM5, UM6, UM7, UM8" to:
"UP0, UP1, UM0, UM1, UM2, UP3, UM3, UM4, UM5"
Where Upx is a unique pad and is not checked for the PCS lane number.

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

ACCEPT.

---

*Cl* **119** *SC* **119.2.4.6** *P* **101** *L* **53** # 15

Dillard, John — Microsemi

*Comment Type* **E** *Comment Status* **A** *Bucket*

Reference to annex 91A should be annex 119a

*SuggestedRemedy*

change reference to annex 119a

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

ACCEPT.

---

*Cl* **119** *SC* **119.2.5.2** *P* **104** *L* **34** # 49

Anslow, Pete — Ciena

*Comment Type* **E** *Comment Status* **A** *Bucket*

UM6 should be UM5

*SuggestedRemedy*

Change UM6 to UM5

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

ACCEPT.

---

*Cl* **119** *SC* **119.2.6.2.2** *P* **108** *L* **43** # 1

Lapierre, Dominic — EXFO Inc.

*Comment Type* **E** *Comment Status* **A** *Bucket*

Typo

*SuggestedRemedy*

Change "Boolean variable this is set to true"
to "Boolean variable that is set to true"

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

ACCEPT.

---

*Cl* **119** *SC* **119.3** *P* **127** *L* **23** # 61

Anslow, Pete — Ciena

*Comment Type* **E** *Comment Status* **A** *Bucket*

Some of the PCS register names in Tables 119-3 and 119-4 do not match the names in Clause 45.
In Table 119-4, MDIO status variable "Wake_error_counter" should be "EEE wake error counter"

*SuggestedRemedy*

In Table 119-3, change the PCS register name for bit 3.20.0 to "EEE control and capability"
In Table 119-4, change the PCS register name for bits 3.1.9, 3.1.11, 3.1.8, and 3.1.10 to "PCS status 1"
In Table 119-4, change the PCS register name for register 3.22 to "EEE wake error counter"
In Table 119-4, change MDIO status variable "Wake_error_counter" to "EEE wake error counter".

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

ACCEPT.

---

*Cl* **119** *SC* **119.6.4.1** *P* **119** *L* **28** # 47

Anslow, Pete — Ciena

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

Skew tolerance is appropriate for the Receive function as in item RF1, but not for the transmit function

*SuggestedRemedy*

Remove PICS item TF1

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

ACCEPT.

*Cl* **119A** *SC* *P* **222** *L* **29** # 17

Dillard, John — Microsemi

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

The parity in tables 119a-1 and 119a-2 is incorrect. Also, it has been suggested to add the scrambled payload before distributing to fec messages.

*SuggestedRemedy*

Correct the parity and add table showing tx_scrambled_am.
I will povide an update with both.

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

ACCEPT.

*Cl* **119A** *SC* **119A** *P* **221** *L* **29** # 2

Trowbridge, Steve — Nokia

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

Since there are more steps in the process to creating the FEC codewords than in Annex 91A, suggest showing an intermediate step rather than just jumping to the final encoded blocks

*SuggestedRemedy*

Add a table in the format of Table 91-3 showing the forty 257B blocks before distribution to CWA and CWB

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

ACCEPT IN PRINCIPLE.

See response to comment #17

*Cl* **119A** *SC* **119A** *P* **222** *L* **29** # 4

Trowbridge, Steve — Nokia

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

The parity symbols are bit-wise reversed (MSB to LSB) as compared to Annex 91A (LSB to MSB)

*SuggestedRemedy*

Replace the parity in Table 119A-1 with "9e26b96f1329799e38500ca61583a6b4d7d4b8f652e589f40a9dbb4f2ba0765eddc8812fbd3". Replace the parity in Table 119A-2 with "b1ff2a2e5a01db40591407f891b99675eff3f7055f67084be5f71d2b9c9254f655bc00fb426"

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

ACCEPT IN PRINCIPLE.

See response to comment #17

*Cl* **119A** *SC* **119A** *P* **222** *L* **29** # 3

Trowbridge, Steve — Nokia

*Comment Type* **ER** *Comment Status* **A** *Bucket*

Add an indication where the data leaves off and the parity begins in the final row of Tables 119A-1 and 119A-2

*SuggestedRemedy*

Indicate the boundary between data and parity in the final row of the two tables. Could either add a vertical line after the first 5 hexadecimal characters, or put the parity in a different font (e.g., bold)

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

ACCEPT.

*Cl* **120** *SC* **120.1.4** *P* **125** *L* **29** # 6

Trowbridge, Steve — Nokia

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

Per the CDXS presentation, four MMD instances are needed for the PMA.

*SuggestedRemedy*

Remove the editor's note. In the following paragraph, list the MMD device numbers available as 1, 8, 9, and 10 and make it black. Update the 3rd sentence of the following paragraph to indicate that separated PMAs may be separated not only by CDAUI but by CDXS. Make the word "three" in the final sentence black, since this is just a specific example that does use three PMA sublayers which is less than the four maximum possible according to the standard. Item (f) at the end of the clause, change "three" to "four" and make it black. Also clause 120.6, two occurrences, change "MMD 8, 9, 10, and 11" to "MMD 8, 9, and 10" and make it black

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

ACCEPT.

*Cl* **120** *SC* **120.2** *P* **128** *L* **41** # 7

Trowbridge, Steve — Nokia

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

Make CDXS black in Figure 120-5 now that this is defined.

*SuggestedRemedy*

Make CDXS black in Figure 120-5 now that this is defined. Also in 2nd paragraph of 120.5.10

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

ACCEPT.

*Cl* **120** *SC* **120.5.4** *P* **134** *L* **21** # 8

Trowbridge, Steve Nokia

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

Make the delay numbers black in Table 120-1: this is the same ns as the delay for P802.3ba with 4x the bits and pause quanta

*SuggestedRemedy*

Make the delay numbers black in Table 120-1

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

ACCEPT.

