

Cl 45 **SC 45.2.1.12b** **P 51** **L 48** # **114**
Dawe, Piers Avago Technologies

Comment Type T **Comment Status D**

Draft says "Register 1.19, bit 14 indicates that the device supports PRBS31 generation or checking." unlike the more usual "When read as a one, bit 1.13.0 indicates that..."

SuggestedRemedy

When read as a one, register 1.19, bit 14 indicates that the device supports PRBS31 generation or checking, and register 1.19, bit 13 indicates that the device supports PRBS9 generation or checking.
Or "indicates whether".
Similarly at line 53.

Proposed Response **Response Status W**

PROPOSED REJECT.

This comment does not address the technical completeness required to progress to the next phase of balloting.

The commenter is requested to resubmit this comment during WG ballot.

Cl 45 **SC 45.2.1.12d** **P 52** **L 44** # **107**
Dawe, Piers Avago Technologies

Comment Type T **Comment Status D**

Note possible use of 20 counters: see comment against 83.5.10.

SuggestedRemedy

Support counting of PRBS31 after gearbox as in 83.5.10.

Proposed Response **Response Status W**

PROPOSED REJECT.

This comment does not address the technical completeness required to progress to the next phase of balloting.

The commenter is requested to resubmit this comment during WG ballot.

Cl 73 **SC 73.2** **P 97** **L 46** # **109**
Dawe, Piers Avago Technologies

Comment Type T **Comment Status D**

The other clauses have delay specifications. If those are necessary, then the delay though the AN sublayer must be controlled also. See comment against 80.3.

SuggestedRemedy

Either add delay section here, and row in Table 80-2, or in Clause 84 add a statement that the delay through AN is counted as part of the PMD's delay.

Proposed Response **Response Status W**

PROPOSED REJECT.

Auto-negotiation does not add any delay to the transmit and receive paths, therefore there is no need to add delay constraints for AN.

It is clear enough from the descriptions of the transmit and receive switch functions in Clause 73 that no delay is added so there is no deficiency in the draft standard.

Cl 80 **SC 80.3** **P 131** **L 33** # **108**
Dawe, Piers Avago Technologies

Comment Type T **Comment Status D**

Table of delay limits is incomplete.

SuggestedRemedy

Either, add row for AN, or if AN delay is counted as part of PMD delay, say so in a table note and give a cross-reference. See comment against 73.

Proposed Response **Response Status W**

PROPOSED REJECT.

See response to comment #109

CI 81 SC 81.3.4.2 P 153 L 45 # 4
Somanache, Vinay A Cisco Systems

Comment Type T Comment Status D

Figure 46-9
Link fault state machine diagram does not directly map the comments given below the diagram. In the figure, If it receives new fault sequence (seq_type != last_seq_type) it comes out of the count state and moves the new fault state and resets the seq_cnt to zero. and takes one clock pulse to reach count state which is unconditional. so let us take a example (LF --> local fault, Remote fault --RF) consider a fault sequence in following order LF -----LF----- RF----- RF----- RF----- RF INIT ----COUNT----NEW FAULT TYPE-- COUNT --COUNT--- COUNT-- as per the state diagram link fault will not indicate remote fault but as per the statements in lin 45,46, it should indicate fault on reception of 4 fault sequence. Does the text take the precedence over the state diagram here LF means local fault and RF means remote fault

I understand it is not catastrophic issue, But wanted the spec. to be more clear.

SuggestedRemedy

In above case, words should take higher priority than the FSM

Proposed Response Response Status W

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

[Editor's note: The commenter used special "tilde" character in the comment text. Replaced "tilde" with a "period"]

The current description in the draft is technically complete and consistent. The commenter suggestion assumes that the SM is driven by a clock, instead it is a behavioral description.

CI 82 SC 82.2.18 P 177 L 42 # 116
Dawe, Piers Avago Technologies

Comment Type T Comment Status D

Now that we have BIP8, counting errors can be done conveniently using it, possibly with lower power, and less extra high-speed circuitry.

SuggestedRemedy

Say that using the BIP8 feature to count errored chunks as normal is an adequate implementation for the test-pattern checker.

Proposed Response Response Status W

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements to the adopted text. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

CI 82 SC 82.2.19.2.4 P 181 L 15 # 3
Jain, Navish Cisco Systems

Comment Type T Comment Status D

The period for 40GBASE-R is specified as 1025 micro seconds, whereas on line 38 of the same page, the period for 40GBASE-R is specified as 1250 micro seconds.

SuggestedRemedy

One of them needs to be corrected.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. [Editor's Note: Looks like the commenter used D1.1 to make the comment. Hence corrected the page number and subclause number to match the subclause number in D1.2]

Change:

"Count up to a maximum of 97 of the number of invalid sync headers within the current 1025 µs (40GBASE-R) or 500 µs (100GBASE-R) period."

To:

"Count up to a maximum of 97 of the number of invalid sync headers within the current 1250 µs (40GBASE-R) or 500 µs (100GBASE-R) period."

CI 82 SC 82.2.19.2.4 P 181 L 17 # 134
Vijayaraghavan, Divya Altera

Comment Type TR Comment Status D

Section 82.2.19.2.4 of the D1.2 specification defines the following 2 counters:

sh_cnt: Count of the number of sync headers checked within the current 64 block window.

sh_invid_cnt: Count of the number of invalid sync headers checked within the current 64 block window.

In the updated lane lock state machine (figure 82-10) sh_cnt clearly increments to 1024 in some cases ("in lock" to "out of lock" transitioning). The sh_cnt and sh_invid_cnt counters need to be updated accordingly.

SuggestedRemedy

Fix sh_cnt and sh_invid_cnt definitions as follows:

sh_cnt: Count of the number of sync headers checked within the current 64 or 1024 block window.

sh_invid_cnt: Count of the number of invalid sync headers checked within the current 64 or 1024 block window

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 82 SC 82.2.4.4 P 170 L 15 # 1
Wong, Don Cisco Systems

Comment Type T Comment Status D
'TXC or RXC' is not specified for Z4, Z5, Z6, Z7

SuggestedRemedy
Please specify 'TXC or RXC' is for Z4, Z5, Z6, Z7

Proposed Response Response Status W
PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements to the adopted text. The commenter is requested to resubmit the comment with additional details on a proposed remedy during WG ballot phase for consideration by the task force.

CI 82 SC 82.2.9 P 174 L 50 # 2
Wong, Don Cisco Systems

Comment Type T Comment Status D
Not clear if a match for BIP3 & BIP7 is required for alignment marker detection or if only M0, M1, M2, M4, M5 & M6 required for alignment marker match. If BIP3 & BIP7 required, please explain how BIP3 is calculated (how does one determine the where 16384-66 Bits is used for BIP3 calculation), prior to lane deskew.

SuggestedRemedy
State explicitly whether BIP3 & BIP7 is required in identifying the alignment marker. If BIP3 & BIP7 is required, please elaborate on how one determines the 16384-66 Bits is used for BIP3 calculation, prior to lane deskew.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This should be specified, Change the description of am_valid.

From (on page 178):

"am_valid

Boolean indication that is set true if received block rx_coded is a valid alignment marker. A valid alignment marker will match one of the encodings in Table 82-2 and it will be repeated every 16384 blocks. Note that we do not know which marker to expect on which PCS lane."

To:

"am_valid

Boolean indication that is set true if received block rx_coded is a valid alignment marker. A valid alignment marker will match one of the encodings in Table 82-2, excluding the BIP3 and BIP7 fields, and it will be repeated every 16384 blocks. Note that we do not know which marker to expect on which PCS lane."

And change (from page 181):

"On a given lane the markers must match each other and an entry from Table 82-2 for 100GBASE-R or Table 82-3 for 40GBASE-R"

To:

"On a given lane the markers must match each other and an entry from Table 82-2 for 100GBASE-R or Table 82-3 for 40GBASE-R. Note that the BIP3 and BIP7 fields are excluded from the markers when making a match to each other or the tables"

CI 83 SC 83.3 P 200 L 2 # 115
Dawe, Piers Avago Technologies

Comment Type T Comment Status D

If the PMD uses Auto-negotiation, there is another primitive AN_LINK.indication, which I think is passed without modification from PMD to PCS (see Figure 73-1). It's not the same as PMA_SIGNAL.indication(SIGNAL_OK). In Figure 73-1, this primitive is shown passing round the PMD and PMA by magic, which doesn't seem acceptable. It should go through the PMD and PMA.

SuggestedRemedy

Add conditional AN_LINK.indication.

Proposed Response Response Status W

PROPOSED REJECT.

The premise of this comment is incorrect (see response to comment #117).

AN_LINK.indication is passed from the PCS to the auto-negotiation sublayer. This is clearly stated in 73.9.1.

A similar comment #599 against D1.1 was REJECTEd since the PMA is not adjacent to the AN sublayer so will not see AN_LINK directly.

There is no problem with technical completeness of the current draft. The commentor may submit another comment during WG ballot if a future update to Figure 73-1 showing the direction and path of the AN_LINK.indication would indicate a role for the PMA concerning this message.

CI 83 SC 83.5.10 P 208 L 4 # 111
Dawe, Piers Avago Technologies

Comment Type T Comment Status D

The PMA receive side PRBS31 checker would be much more useful if it could check a signal that had been through a gearbox, e.g. when testing whole modules or whole gearbox ICs. This is more of a concern for 100G than for 40G. The remedy below makes it optional whether the two PCS lanes within a physical lane are reported as pairs. If wished, could make checking at the PCS lane level optional, for the sake of any existing IC designs.

SuggestedRemedy

Change the paragraph to:

When check Rx PRBS31 test pattern mode is enabled by bits 1.19.7 and 1.19.0 (see 45.2.1.12b), the PMA expects to find one or two PRBS31 pattern(s) on each of the lanes received from the PMA server via the PMAserver_UNITDATA.indicationx primitive. Where there are 10 lanes, there may be two bit-interleaved PRBS31 patterns, one per PCS lane. The Rx test pattern error counters in registers 1.30 through 1.39 (see 45.2.1.12d) count, per lane, errors in detecting the PRBS31 patterns on the lanes from the PMA server. Optionally, the Rx test pattern error counters in registers 1.30 through 1.49 (see 45.2.1.12d) count, per PCS lane, errors in detecting the PRBS31 patterns on the PCS lanes from the PMA server. While in check... [last two sentences unchanged]

Proposed Response Response Status W

PROPOSED REJECT.

The draft as it is is technically complete and the result of extensive consensus building for test patterns at the New Orleans meeting. This constitutes feature creep that is not necessary for technical completeness.

While it is true that if PRBS31 is generated on a per-PCS-lane basis, it could be recovered after gearboxing (not only in the 20:10 case as described in the comment, but in the 10:4 case as well), per PCS lane PRBS31 will not in fact be PRBS31 on the physically instantiated lane (except in the case of 40GBASE-R where PCS lanes and PMA lanes are currently all the same) so will not necessarily have the desired testing properties.

