Cl **01** *SC* **1.3** *P* **25** *L* **45** # 1

Kolesar, Paul CommScope

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

TIA published the "OM4 fiber" standard, TIA 492AAAD, eliminating the need for the Editor's note tracking its progress.

SuggestedRemedy

Delete lines 45 and 46, the Editor's note to be removed prior to publication.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

The document TIA-492AAAD has been published as of Oct, 2009. So this Editor's note is not needed. Remove the Editor's note.

Removing the Editor's note is not considered a substantive change.

Cl **86** *SC* **86.8.4.7** *P* **295** *L* **27** # 2

Anslow, Peter Nortel Networks

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

The response to comment 190 against Draft 2.2 to insert exception f in subclause 86.8.4.8 has incorrectly been applied to subclause 86.8.4.7 instead

SuggestedRemedy

Move exception f) "The mode-conditioning patch cord suitable for 62.5/125 um fiber is not used." from subclause 86.8.4.7 to subclause 86.8.4.8

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **83A** *SC* **83A.5.2** *P* **389** *L* **30** # 3

Petrilla, John Avago Technologies

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

Please spell out +.

SuggestedRemedy

Change, "... jitter of the filter stress + limiter and random jitter ..." to "... jitter of the filter stress plus limiter and random jitter ..."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Proposed Reject

It is noted that the Draft 2.3 is technically correct and complete.

The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:
accept

Cl **83A** *SC* **83A.1** *P* **376** *L* **16** # 4

Petrilla, John Avago Technologies

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

An important characteristic of XLAUI/CAUI is NRZ encoding.

SuggestedRemedy

Add an item, 'g) NRZ encoding.' to the characteristics list or combine with item f.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

NRZ is implied throughout the document

It is noted that Draft 2.3 is technically correct and complete.

The above comment is made against unchanged text and therefore out of scope for this ballot.

Cl **83A** *SC* **83A.2.1** *P* **377** *L* **23** # 5

Petrilla, John Avago Technologies

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

The frequency range for insertion loss in 83A & 83B is from 0.25 GHz to 11.1 GHz, while for 85 it's from 0.05 GHz to 11.1 GHz and for 86A it's from 0.01 GHz to 11.1 GHz. Unless there are good technical reasons for the differences in the low frequency range limit, these should be consistent. Since scrambled data has significant low frequency content, it seems prudent to set the insertion loss frequency range limit to the lowest practical point to guard against unexpected loss of low frequency content.

SuggestedRemedy

For equations 85-14, 83A-1, 83A-2, 83A-9, 83B-1, 83B-2, 83B-3, 83B-4, 86A -4, 86A-5, 86A-6, 86A-7, 86A-15 & 86A-16 change the lower limit of the frequency range to 0.01 GHz.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Please note 86A-4, 86A-5, 86A-6, 86A-7, 86A-15 and 86A-16 have a lower limit of 0.01 GHz. It is noted that the Draft 2.3 is technically correct and complete regarding the stated frequency ranges none of which had changed between Draft 2.2 and Draft 2.3. The task force recognizes that your suggested change, where applicable, might be considered an improvement and mandates the editor to resubmit this comment against draft D3.0.

Cl **83A** *SC* **83A.3.3** *P* **379** *L* **46** # 6

Petrilla, John Avago Technologies

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

In table 83A-1, note a, "Rise/Fall time measurement methodology defined in 83A.3.3.2", is redundant with the entry, "83A.3.3.2", in the Subclause Reference column and can be deleted.

SuggestedRemedy

In table 83A-1, delete note "a Rise/Fall time measurement methodology defined in 83A.3.3.2".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is noted that Draft 2.3 is technically correct and complete.

The above comment is made against unchanged text and therefore out of scope for this ballot.

The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response: proposed accept

Cl **83A** *SC* **83A.3.3.4** *P* **382** *L* **3** # 7

Petrilla, John Avago Technologies

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

In the first sentence, the phrase, "For frequencies from 10 MHz to 11.1 GHz,", is redundant with the content of eq. 83A-6 and should be deleted.

SuggestedRemedy

Change from, "For frequencies from 10 MHz to 11.1 GHz, common mode output return loss ..." to "Common mode output return loss ..."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is noted that Draft 2.3 is technically correct and complete.

The above comment is made against unchanged text and therefore out of scope for this ballot

The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:
proposed accept

Cl **83A** *SC* **83A.3.3.4** *P* **382** *L* **18** # 8

Petrilla, John Avago Technologies

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

Typo: "freqyency" should be "frequency"

SuggestedRemedy

Change "freqyency" to "frequency".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This is not expected to be considered a substantive change because fixing a typo is generally not considered a substantive change.

Cl **83A** *SC* **83A.3.4.3** *P* **384** *L* **37** # 9

Petrilla, John Avago Technologies

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

The phrase, "For frequencies from 10 MHz to 11.1 GHz, ", is redundant with the content of eq. 83a-7 and should be deleted.

SuggestedRemedy

Change from, "For frequencies from 10 MHz to 11.1 GHz, differential input return loss ..." to "Differential input return loss ..."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is noted that Draft 2.3 is technically correct and complete.

The above comment is made against unchanged text and therefore out of scope for this ballot

The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:
proposed accept

Cl **83A** *SC* **83A.3.4** *P* *L* # 10

Petrilla, John Avago Technologies

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

Inconsistent use of hyphenation appears in 83a with the term, 'differential-to-common' - sometimes the hyphenation is used and sometimes not. See for example, lines 28 to 30, "Differential- to-common mode input return loss is given in Equation (83A-8) and is illustrated in Figure 83A-11. Differential to common mode input return loss ...". For consistency, replacing the hyphens with spaces is recommended. In 83a, there are 4 instances.

SuggestedRemedy

Change from "Differential-to-common ..." to "Differential to common ..." on pages 383, 385 (2 instances) and 386.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See suggested remedy

This is not expected to be considered a substantive change because removing hyphens in exchange for spaces is generally not considered a substantive change.

Cl **83A** *SC* **83A.4** *P* **386** *L* **42** # 11

Petrilla, John Avago Technologies

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

The line, "The XLAUI/CAUI is primarily intended as a point-to-point interface of up to approximately 25 cm between integrated circuits ...", is inconsistent with that on page 376, "The XLAUI/CAUI allows interconnect distances of approximately 25 cm over printed circuit board including one connector" and can be lead to confusion.

SuggestedRemedy

Change from, "The XLAUI/CAUI is primarily intended as a point-to-point interface of up to approximately 25 cm between integrated circuits ..." to, "The XLAUI/CAUI is primarily intended as a point-to-point interface of up to approximately 25 cm including one connector between integrated circuits ..."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is noted that Draft 2.3 is technically correct and complete.

The above comment is made against unchanged text and therefore out of scope for this ballot

The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:
proposed accept

Cl **83A** *SC* **83A.5.1** *P* **389** *L* **12** # 12

Petrilla, John Avago Technologies

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

The text states., "The data pattern for jitter measurements shall be test pattern PRBS31.". Should not either pattern 3, pattern 5 (see table 86-11) or valid traffic be acceptable? See also 83a.5.2 line 32 and 83b.2.3 page 404 line 7.

SuggestedRemedy

Change from, "The data pattern for jitter measurements shall be test pattern PRBS31." to "Pattern 3, Pattern 5, see Table 86-11, or valid XLAUI/CAUI signal shall be used for jitter measurements." Repeat/apply in 83a.5.2 line 32 and 83b.2.3 page 404 line 7.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Proposed Reject

It is noted that Draft 2.3 is technically correct and complete.

The above comment is made against unchanged text and therefore out of scope for this ballot.

The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:

PAIP
Resolve comment to ensure consistancy between 83A and 83B
83A.5:
Change from, "The data pattern for jitter measurements shall be test pattern PRBS31."

To:
"The data pattern for jitter measurements shall be test pattern PRBS31 (see 83.5.10) or scrambled idle (see 82.2.10)."

Change from, "A PRBS31 pattern shall be used for evaluating XLAUI/CAUI jitter tolerance."

to

A PRBS31 pattern (see 83.5.10) or scrambled idle (see 82.2.10) shall be used for evaluating XLAUI/CAUI jitter tolerance.