*Cl* **120** *SC* **120.5.11.2** *P* **138** *L* **26** # 9

Trowbridge, Steve Nokia

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

No motivation has emerged to make any of the PAM4 test patterns mandatory

*SuggestedRemedy*

Remove the editor's note. Make the words "may optionally" black in the first sentences of clauses 120.5.11.2.1, 120.5.11.2.2, and 120.5.11.2.3

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

ACCEPT.

*Cl* **120** *SC* **120.5.11.2.1** *P* **138** *L* **30** # 63

Dawe, Piers Mellanox

*Comment Type* **TR** *Comment Status* **R**

When 120D's jitter definitions have changed from this JP03A pattern to PRBS13Q...

*SuggestedRemedy*

Check that the optical clauses haven't adopted it, delete this subclause and recover the MDIO bits.

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

REJECT.

JP03A is used by CDAUI-8 C2C via reference to 94.3.12.6.1.
It would be appropriate to remove it if Clock random jitter, RMS (max) and Clock deterministic jitter, pk-pk (max) are re-defined to use a different pattern in the electrical track.
(Removing it from the draft would un-allocate bits 1.1500.13 and 1.1500.14)

*Cl* **120** *SC* **120.7.3** *P* **147** *L* **12** # 10

Trowbridge, Steve Nokia

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

There is no possibility for 4 lanes upstream from a 400GBASE-R PMA. The signaling rate is always the same for 200G and 400G in the usptream direction, either one or two bits per symbol.

*SuggestedRemedy*

Change Value/Comment field for RX_CLOCK to 26.5625 GBd

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

ACCEPT.

*Cl* **120B** *SC* **120B.1** *P* **229** *L* **33** # 46

Anslow, Pete Ciena

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

Comment #33 against D1.2 changed Figures 120B-1 and 120D-1 to have both stacks with "400GBASE-R PCS". However, for the left hand stack in both figures, this will not be a Clause 119 PCS and therefore should be labelled just "400 Gb/s PCS" to be consistent with Figure 118-1

*SuggestedRemedy*

In Figures 120B-1 and 120D-1, change the left hand stack from "400GBASE-R PCS" to "400 Gb/s PCS".

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

ACCEPT.

*Cl* **120B** *SC* **120B.1** *P* **230** *L* **2** # 65

Dawe, Piers Mellanox

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

C2C CDAUI-16 is supposed to be re-used C2C CAUI-4 but easier because we know it's FEC protected. Here there is a "shall" for AC coupling cutoff while in 83D there isn't even a recommendation. Also, if we leave this "shall" applying to the AC coupling, we would have to nail down where the coupling is: TX Rx or channel. Fig 120B-2 shows it in the channel (both sides!) but the PICS seems to apply it to everything. This is going beyond C2C CAUI-4 and causing trouble for no benefit.

*SuggestedRemedy*

Change shall to should, remove the PICS item.

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

ACCEPT IN PRINCIPLE.
Change "shall be" to "should be".
Remove PICS item ACC from 120B.5.3

*Cl* **120D** *SC* **120D.1** *P* **242** *L* **2** # 70

Dawe, Piers — Mellanox

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

If we leave this "shall" applying to the AC coupling, we have to nail down where the coupling is: TX Rx or channel. Fig 120D-2 shows it in the channel (both sides!) but it's not in the PICS. Sorting this out looks like making work for no benefit.

*SuggestedRemedy*

Change shall to should.

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

ACCEPT IN PRINCIPLE.
"Change shall to should."
See comments #71 & #72
[Editors note: Page changed from 252 to 242]

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*Cl* **120D** *SC* **120D.3.1** *P* **243** *L* **40** # 66

Dawe, Piers — Mellanox

*Comment Type* **E** *Comment Status* **A** *Bucket*

The specifications aren't defined in Table 120D-1, limits are given in the table and the definitions are in all those references.

*SuggestedRemedy*

Change "defined" to "given". Also 120D.3.2, 120E.3.1, 120E.3.2, 120E.3.3, 120E.3.4.

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

ACCEPT IN PRINCIPLE.
Change "specifications defined" to "specifications given" in 120D.3.1.
Make equivlalent changes to 120D.3.2, 120E.3.1, 120E.3.2, 120E.3.3, & 120E.3.4.

---

*Cl* **120D** *SC* **120D.3.1** *P* **243** *L* **42** # 31

Healey, Adam — Broadcom Ltd.

*Comment Type* **T** *Comment Status* **A** *Bucket*

"The transmit output waveform may optionally be manipulated via the feedback mechanism described in 83D.3.3.2, but with eight rather than four lanes." The feedback mechanism for CDAUI-8 is defined in 120D.3.2.3.

*SuggestedRemedy*

Change to: "The transmit output waveform may optionally be manipulated via the feedback mechanism described in 120D.3.2.3."

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

ACCEPT.

---

*Cl* **120D** *SC* **120D.3.1** *P* **244** *L* **26** # 42

Hegde, Raj — Broadcom Corporation

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

The current TX jitter measurement method of extracting CRJ and CDJ from J5 and J6 can result in large errors.

*SuggestedRemedy*

The specification should be changed to direct measurement of JRMS and J5. This topic was discussed in Macau and accepted in general. An updated presentation will be made in support of this comment.

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

ACCEPT IN PRINCIPLE.

Add a new subclause 120D.3.1 labeled "Output jitter" that contains the following:
"Jitter is measured using the JP03A test pattern (reference). The effect of a single-pole high-pass filter with a 3 dB frequency of 4 MHz is applied to the jitter. The voltage threshold for the measurement of BER or crossing times is the mid-point (0 V) of the AC-coupled differential signal.

Jitter measurements are performed with transmitters on all PMD lanes enabled and transmitting the same pattern with identical transmit equalizer settings.

J5 is defined as the time interval that includes all but 10^{-5} of the jitter distribution. J_{RMS} is defined as the RMS value of the jitter distribution. If the jitter distribution is measured using an oscilloscope, the histogram should include at least 10^{6} hits and should be taken over about 1% of the signal amplitude.

J_{RMS} shall be less than or equal to 0.023 UI. J5 shall be less than or equal to 0.128 UI."