CI 83 SC 83.5.2 P 204 L 12 # 104
Jongyoon, Shin ETRI

Comment Type T Comment Status D

The group of output lanes carry the aggregated signal arranged as a set of PCSLs.

SuggestedRemedy

change:

"For a PMA with n output lanes (Tx or Rx direction), each output carries, bit multiplexed, z/n PCSLs."

to

"For a PMA with n output lanes (Tx or Rx direction), each output lane carries, bit multiplexed, z/n PCSLs."

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 83 SC 83.5.2 P 204 L 13 # 105
Jongyoon, Shin ETRI

Comment Type T Comment Status D

Not each input lane but each output lane can carry z/n PCSLs.

SuggestedRemedy

change:

"Each input lane has a nominal signaling rate of R x z/n."

to

"Each output lane has a nominal signaling rate of R x z/n."

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 83A SC 3.3 P 371 L 28 # 57
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

Transmit eye mask definition Y1 conflicts with fig 83A-3

SuggestedRemedy

Remove Y1 from Vtx-demph

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Remove "transmitter eye mask definition Y1" from table 83A-1. This removes the relationship between Y1 and Vtx-demph

CI 83A SC 3.3 P 372 L 16 # 59
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

With current min de-emphasis and without limit on min Vtx-demph the value of Vtx-demph can go to zero at infinite de-emphasis!

SuggestedRemedy

Propose to limit the range of transmit de-emphasis to max of 6.8 dB

Proposed Response Response Status W

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

CI 83A SC 3.3 P 372 L 28 # 58
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

Vtx-demph is not consistent with figure 83A-3

SuggestedRemedy

Either define Vtx-demph/2 or show on fig 83A-3 Vtx-demph peak to peak

Proposed Response Response Status W

PROPOSED REJECT.

Diagram Fig 83A-3 defines as peak-peak

CI 83A SC 3.3.5 P 376 L 8 # 60
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

No reason to have Y1 value on Fig 83A-6

SuggestedRemedy

Remove Y1 from the figure and correct A symbol

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 83A SC 4 P 380 L 41 # 85
 Ghiasi, Ali Broadcom

Comment Type TR Comment Status D
 XLAUI/CAUI channel ripple is not defined

SuggestedRemedy
 The channel ripple magnitude should conform to
 $|Ripple(dB)| \leq 0.15 + 0.16 * f$, where f range is from 0.25 to 5.5 GHz

Proposed Response Response Status W
 PROPOSED REJECT.
 Ripple is limited by insertion loss specification, and 1dB at 5.5GHz is not very much.
 This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

Cl 83A SC 5.2 P 381 L 48 # 83
 Ghiasi, Ali Broadcom

Comment Type TR Comment Status D
 The stress generator has 0.32 UI of non-cancelable ISI which seem excessive for the an FR4 channel

SuggestedRemedy
 Propsoe to redcue stress generator DJ from 0.32 UI to 0.27 UI which result in 0.15 UI of FR4 generated ISI and 0.15 UI of non-cancelableDJ

Proposed Response Response Status W
 PROPOSED REJECT.

This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

Cl 83A SC 5.2 P 381 L 52 # 84
 Ghiasi, Ali Broadcom

Comment Type TR Comment Status D
 Limiter function gain must be defined

SuggestedRemedy
 Propsoe min gain of 20 dB

Proposed Response Response Status W
 PROPOSED REJECT.

This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

Cl 83A SC 83A.3.3 P 372 L 11 # 94
 Petrilla, John Avago Technologies

Comment Type T Comment Status D
 As written, the Minimum De-emphasis requirement appears to require at least 4.8 dB of de-emphasis at all times in operation. Is that the intention? For low insertion loss links this may result in larger than necessary jitter, crosstalk and EMI.

SuggestedRemedy
 If at least 4.8 dB of de-emphasis at all times in operation was not intended, change the name, e.g. from 'Minimum De-emphasis' to 'Minimum de-emphasis capability'

Proposed Response Response Status W
 PROPOSED REJECT.

4.8 dB of de-emphasis at all times is the intention. Retimed interface has the margin to handle added jitter in low loss cases.

Cl 83A SC 83A.3.3.1 P 372 L 49 # 18
 BERGMANN, ERNEST CIRCADIANT / JDSU

Comment Type E Comment Status D
 "units" should be made clearer

SuggestedRemedy
 "De-emphasis = ..." should be changed to:
 "De-emphasis (dB) = ..."

Proposed Response Response Status W
 PROPOSED ACCEPT.

Cl **83A** SC **83A.3.3.1** P **372** L **51** # **19**
BERGMANN, ERNEST CIRCADIANT / JDSU

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

"units" not clear from context

SuggestedRemedy

change: "Minimum Vtx-demph = ..."
to: "Minimum Vtx-demph (mV) = ..." [or volts??]

Proposed Response Response Status **W**

PROPOSED ACCEPT.

Cl **83A** SC **83A.3.3.1** P **372** L **51** # **7**
Arumugham, Vinu Cisco Systems

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

Vtx-deemph is a function of max. rise/fall time. Max. rise/fall time is a function of mask Y1.
Mask Y1 is Vtx-deemph?

SuggestedRemedy

SuggestedRemedy: Define driver template with no de-emphasis. Specify de-emphasis test using OIF CEI methodology per CEI 2.0 (http://www.oiforum.com/public/documents/OIF_CEI_02.0.pdf) Section 2.4.3.

Proposed Response Response Status **W**

PROPOSED REJECT.

See ghiasi_01_0109.pdf
Required de-emphasis is related to the max rise/fall time in relation to the Rx eye mask.

Cl **83A** SC **83A.3.3.1** P **372** L **54** # **20**
BERGMANN, ERNEST CIRCADIANT / JDSU

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

"units" unclear from context

SuggestedRemedy

replace: "where x is max Rise/Fall time, y is De-emphasis value"
to: "where x is max Rise/Fall time in ps and y is De-emphasis value in dB"
[or whatever units are intended!]

Proposed Response Response Status **W**

PROPOSED ACCEPT.

Cl **83A** SC **83A.3.3.3** P **373** L **37** # **21**
BERGMANN, ERNEST CIRCADIANT / JDSU

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

lack of clear formatting makes equation hard to read

SuggestedRemedy

follow the formatting styles exemplified in:
(86-1) on page 273
(86-2) on page 275
(86-3) on page 279

Proposed Response Response Status **W**

PROPOSED ACCEPT.

Cl **83A** SC **83A.3.3.4** P **374** L **36** # **91**
Petrilla, John Avago Technologies

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

In the last sentence, "differential return loss" should be "common mode return loss".

SuggestedRemedy

In the last sentence change, "differential return loss" to "common mode return loss".

Proposed Response Response Status **W**

PROPOSED ACCEPT.

Cl **83A** SC **83A.3.3.4** P **374** L **39** # **22**
BERGMANN, ERNEST CIRCADIANT / JDSU

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

without better formatting it is very hard to read the equations

SuggestedRemedy

follow the formatting styles exemplified in:
(86-1) on page 273
(86-2) on page 275
(86-3) on page 279

Proposed Response Response Status **W**

PROPOSED ACCEPT.

Cl **83A** SC **83A.3.3.5** P **375** L **36** # **95**
 Petrilla, John Avago Technologies

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

The sentence, "The maximum Random Jitter is equal to the maximum Total Jitter minus the actual Deterministic Jitter." is misleading, likely to be controversial and unnecessary. Only where DJ is dual-Dirac DJ will the linear $\text{sum RJ} + \text{DJ} = \text{TJ}$ hold true. For all other cases of DJ, convolution is required. Fortunately, since 83A does contain an RJ requirement for the operating signal this sentence is not needed.

SuggestedRemedy

Delete the sentence, "The maximum Random Jitter is equal to the maximum Total Jitter minus the actual Deterministic Jitter."

Proposed Response Response Status **W**

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

Cl **83A** SC **83A.3.3.5** P **375** L **38** # **8**
 Arumugham, Vinu Cisco Systems

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

Transmitter eye mask amplitude is defined with de-emphasis on and jitter is defined with de-emphasis off? Table 83A-1 defines eye mask Y1 as $V_{txde-emph}$ (de-emphasis on). But this line says de-emphasis is off.

SuggestedRemedy

SuggestedRemedy: Define driver template with no de-emphasis. Specify de-emphasis test using OIF CEI methodology per CEI 2.0 (http://www.oiforum.com/public/documents/OIF_CEI_02.0.pdf) Section 2.4.3.

Proposed Response Response Status **W**

PROPOSED REJECT.

Resolved in comment 57&60

Cl **83A** SC **83A.3.3.5** P **376** L **13** # **92**
 Petrilla, John Avago Technologies

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

In figures 86A-6 and 86A-7 two of the symbols on the vertical axis are strange and likely not intended.

SuggestedRemedy

If appropriate change to -Y1 and -Y2.

Proposed Response Response Status **W**

PROPOSED ACCEPT.

Cl **83A** SC **83A.3.4** P **376** L **10** # **138**
 Chang, Yifeng ZTE Corporation

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

Table 83A-2 is missing differential to common mode output conversion S-parameters

SuggestedRemedy

Add row to Table 83A-2 for differential to common mode output conversion with value of equation (86-11) that has been given in section 86.7.1.1

Proposed Response Response Status **W**

PROPOSED REJECT.

Table 83A-2 deals with receiver (input) characteristics. Therefore common mode output conversion is not necessary.

Cl **83A** SC **83A.3.4** P **376** L **14** # **139**
 Chang, Yifeng ZTE Corporation

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

In Table 83A-2, the superscript 'd' of receiver eye mask definition X2, Y1 and Y2 is wrong spelling.

SuggestedRemedy

d should be changed to c.

Proposed Response Response Status **W**

PROPOSED ACCEPT.

CI **83A** SC **83A.3.4** P **376** L **24** # **5**
 Arumugham, Vinu Cisco Systems

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

Receiver specification does not include a common mode return loss requirement. Add one to improve signal integrity and emissions.

SuggestedRemedy

Add a common mode return loss requirement that is the same as the one for the transmitter (83A.3.3.4).

Proposed Response Response Status **W**

PROPOSED REJECT.

Additional information required with respect to necessity of specification.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

CI **83A** SC **83A.3.4.2, Figure 83A-7** P **377** L **248** # **25**
 BERGMANN, ERNEST CIRCADIANT / JDSU

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

Two of the values in the left vertical axis are undecipherable

SuggestedRemedy

top to bottom the two replacements are probably:
 "-Y1" and
 "-Y2"

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

-Y2, note resolution in comment 60

CI **83A** SC **83A.3.4.3** P **377** L **42** # **26**
 BERGMANN, ERNEST CIRCADIANT / JDSU

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

Equation (83A-5) is hard to read without better formatting.