Add PICS for Jitter Tolerance Pattern

83B.2.3 already has the following:

The recommended pattern for evaluating XLAUI/CAUI jitter tolerance is scrambled idle, (see 82.2.10) or PRBS31 (see 83.5.10).

Cl **83A** *SC* **83A.5.1** *P* **389** *L* **16** # 13

Petrilla, John Avago Technologies

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

The text, "All XLAUI/CAUI channels shall be active during transmit jitter
testing to ensure any channel-channel crosstalk is included in the jitter evaluation." uses the term 'channel' where the term 'lane' is more appropriate. For example, in 802.3ba context, the four lanes of XLAUI form one channel. See also 83a.5.2 line 31 and 83b.2.3 page 404 line 6.

SuggestedRemedy

Change from, "All XLAUI/CAUI channels shall be active during transmit jitter
testing to ensure any channel-channel crosstalk is included in the jitter evaluation." to "All XLAUI/CAUI lanes shall be active during transmit jitter
testing to ensure any lane-lane crosstalk is included in the jitter evaluation." Repeat/apply in 83a.5.2 line 31 and 83b.2.3 page 404 line 6.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is noted that the Draft 2.3 is technically correct and complete.

The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:
accept

Cl **83B** *SC* **83B.2.1** *P* **400** *L* **1** # 14

Petrilla, John Avago Technologies

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

The text, "AC coupling for both TX and RX paths shall be located in the module.", could be interpreted as requiring AC coupling means in both the Tx output and Rx inputs. This may be in conflict with 83a.3.4.5, page 386, line 29, "AC-coupling is considered to be part of the receiver for the purposes of this specification unless explicitly stated otherwise." AC coupling means on both ends of a path seem to serve little purpose and may likely degrade signal performance. Further, since each lane or path has a transmitter on one end and a receiver on the other, the terms Tx path(s) and Rx path(s) can be confusing.

SuggestedRemedy

Change "AC coupling for both TX and RX paths shall be located in the module." to "AC coupling for Rx inputs shall be located in the module."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

For 83B, it was agreed that AC coupling for both Tx and Rx shall be located in the module.

It is noted that Draft 2.3 is technically correct and complete.

The above comment is made against unchanged text and therefore out of scope for this ballot.

Cl **83B** *SC* **83B.2.2** *P* **402** *L* **13** # 15

Petrilla, John Avago Technologies

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

The reference to Table 83B-3 in "Table 83B-3 also lists the equivalent test points for the XLPPI/CPPI" seems intended for Table 83B-4.

SuggestedRemedy

Change, "Table 83B-3 also lists the equivalent test points for the XLPPI/CPPI" to "Table 83B-4 also lists the equivalent test points for the XLPPI/CPPI".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This is not expected to be considered a substantive change because fixing a typo is generally not considered a substantive change.

Cl **83B** *SC* **83B.2.3** *P* **403** *L* **50** # 16

Petrilla, John Avago Technologies

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

Random jitter is not usually specifed as peak-to-peak but either as RMS or for a given BER.

SuggestedRemedy

Change, "... and 0.15 UI peak-to-peak random jitter" to "and 0.15 UI random jitter for BER = 1E-12".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is noted that the Draft 2.3 is technically correct and complete.

The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:

proposed AIP
Considered a technical comment.
Change, "... and 0.15 UI peak-to-peak random jitter" to "and 0.15 UI peak-to-peak random jitter at BER = 1E-12".
Insert the following sentence to 83A.5:
Jitter vales are specified at BER 10-12.

Cl **86** *SC* **86.7.3** *P* **288** *L* **33** # 17

Petrilla, John Avago Technologies

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

In table 86-8, the row, "Receiver jitter tolerance signal level in OMA, each lane" is really an input condition for the receiver jitter tolerance test. As such there should not be a Max in the Type column but a dash as with the jitter entries and the row should be moved to be included with the other conditions.

SuggestedRemedy

In table 86-8, move the row, "Receiver jitter tolerance signal level in OMA, each lane" to be included with the other conditions for the receiver jitter tolerance test and change the entry in the Type column from Max to a dash.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
See response to comment 71

Cl **86** *SC* **86.7.3** *P* **288** *L* **44** # 18

Petrilla, John Avago Technologies

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

In table 86-8, footnote c states "TDP is defined with ±0.15 UI offsets of the sampling instant". (See also 86.8.4.4 exception e.) This particular offset is a residue of a receiver output requirement for a max TJ(BER = 1E-12) of 0.7 UI. This requirement has since been redefined to a max J2 of 0.46 UI and max J9 of 0.62 UI and the TDP offset should be changed to keep in alignment with the Rx output criteria.

SuggestedRemedy

In table 86-8 footnote c, change "TDP is defined with ±0.15 UI offsets of the sampling instant" to "TDP is defined with ±0.27 UI offsets of the sampling instant for J2 and ±0.19 UI offsets of the sampling instant for J9". Make a similar change in 86.7.3 to exception e.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
the +/-0.15UI is consistent with BER=1e-12 sensitivity measurements performed for TDP measurement.
Comment 18 is made against unchanged text and therefore out of scope for this ballot.

Cl **86** *SC* **86.8.4.7** *P* **295** *L* **27** # 19

Petrilla, John Avago Technologies

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

Exception, "f) The mode-conditioning patch cord suitable for 62.5/125 ìm fiber is not used." belongs in 86.8.4.8. See resolution to D2.2 comment 190.

SuggestedRemedy

Move exception, "f) The mode-conditioning patch cord suitable for 62.5/125 ìm fiber is not used." from 86.8.4.7 to 86.8.4.8.

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **83A** *SC* **83A.3.3** *P* **379** *L* **40** # 20

Ghiasi, Ali Broadcom

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

Eye mask defined at BER 1E-12 is not practical and often not measured

SuggestedRemedy

We should consider defining eye mask at a BER where sampling scope can be used

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Since the link is defined for operation at BER E-12, it is appropriate to define an eye mask which corresponds to this.
This definition is also consistent with other 802.3 sections.
Suggested remedy incomplete

Also see comment 257 from D2.0

It is noted that Draft 2.3 is technically correct and complete.

The above comment is made against unchanged text and therefore out of scope for this ballot.

Cl **83A** *SC* **83A.3.4** *P* **383** *L* **47** # 21

Ghiasi, Ali Broadcom

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

Eye mask defined at BER 1E-12 is not practical and often not measured

SuggestedRemedy

We should consider defining eye mask at a BER where sampling scope can be used

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to comment 20

Cl **83A** *SC* **83A.5.2** *P* **389** *L* **37** # 22
Ghiasi, Ali Broadcom

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

Comment on D2.3 not implemented replace "PCB trace stress"

SuggestedRemedy

with "Frequency Dependent Attenuator"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Implementation consistent with 123 in D2.2 :

accept in principle

Change:
FR4 trace stress is then added
until 0.42 UI peak-to-peak deterministic jitter is achieved

to:
Stress is then added using PCB trace or Frequency Dependent Attenuation which emulates PCB loss. PCB trace stress is added until 0.42 UI peak-to-peak deterministic jitter is achieved.

Modify diagram (change FR4 to PCB)

Make same changes in 83B.2.3

Cl **83B** *SC* **83B.2.1** *P* **401** *L* **47** # 23
Ghiasi, Ali Broadcom

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

Eye mask defined at BER 1E-12 is not practical and often not measured

SuggestedRemedy

We should consider defining eye mask at a BER where sampling scope can be used

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to comment 20

Cl **83B** *SC* **83B.2** *P* **404** *L* **13** # 24
Ghiasi, Ali Broadcom

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

Comment on D2.3 not implemented replace "PCB trace stress"

SuggestedRemedy

with "Frequency Dependent Attenuator"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See comment 22

Cl **85** *SC* **85.8.3** *P* **244** *L* **48** # 25
Ghiasi, Ali Broadcom

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

ghiasi 98 comment D2.3 not implemented, DDJ test method not provided and the reference is worng!