In Table 120D-1, replace "Clock random jitter, RMS" and "Clock deterministic jitter, pk-pk" row under "Output jitter" with J_{RMS} and J5 rows, references, and values consistent with the new subclause.

Add editors note that J_{RMS} is different from previously defined jitter measurements

[Note that in hegde_3bs_03_0516, it is proposed that PRBS31Q should be transmitted on lanes other than the lane under test during this measurement. However, the current management infrastructure does not support this. This change could be included at a future date with corresponding changes to the management registers.]

*Cl* **120D** *SC* **120D.3.1** *P* **244** *L* **27** # 67

Dawe, Piers — Mellanox

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

This contains "Clock random jitter" and "Clock deterministic jitter". But there probably isn't an accessible clock, the method of 94.3.12.6.1 uses a real-time scope, an unrepresentative pattern, and too much extrapolation.

*SuggestedRemedy*

Specify J2 Jitter (or RMS jitter) and J4 Jitter (or J5), which are directly measurable, using QPRBS13 if measuring uncorrelated jitter, QPRBS31 if including correlated jitter. Do we need to measure jitter for all three sub-eyes or just the middle one?

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

ACCEPT IN PRINCIPLE.
See resolution of comment #42

*Cl* **120D** *SC* **120D.3.1** *P* **244** *L* **32** # 44

Hegde, Raj — Broadcom Corporation

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

The CDAUI-8 CRU bandwidth was updated to 4MHz during the last meeting. However, this could be still high for DSP based receive solutions and is not in line with the OIF CEI-56G standards where it is set to 3MHz.

*SuggestedRemedy*

Change the CRU bandwidth for CDAUI-8 C2C and C2M to 3MHz to align with CEI-56G standards. A presentation will be made in support of this comment.

*Proposed Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **120D** *SC* **120D.3.1.1** *P* **244** *L* **7** # 68

Dawe, Piers — Mellanox

*Comment Type* **T** *Comment Status* **R**

There are surprisingly many references to Clause 94, which has a different signalling rate to this.

*SuggestedRemedy*

Might be better to point to the equivalent items in 83D C2C CAUI-4 (same architecturally, dual-mode products will be desired) or 802.3by (very similar signalling rate, recently reviewed and cleaned up, now stable and approved) where they are equivalent or preferable.

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

REJECT.
There is nothing technically incorrect with draft as it stands.

*Cl* **120D** *SC* **120D.3.1.1** *P* **244** *L* **21** # 33

Healey, Adam — Broadcom Ltd.

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

The method in 120E.3.3.2 is prescribed for the measurement of CDAUI-8 chip-to-chip even-odd jitter. The method requires accurate identification of transitions between signal levels. Crossing thresholds defined to be mid-points of the upper, middle, and lower eye openings presume such eye openings exist. However, it is stated that "the even-odd jitter specification shall be met regardless of the transmit equalization setting." In some cases, equalization will be necessary to generate the open eye. In other cases, filtering may be needed to compensate for over equalization to generate the open eye. The equalization/filtering is not defined for CDAUI-8.

*SuggestedRemedy*

Define the equalization/filtering to be used to produce the open eyes required for even-odd jitter measurements for all transmit equalization settings. Alternatively, revert to the measurement based on JP03B test pattern which can be applied regardless of the transmitter equalization setting.

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

ACCEPT IN PRINCIPLE.
Need consensus on such a change

A straw poll was taken:
I prefer the option (on page 3 of healey_3bs_02_0516):
1) 10
3) 9

After time for consideration the Straw Poll was re-taken:
I prefer the option (on page 3 of healey_3bs_02_0516):
1) 3
3) 9

Change "Reference" cell for the "Even-Odd Jitter" row of Table 120D-1 from:
"120E.3.3.2"
to
"94.3.12.6.2"
with editorial licence to make consequent changes to the draft.

*Cl* **120D** *SC* **120D.3.1.1** *P* **244** *L* **21** # 35

Healey, Adam — Broadcom Ltd.

*Comment Type* **E** *Comment Status* **A** *Bucket*

The "x" in "0.8 x vf" should be a multiplication sign.

*SuggestedRemedy*

Replace "x" with a multiplication sign.

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

ACCEPT.

*Cl* **120D** *SC* **120D.3.1.1** *P* **244** *L* **21** # 32

Healey, Adam — Broadcom Ltd.

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

IEEE P802.3by/D3.2 has amended Annex 93A to include a transmitter filter in order to represent a source rise time greater than zero. This is being used to reconcile the high pmax/vf ratio (e.g., 0.8) derived from the original COM model with somewhat lower values that can practically be measured (see http://www.ieee802.org/3/by/public/adhoc/architecture/ran_021716_25GE_adhoc.pdf). Specifically, a 12 ps source rise time is used for 25GBASE-KR so that the COM models can represent a pmax/vf limit of 0.75. Similar considerations should be made for CDAUI-8.

*SuggestedRemedy*

Invoke the transmitter rise time filter for CDAUI-8 chip-to-chip. Use the updated model as the basis for a new limit on pmax/vf. A starting point for rise time and pmax/vf values are 12 ps and 0.75.

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

ACCEPT IN PRINCIPLE.
Discussed at 2nd May Electrical ad hoc.

Straw Poll
1) Tr=12ps; LFPP=0.745*vf
2) Tr=14ps; LFPP=0.727*vf
1: 6; 2:6;

No objections to splitting the difference (13ps/0.736)

Change
"Channel characteristics are defined by Channel Operating Margin (COM), computed using the procedure in Annex 93A and the parameters in
Table 120D-7, shall be greater than or equal to 3 dB."
to
"Channel characteristics are defined by Channel Operating Margin (COM), computed using the procedure in 93A.1, where Tr is 13 ps, ß is 2 for Ht(f) in Equation (93A-19), and the parameters in
Table 120D-7, shall be greater than or equal to 3 dB."