SuggestedRemedy

follow the formatting styles exemplified in:
 (86-1) on page 273
 (86-2) on page 275
 (86-3) on page 279

Proposed Response Response Status **W**

PROPOSED ACCEPT.

CI **83A** SC **83A.3.4.7** P **379** L **48** # **9**
 Arumugham, Vinu Cisco Systems

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

Sinusoidal Jitter (SJ) should not be included as part of Deterministic Jitter. Traditionally in XFI, XAUI and CEI, SJ tolerance is required in addition to the DJ included in the RX mask. To avoid reducing the interconnect budget and to avoid confusion, follow XAUI convention.

SuggestedRemedy

The XLAUI/CAUI receiver shall tolerate sinusoidal jitter with any frequency and amplitude defined by the mask of Figure 83A-10 in addition to the Total Jitter of 0.62UI. This sinusoidal jitter is intended to ensure margin for low-frequency jitter, wander, noise, crosstalk and other variable system effects.

Proposed Response Response Status **W**

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

CI 83A SC 83A.3.4.7 P 379 L 49 # 110
Dawe, Piers Avago Technologies

Comment Type T Comment Status D

It's not clear that these jitter specs allow the two concatenated CDRs and an optical link, XFP style, that will be wanted when connecting e.g. a 40GBASE-LR4 module.

SuggestedRemedy

Modify the jitter specifications to be sure they do. This may mean that the specs on the transmit side and receive side differ - I think there has to be a single-tone sinusoidal jitter mask for the transmit side nAUI link, like Fig. 83A-10 but with reduced SJ and corner frequency as appropriate for a transmitter. Fig. 83A-10 can remain for the receive side nAUI link.

Proposed Response Response Status W

PROPOSED REJECT.

Optical specifications for 40GBASE-LR4 will ensure optical link compliance

The commenter has not provided sufficient information; the commenter is requested to resubmit the comment with complete information during WG ballot phase

CI 83A SC 83A.4 P 380 L 23 # 6
Arumugham, Vinu Cisco Systems

Comment Type T Comment Status D

Normative channel spec. will improve interoperability.

SuggestedRemedy

Specify channel using OIF CEI methodology per CEI 2.0 (http://www.oiforum.com/public/documents/OIF_CEI_02.0.pdf) Section 6.3.7.

Proposed Response Response Status W

PROPOSED REJECT.

Normative transmitter and receiver is sufficient.

CI 83A SC 83A.4 P 380 L 304 # 27
BERGMANN, ERNEST CIRCADIANT / JDSU

Comment Type E Comment Status D

the Equations (83A-7) and (83A-8) are very hard to read without better formatting.

SuggestedRemedy

follow the formatting styles exemplified in:
(86-1) on page 273
(86-2) on page 275
(86-3) on page 279

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 83A SC 83A.4, Figure 83A-11 P 380 L 3649 # 28
BERGMANN, ERNEST CIRCADIANT / JDSU

Comment Type ER Comment Status D

The values on the left vertical axis labeled "Insertion Loss (dB)" should not be negative (loss is positive!).

SuggestedRemedy

Conform to the style of other parts of this draft and remove the negative signs!

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 83A SC 83A.5 P 381 L 32 # 96
Petrilla, John Avago Technologies

Comment Type T Comment Status D

A Tx eye mask is defined and a eye mask test is implied. Unfortunately essential information is missing, a test pattern is not identified, minimum BW of the receiver is not specified and a maximum hit ratio is not specified.

SuggestedRemedy

Insert in 83A.5 a subclause defining the Tx eye mask test, indicating acceptable test patterns (e.g. 3,5, or valid 40GBASE-R or 100GBASE-R signals), BW of the reference receiver (e.g. 12 GHz) and the maximum hit ratio (e.g. 5E-5).

Proposed Response Response Status W

PROPOSED REJECT.

Subclause 83A.5.1 is intended to specify how to measure transmit jitter compliance. Test pattern PRBS31 is specified. Annex 48B.3 is also leveraged.

The commenter has not provided sufficient information; the commenter is requested to resubmit the comment with complete information during WG ballot phase

CI **83A** SC **83A.5.2** P **381** L **50** # **10**
 Arumugham, Vinu Cisco Systems

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

Sinusoidal jitter should be added over and above deterministic jitter and random jitter.

SuggestedRemedy

Replace with:

XLAUI/CAUI jitter tolerance evaluation shall be conducted with a stressed input signal which is comprised of at least 0.05U_{lpp} sinusoidal jitter (with a frequency equal to 10x the loop bandwidth, Figure 83A-10), 0.42 U_{lpp} deterministic jitter, and 0.2 U_{lpp} random jitter. Jitter is added to a clean test pattern by adding sinusoidal jitter as defined in 83A.3.4.8, along with low pass filter stress, followed by a limiting function, and FR4 trace stress.

Proposed Response Response Status **W**

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

CI **83A** SC **83A.5.2** P **381** L **6** # **120**
 Dawe, Piers Avago Technologies

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

Jitter tolerance testing should be done with Pattern 5 (scrambled idle), with PRBS31 as an alternative.

SuggestedRemedy

Change "A PRBS31 pattern shall be used for evaluating XLAUI/CAUI jitter tolerance." to "The recommended pattern for evaluating XLAUI/CAUI jitter tolerance is Pattern 5 (scrambled idle, see 82.2.11). The alternative is Pattern 3 (PRBS31)."
 Consider adding "As Pattern 3 is more demanding than Pattern 5 (which itself is the same or more demanding than other 40GBASE-R or 100GBASE-R bit streams) an item which is compliant using Pattern 5 is considered compliant even if it does not meet the required limit using Pattern 3.

Proposed Response Response Status **W**

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

CI **83A** SC **83A.6.3** P **382** L **39** # **119**
 Dawe, Piers Avago Technologies

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

The text about "sound installation practice codes and regulations" is copied from another clause where there is cabling installation to be done. Here, everything in a chip-to-chip nAUI link has been soldered together in a factory: there is no field installation.

SuggestedRemedy

Delete 83A.6.3.

Proposed Response Response Status **W**

PROPOSED REJECT.

1 connector is available.

This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

CI **83A** SC **Figure 83A-12** P **381** L **116** # **29**
 BERGMANN, ERNEST CIRCADIANT / JDSU

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

The left side axis entitled "Return loss (dB) should not be negative.

SuggestedRemedy

Conform to the style of other parts of this draft and remove the negative signs!

Proposed Response Response Status **W**

PROPOSED ACCEPT.

CI **83A** SC **Figure 83A-6** P **376** L **12** # **23**
 BERGMANN, ERNEST CIRCADIANT / JDSU

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

Axes labels along left edge of Figure 83A-6 are undecipherable

SuggestedRemedy

the upper undecipherable is probably "-Y1"
 and the bottom one is probably "-Y2"

[2 changes needed]

Proposed Response Response Status **W**

PROPOSED ACCEPT.

Cl **83A** SC **Table 83A-2** P **376** L **448** # **24**
BERGMANN, ERNEST CIRCADIANT / JDSU

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

There are 3 references to footnote "d" in Table 83A-2, which does not exist for this table.

SuggestedRemedy

[3 places] replace the superscript "d" with "c"

Proposed Response Response Status **W**

PROPOSED ACCEPT.

Cl **83B** SC **1** P **387** L **28** # **70**
Ghiasi, Ali Broadcom

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

Fig 83B-1 is not illustrating full MCB and HCB concept of CL86

SuggestedRemedy

Please either copy Figure 86-4 or reference it

Proposed Response Response Status **W**

PROPOSED REJECT.

Figure 86-4 does not directly apply to 83B since it includes a variety of test points which are not a part of the Annex.

The commenter has not provided sufficient information; the commenter is requested to resubmit the comment with complete information during WG ballot phase

Cl **83B** SC **1** P **387** L **41** # **67**
Ghiasi, Ali Broadcom

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

XLAUI channel loss is only defined at single point nee SDD21 plot

SuggestedRemedy

for SDD21 plot see ghiasi_02_0309

Proposed Response Response Status **W**

PROPOSED REJECT.

Channel loss is compatible with 83A.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC **1** P **387** L **41** # **69**
Ghiasi, Ali Broadcom

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

XLAUI/CAUI componnet to connector ripple is not defined

SuggestedRemedy

The channel ripple magnitude should conform to $|\text{Ripple(dB)}| \leq 0.15 + 0.12 \cdot f$, where f range is from 0.25 to 5.5 GHz

Proposed Response Response Status **W**

PROPOSED REJECT.

Ripple is limited by insertion loss specification, and 1dB at 5.5GHz is not very much. This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

Cl **83B** SC **1** P **387** L **44** # **68**
Ghiasi, Ali Broadcom

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

XLAUI module XLAUI/CAUI component loss is only defined at single point nee SDD21 plot

SuggestedRemedy

for SDD21 plot see ghiasi_02_0309

Proposed Response Response Status **W**

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC 1 P **387** L **44** # **71**
 Ghiasi, Ali Broadcom

Comment Type **TR** Comment Status **D**
 The 2.1 dB module loss implies HCB loss of 2.1 dB

SuggestedRemedy

Define explicitly the HCB loss of 2.1 dB and see ghiasi_02_0309

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC 1 P **387** L **44** # **72**
 Ghiasi, Ali Broadcom

Comment Type **TR** Comment Status **D**
 Module test point is not defined

SuggestedRemedy

Propose to use 0.7 dB loss for the module compliance board loss see fig 86-5 and see ghiasi_02_0309

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC 2.1 P **388** L **35** # **61**
 Ghiasi, Ali Broadcom

Comment Type **TR** Comment Status **D**
 Module input and output return loss must be adjusted due to the effect of compliance board

SuggestedRemedy

ghiasi_02_0309 adjust the chip return loss based on the connector and compliance board response

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC 2.1 P **389** L **10** # **63**
 Ghiasi, Ali Broadcom

Comment Type **TR** Comment Status **D**
 The de-emphasis amount and Vtx-demph equation need to be adjusted for the PCB/HCB

SuggestedRemedy

Min de-emphasis should be 3.5 db and also see ghiasi_02_0309

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC 2.1 P **389** L **24** # **64**
 Ghiasi, Ali Broadcom

Comment Type **TR** Comment Status **D**
 Defining Y1 of 136 mV is not consistent with CL 83A

SuggestedRemedy

Propose to define de-emphasis range instead 3.5 dB to 5.5 dB see ghiasi_02_0309

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC **2.2** P **389** L **45** # **62**
 Ghiasi, Ali Broadcom

Comment Type **TR** Comment Status **D**
 Host input and output return loss must be adjusted due to the effect of compliance board

SuggestedRemedy

ghaisi_02_0309 adjust the chip return loss based on the connector and compliance board response

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC **2.3** P **390** L # **65**
 Ghiasi, Ali Broadcom

Comment Type **TR** Comment Status **D**
 The stress Gen DJ of 0.25 UI is excessive

SuggestedRemedy

Propose to use DJ of 0.2 UI

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC **2.3** P **390** L **37** # **66**
 Ghiasi, Ali Broadcom

Comment Type **TR** Comment Status **D**
 Limiter function gain must be defined

SuggestedRemedy

Propose min gain of 20 dB

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

Cl **83B** SC **83B.2** P **387** L **52** # **11**
 Arumugham, Vinu Cisco Systems

Comment Type **TR** Comment Status **D**
 Do the MCB and HCB here have the same characteristics as those described in 86.7.1.1?