SuggestedRemedy

Please implement remedy per ghiasi 98 D2.2
A suggested metthod is given below:
Total jitter is measured with PRBS31 (pattern 3) at BER of 10-12. Data Dependent jitter is measured with PRBS9 based on method given in 85.8.3 with following definition
DDJ=max(dt1, dt2, ...,dt256) - min(dt1, dt2, ...,dt256).
Section 85.8.3 would need to be updated or the other option is to create a standlone section.
Total Jitter Excluding DDJ = TJ - DDJ

Proposed Response *Response Status* **W**

PROPOSED REJECT.
D2.2 Comment#98 resolution implemented per response:

D2.2 Comment#98 Response:
Measure Total jitter at BER 1E-12 per 83A.5.1.=TJ
Measure DDJ with PN9=DDJ
Total Jitter excluding Data Dependent Jitter = TJ - DDJ
Editor given license to implement response incorporating comment#218 in response.
D2.2 Comment#218 add definition for DDJ:
Response comment#218 -DDJ is a jitter component where jitter that is not correlated to the data pattern has been removed.
D2.3 implementation of comment#98 and comment#218:
See Table 85-4-Transmitter characteristics at TP2 summary table entry "Total jitter excluding data dependent jitter" and footnote (f).
(f)Total jitter at a BER of 10-12 measured per 83A.5.1 excluding data dependent jitter (DDJ). DDJ is a jitter component where jitter that is not correlated to the data pattern has been removed. DDJ is measured with PRBS9 as specified in 83.5.10.

Cl **85** *SC* **85.8.3.4** *P* **250** *L* **22** # 26
Ghiasi, Ali Broadcom

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

Eq 85-14 2nd line uses smaller font

SuggestedRemedy

Please use the same font

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.
See suggested remedy.
This is not expected to be considered a substantive change as it addresses consistency in font usage.

Cl **85** *SC* **85.8.3.4** *P* **250** *L* **35** # 27
Ghiasi, Ali Broadcom

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

It was agreed to include min insertion loss but not implemented

SuggestedRemedy

Please add Eq 86A-16 and updated the fig so it looks like Fig86A-11

Proposed Response *Response Status* **W**

PROPOSED REJECT. D2.2 Comment#101 was rejected.

Response to comment#101
The 86A specification for a minimum provides no real benefit as it produces a minimum specification of 0.15 dB extracted connector insertion loss.
Y:7, N:0,A:2, Room attendance:9

Cl **85** *SC* **85.8.3.5** *P* **251** *L* **17** # 28
Ghiasi, Ali Broadcom

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

Figure 85-5 was suppose to be udpated, why are you avoiding solid test definition of CL86.

SuggestedRemedy

Please implement the comment per D2.3 agrement

Proposed Response *Response Status* **W**

PROPOSED REJECT.

D2.2 Comment#111 was implemented per response to comment#111 which points to comment#158.
See response to comment#158
(1)In Figure 85-5 illustrate Figure 85-11 TP2 or TP3 test fixture attached to TP2 or TP3 test points.

Cl **85** *SC* **85.8.3.5** *P* **251`** *L* **20** # 29
Ghiasi, Ali Broadcom

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

Fig 85-5 state transmitter test fixture on the left dotted line show TP2/Tp3 test fixture. TP3 is a reciver test point how could it be called transmitter test fixtrue!

SuggestedRemedy

Please repalce the figure showing MCB-HCB mated pair, you borrow fig 86-3 but with CL85 test point on it

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change:The test fixture of Figure 85-5, or its functional equivalent, is required for measuring the transmitter specifications
in 85.8.3 at TP2 and TP3 with the exception of the return loss specified in 85.8.3.6.

To:
The test fixture of Figure 85-5, or its functional equivalent, is required for measuring the transmitter specifications
in 85.8.3 at TP2 and the receiver specifications in 85.8.4 at TP3 with the exception of the return loss specified in 85.8.3.6.

This is not expected to be considered a substantive change as it's a clarification of implementation and does not change requirements.

Cl **85** *SC* **85.8.3.6** *P* **251** *L* **38** # 30
Ghiasi, Ali Broadcom

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

It is not clear how to measure the RL, is it probed at pin?

SuggestedRemedy

Since the EQ is the same as CL86 it must be measured with HCB

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Add sentence to end of paragraph under 85.8.3.5 Test fixture "The test fixture of Figure 85-5 is specified in a mated state in 85.10.9."
This is not expected to be considered a substantive change as it's a clarification of implementation and does not change requirements.

Cl **85** *SC* **85.8.3.6** *P* **251** *L* **50** # 31

Ghiasi, Ali Broadcom

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

It is not clear how to measure the IL, is it probed at pin?

SuggestedRemedy

Since the EQ is the same as CL86 it must be measured with HCB

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
See response to comment#30.
This is not expected to be considered a substantive change as it's a clarification of implementation and does not change requirements.

Cl **85** *SC* **85.8.4.3** *P* **253** *L* **37** # 32

Ghiasi, Ali Broadcom

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

FIg 85-6 defines LUT and PGC but you have to read the next section before you know what they are

SuggestedRemedy

Please provide test setup definition in the same section

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add legend to Figure 85-6.
LUT = lane under test
PGC = pattern generator connection
This is not expected to be considered a substantive change as it's a clarification of implementation and does not change requirements.

Cl **85** *SC* **85.8.4.3** *P* **253** *L* **39** # 33

Ghiasi, Ali Broadcom

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

Why is twinaxial cable requried and why n=4, 10, ...?

SuggestedRemedy

Replace twinaxial cable with "CR4 or CR10 cable assembley"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change: Figure 85-6 and Figure 85-7
n pair
Twinaxial cable
n=4,10,.
To: cable assembly 4x or 10x.
This is not expected to be considered a substantive change as it's a clarification of figure text and does not change requirements.

Cl **85** *SC* **85.8.4.3** *P* **253** *L* **39** # 34

Ghiasi, Ali Broadcom

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

Fig 85-6 does not show what showuld be done with cable RX side on the left, open, short, terminate!

SuggestedRemedy

Please show it is terminated to 50 ohms

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Add text subclause 85.8.4.3 Test setup "The cable assembly test fixture receive lanes not connected to receivers are terminated in 100 O differentially."
This is not expected to be considered a substantive change as it's a clarification of implementation and does not change requirements.

Cl **85** *SC* **85.8.4.3.2** *P* **254** *L* **27** # 35

Ghiasi, Ali Broadcom

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

How is someone suppose to know what this statement means"The MDNEXT is measured from points HTx to point LUT in figure 85-7"!

SuggestedRemedy

This section require more clear write up and more deatil picture

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change: The MDNEXT is measured from points HTx to point LUT in Figure 85-7.
To: The MDNEXT is determined from the individual NEXT losses measured from the host transmitter (HTx) test reference points to the LUT in Figure 85-7
using Equation (85-26).
This is not expected to be considered a substantive change as it's a clarification of implementation and does not change requirements.

Cl **85** *SC* **85.8.4.3.3** *P* **254** *L* **45** # 36

Ghiasi, Ali Broadcom

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

Its rise and fall times should be no less than 47 ps! Not clear

SuggestedRemedy

Replace with "Pattern generator transmitter target rise and fall times are 47 ps."

Proposed Response *Response Status* **W**

PROPOSED REJECT.
It is noted that the Draft 2.3 is technically correct and complete. The task
force recognizes that the change suggested above would be an improvement and mandates the editor to resubmit this comment against draft D3.0

Cl **85** *SC* **85.8.4.3.3** *P* **254** *L* **45** # 37

Ghiasi, Ali Broadcom

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

The rise and fall time test patter not provided and definition

SuggestedRemedy

Rise and fall times are measrued with pattern of 8 ones and 8 zeros from 20-80%.

Proposed Response *Response Status* **W**

PROPOSED REJECT. It is noted that the Draft 2.3 is technically correct and complete. The task
force recognizes that the change suggested above would be an improvement and mandates the editor to resubmit this comment against draft D3.0

Cl **85** *SC* **85.10.4** *P* **259** *L* **20** # 38

Ghiasi, Ali Broadcom

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

CL 86 provide common mode return loss as well as SCD in order to control EMI, but CL 85 ignore this critical aspect of system

SuggestedRemedy

Please add common mode definition per CL86, see EQ 86A-2

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The commenter has not demonstrated the applicability of the suggested common mode return loss or SCD limits to the EMI limits of a shielded cable assembly.
In addition, the comment is out of the scope of the ballot i.e., unsatisfied negative comments from the 2nd recirculation ballot and substantive changes made to create IEEE P802.3ba/D2.3 from IEEE P802.3ba/D2.2.