Change value of Linear Fit Pulse Peak (min) in Table 120D-1 from
"0.8 x vf"
to
"0.736 x vf"

*Cl* **120D** *SC* **120D.3.1.1.2** *P* **246** *L* **3** # 19

Dudek, Mike QLogic

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

There is a confusion about what the "PAM4 symbol" is. On line 3 it says that the linearity is defined as a function of the mean signal level for each PAM4 symbol (meaning the 4 different signal levels), but on line 36 it says that there are N PAM4 symbols in the PRBS13Q test pattern (N is not 4 here). Section 120D.3.1.1.2 can be read that there are N different values of Vx, and no way of calculating V0 etc. is given.

*SuggestedRemedy*

Where the PAM4 symbol means 0,1,2 or 3 replace "PAM4 symbol" with "PAM4 symbol level" in sections 120D.3.1.1.1 and 120D.3.1.1.2. ie on
line 3,replace "PAM4 symbol" with "PAM4 symbol level
line 4 replace "PAM4 symbols" with "PAM4 symbol levels
line 41 replace "PAM4 symbol" with "PAM4 symbol level, and add "level" to the end of the sentence.

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

ACCEPT IN PRINCIPLE.
In 120D.3.1.1.1, change
Transmitter linearity is defined as a function of the mean signal level transmitted for each PAM4 symbol. Given the PAM4 symbols 0, 1, 2, and 3, the mean signal level for each symbol are V0, V1, V2, and V3 respectively.
to
Transmitter linearity is defined as a function of the mean signal level transmitted for each PAM4 symbol level. Given the PAM4 symbol levels 0, 1, 2, and 3, the mean signal level for each symbol level are V0, V1, V2, and V3 respectively.

In 120D.3.1.1.2, change
For each PAM4 symbol x, Vx is the mean value of the waveform samples that correspond to that symbol.
to
For each PAM4 symbol level x, Vx is the mean value of the waveform samples that correspond to that symbol level.

*Cl* **120D** *SC* **120D.3.2.1** *P* **247** *L* **3** # 69

Dawe, Piers Mellanox

*Comment Type* **ER** *Comment Status* **A** *Bucket*

"Subclause reference" - but some of these are sub-annexes, and for consistency and brevity...

*SuggestedRemedy*

Change to just "Reference" as in e.g. Table 120D-1.

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

ACCEPT.

*Cl* **120D** *SC* **120D.3.2.1** *P* **247** *L* **15** # 36

Healey, Adam Broadcom Ltd.

*Comment Type* **E** *Comment Status* **A** *Bucket*

The indentation of the wrapped text in the lettered list is not correct. For example, "to-peak.." should be aligned with "The test.". Also, there appears to be extra white space in "peak-to-peak".

*SuggestedRemedy*

Make appropriate editorial changes per comment.

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

ACCEPT.
[Editors note: This can be corrected by: apply paragraph tag L1,LetteredList to item a and delete the manually entered a). Re-apply paragraph tag L,LetteredList to the other items and delete the manually entered letters.]

*Cl* **120D** *SC* **120D.3.2.3** *P* **248** *L* **44** # 34

Healey, Adam Broadcom Ltd.

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

The example of a possible transmitter equalization tuning process provided in 83D.5 is representative of what could be used for CDAUI-8 but it contains several CAUI-4 specific details. The most obvious different is 8 lanes for CDAUI-8 versus 4 lanes for CAUI-4. A potentially confusing difference is that 83D.5 references the CAUI-4 register set while CDAUI-8 uses a different set of registers. While the re-use of existing text is appreciated, it may be useful to point out these key differences.

*SuggestedRemedy*

Note the exceptions to the lane count and register mapping in the reference to 83D.5.

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

ACCEPT IN PRINCIPLE.
Add the following Sentence after the reference to 83D.5:
Note that CDAUI-8 uses a different number of lanes and a different register set to those in 83D.5.

*Cl* **120D** *SC* **120D.4** *P* **249** *L* **10** # 18

Hidaka, Yasuo — Fujitsu Laboratories of

*Comment Type* **TR** *Comment Status* **R**

The device capacitance C_d of 0.28pF causes too much reflection in COM model.

Just a lump capacitor is too simple and does not represent actual device characteristics with T-Coil (Termination Coil) which is commonly used in many actual devices at this high data rate.

*SuggestedRemedy*

Add T-Coil to the COM model.

A presentation to propose the detail model and parameters of T-Coil for COM will be given at the Task Force meeting in May 2016.

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

REJECT.

Straw Poll on options in slide 27 of hidaka_3bs_01a_0516.pdf
Option A: 3
Option B: 4
Option C/More information needed: 11

More information and further presentations solicited

*Cl* **120D** *SC* **120D.4** *P* **249** *L* **40** # 45

Hegde, Raj — Broadcom Corporation

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

The current CTLE configuration for chip-to-chip is a 2-zero, 2-pole structure. Traditionally, the CTLE has carried an extra pole at fb to model the bandlimiting nature of real CTLEs.

*SuggestedRemedy*

Add a 3rd pole to the CTLE at fb. A presentation will be made in support of this comment.

*Proposed Response* *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **120E** *SC* **120E.1** *P* **254** *L* **37** # 20

Dudek, Mike — QLogic

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

Figure 120E-1 is an example CDAUI-8 forming part of a 400GBASE-SR16 link. This is an unlikely application as it involves a reverse mux in the PMA. It would be better to use a more likely example.

*SuggestedRemedy*

Change 400GBASE-SR16 to 400GBASE-FR8.

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

ACCEPT.

*Cl* **120E** *SC* **120E.1** *P* **254** *L* **53** # 71

Dawe, Piers — Mellanox

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

The draft requires "The low-frequency 3 dB cutoff of the AC-coupling within the module shall be less than 100 kHz". This is actually two requirements, for module input and module output. For module output, it is not obvious what is necessary and we haven't established how to measure it (unlike a passive channel where both ends are accessible). CAUI-4 and XLPPI do not even have a recommendation on this.

*SuggestedRemedy*

Remove this sentence. In 120E.3.2, CDAUI-8 module output, add "The low-frequency 3 dB cutoff of the output AC-coupling within the module ***should*** be less than 100 kHz."