SuggestedRemedy

If yes, add a reference here to 86.7.1.1.

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

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl **83B** SC **83B.2.1** P **388** L **21** # **12**
 Arumugham, Vinu Cisco Systems

Comment Type **TR** Comment Status **D**
 AC coupling capacitors for both TX and RX paths should be located on the module.

SuggestedRemedy

Add this requirement.

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

Cl **83B** SC **83B.2.1** P **389** L **1** # **13**
 Arumugham, Vinu Cisco Systems

Comment Type **TR** Comment Status **D**
 In Table 83B-3, high frequency Sinusoidal Jitter (0.05UI) should not be included in the Max. Total Jitter and Max. Deterministic Jitter values.

SuggestedRemedy

Change Max. Total Jitter to 0.35UI and Max. Deterministic Jitter to 0.20UI.

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

This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

Cl **83B** SC **83B.2.3** P **390** L **22** # **14**
 Arumugham, Vinu Cisco Systems

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

A compliant host could fail this test unless the pattern generator is specified to include 3.9 dB of de-emphasis.

SuggestedRemedy

Specify that the pattern generator output should include 3.9dB de-emphasis.

Proposed Response Response Status **W**

PROPOSED REJECT.

Jitter tolerance test has been designed such that de-emphasis from the generator is not necessary.

This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

Cl **83B** SC **83B.2.3** P **390** L **32** # **121**
 Dawe, Piers Avago Technologies

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

Jitter tolerance testing should be done with Pattern 5 (scrambled idle), with PRBS31 as an alternative.

SuggestedRemedy

Change "A PRBS31 pattern shall be used for evaluating XLAUI/CAUI jitter tolerance." to "The recommended pattern for evaluating XLAUI/CAUI jitter tolerance is Pattern 5 (scrambled idle, see 82.2.11). The alternative is Pattern 3 (PRBS31)."

Consider adding "As Pattern 3 is more demanding than Pattern 5 (which itself is the same or more demanding than other 40GBASE-R or 100GBASE-R bit streams) an item which is compliant using Pattern 5 is considered compliant even if it does not meet the required limit using Pattern 3.

Proposed Response Response Status **W**

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter suggests improvements (or enhancements) to the adopted parameters or method. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

Cl **83B** SC **83B.3.3** P **391** L **15** # **118**
 Dawe, Piers Avago Technologies

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

The text about "sound installation practice codes and regulations" is copied from another clause where there is cabling installation to be done. Here, we are talking about plugging a module in which isn't regulated by law as far as I know, and doesn't have the same wiring-safety implications.

SuggestedRemedy

Delete 83B.3.3.

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

Cl **84** SC **84.2** P **219** L **3** # **117**
 Dawe, Piers Avago Technologies

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

If this PMD uses Auto-negotiation, there is another primitive AN_LINK.indication which I believe is passed without modification from PMD to PCS (see Figure 73-1). It's not the same as PMD_SIGNAL.indication. In Figure 73-1, this primitive is shown passing round the PMD and PMA by magic, which doesn't seem acceptable. It should go through the PMD and PMA.

SuggestedRemedy

Add AN_LINK.indication.

Proposed Response Response Status **W**

PROPOSED REJECT.

The premise of this comment is incorrect.

AN_LINK.indication is passed from the PCS to the auto-negotiation sublayer. This is clearly stated in 73.9.1.

It does not make sense to route this signal through the PMD from either the architectural or the implementation point of view.

There is no problem with technical completeness of the draft standard however the commenter is welcome to submit a comment during working group ballot to modify Figure 73-1 to more clearly show the direction of AN_LINK.indication to be from the PCS to the AN sublayer (by removing the arrow going into the PCS). This would clear up the confusion concerning the direction of travel of this signal.

Cl 85 SC 10.2 P 248 L 12 # 80
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

Cable assembly insertion loss and other parameters are not clear if it include connector or test board!

SuggestedRemedy

Please reference CL 86.7.1 test are a used for all cable measuremets.

Proposed Response Response Status W

PROPOSED REJECT.

86.7.1 Definitions of electrical and optical parameters and measurement methods are not consistent with clause 85 test points. Clause 85 test points clearly demarcate reference to connectors.

The commenter has not provided sufficient information to support suggested remedy; the commenter is requested to resubmit the comment with complete information during WG ballot phase.

Cl 85 SC 7.1 P 238 L 20 # 73
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

There is no definition for TP0 and TP5 loss from the TX/RX function

SuggestedRemedy

Please use definition per CL 83A.2.2 $SDD_{21}(dB) \leq -0006 - 0.16 * \sqrt{f} - 0.0587(f)$ where f is from 0.25 to 11.1 GHz.

Proposed Response Response Status W

PROPOSED REJECT.

The channel is specified from TP0 to TP5. There are no definitions or specifications for TX to TP0 and RX to TP5 for many other parameters.

Cl 85 SC 8 P 242 L 22 # 88
Misek, Brian Avago Technologies

Comment Type T Comment Status D

Table 85.4

Max amplitude of 1200 mV differential and a min amplitude of 800mV should be added to Table for TP0 specification in order to remove any ambiguity.
KR min Amplitude capability is specified in 69A.2.2 of mV for 1010
The KR preset amplitude is specified in Table 72-8.

SuggestedRemedy

Lines be added to Table 85-4

Parameter	Subclause	Value	Units
Differential peak-to-peak output voltage (max.)	72.7.1.11	1200 "c"	mV
Differential peak-to-peak output voltage (min.)	72.7.1.11	800 "c"	mV

note: "c" measured with alternating 1100 pattern and the Tx in the "preset" state

Proposed Response Response Status W

PROPOSED REJECT.

This comment does not address technical completeness, instead suggests improvement to the adopted parameter(s) or method. The commenter is requested to resubmit the comment during WG ballot.

Cl 85 SC 8 P 244 L 3 # 87
Misek, Brian Avago Technologies

Comment Type E Comment Status D

Clause 72.7.1 deals with TX. This is the Rx, should be 72.7.2

SuggestedRemedy

Change 72.7.1.1 to 72.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. Change: detailed in 72.7.1.1 through 72.7.2.5 with the

To:detailed in 72.7.2.1 through 72.7.2.5.

CI 85 SC 8 P 244 L 30 # 89
Misek, Brian Avago Technologies

Comment Type T Comment Status D

The test nor the test points are not defined for this test for compliance to 1E-12 BER.

Adopt a test procedure using the method of 69A and a 72.7.2.1, with the channel based on the channel defined in 85.9. This creates TP5 as the normative test point. The injected broadband noise is based on connector cross talk for the adopted CX4 and CX10 connectors.

SuggestedRemedy

Change section heading to: "Receiver interference tolerance"

Change text to:

"The receiver interference tolerance shall consist of two separate tests as described in Annex 69A with the parameters specified in Table 85-XX. The data pattern for the interference tolerance test shall be the test patterns 2 or 3 as defined in 52.9.1.1. The receiver shall satisfy the requirements for interference tolerance specified in Annex 69A for both tests."

The added table 85-XX. Boiler plate from table 72-10.

There are still 2 tests. One for CR4 and the other for CR10.
The Channels are electrically the same so mTC=1 for both.
The amplitude of the broadband noise could be different due to the connectors being different. Use cross talk computed from QSFP for a place holder if TBDs are not allowed.

Proposed Response Response Status W

PROPOSED REJECT.

85.8.4.1 Bit error ratio

The receiver shall operate with a BER 10-12 or better when receiving a compliant transmit signal, as defined in 85.8.3, through a compliant cable assembly as defined in 85.10 exhibiting the maximum insertion loss of 85.10.2.

The commenter has not provided sufficient information for alternative approach; the commenter is requested to resubmit the comment with complete information during WG ballot phase.

CI 85 SC 8.3 P 242 L 33 # 74
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

It is not defined where TP2 is located or the property of the test board

SuggestedRemedy

Please either refer to CL 86.7.1 Compliance Board Parameters or copy this section and included it in the CL 85

Proposed Response Response Status W

PROPOSED REJECT.

Clause 85 test points clearly demarcate reference to TP2. Test fixture is specified in 85.8.3.1. Host compliance board parameters in CL 86.7.1 not applicable to CR10 or CR4 Style-2.

The commenter has not provided sufficient information for alternative approach; the commenter is requested to resubmit the comment with complete information during WG ballot phase.

CI 85 SC 8.3.2 P 243 L 33 # 75
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

Test fixture impedance is define but more critical parameter SDD21 is not defined

SuggestedRemedy

Define test fixture SDD21 per CL 83A.2.2 SDD21=-0.0006 -0.16*SQRT(f)-0.0587*f f from 0.25 to 11.1 GHz.

Test fixture SDD11 may be removed, if you are using lousy test fixture TP0 likely will fail, but failing TP0 could pass with test fixture with good return loss and extra few dB loss.

Proposed Response Response Status W

PROPOSED REJECT.

See response to comment#74

Cl 85 SC 8.4 P 244 L 3 # 76
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

Other compliance point are referred by TPx consistant with Fig 85-2, but no test point associated with the receiver

SuggestedRemedy

Please refer to table 85-6 "TP5 receiver ..."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Page 244, Line 3,

Change: Receiver characteristics are summarized in..

To: Receiver characteristics at TP5 are summarized in..

Cl 85 SC 8.4 P 244 L 3 # 78
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

TP2 and TP3 are the most important compliance point for Ethernet interface as it provide system level interoperability. CL 85.8.3 defines TP2 but CL 85.8.4 does not define TP3. Since CR4/CR10 system are build by many OEMs, currently the only way to detimer if a system does not work you need detail PCB loss which is not available.

Without TP3 definition the draft is not technically complete.

SuggestedRemedy

Define TP3 stressor starting with KR intereference tolerance tester 69A.1 for full proposal see ghiasi_01_0309. This propsoal repalces Frequncy dependent attenuator of Fig 69A-1 with 10 m cable impulse response otherwise the set up is identical to Fig 69A-1.

