*Cl* **83D**    *SC* **83D.4**                *P* **157**        *L* **49**        # i-1

Mellitz, Richard                    Intel Corporation

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

Table 83d-6 Continuous time filter entry and data in Table 83d-7 is based on an a receiver without a DFE. The CTLE parameters in Clause 93 Table 93-9 are for a CTLE which is intended to be used with a DFE.

Channel margin is expected to improve by 0.5-1 dB.
See>
http://www.ieee802.org/3/bm/public/cuadhoc/meetings/apr24_14/mellitz_01_042414_caui.pdf

*SuggestedRemedy*

accept recommedation in
http://www.ieee802.org/3/bm/public/cuadhoc/meetings/may15_14/latchman_01_051514_caui.pdf

slide 5

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


*Cl* **95**     *SC* **95.1**               *P* **103**        *L* **41**        # i-2

Anslow, Peter                    Ciena Corporation

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

There is a typographical error in Table 95-1 footnote b

*SuggestedRemedy*

Change:
"RS-FEC correction function may is not supported." to:
"RS-FEC correction function is not supported."

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


*Cl* **83D**    *SC* **83D.3.3**            *P* **156**        *L* **10**        # i-3

Latchman, Ryan

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

Replace discrete two point jitter tolerance test with single interference tolerance test that includes continuous SJ per Table 88-13

*SuggestedRemedy*

In  Table 83D-4, remove "Jitter Tolerance" row.
In 83D 3.3.1, add new exception "c) Sinusoidal jitter is added to the test transmitter by modulating the clock source."
In Table 83D-5, add a row "Applied pk-pk sinusoidal jitter" with min value of "Table 88-13" for both tests.
See latchman_01_053014_caui slides 3 and 4

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


*Cl* **83D**    *SC* **83D.4**                *P* **157**        *L* **48**        # i-4

Latchman, Ryan

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

Change COM CTLE for DFE based RX to align with 802.3bj

*SuggestedRemedy*

Update Table 83D-6 Continuous time filter parameters as per latchman_01_053014_caui slide 5.
Delete Table 83D-7 "Reference CTLE coefficients"

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


*Cl* **83E**    *SC* **83E.3.1.6**          *P* **169**        *L* **11**        # i-5

Latchman, Ryan

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

Add text on recommended CTLE peaking being used for host output eye evaluation

*SuggestedRemedy*

In 83E.3.1.6 change:
"The recommended CTLE peaking value is provided ..." to:
"The recommended CTLE peaking value (which is also used for host output eye measurements) is provided ..."
See latchman_01_053014_caui slide 6

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected      RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-5**        Page 1 of 24
23/06/2014 09:34:39

*Cl* **83E**   *SC* **83E.3.4.2.1**    *P* **179**    *L* **49**    # i-6
Latchman, Ryan

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

Make explicit that the module shall meet the BER requirement with +/-1dB values for
Recommended_CTLE_value.  Make explicit the optional use of
Recommended_CTLE_value.  Add pics

*SuggestedRemedy*

In 83E.3.4.2.1 change:
"The module under test is evaluated with three ..." to:
"The module under test shall meet the BER requirement as described in Table 83E-7 using
three ..."
Add to the end of the same paragraph: "Modules may optionally elect not to use the
Recommeded_CTLE_Value."
Add a row to PICS under 83E.5.3 Major capabilities/options
(item: ADR, Feature:  Adaptive receiver, Subclause: 83E.3.4.2.1, Value: Module receiver
does not use Recommended_CTLE_value, Status: O, Support: Yes [ ] No [ ]
See latchman_01_053014_caui slides 6 and 7

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


*Cl* **83D**   *SC* **83D.3.1**    *P* **153**    *L* **43**    # i-7
Latchman, Ryan

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

Table 83D-1 reference to output jitter needs to be updated based on latest 802.3bj draft

*SuggestedRemedy*

In Table 83D-1, change reference for the bottom row from 92.8.3.9 to 92.8.3.8

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


*Cl* **95**   *SC* **95**    *P*    *L*    # i-8
King, Jonathan

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

Replace TDP with TxVEC.

*SuggestedRemedy*

Replace TDP with TxVEC.

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


*Cl* **83D**   *SC* **83D.3.1.1**    *P* **154**    *L* **4**    # i-9
RAN, ADEE    Intel Corporation

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

The current method for setting the transmitter equalization coefficient is unidirectional.
There is no standardized method for a receiver to indicate whether the current transmitter
equalization coefficients are good or not, or to request a change to the coefficients in use.
Configuring a multi-port system without such methods is difficult if at all possible.

