

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

**Comment Type**    **T**    **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **T**    **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **T**    **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **T**    **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **T**    **Comment Status**    **X**

**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**

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

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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

[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]

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

Comment Type TR Comment Status X

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 O

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

Comment Type T Comment Status X

'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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type **T** Comment Status **X**

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 **O**

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

Comment Type **TR** Comment Status **X**

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

*SuggestedRemedy*

Remove Y1 from Vtx-demph

Proposed Response Response Status **O**

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

Comment Type **TR** Comment Status **X**

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

*SuggestedRemedy*

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

Proposed Response Response Status **O**

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

Comment Type **TR** Comment Status **X**

Vtx-demph is not consistant 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 **O**

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

Comment Type **TR** Comment Status **X**

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

*SuggestedRemedy*

Remove Y1 from the figure and correct ,A symbol

Proposed Response Response Status **O**

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

Comment Type **TR** Comment Status **X**

XLAUI/CAUI channel ripple is not defined

*SuggestedRemedy*

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

Proposed Response Response Status **O**

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

Comment Type **TR** Comment Status **X**  
 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 **O**

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

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

SuggestedRemedy  
 Propsoe min gain of 20 dB

Proposed Response Response Status **O**

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

Comment Type **T** Comment Status **X**  
 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 **O**

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

Comment Type **E** Comment Status **X**  
 "units" should be made clearer

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

Proposed Response Response Status **O**

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

Comment Type **TR** Comment Status **X**  
 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](http://www.oiforum.com/public/documents/OIF_CEI_02.0.pdf)) Section 2.4.3.

Proposed Response Response Status **O**

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

Comment Type **E** Comment Status **X**  
 "units" not clear from context

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

Proposed Response Response Status **O**

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

Comment Type E Comment Status X

"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 O

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

Comment Type E Comment Status X

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 O

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

Comment Type E Comment Status X

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 O

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

Comment Type E Comment Status X

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 O

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

Comment Type T Comment Status X

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 sum  $RJ + DJ = TJ$  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 O

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

Comment Type TR Comment Status X

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 Vtxde-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](http://www.oiforum.com/public/documents/OIF_CEI_02.0.pdf)) Section 2.4.3.

Proposed Response Response Status O

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

Comment Type E Comment Status X  
 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 O

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

Comment Type T Comment Status X  
 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 O

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

Comment Type ER Comment Status X  
 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 O

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

Comment Type T Comment Status X  
 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 O

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

Comment Type E Comment Status X  
 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 O

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

Comment Type E Comment Status X  
 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 O

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

Comment Type TR Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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](http://www.oiforum.com/public/documents/OIF_CEI_02.0.pdf)) Section 6.3.7.

Proposed Response Response Status O

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

Comment Type E Comment Status X

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 O

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

Comment Type ER Comment Status X

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 O

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

Comment Type T Comment Status X

A Tx eye mask is defined and an 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 O



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

Comment Type **TR** Comment Status **X**

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<sub>lpp</sub> sinusoidal jitter ( with a frequency equal to 10x the loop bandwidth, Figure 83A-10), 0.42 U<sub>lpp</sub> deterministic jitter, and 0.2 U<sub>lpp</sub> 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 **O**

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

Comment Type **T** Comment Status **X**

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 **O**

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

Comment Type **T** Comment Status **X**

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 **O**

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

Comment Type **ER** Comment Status **X**

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 **O**

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

Comment Type **E** Comment Status **X**

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 **O**

Cl **83A** SC **Table 83A-2** P **376** L **448** # **24**  
 BERGMANN, ERNEST CIRCADIANT / JDSU  
 Comment Type **E** Comment Status **X**  
 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 **O**

Cl **83B** SC **1** P **387** L **28** # **70**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 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 **O**

Cl **83B** SC **1** P **387** L **41** # **67**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 XLAUI channel loss is only defined at single point nee SDD21 plot  
 SuggestedRemedy  
 for SDD21 plot see ghiasi\_02\_0309  
 Proposed Response Response Status **O**

Cl **83B** SC **1** P **387** L **41** # **69**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 XLAUI/CAUI componnet to connector ripple is not defined  
 SuggestedRemedy  
 The channel ripple magnitude should conform to  
 $|Ripple(dB)| \leq 0.15 + 0.12 * f$ , where f range is from 0.25 to 5.5 GHz  
 Proposed Response Response Status **O**

Cl **83B** SC **1** P **387** L **44** # **72**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 Module test point is not definded  
 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 **O**