Cl **85** *SC* **85.10.9..2** *P* **264** *L* **28** # 39

Ghiasi, Ali Broadcom

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

Missing mated test fixture SCC and SCD specificaitons

SuggestedRemedy

Please see 86A.5.1.1.2

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The commenter has not demonstrated the applicability of the suggested common mode return loss or SCD limits to sytem perfomance e.g., BER,.
In addition, the comment is out of the scope of the ballot i.e., unsatisfied negative comments from the 2nd recirculation ballot and substantive changes made to create IEEE P802.3ba/D2.3 from IEEE P802.3ba/D2.2.

Cl **85** *SC* **85.11.1.1** *P* **267** *L* **31** # 40

Ghiasi, Ali Broadcom

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

MLD can reorder lane but figure 85-12 shows specific SL# connected to the each pin of the MDI connector. Connecting lane 1 to lane one of the the MDI could compromise the signal integrity

SuggestedRemedy

Current statement "The Style-1 40GBASE-CR4 MDI connector contact assignment shall be as defiend in Table 85-12."

to "Example Style-1 40GBASE-CR4 MDI connector contact assignment is shown in Table 85-12. Other wiring assignment is acceptable as long as Tx lane and Rx lane pairs are not broken and the polarity is maintained."

Proposed Response *Response Status* **W**

PROPOSED REJECT. MLD is independent of MDI source lane (SL) naming conventions; MDI contact assignments consistent with SFF-8436.
In addition, the comment is out of the scope of the ballot i.e., unsatisfied negative comments from the 2nd recirculation ballot and substantive changes made to create IEEE P802.3ba/D2.3 from IEEE P802.3ba/D2.2.

Cl **85** *SC* **85.11.1.2.1** *P* **269** *L* **20** # 41

Ghiasi, Ali Broadcom

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

MLD can reorder lane but figure 85-13 shows specific SL# connected to the each pin of the MDI connector. Connecting lane 1 to lane one of the the MDI could compromise the signal integrity

SuggestedRemedy

Current statement "The Style-2 40GBASE-CR4 MDI connector contact assignment shall be as defiend in Table 85-13."

to "Example Style-2 40GBASE-CR4 MDI connector contact assignment is shown in Table 85-13. Other wiring assignment is acceptable as long as Tx lane and Rx lane pairs are not broken and the polarity is maintained."

Proposed Response *Response Status* **W**

PROPOSED REJECT.
MLD is independent of MDI source lane (SL) naming conventions; MDI contact assignments consistent with IEC 61076-3-113. SFF-8642. In addition, the comment is out of the scope of the ballot i.e., unsatisfied negative comments from the 2nd recirculation ballot and substantive changes made to
create IEEE P802.3ba/D2.3 from IEEE P802.3ba/D2.2.

Cl **85** *SC* **85.11.3** *P* **271** *L* **20** # 42

Ghiasi, Ali Broadcom

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

MLD can reorder lane but Table 85-14 shows specific SL# connected to the each pin of the MDI connector. Connecting lane 1 to lane one of the the MDI could compromise the signal integrity

SuggestedRemedy

Current statement "The 100GBASE-CR10 MDI connector contact assignment shall be as defiend in Table 85-14."

to "Example 100GBASE-CR10 MDI connector contact assignment is shown in Table 85-14. Other wiring assignment is acceptable as long as Tx lane and Rx lane pairs are not broken and the polarity is maintained."

Proposed Response *Response Status* **W**

PROPOSED REJECT. MLD is independent of MDI source lane (SL) naming conventions; MDI contact assignments consistent with SFF-8642.
In addition, the comment is out of the scope of the ballot i.e., unsatisfied negative comments from the 2nd recirculation ballot and substantive changes made to create IEEE P802.3ba/D2.3 from IEEE P802.3ba/D2.2.

Cl **85** *SC* **85.11.2** *P* **269** *L* **38** # 43

Ghiasi, Ali Broadcom

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

IEC XXXXXXXX-XXX was suppose to be remvoed

SuggestedRemedy

Plesae remove place holders

Proposed Response *Response Status* **W**

PROPOSED REJECT. IEC XXXXXXXX-XXX is a place holder to be removed prior to publication.In addition, the comment is out of the scope of the ballot i.e., unsatisfied negative comments from the 2nd recirculation ballot and substantive changes made to create IEEE P802.3ba/D2.3 from IEEE P802.3ba/D2.2.

Cl **86A** *SC* **86A.4.1.1** *P* **423** *L* **43** # 44

Ghiasi, Ali Broadcom

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

With current set of specifications the SerDes transmitter may have very large amount of deemphasis 3-5 dB resulting in signifincat distortion at TP1a and also see comment 216/218 on D2.1 and comment 131 on D2.2

SuggestedRemedy

The options here are either limit max DDJ to about 0.125 UI or max 3 dB de-emphasis, see ghiasi_03_0909

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The comment restates comment #131 from draft D2.2 ballot, which was submitted by the same balloter, and rejected. It can therefore be considered a "pile on" to the balloter's own comment.
See response to comment 45.

Cl **86A** *SC* **86A.4.1.1** *P* **422** *L* **32** # 45

Ghiasi, Ali Broadcom

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

With current set of specifications the SerDes transmitter may have very large amount of deemphasis 3-5 dB resulting in signifincat distortion at TP1a and also see comment 216/218 on D2.1 and comment 131 on D2.2

SuggestedRemedy

The options here are either limit max DDJ to about 0.125 UI or max 3 dB de-emphasis, see ghiasi_03_0909

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The comment restates comment #131 from draft D2.2 ballot, which was submitted by the same balloter, and rejected. It can therefore be considered a "pile on" to the balloter's own comment.
The Task Force considered ghiasi_03_0909 in the Chicago meeting, decided there was insufficient information and invited further work. Without more analysis it is not clear that there is a problem and if there is, what remedy would be suitable.

Cl **88** *SC* **88.8.10** *P* **351** *L* **20** # 46

Ghiasi, Ali Broadcom

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

Stress receiver sensitivy has corner frequncy of 10 MHz also see comment 224 and 225 D2.1 and comment 129 D2.2 will lead to higher power and complexity for the receier. The clock and power supply noise do not scale with higher baudrate so there is very little benifit of higher CRU BW. The CRU increased BW has very little benifit on the VCO noise. The 10 MHz burden will remin even in the case of future generations where ASIC/SerDes operate at 25 G with DFE implementation!
SuggestedRemedy

SuggestedRemedy

Propose to consider corner frequency of 7 MHz instead of current 10 MHz and change 100 KHz to 70 KHz. Higher CRU BW has very little benifit on the VCO noise and power supply nosie but significant penalty on the receiver, see ghiasi_01_1109

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The comment restates comment #129 from draft D2.2 ballot, which was submitted by the same balloter, and rejected. It can therefore be considered a "pile on" to the balloter's own comment.
Comments 127, 128 and 129 against D 2.2 were disscussed by the Task Force Optical track during the Chicago meeting.
The result of a vote was:
The Task Force voted on whether to:
A - Leave the CRU corner frequency at 10 MHz and correct the formula in Table 88-13
B - Change the CRU corner frequency to 7 MHz in a consistent manner in clause 88
A 9
B 1

Cl **88** *SC* **88.8.8** *P* **350** *L* **45** # 47

Ghiasi, Ali Broadcom

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

Transmitter eye diagrm is measured CRU BW of 10 MHz also see comment 224 and 225 D2.1 and comment 128 will result to more complex higher power receiver implementations. The clock and power supply noise do not scale with higher baudrate so there is very little benifit of higher CRU BW. The CRU increased BW has very little benifit on the VCO noise. The 10 MHz burden will remin even in the case of future generations where ASIC/SerDes operate at 25 G with DFE receiver!

SuggestedRemedy

Propose to consider CRU BW 7 MHz instead of current 10 MHz. Higher CRU BW has very little benifit on the VCO noise and power supply nosie but significant penalty on the receiver, see ghiasi_01_1109

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The comment restates comment #128 from draft D2.2 ballot, which was submitted by the same balloter, and rejected. It can therefore be considered a "pile on" to the balloter's own comment.
See Response to comment 46.