Using a back channel for transmitter equalization tuning as in Clause 72 is a powerful
feature. Since CAUI-4 does not use the clause 72 training, to avoid adding complexity it is
suggested to add an optional back-channel through MDIO control.

Having a standardized MDIO-based method will help multi-port systems integration and
tuning and promote interoperability.

*SuggestedRemedy*

A proposal was discussed in the CAUI-4 ad hoc. Presentation and detailed text, tables and
figure will be supplied.

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-9**   Page 2 of 24
23/06/2014 09:34:39

---

*Cl* **83D**    *SC* **83D.3.3.1**         *P* **156**      *L* **33**        # i-10

RAN, ADEE                          Intel Corporation

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

Table 83D-5 replaces Table 93-6. The latter defines two tests per symbol error ratio, one with a specified maximum insertion loss ("short channel') and one with a specified minimum insertion loss ("long channel"). Table 83D-5 has two tests, but both specify only a maximum-loss channel.

Since the Annex 93C test method for both cases, the test condition limiting parameters should be similar. The current difference may cause confusion among test implementers and different interpretation of the test requirements, as either "minimum stress" or "required operating region".

This ambiguity has a simple solution - since the CAUI-4 channel specification is normative, there is no need to re-define the required operating region; interference tolerance should be defined with a minimum stress. This aligns with the maximum COM value used in both tests.

Test 1 should be a "long channel" with minimum loss, and test 2 should be a "short channel" with maximum loss.

*SuggestedRemedy*

Change "Insertion loss at 12.89 GHz" value for test 1 from "max 20" to "min 20" dB.

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

---

*Cl* **83D**    *SC* **83D.5.4**          *P* **160**      *L* **42**        # i-11

RAN, ADEE                          Intel Corporation

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

"waveform" is the established term.

*SuggestedRemedy*

Change "wave form" to "waveform".

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

---

*Cl* **83A**    *SC* **83A.3.4.7**         *P* **326**      *L* **8**         # i-12

RAN, ADEE                          Intel Corporation

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

"When aui_rx_mode = QUIET, SIGNAL_DETECT shall be set to OK within 500 ns following the application of a signal at the receiver input detects an ALERT signal driven from the XLAUI/CAUI link partner"...

This is a malformed and illegible statement. It seems to be copied from 83A, which had this phrasing since D1.3 of 802.3bj. Unfortunately it has escaped unnoticed.

A meaningful variation of this sentence appears in 84.7.4 (as modified by 802.3bj):

"When rx_mode = QUIET, SIGNAL_DETECT shall be set to OK within 500 ns following the application of a signal at the receiver input that corresponds to an ALERT transmission (see 84.7.2) from the link partner."

85.7.4 has a similar meaningful statement.

*SuggestedRemedy*

Change "detects" to "that corresponds to" to create a meaningful statement.

Consider applying a similar correction in 83A.3.4.7 too.

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

---

*Cl* **83E**    *SC* **83E.3.3**          *P* **173**      *L* **20**        # i-13

RAN, ADEE                          Intel Corporation

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

Bit error ratio is meaningless at TP4a as defined in Figure 83E-5 - it is a physical point outside of any receiver capable of detecting bits.

*SuggestedRemedy*

Delete this row from the table. Define BER as a CAUI-4 normative requirement (e.g. add "shall" in 83E.3.3.1 and 83E.3.4.1).

The host receiver interference tolerance test already has this requirement.

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-13**

Page 3 of 24
23/06/2014 09:34:39

*Cl* **83E**    *SC* **83E.3.3.3.1**         *P* **177**      *L* **6**        # i-14
RAN, ADEE                          Intel Corporation

*Comment Type*  **TR**      *Comment Status*  **X**
"Random jitter and the pattern generator output amplitude is adjusted to result in the eye
height and eye width given in Table 83E-5 using the reference receiver."

As currently written, the amplitude may exceed the "Differential pk-pk input voltage
tolerance" parameter. This can create an excessive stress or damage the receiver under
test.

*SuggestedRemedy*
Append to this paragraph "as long as the pattern generator's peak-to-peak voltage does
not exceed the receiver's Differential pk-pk input voltage tolerance specification (see Table
83E-7)".