Add TP3 Receiver Table Similar to table 72-10

Target BER 10-12

min KR receive waveform "V2" at TP3 150 mV (see note b on page 242)

Amplitude of Broadband noise source 3.7 mV

Applied transition time (20-80%) 47 ps

Applied Sinusoidal jitter (min peak peak) 0.115 UI

Applied random jitter (min peak to peak) 0.130 UI

Applied Duty Cycle Distortion (min peak to peak) 0.035

Proposed Response Response Status W

PROPOSED REJECT.

See response to comment#89

Cl 85 SC 8.4.3 P 244 L 42 # 77
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

This section states receiver is AC coupled to the cable assembly, not clear where the AC coupling function is located

SuggestedRemedy

All style-1 cable assembly the AC-coupled function shall be locted between TP3 and MDI and for style-2 shall be located between TP4 and TP5.

Proposed Response Response Status W

PROPOSED REJECT.

This comment suggests alternative methods not related to addressing technical completeness. The commenter is requested to resubmit the comment during WG ballot phase.

Cl 85 SC 85.10.2 P 248 L 13 # 112
Dawe, Piers Avago Technologies

Comment Type T Comment Status D

Specification range for cable insertion loss is not adequate especially at low frequencies. SFP+ Annex E cable S-parameter specs go from 10 MHz to 11.1 GHz. This is not about 1G operation; a cable that is allowed any amount of loss below 100 MHz WILL be expected to fail at 10G/lane, 64B/66B. Don't tell me about a baseline motion; that's in the past, the draft is open for removal of technical issues, and the electrons won't read a baseline motion anyway!

SuggestedRemedy

Extend the frequency range of Cable assembly insertion loss, Cable assembly return loss, Near-End Crosstalk, MDNEXT, FEXT and MDELNEXT down to 10 MHz at the low end.

Proposed Response Response Status W

PROPOSED REJECT.

The commenter has not provided sufficient information to support suggested remedy; the commenter is requested to resubmit the comment with complete information during WG ballot phase.

CI 85 SC 85.10.8 P 252 L 21 # 130
Mellitz, Richard Intel Corporation

Comment Type T Comment Status D

Equation 85-33 seems inconsistent with eq 85-12 p246.
It would seem that cable would have better crosstalk characteristics that for the entire channel.

SuggestedRemedy

Review cable test characteristics data for a selection of cable and determine better ICRcamin.

Proposed Response Response Status W

PROPOSED REJECT. The difference in the channel ICR (Equation 85-12) and the cable assembly ICR (Equation 85-33) is to account for the addition of the Tx and Rx PCB trace loss.

CI 85 SC 85.10.8 P 252 L 26 # 129
Mellitz, Richard Intel Corporation

Comment Type T Comment Status D

Graph does not agree with equation 85-33. Intercept should be 55 dB not 52.5 dB

SuggestedRemedy

Adjust graph if equation is correct. Then could be cast moot by my next comment.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Figure 85-4-Minimum channel insertion loss to crosstalk ratio was incorrectly used for Figure 85-8-Minimum cable assembly insertion loss to crosstalk ratio

Remedy: plot equation 85-33 for Figure 85-8.

CI 85 SC 85.11.1 P 253 L 33 # 101
DiMinico, Christopher MC Communications

Comment Type ER Comment Status D

Remove editor's note. subclause text embodies editorial notes guidance e.g., includes placeholder for IEC reference and references SFF-8436.

SuggestedRemedy

Remove editor's note: [Editor's note (to be removed prior to publication) - Style-1 40GBASE-CR4 MDI connectors figure files to be included in revision. IEC reference to be provided for Style-1 plug and receptacle, till then see reference to small form factor pluggable (QSFP), SFF-8436]

Proposed Response Response Status W

PROPOSED ACCEPT.

Accept suggested remedy

CI 85 SC 85.11.1.1.1 P 255 L 5 # 102
DiMinico, Christopher MC Communications

Comment Type T Comment Status D

Remove editor's: editor to implement the editor's note recommendation [Editor's note (to be removed prior to publication) - Subclause to specify pin assignment states to implement baseline objective to enable detection of copper versus fiber or no module present.]

SuggestedRemedy

Remove editors note: Editor to include diminico_02_0708.pdf slide 15 table and signal description text under subclause 85.11.1.1.1.

Proposed Response Response Status W

PROPOSED ACCEPT.

Accept suggested remedy

CI 85 SC 85.7.1 P 238 L 12 # 100
DiMinico, Christopher MC Communications

Comment Type ER Comment Status D

Remove editor's note; the expectation expressed in the editor's note is embodied in the specifications.

SuggestedRemedy

Remove editors note: [Editor's note (to be removed prior to publication) - The 40GBASE-CR4 and 100GBASE-CR10 channel parameters are expected to fall within the high confidence region as defined for 10GBASE-KR in 802.3ap Annex 69B.].]

Proposed Response Response Status W

PROPOSED ACCEPT.

Accept suggested remedy

CI 85 SC 85.7.4 P 239 L 16 # 106
Dawe, Piers Avago Technologies

Comment Type T Comment Status D

Exchange of DME frames is an unnecessary burden on the host. It is not necessary for these copper links, and should not appear on front-panel ports. The choice of link types is 4 x 3.125 lanes, 4x10G lanes, and 4x10G lanes with FEC, and this can be managed with 'Parallel Detection' not DME frames.

SuggestedRemedy

Either now or in WG ballot, add text in Clause 85 saying that 40GBASE-CR4 and 100GBASE-CR10 use Parallel Detection.

Proposed Response Response Status W

PROPOSED REJECT.

Proposal insufficiently supported and lacking sufficient recommended changes to implement in the draft.

CI 85 SC 85.8.3 P 242 L 1 # 99
DiMinico, Christopher MC Communications

Comment Type ER Comment Status D

Remove editor's note:
The Differential peak-to-peak output voltage (max.) with TX disabled 30 mV specified in Table 85-4.

SuggestedRemedy

Remove editor's note:[Editor's note (to be removed prior to publication) - Table 85-4 transmitter off level needs to be considered with compliance testing].

Proposed Response Response Status W

PROPOSED ACCEPT.

Accept suggested remedy

CI 85 SC 85.8.3 P 242 L 41 # 103
DiMinico, Christopher MC Communications

Comment Type T Comment Status D

Per valliappan_01_0109.pdf the Vertical Eye Opening parameter should be informative.

SuggestedRemedy

Indicate that Vertical Eye Opening parameter Table 85-5-Transmitter characteristics'at TP2 is informative.

Proposed Response Response Status W

PROPOSED ACCEPT.

Accept suggested remedy

CI 85 SC 85.8.3.1 P 243 L 1 # 132
Palkert, Tom Xilinx

Comment Type T Comment Status D

Subclauses 85.8.3.1 and 85.8.3.2, lines 1-45.
The test fixture for CR4 and CR10 should use the same host compliance board as SR4 and SR10.

SuggestedRemedy

Replace the text in 85.8.3.1 and 85.8.3.2 with clause 86.7.1 (make appropriate modifications for a copper channel).

Proposed Response Response Status W

PROPOSED REJECT.

See response to comment#74

CI 85 SC 85.8.4 P 244 L 12 # 140
 Chang, Yifeng ZTE Corporation

Comment Type T Comment Status D

Table 85-6 is missing differential to common mode conversion SCD12 or SCD21

SuggestedRemedy

Add row to Table 85-6 for SCD12 or SCD21 with value of equation (86-11) that has been given in section 86.7.1.1

Proposed Response Response Status W

PROPOSED REJECT.

The commenter has not provided sufficient information to support suggested remedy; the commenter is requested to resubmit the comment with complete information during WG ballot phase.

CI 85 SC 85.8.4 P 244 L 2 # 128
 Mellitz, Richard Intel Corporation

Comment Type T Comment Status D

72.7.2 points to 69A which defined Rx Rx interference tolerance test as between TP1 and TP4

SuggestedRemedy

Annotate in 85.8.4 that for clause 85 Rx interference tolerance test is defined between TP0 and TP5.

Proposed Response Response Status W

PROPOSED REJECT.

See response to comment#89

CI 85 SC 85.8.4.3 P 244 L 42 # 133
 Palkert, Tom Xilinx

Comment Type T Comment Status D

The host interface should be the same for both CR and SR variants. The CR variants require AC coupling in the host. The SR variants require AC coupling in the module.

SuggestedRemedy

Replace the first two sentences of 85.8.4.3.

Change from:

The 40GBASE-CR4 and 100GBASE-CR10 receiver shall be AC-coupled to the cable assembly to allow for maximum interoperability. AC-coupling is considered to be part of the receiver for the purposes of this standard unless explicitly stated otherwise.

To:

'The 40GBASE-CR4 and 100GBASE-CR10 cable assembly shall incorporate AC coupling to allow for maximum interoperability.'

Proposed Response Response Status W

PROPOSED REJECT.

This comment suggests alternative methods not related to addressing technical completeness. The commenter is requested to resubmit the comment during WG ballot phase.

CI 85 SC 85.9 P 245 L 3 # 124
 Mellitz, Richard Intel Corporation

Comment Type T Comment Status D

The text defines the channel between TP0 and TP1

SuggestedRemedy

Change the definition to be between TP0 and TP5.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

refer to response to comment#98

Cl 85 SC 85.9 P 245 L 3 # 98
DiMinico, Christopher MC Communications

Comment Type ER Comment Status D

Typo: TP1 is incorrect; channel is defined between TP0 and TP5.

SuggestedRemedy

Change TP1 to TP5.

Proposed Response Response Status W

PROPOSED ACCEPT.
Change TP1 to TP5.

Cl 85 SC 85.9.1 P 245 L 9 # 127
Mellitz, Richard Intel Corporation

Comment Type T Comment Status X

IL for the PCB is not measured at a sperable interface. It is also inherity specified in the Tx characteristic (85.8.3). This seems like a double specification.

SuggestedRemedy

Make the Tx PCB loss informative

Proposed Response Response Status W

PROPOSED REJECT. The channel IL is normatively defined between Tx and Rx. The cable assembly and the TxPCB and RxPCB IL are specified to constrain channel IL.

Cl 85 SC 85.9.1 P 245 L 9 # 126
Mellitz, Richard Intel Corporation

Comment Type T Comment Status D

The inference that IL_PCB(f) is the sum of both Tx PCB and Rx PCB is not clear

SuggestedRemedy

Clearly state that that IL_PCB(f) is the sum of both Tx PCB and Rx PCB.

Proposed Response Response Status W

PROPOSED REJECT.
See Page 245 line 40
The sum of the transmit PCB loss and the receive PCB loss depicted in Figure 85-2.provides requested relationship.

Cl 85 SC 85.9.1 P 245 L 9 # 125
Mellitz, Richard Intel Corporation

Comment Type T Comment Status D

The test points for the transmitter PCB and Recevier PCB are only inferred.