Cl **83B** SC **1** P **387** L **44** # **68**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 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 **O**

Cl **83B** SC **1** P **387** L **44** # **71**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 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 **O**

Cl **83B** SC **2.1** P **388** L **35** # **61**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 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 compiance board response  
 Proposed Response Response Status **O**

Cl **83B** SC **2.1** P **389** L **10** # **63**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 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 **O**

Cl **83B** SC **2.1** P **389** L **24** # **64**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 Defining Y1 of 136 mV is not consistant 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 **O**

Cl **83B** SC **2.2** P **389** L **45** # **62**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 Host 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 compiance board response  
 Proposed Response Response Status **O**

Cl **83B** SC **2.3** P **390** L # **65**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 The stress Gen DJ of 0.25 UI is excessive  
 SuggestedRemedy  
 Propose to use DJ of 0.2 UI  
 Proposed Response Response Status **O**

Cl **83B** SC **2.3** P **390** L **37** # **66**  
 Ghiasi, Ali Broadcom  
 Comment Type **TR** Comment Status **X**  
 Limiter function gain must be defined  
 SuggestedRemedy  
 Propsoe min gain of 20 dB  
 Proposed Response Response Status **O**

Cl **83B** SC **83B.2** P **387** L **52** # **11**  
 Arumugham, Vinu Cisco Systems  
 Comment Type **TR** Comment Status **X**  
 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 **O**

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

Comment Type **TR** Comment Status **X**

AC coupling capacitors for both TX and RX paths should be located on the module.

SuggestedRemedy  
 Add this requirement.

Proposed Response Response Status **O**

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

Comment Type **TR** Comment Status **X**

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 **O**

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

Comment Type **TR** Comment Status **X**

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 **O**

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

Comment Type **T** Comment Status **X**

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 **O**

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

Comment Type **T** Comment Status **X**

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 **O**

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

Comment Type **T** Comment Status **X**

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 **O**

Cl 85 SC 10.2 P 248 L 12 # 80  
 Ghiasi, Ali Broadcom  
 Comment Type TR Comment Status X  
 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 aused for all cable measuremets.  
 Proposed Response Response Status O

Cl 85 SC 7.1 P 238 L 20 # 73  
 Ghiasi, Ali Broadcom  
 Comment Type TR Comment Status X  
 There is no definition for TP0 and TP5 loss from the TX/RX function  
 SuggestedRemedy  
 Please use definition per CL 83A.2.2  $SDD21(dB) \leq -0006 - 0.16 * \sqrt{f} - 0.0587(f)$  where f is from 0.25 to 11.1 GHz.  
 Proposed Response Response Status O

Cl 85 SC 8 P 242 L 22 # 88  
 Misek, Brian Avago Technologies  
 Comment Type T Comment Status X  
 Table 85.4  
 Max amplitude of 1200mV 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 800mV 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 O

Cl 85 SC 8 P 244 L 3 # 87  
 Misek, Brian Avago Technologies  
 Comment Type E Comment Status X  
 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 O

Cl 85 SC 8 P 244 L 30 # 89  
 Misek, Brian Avago Technologies  
 Comment Type T Comment Status X  
 The test nor the test points are not defined for this test for compliance to 1E-12 BER.  
 Adopt a test procedure using th meathod 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 O

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

Comment Type TR Comment Status X

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 O

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

Comment Type TR Comment Status X

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

*SuggestedRemedy*

Define test fixture SDD21 per CL 83A.2.2  $SDD21 = -0.0006 - 0.16 * \sqrt{f} - 0.0587 * f$  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 O

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

Comment Type TR Comment Status X

Other compliance point are referred by TPx consistent 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 O

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

Comment Type TR Comment Status X

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 interference tolerance tester 69A.1 for full proposal see ghiasi\_01\_0309. This proposal replaces Frequency 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 O

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

Comment Type TR Comment Status X

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 located between TP3 and MDI and for style-2 shall be located between TP4 and TP5.

Proposed Response Response Status O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type ER Comment Status X

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 O

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

Comment Type T Comment Status X

Remove editor's: editor to implent 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 O

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

Comment Type ER Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type ER Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O



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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

The text defines the channel between TP0 and TP1

*SuggestedRemedy*

Change the definition to be between TP0 and TP5.

Proposed Response Response Status O

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

Comment Type ER Comment Status X

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

*SuggestedRemedy*

Change TP1 to TP5.