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

ACCEPT IN PRINCIPLE.
Remove this sentence. In 120E.3.2, CDAUI-8 module output, add after the first sentence: "The low-frequency 3 dB cutoff of the output AC-coupling within the module should be less than 100 kHz."
See comments #70 & #72

*Cl* **120E** *SC* **120E.1** *P* **254** *L* **53** # 72

Dawe, Piers — Mellanox

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

The draft requires "The low-frequency 3 dB cutoff of the AC-coupling within the module shall be less than 100 kHz". This is actually two requirements, for module input and module output. For module input, this would be extremely complicated to measure and is none of the standard's business: the module input is tested with a long pattern that addresses low frequency effects, and the module implementer should be free to design good products as he chooses.

*SuggestedRemedy*

Remove this sentence. Add whatever is appropriate (see another comment) to 120E.3.2, CDAUI-8 module output. No need to add anything to 120E.3.4 CDAUI-8 module input.

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

ACCEPT IN PRINCIPLE.

See response to comment #71

*Cl* **120E** *SC* **120E.3.2** *P* **261** *L* **48** # 73

Dawe, Piers — Mellanox

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

Software channel loss needs tweaking, eye width, ESMW and eye height limits need review anyway.

*SuggestedRemedy*

Adjust software channel loss to be consistent with insertion loss budget in 120E.1, allowing for host package. Review, and if we can, improve the limits.

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

ACCEPT IN PRINCIPLE.
See responses to comments 43 & 24

*Cl* **120E** *SC* **120E.3.2.1** *P* **262** *L* **23** # 21

Dudek, Mike — QLogic

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

The values for eye width and eye height in this section do not say whether they are near end or far end and conflict with the values in table 120E-3. The requirement to meet the specifications in that table is already normative on page 261 line 34 so repeating the numbers here is unnecessary.

*SuggestedRemedy*

Delete the first sentence of this paragraph. Also Change the PICS TM9, TM10 adding rows so that both near end and far end eye heights and widths are included.

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

ACCEPT IN PRINCIPLE.
Delete the first two sentences of 120E.3.2.1:
"The Module output eye width of each PAM4 eye is greater than 0.4 UI. The Module output eye height of each PAM4 eye is greater than 120 mV."
Change the PICS TM9, TM10 adding rows so that both near end and far end eye heights and widths are included.

*Cl* **120E** *SC* **120E.3.2.1.1** *P* **262** *L* **35** # 43

Hegde, Raj — Broadcom Corporation

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

The current eye width and height measurement method needs to be updated according to the consensus comments received during the last meeting as well as the latest ad-hocs. The eye-height and width numbers as well as the loss-channel specification will need to be updated.

*SuggestedRemedy*

A presentation will be made in support of this comment. This topic is being discussed at the ad-hocs. Based on the consensus reached, a modification draft will also be submitted along with the presentation.

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

ACCEPT IN PRINCIPLE.

Change
"The coefficients of this loss channel, as a finite impulse response (FIR) filter over-sampled at four times the symbol rate, are provided in Table 120E-4."
to
"Use the host trace defined in 92.10.7.1.1 with Zp = 151mm."
with editorial license.
Remove Table 120E-4.

Change far-end eye ESMW and eye width parameters from 0.22UI to 0.20UI

*Cl* **120E** *SC* **120E.3.2.1.1** *P* **262** *L* **38** # 22

Dudek, Mike QLogic

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

The reference receiver defined in 83E.3.2.1.1 doesn't have the low frequency poles so you can't use it and refer to Table 120E-2 for values.

*SuggestedRemedy*

Replace 83E.3.2.1.1 with 120E.3.6.1

Change the title of 120E.3.1.6.1 from "Reference receiver for host output eye width and eye height evaluation" to "Reference receiver for eye width and eye height evaluation" (Note the suggestion is to remove the word "output" as well as "host" as this is used for calibration of the stressed inputs as well.

delete host on line 33.

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

ACCEPT IN PRINCIPLE.

Replace 83E.3.2.1.1 with 120E.3.1.6.1

Change the title of 120E.3.1.6.1 from "Reference receiver for host output eye width and eye height evaluation" to "Reference receiver for eye width and eye height evaluation"

Give editorial license to move this sub-clause to a more appropriate position in the clause hierachy.

delete host on line 33.

*Cl* **120E** *SC* **120E.3.2.1.1** *P* **262** *L* **45** # 24

Dudek, Mike QLogic

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

7.5dB loss is too great (assuming the far end eye is supposed to be representative of the signal at the ball of the host IC.) as this loss is the complete loss of the host channel and the module output is being measured at the output of the Module Compliance board. Also an FIR filter is an un-necessary complication and may not be as representative of a host trace as can be

*SuggestedRemedy*

Change 7.5dB to 6.4dB. (6.4dB is the 7.5dB host loss - 1.2dB for the MCB trace loss + 0.1dB for the difference between the loss of the MCB connector and the connector loss allocated in the budget.).

Use the host trace defined in 92.10.7.1.1 with Zp = 151mm. (ie identical to the host trace used in clause 92.

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

ACCEPT IN PRINCIPLE.
See comment #74
Also change
"(~7.5 dB loss at Nyquist/2)"
to
"(~6.4 dB loss at Nyquist)"

*Cl* **120E** *SC* **120E.3.2.1.1** *P* **262** *L* **46** # 23

Dudek, Mike QLogic

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

The loss of the channel should not be approx 7.5dB at Nyquist/2

*SuggestedRemedy*

Replace "Nyquist/2" with "Nyquist" or "Symbol rate/2" or "13.28GHz"

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

ACCEPT IN PRINCIPLE.
See response to comment 24

*Cl* **120E** *SC* **120E.3.2.1.1** *P* **263** *L* **32** # 74

Dawe, Piers Mellanox

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

The channel given by this 64-entry table seems to show some artifacts both at low and high frequencies which may be caused by having only 64 entries.

*SuggestedRemedy*

If we stay with a far-end eye, replace table with a formula e.g. a simplification of the transmission line model in COM (93A.1.2.3).

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

ACCEPT IN PRINCIPLE.
See response to comment # 43 & 24

---

*Cl* **120E** *SC* **120E.3.3.2** *P* **264** *L* **44** # 26

Dudek, Mike QLogic

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

It is strange to have Even-odd jitter as a sub-section in host input characteristics. Whereas the first mention is in transmitter characteristics.