Cl **88** *SC* **88.8.5** *P* **350** *L* **11** # 48

Ghiasi, Ali Broadcom

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

The CRU BW for the TDP measurement is defiend to be 10 MHz also see comment 224 and 225 D2.1 and comment 127 on D2.2 will result in higher power more complex receiver. The clock and power supply noise do not scale with higher baudrate so there is very little benifit of higher CRU BW. The CRU increased BW has very little benifit on the VCO noise. The 10 MHz burden will remin even in the case of future generations where ASIC/SerDes operate at 25 G with DFE receiver!

SuggestedRemedy

Propose to consider CRU BW 7 MHz instead of current 10 MHz. Higher CRU BW has very little benifit on the VCO noise and power supply nosie but significant penalty on the receiver, see ghiasi_01_1109

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The comment restates comment #127 from draft D2.2 ballot, which was submitted by the same balloter, and rejected. It can therefore be considered a "pile on" to the balloter's own comment.
See Response to comment 46.

Cl **00** *SC* **0** *P* **383** *L* **6** # 49

Dawe, Piers Independent

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

Following up D2.1 comment 159 and D2.2 comment 82: we should not call part of the receiver a "transmitter" or part of the transmitter a "receiver".
According to 83.3, a PMA has TX and RX directions, each of which has an input and an output. nAUI is intended to connect PMAs, e.g. one in the host and one in a module. Therefore nAUI must connect a (host) TX (transmitter) output to a (module) transmitter input, and a (module) RX (receiver) output to a (host) receiver input. 83B used to use, and 86A uses, the terms host output, module input, module output, host input, according to resolution of D2.0 comment 470:
'ACCEPT IN PRINCIPLE. Need to avoid using "receive" or "receiver" on the transmit path (down the stack, PMA to MDI) or "transmit" or "transmitter" on the receive path (up the stack, MDI to PMA).
Change names using the terms host, module, input and output. For example, in the caption of Table 86-6 change "PPI electrical transmit signal output specifications at TP1a" to "nPPI host electrical output specifications at TP1a" '
This is compatible with 83 and the rest of 802.3ba except 83A and now 83B. But Figure 83A-2 shows two "Transmitter"s and two "Receiver"s, one for each direction. This isn't compatible terminology.
If we were not trying to move to Sponsor ballot this would be a TR.

SuggestedRemedy

Change "Transmitter" to "output", "Transmit Compliance Point" to "output compliance point", "Receiver" to "input", and "Receiver Compliance Points" and "Receive Compliance Point" to "input compliance point", throughout 83A.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to comment 200 from D2.2:

aip:
For Driver use Transmitter and for Input use Receiver and use Component instead of IC in figure 83B-3, 83B-5, 83B-7

It was agreed that the naming used in this resolution was more appropriate than the naming proposed by the commenter. Also See response to comment 82 (reject & referring to comment 200) from draft 2.2 which has the same naming request by the commentor.

Cl **00** *SC* **0** *P* **396** *L* **40** # 50

Dawe, Piers Independent

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

Figure 83B-3 has been messed up. It shows two paths: Tx from right to left and Rx from left to right. Previously, both paths went from a driver and an input; now they are shown as going from transmitter to receiver. Calling part of the transmit path "receiver" and part of the receive path "transmitter" is bad, and not consistent with Clause 83 or 86A. See response to D2.0 comment 470.
Note Clause 85 does not have this problem because it doesn't have an exposed driver on the receive side.
"Response" to D2.0 comment 82 does not answer the comment.
If we were not trying to move to Sponsor ballot this would be a TR.

SuggestedRemedy

Change transmitter or transmit back to to output, change receiver (back) to input, throughout 83B.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to comment 200 from D2.2

aip:
For Driver use Transmitter and for Input use Receiver and use Component instead of IC in figure 83B-3, 83B-5, 83B-7

It was agreed that the naming used in this resolution was more appropriate than the naming proposed by the commenter. Also See response to comment 82 (reject & referring to comment 200) from draft 2.2 which has the same naming request by the commentor.

Cl **00** *SC* **0** *P* **235** *L* **1** # 51

Dawe, Piers Independent

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

After recent changes to the electrical spec including crosstalk limits, it's time to revisit the error propagation analysis, which has been done with example (not limit) KR error propagation statistics but not for CRn. Remember that unlike KR, CRn is for multi-vendor use, not just for closed systems

SuggestedRemedy

Using the current draft spec, between now and January find out what the error propagation statistics of CRn could be, then work out the MTTFPA. If it isn't adequate, fix the issue. (There may be several ways to fix it, e.g. tightening the hi_ber rules.)
Note that "adequate" must be VERY good indeed. A packet falsely accepted is a much more serious issue than a dropped packet.

Proposed Response *Response Status* **U**

PROPOSED REJECT. The analysis of crosstalk has changed from limit based to integrated noise. The CRn channel insertion has decreased aligning it closer to KR. In summary, it's not necessary to revisit the error propagation analysis, as KR error propagation statistics still apply. Please see gustlin_04_0509 CR4/CR10 MTTFPA relative to the age of the universe (slide 7).

Cl **01** *SC* **1.5** *P* **27** *L* **32** # 52

Dawe, Piers Independent

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

LSB and MSB don't denote proper names. This was nearly right in an earlier draft.

SuggestedRemedy

Change "Least Significant Bit" to "least significant bit", change "Most Significant Bit" to "most significant bit".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment is made against unchanged text and therefore out of scope for this ballot.

The capitalization of MSB, LSB was changed as per resolution to comment #668 in D2.0.

The task force recognizes that the change suggested would be an editorial improvement and mandates the editor to resubmit this comment against draft D3.0.

Cl **82** SC **82.2.17** P **181** L **40** # 53

Dawe, Piers Independent

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

Following up on D2.2 comment 69, "There are two error counting mechanisms that can be used on 64B/66B signals: errored blocks and BIP errors... We should be unambiguous which is meant by BER for the purposes of compliance. As the errored block counter is not very good in service at marginal and good BERs, we expect in-service monitoring to use BIP (that's why it was introduced). It is HIGHLY desirable that the same definition of BER apply in compliance testing with the scrambled idle signal as in service."
Also it seems that the 82.2.17 Test-pattern checker will typically count 2 for an isolated error while the 82.2.14 BIP checker will count 1.
Note that any change to the PCS operation would be a simplification, and option 1 below makes no change.

SuggestedRemedy

Option 1: no chnage to silicon: Add text to 82.2.17 line 33 "However, the BIP error count according to 82.2.14 is the preferred measure for BER."

Option 2: To bring the definition of BER in scrambled idle test pattern mode in line with the expected de-facto definition of errors in service, it would be desirable to change:
"When operating in scrambled idle test pattern, the test-pattern error counter counts blocks with a mismatch. Any mismatch indicates an error and shall increment the test-pattern error counter."
to
"When operating in scrambled idle test pattern, the test-pattern error counter counts BIP errors according to 82.2.14.".
There may be consequential changes to wording in Clause 45.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
It is noted that Draft 2.3 is technically correct and complete.
The above comment is made against unchanged text and therefore out of scope for this ballot.

The per pcs lane BIP counters do operate in test pattern mode, and the test pattern error counting that is specified in the draft is consistent with clause 49, so with the draft as is allows a user to choose to look at the BIP or test pattern error counter.

Cl **83** SC **83.5.10** P **213** L **23** # 54

Dawe, Piers Independent

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

Following up on D2.2 comment 79. Objection 1 cited anslow_05_0709, which showed that with 32 UI offset between lanes, the peak baseline wander was about 50% more than for a single PRBS31. Now that the minimum offset has been increased to 20,000 UI (D2.2 comment 75), I believe that this issue and objection 2 "it can be shown that it is not unduly onerous" have been addressed. (But I haven't absolutely proved by simulation that objection 1 is overcome.) As to the last objection, "other mechanisms (e.g., scrambled idle test pattern, BIP) are available for multi-sublayer testing": these don't work with factory-standard PRBS31-based test equipment; that's why we have a PRBS31 feature.