SuggestedRemedy

Explicitly define Tx PCB as between TP0 and TP1 and Rx PCB between TP4 and TP5.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Page 238 line 9 and 10:

Change: Transmitter and receiver differential controlled impedance printed circuit board insertion losses are specified in 85.9.1.
To:Transmitter and receiver differential controlled impedance printed circuit board insertion losses defined between TP0-TP1 and TP4-TP5 respectively are specified in 85.9.1.

Cl 85 SC 85.9.2 P 245 L 33 # 123
Mellitz, Richard Intel Corporation

Comment Type T Comment Status D

The term IL_camax term in not explicitly defined in reference equation 85-12

SuggestedRemedy

change eq 85.13 to
Insertion Loss (f) <= IL_camax(f) = 1.92749e-4* sqrt(f) + 1.494e-9*f

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Change:Insertion Loss (f) =(0.192749 × f)+(0.001494 × f
To:ILca(f)= ILcamax(f)=(0.192749 × f)+(0.001494 × f)

see response to comment#123

Cl 85 SC 85.9.2 P 245 L 33 # 122
Mellitz, Richard Intel Corporation

Comment Type T Comment Status D

IL_Chmax(f) equation has mixed units. IL_PCB_max(f) assumes f in Hertz and IL_Camax(f) assumes Megahertz. Units should be consistent with 802.3ap

SuggestedRemedy

Change equations so that frequency is in Hertz.
Change Eq. 85-20, 25-21 ...replace $f \times 10^6$ with f.
Change Eq. 85-23 ... replace 1250 with 1250 MHz
Change Eq. 85-12 to $1.92749E-4 \times \sqrt{f} + 1.494E-9$

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Need to be consistent with units in CR4 and CR10 where f(MHz) except for equation 85-3 where f(Hz) which I used for consistency with 802.3ap resulting in mixed units as you described. I recommend changing f units to MHz while maintaining b1-b4 for consistency with 802.3ap

Change:

$IL_{pcb}(f) = IL_{pcbmax}(f) = (0.2032) \times [20 \times \log_{10}(e) \times (b1 \sqrt{f} + b2f + b3f^2 + b4f^3)]$

To:

$IL_{pcb}(f) = IL_{pcbmax}(f) = (0.2032) \times [20 \times \log_{10}(e) \times (b1 \sqrt{f \times 10^6} + b2(f \times 10^6) + b3(f \times 10^6)^2 + b4(f \times 10^6)^3)]$

Change: page 245 line 10
where f is expressed in Hz
To:
where f is expressed in MHz

implement changes per comment#123

Cl 85 SC 85.9.5 P 246 L 12 # 131
Mellitz, Richard Intel Corporation

Comment Type T Comment Status X

It seems to me that the 2.5 dB should be added to raise min ICR level.

SuggestedRemedy

Double check my thought process. If correct rectify.

Proposed Response Response Status W

PROPOSED REJECT. The difference in the channel (Equation 85-12) and the cable assembly (Equation 85-33) is to account for the additional loss of the Tx and Rx PCB traces.

Cl 85 SC 9 P 243 L 3 # 86
Misek, Brian Avago Technologies

Comment Type E Comment Status D

The Channel is define between TP0 and TP5

SuggestedRemedy

Change TP1 to TP5

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment#98

Cl 85 SC 9.3 P 245 L 48 # 79
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

Channel return loss is missing common mode parameter

SuggestedRemedy

Add common mode return loss per following EQ
 $SCC_{ii} = -7 + 1.6 \times f$, where f is from 0.01 to 10 GHz
 $SCC_{ii} = -3$ from 2.5 to 10 GHz

Proposed Response Response Status W

PROPOSED REJECT.

We need a technical contribution as basis for establishing suggested limits for SCC_{ii} ; remedy insufficiently supported.

Cl 86 SC 6 P 274 L 21 # 90
Misek, Brian Avago Technologies

Comment Type T Comment Status D

X1 point too restrictive. Change back to value that is in D1.1

SuggestedRemedy

X1=.12

Proposed Response Response Status W

PROPOSED REJECT. This is needed considering the portion of the jitter budget taken by the PPI receiver. See petrilla_01_0109.

CI 86 SC 6.1.2 P 275 L 37 # 81
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

Current Scii as defiend in EQ 86-2 starts at -12 dB which the same as PMD return loss, no margin left for the host PCB or the connector.

SuggestedRemedy

Please modify the EQ per
 $SCC_{ii} = -7 + 1.6 * f$, where f is from 0.01 to 10 GHz
 $SCC_{ii} = -3$ from 2.5 to 10 GHz

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. Modify Equation 86-2:
 $20 * \log_{10}(|SCC_{22}|) \leq -7 + 1.6 * f$ $0.01 \leq f \leq 2.5$
 ≤ -3 $2.5 \leq f \leq 11.1$
 Revise Figure 86-3 to match
 Do not modify Equation 86-10 or Figure 86-7 for this issue.

CI 86 SC 6.4 P 277 L 31 # 82
Ghiasi, Ali Broadcom

Comment Type TR Comment Status D

The condition for jitter tolerance is only defined at two frequency with no stress. This test was created in LRM to test the DFE loop and not applicable to limiting link when the transmitt test are done with 4 MHz CRU.

SuggestedRemedy

Jitter tolerance must use mask per CL 52-4

Proposed Response Response Status W

PROPOSED REJECT. In LRM, low frequency sinusoidal jitter tolerance was separated out because it is a test of the CDR which is typically made by a different implementer to the E/O. The same reason applies here.

CI 86 SC 86.1 P 265 L 7 # 32
Swanson, Steven Corning Incorporated

Comment Type ER Comment Status D

Existing text implies that all 40/400G Inks will be poin-to-point which is not accurate for structured cabling.

SuggestedRemedy

Replace "The 40GBASE-SR4 and 100GBASE-SR10 PMD sublayers provide point-to-point 40 Gb/s and 100 Gb/s Ethernet links over four or ten pairs of multimode fiber, up to at least 100 m."

with

"The 40GBASE-SR4 and 100GBASE-SR10 PMD sublayers provide 40 Gb/s and 100 Gb/s Ethernet links over four or ten pairs of multimode fiber, up to at least 100 m."

Proposed Response Response Status W

PROPOSED REJECT. The links are point-to-point (as opposed to point-to-multipoint like PON or shared medium like the original Ethernet). The fibre paths are point-to-point. The cabling topology may be more complicated but that is another matter. In WG ballot, could check terminology, e.g. would 'connections' be better than 'links'.

CI 86 SC 86.1 P 265 L 8 # 31
Swanson, Steven Corning Incorporated

Comment Type E Comment Status D

Consistent with Clauses 87 and 88, consider moving the last sentence on line 8 and Table 86-1 to Clause 86.6, PMD to MDI specifications. This is where Table 86-1 is referenced.

SuggestedRemedy

Move "Table 86-1 shows the primary attributes of each PMD type." and Table 86-1 to Page 273 under Clause 86.6.

Proposed Response Response Status W

PROPOSED REJECT. Table 1 is part of the overview and provides a valuable summary to help the reader.

CI 86 SC 86.10.1 P 294 L 10 # 40
Swanson, Steven Corning Incorporated

Comment Type T Comment Status D

Specified cabling skew fails to capture actual optical media skew capability for current and future infrastructure. Tight buffer, loose tube and ribbon cable designs easily exhibit skew of 1-3 ns at 100m. Recommending an informative footnote be included for typical industry cabling skew performance for future consideration.

SuggestedRemedy

In Table 86-18, add footnote designation to 79.

"c Typical optical fiber cable skew is ≤ 3 ns at 100m."

Proposed Response Response Status W

PROPOSED REJECT. A standard specifies requirements, not capability.

CI 86 SC 86.10.1 P 294 L 24 # 41
Swanson, Steven Corning Incorporated

Comment Type T Comment Status D

We need to allow both the 1 jumper method and the 3 jumper method for the measurement of insertion loss because field test equipment may not have the MPO connector.

SuggestedRemedy

Replace:

"...Insertion loss measurements of installed fiber cables are made in accordance with IEC 61280-4-1/Method 2. The fiber optic cabling model (channel) defined here is the same as a unidirectional fiber optic link segment. The term channel is used here for consistency with generic cabling standards. [Editor's note (to be removed prior to publication) - IEC 61280-4-1/Method 2 will be renamed IEC 61280-4-1/Annex A when a revised IEC 61280-4-1 (currently at FDIS stage) is published.]"

with:

"...Insertion loss measurements of installed fiber cables are made in accordance with IEC 61280-4-1/Method 2 or IEC 61280-4-1/Method 3. The fiber optic cabling model (channel) defined here is the same as a unidirectional fiber optic link segment. The term channel is used here for consistency with generic cabling standards. [Editor's note (to be removed prior to publication) - IEC 61280-4-1/Method 2 will be renamed IEC 61280-4-1/Annex A and IEC 61280-4-1/Method 3 will be renamed IEC 61280-4-1/Annex B when a revised IEC 61280-4-1 (currently at FDIS stage) is published.]"

Proposed Response Response Status W

PROPOSED REJECT. On the other hand, field test equipment may have the MPO connector. The comment suggests a possible improvement but the options would need review. Is there a freely available explanation of the issue or would a short presentation in WG ballot be useful? The commenter is invited to submit a comment on this topic during working group ballot.

CI 86 SC 86.10.1 P 71 L 50 # 113
Dawe, Piers Avago Technologies

Comment Type T Comment Status D

Point out that cabling does not have to preserve lane numbering.

SuggestedRemedy

Find suitable wording to this effect: As the PCS is capable of receiving the lanes in any arrangement, the cabling is not required to preserve lane numbering.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. Develop suitable wording. If not available, the commenter is invited to submit wording during working group ballot.

Cl 86 **SC 86.10.2.2.1** **P 294** **L 48** # **42**
Swanson, Steven Corning Incorporated

Comment Type ER **Comment Status D**

Connections with different loss characteristics only impact the CIL and not the fiber and cable characteristics

SuggestedRemedy

Replace:

"...Connections with different loss characteristics may be used provided the requirements of Table 86-18 and Table 86-19 are met."

with:

"...Connections with different loss characteristics may be used provided the requirements of Table 86-18 are met."

Proposed Response **Response Status W**

PROPOSED REJECT. Connections with different loss characteristics can also affect the channel bandwidth and cause modal noise. However, the commenter is invited to resubmit this comment during working group ballot.

Cl 86 **SC 86.10.3** **P 295** **L 23** # **43**
Swanson, Steven Corning Incorporated

Comment Type E **Comment Status D**

Consistent with the 100GBASE-SR10 PMD, we should reference Figure 86-14.

SuggestedRemedy

Replace:

"The 40GBASE-SR4 PMD is coupled to the fiber optic cabling through one connector plug into the MDI optical receptacle."

with:

"The 40GBASE-SR4 PMD is coupled to the fiber optic cabling through one connector plug into the MDI optical receptacle as shown in figure 86-14"

Proposed Response **Response Status W**

PROPOSED REJECT. This comment does not address technical completeness, instead suggests improvement to the adopted wording. The commenter is requested to resubmit the comment during working group ballot.