*SuggestedRemedy*

Move this section (and references to it) to be part of 120E.4 (measurement methodology.

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

ACCEPT IN PRINCIPLE.
Add editors note that sub-clause is no longer referenced and should probably be removed.

---

*Cl* **120E** *SC* **120E.3.3.3** *P* **265** *L* **25** # 75

Dawe, Piers Mellanox

*Comment Type* **E** *Comment Status* **A** *Bucket*

Input tolerance isn't really defined in the little Table 120E-6, it takes a lot more than that.

*SuggestedRemedy*

Change "defined in " to "defined by" or "specified by". Also 120E.3.4.1.

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

ACCEPT IN PRINCIPLE.
Change "defined in " to "with the parameters in" .
Change also in 120E.3.4.1.

---

*Cl* **120E** *SC* **120E.3.3.3** *P* **265** *L* **46** # 27

Dudek, Mike QLogic

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

The host stressed input parameters should match the module output parameters. The text doesn't say whether the eye parameters are far end or near end, nor does it say whether the adjustments should be to make the far end eye worst case or the near end eye the worst case, or whether two tests are required. I think that it should be sufficient to do just one test and that the far end module specification is the more relevant.

*SuggestedRemedy*

Replace the values (and parameters) in table 120E-6 with the far end module specifications from table 120E-3.

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

ACCEPT IN PRINCIPLE.
Change the eye Height and width values and parameter names in Table 120E-6 to match the far-end eye values in Table 120E-3, as amended by comment 43.

---

*Cl* **120E** *SC* **120E.3.3.3.1** *P* **266** *L* **36** # 76

Dawe, Piers Mellanox

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

Use consistent terminology; the bounded jitter PRBS isn't data anyway. Two sentences could be joined together to make it clearer which we are talking about, 25G signal or ~2.5G jitter generator. Makes the text a bit shorter, but inserting "e.g." for clarity.

*SuggestedRemedy*

Change "The PRBS pattern length should be between PRBS7 and PRBS9. The data rate should be approximately 1/10 of the stressed pattern signaling rate (2.65625 GBd)." to "The PRBS pattern length should be between PRBS7 and PRBS9 with a signaling rate approximately 1/10 of the stressed pattern signaling rate (e.g. 2.65625 GBd)."

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

ACCEPT.
Change
"The PRBS pattern length should be between PRBS7 and PRBS9. The data rate should be approximately 1/10 of the stressed pattern signaling rate (2.65625 GBd)."
to
"The PRBS pattern length should be between PRBS7 and PRBS9 with a signaling rate approximately 1/10 of the stressed pattern signaling rate (e.g., 2.65625 GBd)."

*Cl* **120E** *SC* **120E.3.3.3.1** *P* **266** *L* **42** # 77

Dawe, Piers — Mellanox

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

Setting the pattern generator to the CDAUI-8 C2C output jitter profile given in Table 120D-1 then adding RJ to get to the EW spec implies a lot of RJ and very little BUJ - seems an untypical case, not the best one for testing with.

*SuggestedRemedy*

When we have a jitter spec for 120D, consider using a little more high probability jitter here and in 120E.3.4.1.1.

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

ACCEPT IN PRINCIPLE.
However no changes to the draft will be made at this time. Specific proposals are solicited.

---

*Cl* **120E** *SC* **120E.3.4.1.1** *P* **267** *L* **53** # 28

Dudek, Mike — QLogic

*Comment Type* **E** *Comment Status* **A** *Bucket*

Hot link to table 120E-7 doesn't seem to be working properly.

*SuggestedRemedy*

fix it.

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

ACCEPT.
Change the hot link to point to Table 120E-7 rather than Figure 120E-7

---

*Cl* **120E** *SC* **120E.3.4.1.1** *P* **267** *L* **54** # 78

Dawe, Piers — Mellanox

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

Nine lines of repetition.

*SuggestedRemedy*

Delete "Bounded uncorrelated jitter provides ... below the upper frequency limit of the pattern generator external modulator input."
Change "Random jitter and bounded uncorrelated jitter are added" to "Random jitter and bounded uncorrelated jitter (see 120E.3.3.3.1) are added".

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

REJECT.
Whilst there are 9 lines of text in 120E.3.3.3.1 that are the same as the 9 lines of text in 120E.3.4.1.1, referring back to them would not be in the interests of the reader.
This duplication also exists in Annex 83E (CAUI-4), where it has not been an issue.

---

*Cl* **120E** *SC* **120E.3.4.1.1** *P* **268** *L* **53** # 29

Dudek, Mike — QLogic

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

The requirement is now for 1e-5 probability eyes. EH6 and EW6 are not appropriate

*SuggestedRemedy*

Change "EH6 and EW6" to "Eye height and eye width"

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

ACCEPT.
Change "EH6 and EW6" to "eye height and eye width"

---

*Cl* **120E** *SC* **120E.4.2** *P* **269** *L* **10** # 80

Dawe, Piers — Mellanox

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

I wonder if we are making the module output test pay too much attention to state of emphasis rather than signal quality, bearing in mind that a host receiver probably has more than one degree of freedom, even though a full C2C CDAUI-8 receiver is not necessary. The method in the draft relies on real hosts having channels like the software channel in the draft, and I don't know that that's reasonable to the accuracy implied.

*SuggestedRemedy*

Would it be more realistic, for module output (not host output), to measure the eye height in the best 5% of the UI rather than the central 5%?

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

ACCEPT IN PRINCIPLE.
A presentation on this subject showing consensus for a change is solicited from the commenter.

---

*Cl* **120E** *SC* **120E.4.2** *P* **269** *L* **48** # 79

Dawe, Piers — Mellanox

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

If it takes 4 million UI equivalent to get to 1e-6, 2 CDFs in each direction, I believe it will take 1.2 million to get to 1e-5, 6 CDFs in each direction.

*SuggestedRemedy*

Change "400 thousand" to "1.2 million" or if the style giude tells us to, "1 200 000".