SuggestedRemedy

Change "on each of the lanes" to "on each of the PCS lanes" here and at line 32.
Change "one lane and any other lane" to "one PCS lane and any other PCS lane"
In the paragraphs beginning line 40 and top of page 214, change "lane" or "lanes" to "PCS lane" or PCS lanes". Change "Ln9_PRBS_TX_test_err_counter count" to "Ln19_PRBS_TX_test_err_counter count".
Delete "Note that bit multiplexing of per-lane PRBS31 may produce a signal which is not meaningful for downstream sublayers."
Provide 20 PRBS31 error counters in each direction, one per PCS lane.
Add informative NOTE explaining that a 10G, 20G or 40G PRBS31 contains PCS lanes with PRBS31s with much more than 20,000 UI offset.
Another solution which would take a few more words would be to mandate generation by 10G lanes and checking by PCS lanes. Although for 40G, because we have a binary series of lane speeds, generating per PMA lane (whatever that is) and checking per (10G) PCS lane is ideal.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Per the analysis of anslow_01_1109.pdf, bit-interleaved PRBS31 signals with an offset of at least 20000 bits produces a pattern which, in terms of clock content is significantly less stressful than either serial PRBS31 or scrambled idles, and is also less stressful than PRBS31 in terms of baseline wander.

Cl **83A** SC **83A.3.3.1** P **380** L **15** # 55

Dawe, Piers Independent

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

As stated in D2.0 comment 84, de-emphasis means a relative attenuation of the higher frequencies, as in "Dolby noise reduction is a form of dynamic preemphasis employed during recording, plus a form of dynamic deemphasis used during playback". Or according to the ANSI standard "ATIS Telecom Glossary 2007", deemphasis is "In FM transmission, the process of restoring (after detection) the amplitude-vs.-frequency characteristics of the signal." So de-emphasis is the opposite of what's happening here, which is "preemphasis
A system process designed to increase, within a band of frequencies, the magnitude of some (usually higher) frequencies with respect to the magnitude of other (usually lower) frequencies, in order to improve the overall signal-to-noise ratio by minimizing the adverse effects of such phenomena as attenuation differences, or saturation of recording media, in subsequent parts of the system. Note: Preemphasis has applications, for example, in audio recording and FM transmission.".

An implementation might achieve emphasis by a subtractive method, and the implementer might call his method what he wants. However, that's implementation. Viewed from the outside, pre-emphasis is a relative boosting of the higher frequencies and de-emphasis is its opposite.

Response to comment 84 gives no evidence.
If we were not trying to move to Sponsor ballot this would be a TR.

SuggestedRemedy

We don't need to argue about de- versus pre-: just change "de-emphasis" to "emphasis" throughout.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The comment restates comments #84 from draft D2.2 ballot, which was submitted by the same balloter, and rejected. It can therefore be considered a "pile on" to the balloter's own comment.

Cl **83A** SC **83A.3.3.1** P **380** L **21** # 56

Dawe, Piers Independent

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

As requested in D2.0 comment 84, "Vtx-demph" should be replaced with "VMA" throughout 83A and 83B.
"Vtx-demph" is a bad metric for four reasons:
If using a sampling scope, a measurement at a point in time is slower than a measurement over a time window.
A measurement at a point in time is degraded by signal and instrument noise (hence needs averaging, which makes the measurement even slower).
A measurement at a point in time is degraded by waveform roughness caused by e.g. reflections (averaging over repeated measurements doesn't fix this).
This metric does the same job as the already well-established VMA, so it adds clutter for no benefit.
Also, draft says "Amplitude measurements are... taken at the center of the respective UI" yet Figure 83A-5 implies that "Maximum absolute output", "Minimum absolute output" and "Differential peak-to-peak amplitude" are taken from the extremes of the waveform irrespective of the UI.
Also, the number of waveforms to average is not a proper item of specification: measurement accuracy is something for the implementer to trade off against guard-bands and other cost considerations.
If we were not trying to move to Sponsor ballot this would be a TR.

SuggestedRemedy

At line 10, replace "Amplitude measurements are taken using an average of at least 16 waveforms and taken at the center of the respective UI using a square wave test pattern as defined in 83.5.10."
with either:
"Differential peak-to-peak amplitude is defined by an average over the central 20% of the first UI of each half of the square wave test pattern defined in 83.5.10. VMA is defined in 86A.5.3.5." if the UI matters,
or:
"VMA is defined in 86A.5.3.5." if the UI doesn't matter for differential peak-to-peak amplitude, as in Figure 83A-5.
Replace "Vtx-demph" with "VMA" throughout.
If we want to give guidance on averaging, add "NOTE--It is recommended that at least 16 waveforms be averaged for an emphasis measurement."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The comment restates comment #84 from draft D2.2 ballot, which was submitted by the same balloter, and rejected. It can therefore be considered a "pile on" to the balloter's own comment.

Cl **83A** *SC* **83A.3.3.1** *P* **380** *L* **14** # 57

Dawe, Piers Independent

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

Draft says "See Figure 83A-5 for ... definition of de-emphasis" yet Figure 83A-5 does not define "de-emphasis": Equation 83A-3 does, as stated two sentences earlier. Also, should not put whole sentences in figures, especially if normative. That's what text is for.

SuggestedRemedy

Change to:
"See Figure 83A-5 for an illustration of absolute driver output voltage limits, and definition of differential peak-to-peak amplitude. SLi<P> and SLi<N> are the positive and negative sides of the differential signal pair for lane i (i = 0, 1, 2, 3 for XLAUI. For CAUI i = 0:9)."
Remove the sentence in square brackets from Figure 83A-5.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is noted that the Draft 2.3 is technically correct and complete.
The above comment is made against unchanged text and therefore out of scope for this ballot
The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:
proposed aip:
change to:
See Figure 83A-5 for an illustration of absolute driver output voltage limits, definition of differential peak to-
peak amplitude, and definition of the parameters used to calculate de-emphasis

Figure 83A-5 style is consistent with Figure 47-3

Cl **83B** *SC* **83B.1** *P* **397** *L* **7** # 58

Dawe, Piers Independent

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

If 85A.4 and 86A now support 0.87 dB connector loss, 83B should at least match it. But no need to deal in 1/00ths of dB (0.2%).

SuggestedRemedy

Change 0.5 to 0.9 here and in Figure 83B-3. Consider reducing the host insertion loss by 0.4 dB to keep the loss budget the same.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Retimed & non-retimed interfaces do not have the same budgets. 83A provides additional information on link budgeting if 83B characteristics are not met.

Derivation of 0.87dB in gustlin_04_0709 included deviations from nominal

HCB: 1.26dB nominal
- MCB: 0.67dB
- Mated HCB / MCB: 2 to 2.8dB
- Connector loss and deviations from nominal = 2.8 - 1.26 - 0.67 = 0.87dB

Cl **83B** *SC* **83B.1** *P* **396** *L* **7** # 59

Dawe, Piers Independent

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

Font too small in Figure 83B-1, 2, 4, 6, 8, 9 (6.5 or 7 pt, should not be smaller than 8 pt). This may be because the charts have been shrunk.

SuggestedRemedy

Please fix.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Enlarge charts

This is not expected to be considered a substantive change because fixing chart size is generally not considered a substantive change.

Cl **83** *SC* **83.5.10** *P* **213** *L* **25** # 60

Dawe, Piers Independent

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

Asking for something to be random is not a good idea. It's very difficult to implement a true random number generator and very difficult or impossible to test for. However, randomness is not the point, and at least here there is no "shall" so no conformance test.

SuggestedRemedy

Change "from independent, random seeds" to "from seeds chosen independently" (or delete, leaving the strong recommendation for a minimum offset of 20 000 UI). If it is important that different seeds are chosen every time, use "pseudo-random" in place of random.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The proposed remedy could lead to error if a designer sees the words "pseudo-random" and makes a hasty assumption that since the PRBS31 sequence itself is pseudo-random, they could use the PRBS31 generator itself to create the seeds - adjacent or nearby portions of the PRBS31 sequence used as seeds would not provide the desired offset between lanes.

Several other proposed wordings proposed by the commenter were considered, and all had the problem that they would be difficult to understand for a reader who had not seen the original text.

The word "random" in statistics means "of or characterizing a process of selection in which each item of a set has an equal probability of being chosen", which seems to make the words "independent, random seeds" an accurate description of what is desired. "Random" doesn't need to be a process of chance.

Cl **85** *SC* **85.10.3** *P* **258** *L* **6** # 61

Dawe, Piers Independent

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

Here we have IL(f), 85.10.2 says "IL is a column vector of the measured insertion loss values, ILn", while 85.10.7 says "IL is the value of the cable assembly insertion loss in dB at 5.15625 GHz."