Cl 86 **SC 86.10.3** **P 295** **L 25** # **44**
Swanson, Steven Corning Incorporated

Comment Type T **Comment Status D**

Inclusion of multiple 100G MDI connector interfaces lacks interoperability and creates manufacturer and end-user complexities. Two 12F MPO connectors cannot interface into a single port 100G MDI interface.

SuggestedRemedy

Replace:

"...The 100GBASE-SR10 PMD is coupled to the fiber optic cabling through one or two connector plugs into the MDI optical receptacle(s), depending on choice of implementation, as shown in Figure 86-15."

with:

"...The 100GBASE-SR10 PMD is coupled to the fiber optic cabling through one connector plug into the MDI optical receptacle as shown in Figure 86-15."

Proposed Response **Response Status W**

PROPOSED REJECT. Interoperability is achieved via cabling; a GBIC is interoperable with a SFP. Provision for different connector types is seen as desirable to allow the various module formats anticipated. The text represents the compromise which has achieved strong consensus.

Cl 86 **SC 86.10.3.2** **P 296** **L 1** # **45**
Swanson, Steven Corning Incorporated

Comment Type T **Comment Status D**

Inclusion of multiple 100G MDI connector interfaces lacks interoperability and creates manufacturer and end-user complexities. Two 12F MPO connectors cannot interface into a single port 100G MDI interface. A hybrid two 12F MPOs to 24F MPO jumper can be used to interconnect the transceiver MDI to structured cabling that utilizes 12F MPOs.

SuggestedRemedy

Delete Options B and C in Figure 86-15

Delete "Recommended Option A" and "Transmitter on lower row" for clarity.

Delete "The single-receptacle Option A is recommended, the two-receptacle Option B and Option C are alternatives."

Delete "...For the depicted 12-position rows, the optical signal lanes occupy the center ten positions of each row with the outermost positions unused."

Proposed Response **Response Status W**

PROPOSED REJECT. The hybrid jumper or patchcord is why there is not an interoperability problem. See response to comment 44.

CI 86 SC 86.10.3.3 P 296 L 51 # 46
Swanson, Steven Corning Incorporated

Comment Type T Comment Status D
Current reference does not allow angled interfaces.

SuggestedRemedy
Replace:

"...The plug terminating the optical fiber cabling shall meet the dimensional specifications of IEC 61754-7 interface 7-4, MPO female plug connector flat interface..."

with:

"...The plug terminating the optical fiber cabling shall meet the dimensional specifications of IEC 61754-7, MPO female plug connector interface..."

Proposed Response Response Status W
PROPOSED REJECT. Committee has agreed to "flat" interface. Mating flat to angled connectors would be undesirable.

CI 86 SC 86.4.5 P 272 L 17 # 33
Swanson, Steven Corning Incorporated

Comment Type E Comment Status D
Redundant text.

SuggestedRemedy
Delete "Various implementations of the Signal Detect function are permitted by this standard." which is a repeat of line 10.

Proposed Response Response Status W
PROPOSED REJECT. Strictly, it isn't redundant, as there could be different rules for the global signal detect function and the lane by lane signal detect function.

CI 86 SC 86.6 P 273 L 27 # 34
Swanson, Steven Corning Incorporated

Comment Type T Comment Status D
Specified fiber type is inconsistent with Table 86-1.

SuggestedRemedy
Replace:

"A compliant PMD operates on type A1a (50/125 im) multimode fibers according to the specifications of Table 86-19."

with:

"A compliant PMD operates on type A1a.2 (50/125 im) multimode fiber according to the specifications of Table 86-19."

Proposed Response Response Status W
PROPOSED REJECT. Choice of:
Accept;
Leave as is and also indicate range on M2 fibre;
Leave as is, consider in WG ballot.

CI 86 SC 86.6.1.1 P 274 L 17 # 135
Chang, Yifeng ZTE Corporation

Comment Type T Comment Status D
Table 86-7 is missing differential to common mode conversion SCD12 or SCD21

SuggestedRemedy
Add row to Table 86-7 for SCD12 or SCD21 with value of equation (86-11) that has been given in section 86.7.1.1

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE. The specification in 86.7.1.1 applies to the mated HCB and MCB, not to product. The PPI electrical transmit signal input does not have a relevant electrical port 2. Common-mode generation is controlled by the AC common mode output voltage specification in Table 86-6, and reflected differential to common-mode conversion is controlled in Table 86-7.

Cl 86 SC 86.6.2 P 276 L 25 # 35
Swanson, Steven Corning Incorporated

Comment Type T Comment Status D
In Table 86-8, the encircled flux incorrectly specified.

SuggestedRemedy
Replace:

> 86% at 19 im,
< 30% at 4.5 im

with

>= 86% at 19 im,
< 30% at 4.5 im with footnote designation c

Proposed Response Response Status W

PROPOSED REJECT. As encircled flux is an analog quantity, "> x" means the same as ">= x", and a change is not warranted at this stage. If comment 36 accepted, change > to >=.

Cl 86 SC 86.6.2 P 276 L 28 # 97
Petrilla, John Avago Technologies

Comment Type TR Comment Status D
In Table 86-8, Tx eye mask coordinates Y1(0.17) and Y2(0.17) are a result of an unfortunate error in comment 427 for d1.1 and a mis-communication during the comment resolution at the New Orleans meeting. The value for Y1 & Y2 consistent with the value for X2(0.33) should have been reported as 0.33. This error was identified in petrilla_01_0109, but unfortunately it was not communicated sufficiently to have it corrected during comment resolution. The eye mask coordinates proposed in comment 427 (when corrected) and in petrilla_01_0109 are from simulations for a minimum performance Tx case. Leaving the Y1 value at 0.17 vs the intended 0.33 will require a significant but otherwise unnecessary increase in Tx performance. For the intended minimum performance Tx, the Y1 value of 0.17 aligns with a X2 value of 0.48

SuggestedRemedy

In Table 86.8 change Tx eye mask coordinates Y1 & Y2 from 0.17 to 0.33.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change Y2 from 0.17 to 0.33

Change Y1 from 0.17 to 0.27

Change X3 from 0.34 to 0.43

The higher central region is needed to screen for highly resonant signals that pass the TDP test (early and late) but have bad ISI right in the middle of the eye. It does not exclude other waveforms that would pass the hexagonal mask with Y1=Y2=0.33.

Cl 86 SC 86.6.2 P 276 L 34 # 36
Swanson, Steven Corning Incorporated

Comment Type T Comment Status D
More information needed for encircled flux for clarity.

SuggestedRemedy
Add footnote c tied to encircled flux that reads:

"c When measured into type A1a.2 50um fiber in accordance with TIA-455-203 or IEC 61280-1-4."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. Footnote applicable to both encircled flux specs? Pick just one reference; ANSI/TIA/EIA-455-203 (2001) if technically superior; or IEC 61280-1-4 (2003) if equal; or Will TIA-455-203-A be ready in time for this project and is it technically superior to IEC 61280-1-4 (2003)? or draft of IEC 61280-1-4 (currently 86C/865/CDV CCDV, expected publication Jan 2010) . Propose the last.

Add footnote:

"c If measured into type A1a.2 50 um fiber in accordance with IEC 61280-1-4." Also add to 1.3: IEC 61280-1-4: 2010, Fibre optic communication subsystem test procedures - Part 1-4: General communication subsystems - Light source encircled flux measurement method.

Cl 86 SC 86.6.5 P 278 L 7 # 137
Chang, Yifeng ZTE Corporation

Comment Type T Comment Status D
Table 86-11 is missing the differential NEXT and FEXT response

SuggestedRemedy

Add row to Table 86-11 for NEXT and FEXT with value of equations (86-12) and (86-13) that has been given in section 86.7.1.1

Proposed Response Response Status W

PROPOSED REJECT. Crosstalk is controlled by specifying e.g. jitter and eyes for each input and output with all other lanes operational in both directions.

CI 86 SC 86.6.5 P 278 L 7 # 136
Chang, Yifeng ZTE Corporation

Comment Type T Comment Status D

Table 86-11 is missing differential to common mode conversion SCD12 or SCD21

SuggestedRemedy

Add row to Table 86-11 for SCD12 or SCD21 with value of equation (86-11) that has been given in section 86.7.1.1

Proposed Response Response Status W

PROPOSED REJECT. The specification in 86.7.1.1 applies to the mated HCB and MCB, not to product. The PPI receiver electrical output does not have a relevant electrical port 1. Common-mode generation is controlled by the AC common mode output voltage specification, and reflected differential to common-mode conversion is controlled in Table 86-12.

CI 86 SC 86.7.1 P 279 L 45 # 37
Swanson, Steven Corning Incorporated

Comment Type E Comment Status D

Editorial; improved text.

SuggestedRemedy

Replace:

"...These are TP1, TP1a, TP2, TP3, TP4 and TP4a, and four of these are skew points SP2, SP3, SP4 and SP5 as shown."

with:

"...These are TP1, TP1a, TP2, TP3, TP4 and TP4a. Four of these are also skew points SP2, SP3, SP4 and SP5 as shown."

Proposed Response Response Status W

PROPOSED REJECT. This comment does not address technical completeness, instead suggests improvement to the adopted wording. The commenter is requested to resubmit the comment during working group ballot.

CI 86 SC 86.7.4.5 P 289 L 6 # 93
Petrilla, John Avago Technologies

Comment Type T Comment Status D

While eye mask tests of optical waveforms, clause 86.7.5.6 specify frequency attributes of the reference, this appears missing for eye mask tests of electrical signals.

SuggestedRemedy

Insert in 86.7.4.5 a minimum BW requirement of 12 GHz. For example, add at the end of the existing paragraph, "The eye is measured using a receiver with a minimum 3dB bandwidth of 12 GHz."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. Insert in 86.7.4.5 before last sentence "The eye is defined as measured using a receiver with an electrical -3 dB bandwidth of 12 GHz."

CI 86 SC 86.7.5.1 P 289 L 20 # 38
Swanson, Steven Corning Incorporated

Comment Type E Comment Status D

Add international reference and correct text.

SuggestedRemedy

Replace:

"The wavelength of each optical lane shall be within the range given in Table 86-8 if measured using the method given in TIA-455-127-A."

with:

"The wavelength of each optical lane shall be within the range given in Table 86-8 when measured using the method given in TIA-455-127-A or IEC 61280-1-3."

Proposed Response Response Status W

PROPOSED REJECT. Maintaining dual references would be too onerous. TIA-455-127-A dated 2006 is an improvement on IEC 61280-1-3 (1998). A revised version of IEC 61280-1-3 is currently being developed by IEC and is expected to be completed by January 2010 so it is better to reference this document when available.

The wording used should remain as "if measured" rather than "when measured" because the text should not imply that all devices have to be measured for a particular parameter.