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

ACCEPT IN PRINCIPLE.
Change "400 thousand" to "1.2 million".

*Cl* **120E** *SC* **120E.4.2** *P* **269** *L* **52** # 30

Dudek, Mike QLogic

*Comment Type* **T** *Comment Status* **A** *Bucket*

There are more than two allowed CTLE settings for the module output.

*SuggestedRemedy*

Change "either of the CTLE settings" to "any single CTLE setting"

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

ACCEPT.

*Cl* **120E** *SC* **120E.4.2** *P* **270** *L* **17** # 81

Dawe, Piers Mellanox

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

at time TCmid

*SuggestedRemedy*

Should be "within 0.025 UI of time Tcmid" as in step 5. Also in step 7.

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

ACCEPT.
In Steps 6 and 7, change:
"at time Tcmid"
to
"within 0.025 UI of time Tcmid"
[Editor's note: Page 269 changed to 270]

*Cl* **120E** *SC* **120E.4.2.1** *P* **272** *L* **48** # 25

Dudek, Mike QLogic

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

Whether the vercial eye closure is measured as near end or far end is not stated. Also the original intent of this specification was to protect hosts from large amplitude very large distortion eyes. The addition of the far end specification provides this protection.

*SuggestedRemedy*

Change the sentence to "Vertical eye closure is measured on the near end eye and is calculated.....". Consider deleting all references to the Vertical eye closure.

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

ACCEPT IN PRINCIPLE.
Change the sentence to "Vertical eye closure is measured on the near end eye and is calculated.....".

Straw Poll
I support removing all references to Vertical eye closure in Annex 120E.
Yes 5; No 0; More information needed 9;

*Cl* **121** *SC* **121.8.5** *P* **160** *L* **22** # 52

Anslow, Pete Ciena

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

TDEC as defined in 95.8.5.1 includes: "The clock recovery unit (CRU) has a corner frequency of 10 MHz and a slope of 20 dB/decade."

*SuggestedRemedy*

Change: "... with the exception that in Equation 95-6 ..." to:
"... with the exceptions that the clock recovery unit (CRU) has a corner frequency of 4 MHz and in Equation 95-6 ..."

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

ACCEPT.

*Cl* **121** *SC* **121.8.7** *P* **160** *L* **39** # 53

Anslow, Pete Ciena

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

The transmitter optical waveform measurement defined in 95.8.7 uses a 10 MHz CRU.

*SuggestedRemedy*

Change:"... if measured according to the methods specified in 95.8.7." to:
"... if measured according to the methods specified in 95.8.7 with the exception that the clock recovery unit's high-frequency corner bandwidth is 4 MHz."

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

ACCEPT.

*Cl* **121** *SC* **121.8.8** *P* **160** *L* **44** # 54

Anslow, Pete Ciena

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

The stressed receiver sensitivity measurement defined in 95.8.8 uses a 10 MHz CRU and added jitter appropriate to this CRU bandwidth.

*SuggestedRemedy*

Add two more exceptions:
- The clock recovery unit (CRU) has a corner frequency of 4 MHz.
- Sinusoidal jitter is added as specified in Table 87-13 instead of Table 95-11.

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

ACCEPT.

*Cl* **122** *SC* **122.3.2** *P* **172** *L* **27** # 51

Anslow, Pete — Ciena

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

The sentence "The Skew Variation must also be limited to ensure that a given PCS lane always traverses the same physical lane." is in magenta font.
As the current PMA structures only involve 2:1 or 4:1 mux or demux, the consequence of excessive skew variation isn't likely to be a PCS lane traversing a different physical lane.

*SuggestedRemedy*

Delete this sentence here and in 123.3.2

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

ACCEPT IN PRINCIPLE.
Delete the sentence and change the first sentence to:
"The Skew (relative delay between the lanes) and Skew Variation must be kept within limits so that the information on the lanes can be reassembled by the PCS." here and in 123.3.2

---

*Cl* **122** *SC* **122.7.1** *P* **177** *L* **34** # 88

Liu, Hai-Feng — Intel Corp

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

Maximum optical return loss tolerance is determined by the field addition of all possible reflections (assuming they are in phase) in the link at TP2 when the link loss is at minimum. ORL tolerance defined with maximum link loss will not cover the worst case.

*SuggestedRemedy*

Recommend to calculate max ORL tolerance with zero link loss in the lack of agreed minimum link loss. It would be 22.8 dB for DR4 links. Plan to make a presentation at May meeting for details.

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

ACCEPT IN PRINCIPLE.
Change the ORL tolerance to 22.8 dB

---

*Cl* **122** *SC* **122.8.5.1** *P* **180** *L* **51** # 89

Liu, Hai-Feng — Intel Corp

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

This ORL for TDP testing has been considered the same at the maximum ORL tolerance above.

*SuggestedRemedy*

As we are moving away from TDP, suggest to revisit this when TDEC is finalized

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

ACCEPT IN PRINCIPLE.
See response to comment #12 for replacement for TDP. This measurement should be made in the presence of a reflection equal to the ORL tolerance value (22.8 dB)
See also comment #88

---

*Cl* **122** *SC* **122.8.7** *P* **181** *L* **29** # 82

Liu, Hai-Feng — Intel Corp

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

The ORL should be consistent with that in Sub-clause 122.7.1

*SuggestedRemedy*

Change the ORL to 22.8 dB

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

ACCEPT IN PRINCIPLE.
Having agreed a value for the ORL tolerance (see comment #88) the same value should be used in 122.8.5.1 and in 122.8.7 (22.8 dB).
See also comment #88

---

*Cl* **122** *SC* **122.8.7** *P* **181** *L* **31** # 58

Anslow, Pete — Ciena

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

In item b), the part about an optical filter is not appropriate for DR4.
53.2 GHz is magenta

*SuggestedRemedy*

Change item b) to:
b) Each lane may be tested individually with the sum of the optical power from all of the lanes not under test being below -30 dBm.
Make 53.2 black

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

ACCEPT.