SuggestedRemedy

It would be better to use a different symbol for the "insertion loss" as a function of frequency and for the "insertion loss" at a spot frequency.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The usage of IL is clear in context of usage i.e., as vector or at a given frequency f as stated.

Cl **85** *SC* **85.10.2** *P* **256** *L* **30** # 62

Dawe, Piers Independent

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

It is not clear in 85.10.2 what the vector IL is. It might be (P_incident-P_out)/P_incident, aligning with the English meaning of loss ("a person or thing or an amount that is lost: the power diminution of a circuit or circuit element corresponding to conversion of electrical energy into heat by resistance"
It might be 10 log10(P_out/P_incident) as in CEI-28G.
It might be P_incident/P_out or |V_incident|/|V_out| or |V_out|/|V_incident|.
It might be 10 log10(P_incident/P_out).
But the equations do not say dB.
The reader can't tell if an "algebraic" or "geometric" fit is intended.

SuggestedRemedy

At least make clear whether IL is supposed to be in dB or not.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add dB to equation (85-19).
This is not expected to be considered as a substantive change as it provides clarification of parameter in equation.

Cl **85** *SC* **85.8.3.7** *P* **251** *L* **48** # 63

Dawe, Piers Independent

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

"The effects of differences ... should be accounted for" is too weak: needs to be required not just recommended. Compare text at 86A.5.1.1.
If we were not trying to move to Sponsor ballot this would be a TR.

SuggestedRemedy

Change "The effects of differences between the insertion loss of an actual test fixture and the reference insertion loss should be accounted for in the measurements." to
"Any differences between the insertion loss of an actual test fixture and the reference insertion loss are accounted for in the measurements."
Similarly in 85.10.8 and 83B.2 (twice).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Change: "The effects of differences between the insertion loss of an actual test fixture and the reference insertion loss should be accounted for in the measurements."
To:"The differences between the insertion loss of an actual test fixture and the reference insertion loss are to be accounted for in the measurements."
This is not expected to be considered a substantive change as it's a clarification of implementation and does not change requirements. Implement change in 85.10.8 and 83B.2.

Cl **85** *SC* **85.10.10.3** *P* **270** *L* **32** # 64

Dawe, Piers Independent

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

Inconsistent notation: here we have MDNEXT subscript loss while previously in 85 we had Insertion_loss, IL, Return_loss. 85A uses IL a lot.

SuggestedRemedy

My preferred solution is to use simply "MDNEXT" to and flip the sign, and replace Insertion_loss and IL with SDD21 (and flip the sign), in line with CEI, SFP+ and CXP.

Proposed Response *Response Status* **W**

PROPOSED REJECT. It is noted that the Draft 2.3 is technically
correct and complete. The task force recognizes that the change suggested would be an improvement and mandates the editor to resubmit this comment against draft D3.0.

Cl **85** *SC* **85.10.10.3** *P* **259** *L* **42** # 65

Dawe, Piers Independent

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

Repeating D2.2 comment 65:
Draft says "Multiple Disturber Near-End Crosstalk (MDNEXT) loss is specified as the power sum of the individual NEXT losses." and "MDNEXT loss is determined by summing the power of the four or ten individual pair-to-pair differential
NEXT loss values". These statements are not correct: MDNEXT is the power sum of the individual NEXTs, but as equation 85-26 shows, "MDNEXT loss" is the inverse of the power sum of the individual inverses of "NEXT losses".
The power sum of the individual NEXT losses would be dominated by the weakest NEXT, which is not what we want.

SuggestedRemedy

My preferred solution is change "NEXT loss" to "NEXT" and "MDNEXT loss" to "MDNEXT", and flip the signs. This brings the signs in line with CEI, SFP+, CXP.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "MDNEXT loss is determined by summing the power of the four or ten individual pair-to-pair differential NEXT loss values using Equation (85-26)."

To: "MDNEXT loss is determined from the the four or ten individual pair-to-pair differential NEXT loss values using Equation (85-26)."

This is not expected to be considered as a substantive change as it's a clarification of existing text describing equation and does not change requirements.

Cl **85** *SC* **85.10.7** *P* **260** *L* **46** # 66

Dawe, Piers Independent

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

What does "Fast Fourier transform (FFT) [is] inversely proportional to the 20% to 80% rise and fall time Tft" mean?
Is what follows "Note that" a NOTE, i.e. informative and not part of the standard? Although the style guide allows it, it's ambiguous and should be avoided.
Other editorial issues.
I think the equation at line 48 and the units in Table 85-10 are not consistent (needs checking).

SuggestedRemedy

Change
"Define the weight at each frequency fn using" to "The weights Wnt and Wft at each frequency fn are given by" (or add "here lines for Wnt and Wft).
Change
"where the equation parameters are given in Table 85-10.
Note that the 3 dB transmit filter bandwidths fnt and Fast Fourier transform (FFT) are inversely proportional to the 20% to 80% rise and fall times Tnt and Tft respectively. The constant of proportionality is 0.2365 (e.g. Tnt fnt = 0.2365). In addition, fr is the 3 dB reference receiver bandwidth which is set to 7.5 GHz."
to
"where
fnt is in GHz and is given by Equation 85-new1,
fft is in GHz and is given by Equation 85-new2,
fr, the reference receiver 3 dB bandwidth, is 7.5 GHz,
and the other equation parameters are given in Table 85-10.
fnt= 236.5 / Tnt (85-new1)
fft= 236.5 / Tft (85-new2)
where Tnt and Tft are the 20% to 80% rise and fall times in picoseconds given in Table 85-10."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Change: Note that the 3 dB transmit filter bandwidths fnt and Fast Fourier transform (FFT) are inversely proportional
to the 20% to 80% rise and fall times Tnt and Tft respectively. The constant of proportionality is 0.2365 (e.g.
Tnt fnt = 0.2365). In addition, fr is the 3 dB reference receiver bandwidth which is set to 7.5 GHz.
To:Note that -3 dB transmit filter bandwidths fnt and fft are inversely proportional to the 20 to 80% rise and fall times Tnt and Tft respectively. The constant of proportionality is 0.2365 (e.g. Tnt fnt = 0.2365) where fnt is in units of Hz and Tnt is in units of seconds. In addition, fr is the -3 dB reference receiver bandwidth which is set to 7.5 GHz.

This is not expected to be considered a substantive change as it provides clarification of existing text and does not change requirements.

Cl **85A** *SC* **85A.4** *P* **416** *L* **37** # 67

Dawe, Piers Independent

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

If this e is the mathematical constant it should not be italic.

SuggestedRemedy

Change to upright, here and line 51.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.
See suggested remedy.
This is not expected to be considered a substantive change as it addresses implementing style guide and does not change requirements.

Cl **85A** *SC* **85A.4** *P* **416** *L* **30** # 68

Dawe, Piers Independent

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

Draft says "an assumed connector loss of 1.74 dB". I thought the allowed connector loss was 0.87 dB.

SuggestedRemedy

Either change "an assumed connector loss of 1.74 dB" to "an assumed loss of 1.74 dB for two MDI connectors" or (preferred) "an assumed loss of 0.87 dB per MDI connector".

Proposed Response *Response Status* **W**

PROPOSED REJECT.
It is noted that the Draft 2.3 is technically
correct and complete. The task force recognizes that the change suggested would be an improvement and mandates the editor to resubmit this comment against draft D3.0.

Cl **85A** *SC* **85A.4** *P* **416** *L* **30** # 69

Dawe, Piers Independent

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

Dead link. Also the English could be improved.

SuggestedRemedy

Turn "85.8.3.4" into a proper cross-reference. Suggested rewording:
With the insertion loss from TP0 to TP2 or TP3 to TP5 given in 85.8.3.4 and...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Turn "85.8.3.4" into a proper cross-reference.
This is not expected to be considered a substantive change as it fixes cross-reference linkage and does not change requirements.

Cl **85A** *SC* **85A.4** *P* **416** *L* **34** # 70

Dawe, Piers Independent

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

Ambiguous "The maximum insertion loss allocation for the transmitter and receiver differential controlled impedance printed circuit boards is 7 dB at 5.15625 GHz." Does this include the connectors or not?

SuggestedRemedy

Please make it clear. Similarly for the minimum loss on the next page.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The losses are identified as "the insertion losses from TP0
to the MDI host receptacle and from TP5 to the MDI host receptacle".