Proposed Response Response Status O

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

Comment Type T Comment Status X

The test points for the transmitter PCB and Receiver 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 O

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 separable interface. It is also inherited 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 O

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

Comment Type T Comment Status X

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 O

Cl 85 SC 85.9.2 P 245 L 33 # 123  
 Mellitz, Richard Intel Corporation  
 Comment Type T Comment Status X  
 The term IL\_camax term in not explicitly defined in reference equation 85-12  
 SuggestedRemedy  
 change eq 85.13 to  

$$\text{Insertion Loss (f)} \leq \text{IL\_camax(f)} = 1.92749\text{e-}4 * \text{sqrt(f)} + 1.494\text{e-}9 * \text{f}$$
  
 Proposed Response Response Status O

Cl 85 SC 85.9.2 P 245 L 33 # 122  
 Mellitz, Richard Intel Corporation  
 Comment Type T Comment Status X  
 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 803.3ap  
 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  $1.92749\text{E-}4 * \text{sqrt(f)} + 1.494\text{E-}9$   
 Proposed Response Response Status O

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 O

Cl 85 SC 9 P 243 L 3 # 86  
 Misek, Brian Avago Technologies  
 Comment Type E Comment Status X  
 The Channel is define between TP0 and TP5  
 SuggestedRemedy  
 Change TP1 to TP5  
 Proposed Response Response Status O

Cl 85 SC 9.3 P 245 L 48 # 79  
 Ghiasi, Ali Broadcom  
 Comment Type TR Comment Status X  
 Channel return loss is missing common mode parmeter  
 SuggestedRemedy  
 Add common mode return loss per follwoing EQ  
 $\text{SCCii} = -7 + 1.6 * \text{f}$ , where f is from 0.01 to 10 GHz  
 $\text{SCCii} = -3$  from 2.5 to 10 GHz  
 Proposed Response Response Status O

Cl 86 SC 6 P 274 L 21 # 90  
 Misek, Brian Avago Technologies  
 Comment Type T Comment Status X  
 X1 point too restrictive. Change back to vaule that is in D1.1  
 SuggestedRemedy  
 $X1 = .12$   
 Proposed Response Response Status O

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

**Comment Type**    **TR**            **Comment Status**    **X**

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  
 SCCii=-7+1.6\*f, where f is from 0.01 to 10 GHz  
 SCCii=-3 from 2.5 to 10 GHz

**Proposed Response**                      **Response Status**    **O**

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

**Comment Type**    **TR**            **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **ER**            **Comment Status**    **X**

Existing text implies that all 40/400G lnks 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**    **O**

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

**Comment Type**    **E**              **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **T**              **Comment Status**    **X**

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 furture 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**    **O**

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

**Comment Type**    **T**                      **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **T**                      **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **ER**                      **Comment Status**    **X**

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**    **O**

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

**Comment Type**    **E**                                      **Comment Status**    **X**

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**    **O**

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

**Comment Type T**    **Comment Status X**

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 O**

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

**Comment Type T**    **Comment Status X**

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 O**

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

**Comment Type T**    **Comment Status X**

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 O**

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

**Comment Type E**    **Comment Status X**

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 O**

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

Comment Type T Comment Status X  
 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

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

Comment Type T Comment Status X  
 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

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

Comment Type T Comment Status X  
 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

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

Comment Type TR Comment Status X  
 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

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

Comment Type T Comment Status X  
 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 O

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

Comment Type T Comment Status X  
 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 O

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

Comment Type T Comment Status X  
 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 O

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

Comment Type E Comment Status X  
 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 O

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

Comment Type T Comment Status X  
 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 O

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

Comment Type E Comment Status X

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 O

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

Comment Type E Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O



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

Comment Type E Comment Status X  
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 O

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

Comment Type E Comment Status X  
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 O

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

Comment Type E Comment Status X  
missing blank in "Square or4"

SuggestedRemedy  
change to "Square or 4"

Proposed Response Response Status O

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

Comment Type E Comment Status X  
missing space in "3 or5"

SuggestedRemedy  
change to "3 or 5"

Proposed Response Response Status O

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

Comment Type E Comment Status X  
missing space in "3 or5"

SuggestedRemedy  
change to "3 or 5"

Proposed Response Response Status O

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

Comment Type T Comment Status X

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

[Editor's Note: Added Missing clause/subclause number and page number to the comment]

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type T Comment Status X

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 O

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

Comment Type E Comment Status X

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 O

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

Comment Type E Comment Status X

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 O