*Cl* **122** *SC* **122.10** *P* **183** *L* **47** # 83

Liu, Hai-Feng — Intel Corp

*Comment Type* **T** *Comment Status* **R**

It seems this 39dB channel ORL is calcualated by the intensity addition of all the reflections from 4 MPO connectors. Not sure why the ORL is calculated differently here.

*SuggestedRemedy*

Provide jusification of doing intensity addition for this ORL, or change to the ORL determined by field addition (would be 33 dB without Rx).

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

REJECT.
This is a condition on the optical channel, which should be easy to verify by a simple test. The normal test equipment used to verify the optical return loss of the fiber optic cabling will give a value that is consistent with the intensity addition of all of the reflections.

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*Cl* **122** *SC* **122.11.2.2** *P* **184** *L* **41** # 64

Dawe, Piers — Mellanox

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

Who is supposed to obey this "shall"? The editor?

*SuggestedRemedy*

Change "The maximum number of instances with a
maximum discrete reflectance of -45 dB shall be four" to "The number of instances with a maximum discrete reflectance of -45 dB shall not exceed four". Similarly in 123.11.2.2.

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

ACCEPT.

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*Cl* **123** *SC* **123.7.1** *P* **199** *L* **41** # 84

Liu, Hai-Feng — Intel Corp

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

Maximum optical return loss tolerance is determined by the field addition of all possible reflections (assuming they are in phase) in the link at TP2 when the link loss is at minimum. ORL tolerance defined with maximum link loss will not cover the worst case.

*SuggestedRemedy*

Recommend to calculate max ORL tolerance with zero link loss in the lack of agreed minimum link loss. They would be 17.8 dB for FR8 and 15.7 dB for LR8. Plan to make a presentation at May meeting for details.

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

ACCEPT IN PRINCIPLE.
Change the ORL tolerance for LR8 to 15.7 dB
Change the ORL tolerance for FR8 to 17.8 dB

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*Cl* **123** *SC* **123.8.5** *P* **203** *L* **20** # 12

King, Jonathan — Finisar

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

TDP and SRS are TBD
Include TDECQ in clause 123, a transmitter quality metric, and SECQ, a metric for the SRS test source, by making the changes described in king_3bs_01_0516.pdf. The suggested changes affect 123.8.5, 123.8.10 and other sub sections where TDP or SRS is mentioned.

*SuggestedRemedy*

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

ACCEPT IN PRINCIPLE.
Make the changes to incorporate TDECQ and SRS into Clause 123 proposed in http://www.ieee802.org/3/bs/public/16_05/king_3bs_01_0516.pdf with editorial license.
Make equivalent changes to Clause 122 with editorial license.

In Table 123-7:
set the "Difference in launch power between any two lanes (OMAouter) (max)" to 4.4 dB for both 400GBASE-FR8 and 400GBASE-LR8
set the RIN values to -136 dB/Hz for both 400GBASE-FR8 and 400GBASE-LR8
In Table 123-8:
set the "Difference in receive power between any two lanes (OMAouter) (max)" to 4.5 dB for 400GBASE-FR8 and 4.9 dB for 400GBASE-LR8

*Cl* **123** *SC* **123.8.5** *P* **203** *L* **22** # 50

Anslow, Pete — Ciena

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

For the TDEC metric and SRS calibration being discussed in the SMF Ad Hoc (see http://www.ieee802.org/3/bs/public/adhoc/smf/16_04_19/king_01a_0416_smf.pdf) a short test pattern will be required.

*SuggestedRemedy*

Adopt the SSPRQ pattern (2^16-1 symbols long version) as proposed in http://www.ieee802.org/3/bs/public/adhoc/logic/apr28_16/anslow_01_0416_logic.pdf for TDEC and SRS calibration in Clauses 122 and 123 with editorial license.

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

ACCEPT IN PRINCIPLE.
Adopt the SSPRQ pattern (2^16-1 symbols long version) as proposed in http://www.ieee802.org/3/bs/public/adhoc/logic/apr28_16/anslow_01_0416_logic.pdf for TDECQ and SRS calibration in Clauses 122 and 123 with editorial license.
Add this test pattern to Clause 120 in the Tx direction.

A straw poll was taken:
Do you support adopting the SSPRQ pattern for TDECQ and SRS calibration in Clauses 122 and 123?
Yes 41
No 2

*Cl* **123** *SC* **123.8.5.1** *P* **203** *L* **35 &** # 85

Liu, Hai-Feng — Intel Corp

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

These ORLs for TDP testing have been considered the same at the maximum ORL tolerance above.

*SuggestedRemedy*

Suggest to revisit this when TDEC is finalized

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

ACCEPT IN PRINCIPLE.
See response to comment #12 for replacement for TDP. This measurement should be made in the presence of a reflection equal to the ORL tolerance value (15.7 dB for LR8 and 17.8 dB for FR8).
See also comment #88

*Cl* **123** *SC* **123.8.7** *P* **204** *L* **15** # 86

Liu, Hai-Feng — Intel Corp

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

ORLs should be consistent with that in Sub-clause 123.7.1

*SuggestedRemedy*

17.8 dB for FR8 and 15.7 dB for LR8.

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

ACCEPT IN PRINCIPLE.
Having agreed a value for the ORL tolerance (see comment #84) the same value should be used in 123.8.5.1 and in 123.8.7 15.7 dB for LR8 and 17.8 dB for FR8).
See also comment #84

*Cl* **123** *SC* **123.10** *P* **207** *L* **39** # 87

Liu, Hai-Feng — Intel Corp

*Comment Type* **T** *Comment Status* **R**

It seems the channel ORLs are calcualated by the intensity addition of the reflections from all the connectors of the links. Not sure why they are calculated differently here.

*SuggestedRemedy*

Provide jusification of doing intensity addition for these ORLs, or change to the ORLs determined by field addition (would be 22.1 dB for FR8 and 18.9 dB for LR8 without Rx).

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

REJECT.
This is a condition on the optical channel, which should be easy to verify by a simple test. The normal test equipment used to verify the optical return loss of the fiber optic cabling will give a value that is consistent with the intensity addition of all of the reflections.