Cl 86 *SC* 86.7.5.2 *P* 289 *L* 26 # 39
Swanson, Steven Corning Incorporated

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

Add international reference and correct text.

SuggestedRemedy

Replace:

"The average optical power of each lane shall be within the limits given in Table 86-8 if measured using the methods given in TIA/EIA-455-95A."

with:

"The average optical power of each lane shall be within the limits given in Table 86-8 when measured using the methods given in TIA/EIA-455-95A or IEC 61280-1-1"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Maintaining dual references would be too onerous; we should choose the international one, or TIA if technically superior.

Change 95A to 95-A, here and in 1.3.

The wording used should remain as "if measured" rather than "when measured" because the text should not imply that all devices have to be measured for a particular parameter.

Cl 87 *SC* 87.11.1 *P* 324 *L* 3 # 50
Swanson, Steven Corning Incorporated

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

We need to add bend insensitive fibers, correct the reference and new text is proposed consistent with 86.10.2

SuggestedRemedy

Replace:

"The fiber optic cable requirements are satisfied by type B1.1 (dispersion un-shifted single-mode) and type B1.3 (low water peak single-mode) fibers specified in IEC 60793-2 and the requirements in Table 87-15 where they differ."

with:

The fiber contained within the 40GBASE-LR4 fiber optic cabling shall meet the requirements of IEC 60793-2-50 type B1.1 (dispersion un-shifted single-mode), type B1.3 (low water peak single-mode) or type B6_A (bend insensitive) fibers and the requirements in Table 87-15 where they differ."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Correct the reference from IEC 60793-2 to IEC 60793-2-50.

To add an additional fibre type would go beyond 802.3ba agreed objectives. However, the commenter is invited to submit supporting material to justify the addition of a new fibre type and show significant support for doing so. The commenter is invited to resubmit their comment proposing to add bend insensitive fibres to clause 87 during working group ballot.

Cl 87 *SC* 87.7 *P* 314 *L* 43 # 47
Swanson, Steven Corning Incorporated

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

We need to include bend insensitive fibers.

SuggestedRemedy

Replace:

"...A 40GBASE-LR4 compliant PMD operates on type B1.1 and type B1.3 single-mode fibers according to the specifications defined in Table 87-14...."

with:

"...A 40GBASE-LR4 compliant PMD operates on type B1.1, B1.3 or B6_A single-mode fibers according to the specifications defined in Table 87-14...."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

see response to comment 50

Cl 87 *SC* 87.8.3 *P* 318 *L* 31 # 48
Swanson, Steven Corning Incorporated

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

Add international reference and correct text.

SuggestedRemedy

Replace:

"The wavelength of each optical lane shall be within the ranges given in Table 87-5 if measured per TIA/EIA-455-127-A."

with:

"The wavelength of each optical lane shall be within the ranges given in Table 87-5 when measured per TIA/EIA-455-127-A or IEC 61280-1-3."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

TIA-455-127-A is dated 2006 while IEC 61280-1-3 was published in 1998. A revised version of IEC 61280-1-3 is currently being developed by IEC and is expected to be completed by January 2010 so it is better to reference this document when available. The wording used should remain as "if measured" rather than "when measured" because the text should not imply that all devices have to be measured for a particular parameter.

Cl 87 *SC* 87.8.4 *P* 318 *L* 37 # 49
Swanson, Steven Corning Incorporated

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

Add international reference and correct text.

SuggestedRemedy

Replace:

"The average optical power of each lane shall be within the limits given in Table 87-7 for 40GBASE-LR4 if measured using the methods given in TIA/EIA-455-95, with the sum of the optical power from all of the lanes not under test below -30 dBm, per the test set-up in Figure 53-6."

with:

"The average optical power of each lane shall be within the limits given in Table 87-7 for 40GBASE-LR4 when measured using the methods given in TIA/EIA-455-95 or IEC 61280-1-1, with the sum of the optical power from all of the lanes not under test below -30 dBm, per the test set-up in Figure 53-6."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "method given in TIA/EIA-455-95" to "method given in TIA/EIA-455-95-A or IEC 61280-1-1"

The wording used should remain as "if measured" rather than "when measured" because the text should not imply that all devices have to be measured for a particular parameter. See also response to comment 39.

Cl 87 *SC* Table 87-11 *P* 318 *L* 11 # 15
BERGMANN, ERNEST CIRCADIANT / JDSU

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

missing blank in "Square or4"

SuggestedRemedy

change to "Square or 4"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **87** *SC* **Table 87-11** *P* **318** *L* **13** # **16**
 BERGMANN, ERNEST CIRCADIANT / JDSU

Comment Type **E** *Comment Status* **D**
 missing space in "3 or5"

SuggestedRemedy
 change to "3 or 5"

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

Cl **87** *SC* **Table 87-11** *P* **318** *L* **20** # **17**
 BERGMANN, ERNEST CIRCADIANT / JDSU

Comment Type **E** *Comment Status* **D**
 missing space in "3 or5"

SuggestedRemedy
 change to "3 or 5"

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

Cl **88** *SC* **88.12.1** *P* **350** *L* **40** # **30**
 Swanson, Steven Corning Incorporated

Comment Type **T** *Comment Status* **D**
 We need to add bend insensitive fibers, correct the reference and new text is proposed consistent with 86.10.2

SuggestedRemedy
 Replace:

 "The fiber optic cable requirements are satisfied by type B1.1 (dispersion un-shifted single-mode) and type B1.3 (low water peak single-mode) fibers specified in IEC 60793-2 and the requirements in Table 88-19 where they differ."

 with:
 The fiber contained within the 100GBASE-LR4 and 100GBASE-ER4 fiber optic cabling shall meet the requirements of IEC 60793-2-50 type B1.1 (dispersion un-shifted single-mode), type B1.3 (low water peak single-mode) or type B6_A (bend insensitive) fibers and the requirements in Table 88-19 where they differ."

Proposed Response *Response Status* **W**
 PROPOSED REJECT.
 [Editor's Note: Added Missing clause/subclause number and page number to the comment]
 The current description in the draft is technically complete since fiber type B6_A meets the requirements for type B1.1. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

Cl **88** *SC* **88.7** *P* **338** *L* **42** # **51**
 Swanson, Steven Corning Incorporated

Comment Type **T** *Comment Status* **D**
 We need to include bend insensitive fibers.

SuggestedRemedy
 Replace:

 "...A 100GBASE-LR4 compliant PMD operates on type B1.1 and type B1.3 single-mode fibers according to the specifications defined in Table 88-18...."

 with:
 "...A 100GBASE-LR4 compliant PMD operates on type B1.1, B1.3 or B6_A single-mode fibers according to the specifications defined in Table 88-18...."

Proposed Response *Response Status* **W**
 PROPOSED REJECT.
 The current description in the draft is technically complete since fiber type B6_A meets the requirements for type B1.1. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

Cl 88 **SC 88.8** **P 341** **L 28** # **52**
 Swanson, Steven Corning Incorporated

Comment Type T **Comment Status D**
 We need to include bend insensitive fibers.

SuggestedRemedy
 Replace:

"...A 100GBASE-ER4 compliant PMD operates on type B1.1 and type B1.3 single-mode fibers according to the specifications defined in Table 88-18...."

with:

"...A 100GBASE-ER4 compliant PMD operates on type B1.1, B1.3 or B6_A single-mode fibers according to the specifications defined in Table 88-18...."

Proposed Response **Response Status W**
 PROPOSED REJECT.
 The current description in the draft is technically complete since fiber type B6_A meets the requirements for type B1.1. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

Cl 88 **SC 88.8** **P 341** **L 42** # **53**
 Swanson, Steven Corning Incorporated

Comment Type T **Comment Status D**
 Add bend insensitive fiber.

SuggestedRemedy
 In Table 88-10, replace:

"a Links longer than 30 km for the same link power budget are considered engineered links. Attenuation for such links needs to be less than the worst case specified for B1.1 or B1.3 single-mode fiber."

with:

"a Links longer than 30 km for the same link power budget are considered engineered links. Attenuation for such links needs to be less than the worst case specified for B1.1, B1.3 or B6_A single-mode fiber."

Proposed Response **Response Status W**
 PROPOSED REJECT.
 The current description in the draft is technically complete since fiber type B6_A meets the requirements for type B1.1. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

Cl 88 **SC 88.8.3** **P 344** **L 19** # **54**
 Swanson, Steven Corning Incorporated

Comment Type T **Comment Status D**
 Add bend insensitive fiber.

SuggestedRemedy
 In Table 88-13, replace:

"a Links longer than 30 km are considered engineered links. Attenuation for such links needs to be less than the worst case specified for B1.1 or B1.3 single-mode fiber."

with:

"a Links longer than 30 km for the same link power budget are considered engineered links. Attenuation for such links needs to be less than the worst case specified for B1.1, B1.3 or B6_A single-mode fiber."

Proposed Response **Response Status W**
 PROPOSED REJECT.
 The current description in the draft is technically complete since fiber type B6_A meets the requirements for type B1.1. The commenter is requested to resubmit the comment during WG ballot phase for consideration by the task force.

Cl 88 **SC 88.9.2** **P 344** **L 51** # **55**
 Swanson, Steven Corning Incorporated

Comment Type E **Comment Status D**
 Add international reference and correct text.

SuggestedRemedy
 Replace:

"The wavelength of each optical lane shall be within the ranges given in Table 88-5 if measured per TIA/EIA-455-127-A."

with:

"The wavelength of each optical lane shall be within the ranges given in Table 88-5 when measured per TIA/EIA-455-127-A or IEC 61280-1-3."

Proposed Response **Response Status W**
 PROPOSED REJECT.
 See response to comment 38.

CI 88 SC 88.9.3 P 345 L 30 # 56
Swanson, Steven Corning Incorporated

Comment Type E Comment Status D

Add international reference and correct text.

SuggestedRemedy

Replace:

"The average optical power of each lane shall be within the limits given in Table 88-7 for 100GBASE-LR4 or Table 88-11 for 100GBASE-ER4 if measured using the methods given in TIA/EIA-455-95, with the sum of the optical power from all of the lanes not under test below -30 dBm, per the test set-up in Figure 53-6."

with:

"The average optical power of each lane shall be within the limits given in Table 88-7 for 100GBASE-LR4 or Table 88-11 for 100GBASE-ER4 when measured using the methods given in TIA/EIA-455-95 or IEC 61280-1-1, with the sum of the optical power from all of the lanes not under test below -30 dBm, per the test set-up in Figure 53-6."

Proposed Response Response Status W

PROPOSED REJECT.

The current description in the draft is technically complete. The commenter is requested to resubmit the comment to add IEC reference during WG ballot phase for consideration by the task force.

The wording used should remain as "if measured" rather than "when measured" because the text should not imply that all devices have to be measured for a particular parameter.