Cl **86** *SC* **86.7.3** *P* **288** *L* **33** # 71

Dawe, Piers Independent

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

"Receiver jitter tolerance signal level in OMA, each lane" (shown as "Max" in D2.3) is used in 86.8.4.8 "as in 68.6.11, with the following differences:
...
b) The parameters of the signal are specified in Table 86-8..."
68.6.11 says "... the power in OMA at the receiver is adjusted, using the optical attenuator, to be equal to the stressed sensitivity in OMA, also given in Table 68-5, and a BER of better than 10-12 shall be achieved."
So, we are to adjust the power in OMA to any value we like as long as it doesn't exceed the -5.4 limit in Table 86-8. So the spec is arbitrary and uncertain: a tester can make anything fail by setting the OMA low enough.
Note this is unlike stressed sensitivity which is a property of the receiver under test not of the test rig. It's more like an eye mask, which is also fixed.
If we were not trying to move to Sponsor ballot this would be a TR.

SuggestedRemedy

Change the row
"Receiver jitter tolerance signal level in OMA, each lane Max -5.4 dBm"
to
"Receiver jitter tolerance, each lane, per conditions below" (deleting "Max -5.4 dBm" and below "Conditions of receiver jitter tolerance test:", insert a new row
Signal level in OMA - -5.4 dBm"
Keep the footnote, but change "This is a test of the optical receiver's ability" to "Jitter tolerance defines the optical receiver's ability"

Another remedy would be to change "Receiver jitter tolerance signal level in OMA" to "Receiver jitter tolerance in OMA" and modify 86.8.4.8 b to say that the test signal's OMA is set at the maximum for receiver jitter tolerance signal level in OMA given in Table 86-8.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
It is noted that the Draft 2.3 is technically correct and complete.
The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:
proposed AIP: Change "Receiver jitter tolerance signal level in OMA" to "Receiver jitter tolerance in OMA" and change item b in 86.8.4.8 to be "The parameters of the signal are specified in Table 86-8 and the power in OMA at the receiver is set to the maximum for receiver jitter tolerance in OMA given in Table 86-8;"

Cl **86** *SC* **86.8.4.7** *P* **295** *L* **27** # 72

Dawe, Piers Independent

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

According to D2.2 comment 190, the new bullet f should have been added to 86.8.4.8 not 86.8.4.7.

SuggestedRemedy

Move bullet f from 86.8.4.7 to 86.8.4.8.

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **86A** *SC* **86A.4.1** *P* **422** *L* **23** # 73

Dawe, Piers Independent

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

D2.2 comment 85 said "Whatever you do, don't mess up 86A".
As "loss" is used in two ways in 802.3 and the industry more widely, one the inverse of the other (see CEI and XFP for example), and neither aligns with ordinary English (a loss is what's lost), replacing clear and unambiguous microwave-compatible S-parameters with badly defined and ambiguous "X loss" language from 10BROAD36 and 10BASE-T at 1/1000 of the frequency was a step backwards. Note that all of the 10G/lane and 25G/lane world except KR uses S-parameters. We won't get to 25G electrical lanes (see CEI-28) by avoiding S-parameters.
If we were not trying to move to Sponsor ballot this would be a TR.

SuggestedRemedy

Restore the S-parameters in 86A.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The comment restates comment #85 from draft D2.2 ballot, which was submitted by the same balloter, and rejected. It can therefore be considered a "pile on" to the balloter's own comment.
Comment 85 against D 2.2 was discussed together with Comment 15 against D 2.2 during the Chicago meeting.
A vote of the Task Force on whether to remove the S-parameters from the draft was:
Yes 30
No 0

Cl **86A** *SC* **86A.5.1.1.2** *P* **429** *L* **44** # 74

Dawe, Piers Independent

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

In SFP+ and previously in 86A, HCB-MCB crosstalk was controlled up to 15 GHz. Now 86A refers to 85.10.9.3 which does not control above 10 GHz. HCB-MCB crosstalk needs to be controlled to a frequency higher than product crosstalk (affects J9, eye, Qsq) according to the roll-off of the aggressor signal. Qsq is observed in a 12 GHz bandwidth. Also, every other spec in 86A starts at 10 MHz not 50 MHz.

SuggestedRemedy

Define an appropriate upper end of the frequency range for HCB-MCB crosstalk (for Annex 86A purposes). Define the lower end at 10 MHz (for Annex 86A purposes).

Proposed Response *Response Status* **W**

PROPOSED REJECT.
It is noted that the Draft 2.3 is technically correct and complete.
The task force recognizes that the change suggested below would be an improvement and mandates the editor to resubmit this comment against draft D3.0. The editor shall provide the following proposed response:
proposed AIP: Change "The limits on integrated crosstalk noise of the mated HCB and MCB are specified in 85.10.9.3." to "The limits on integrated crosstalk noise of the mated HCB and MCB are specified in 85.10.9.3 with the exception that the frequency range is 0.01 GHz to 15 GHz."

Cl **86A** *SC* **86A.4.2** *P* **425** *L* **19** # 75

Dawe, Piers Independent

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

BER is a criterion of tolerance, not a metric of it. It's already stated in 86A.5.3.8.6 and is the same for the whole project so should not be repeated here.
Note comment on related issue against 86.7.3 Table 86-8.
Also, per D2.0 comment 470:
'ACCEPT IN PRINCIPLE. Need to avoid using "receive" or "receiver" on the transmit path (down the stack, PMA to MDI) or "transmit" or "transmitter" on the receive path (up the stack, MDI to PMA).
Change names using the terms host, module, input and output.'

SuggestedRemedy

In Table 86A-4, change
"Receiver signal tolerance, each lane (BER) - 10-12"
to
"Host input signal tolerance, each lane, per conditions below"
In footnote b, change "host receiver (see 86A.5.3.8)." to "host input (see 86A.5.3.8)." (it happens that the host input is a receiver input but we resolved to use "input" and "output" in D2.0 comment 470).
Make the cross-reference into a proper link.
In Table 86A-6 and 86A.5.3.8 consider changing "receiver tolerance" to input tolerance" as appropriate.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
The test proceedure in 86A.5.3.8.6 ends with "The BER of a compliant host receiver remains below 10-12" so indicating a limit of BER is appropriate.
It is noted that the Draft 2.3 is technically correct and complete.
However, the task force recognizes that the change suggested below would be an improvement.
This change is not expected to be considered a substantive change and the editor will use the editorial license to make this change.
Change "Receiver signal tolerance, each lane (BER)" to "Host input signal tolerance, each lane (BER)"
In Note b change "host receiver" to "host electrical receiver" and make the reference a link.
This change in terminology is in accordance with the response to comment 470 against D 2.0

Cl **86A** *SC* **86A.6** *P* **438** *L* **26** # 76

Dawe, Piers Independent

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

There is a new recommended minimum of 0 dB for the host PCB, connector and HCB, between 10 MHz and 1 GHz.
At 10 MHz the HCB reference loss is 0.031 while at 1 GHz it is about 0.4 dB
If the PCB loss is like the MCB loss but scaled to 3 dB at 7 GHz it would be 0.06 dB at 10 MHz and 0.79 dB at 1 GHz. With practical measurement uncertainty, it would be difficult to show compliance at 10 MHz, and pointless? at 1 GHz.

SuggestedRemedy

Delete the new row "0 0.01 <= f <= 1".

Proposed Response *Response Status* **W**

PROPOSED REJECT.
It is not clear that there is a technical problem nor that the suggested remedy would improve the draft.

The 0.01 to 1 GHz limit line was discussed by the task force optical track during resolution of comment 179 against D2.2. The agreed resolution of that comment was an ' ACCEPT IN PRINCIPLE ' and included:
' ..... add a row to the equation
0.01<f<1 value 0 .....'
which addressed the concern that the minimum insertion loss limit was unspecified for the 0.01 to 1 GHz frequency range.

Cl **86A** *SC* **86A.5.3.8.3** *P* **435** *L* **2** # 77

Dawe, Piers Independent

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

House style for figures doesn't use a box round the figure.

SuggestedRemedy

Remove box round Figure 86A-9.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Removing the box around a figure is not considered a substantive change as this line is purely editorial. The editor will use the editorial license to make this change.