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


*Cl* **83E**    *SC* **83E.3.3.3.1**         *P* **177**      *L* **6**        # i-15
RAN, ADEE                          Intel Corporation

*Comment Type*  **E**       *Comment Status*  **X**
Two parameters are adjusted.

*SuggestedRemedy*
change "is adjusted" to "are adjusted".

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


*Cl* **83E**    *SC* **83E.3.3.1**         *P* **173**      *L* **42**        # i-16
RAN, ADEE                          Intel Corporation

*Comment Type*  **E**       *Comment Status*  **X**
"The CAUI-4 chip-to-module host input is defined to operate at a bit error ratio..."

Bit error ratio is a characteristic of a receiver.

*SuggestedRemedy*
Change "chip-to-module host input" to "chip-to-module host receiver".

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


*Cl* **83E**    *SC* **83E.3.4**         *P* **177**      *L* **29**        # i-17
RAN, ADEE                          Intel Corporation

*Comment Type*  **TR**      *Comment Status*  **X**
"Differential pk-pk input voltage tolerance" is specified as (min) 900 mV. In contrast,
"Single-ended voltage tolerance" and "DC common mode voltage" in this same table have
both min and max specifications, and clearly the working range is between the two.

For clarity and uniformity, it is better to that specify all tolerance values as maximum
allowed values.

A similar definition (and problem) exists in table 83E-4.

*SuggestedRemedy*
Change "Differential pk-pk input voltage tolerance (min)" to "Differential pk-pk input voltage
tolerance (max)", in both tables.

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


*Cl* **83E**    *SC* **83E.5.4.3**         *P* **184**      *L* **48**        # i-18
RAN, ADEE                          Intel Corporation

*Comment Type*  **T**       *Comment Status*  **X**
"Differential pk-pk input voltage tolerance" "termination mismatch" and "Common move
voltage" from Table 83E-4 do not have PICS items.

*SuggestedRemedy*
Add PICS items for these parameters, or for the whole table 83E-4.

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


*Cl* **95**    *SC* **95**         *P*       *L*        # i-19
Ben Ary, Jacob                          Teldor Cables & Syste

*Comment Type*  **T**       *Comment Status*  **X**
Throughout clause 95 it is important to be accurate and consistent both with ISO/IEC and
IEC terminology. Specifically as regards the use of the terms OM3 and OM4. These terms
do not define "fiber types" but rather performance categories of cabled fiber. Wherever the
use of fiber type is mandated or required for clarity or technical accuracy - use the IEC
nomenclature A1a.2 and A1a.3. OM3 and OM4 can be used in the tables where link
performance parameters are specified, but again, not as fiber types.

*SuggestedRemedy*

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general          *Comment ID* **i-19**          Page 4 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn          23/06/2014 09:34:39
SORT ORDER: Comment ID

*Cl* **00**    *SC* **0**         *P* **0**       *L* **0**       # i-20

Turner, Michelle

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

This draft meets all editorial requirements.

*SuggestedRemedy*

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

---

*Cl* **45**    *SC* **45.2.3.46**     *P* **38**      *L* **18**      # i-21

Healey, Adam                     Avago Technologies

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

This comment is based on IEEE 802.3 revision request #1242
(http://ieee802.org/3/maint/requests/maint_1242.pdf). In Table 45-140, only 20 lanes are
required for the currently defined PCS implementation,
therefore the 6th bit is superfluous.

*SuggestedRemedy*

Subclause 45.2.3.46, change Table 45-140, column Bit(s), 3.400.15:6 to 3.400.15:5 and
3.400.5:0 to 3.400.4:0.

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

---

*Cl* **80**    *SC* **80.4**       *P* **50**      *L* **23**      # i-22

Healey, Adam                     Avago Technologies

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

This comment is based on IEEE 802.3 revision request #1244
(http://ieee802.org/3/maint/requests/maint_1244.pdf). Clause 44.3 deals with 10 Gb/s and
the calculation implicitly assumes a bit time of 100 ps. Clause 80 is an introduction to 40
Gb/s and 100 Gb/s networks, so this assumption results in the calculation being wrong.

*SuggestedRemedy*

The second paragraph in this clause says "See 44.3 for the calculation of bit time per
meter of fiber or electrical cable." It should be changed to the following text (including a
new equation):

<start replacement text>
Equation (80-1) specifies the calculation of cable delay in nanoseconds per meter of fiber
or electrical cable, based upon the parameter n, which represents the ratio of the speed of
electromagnetic propagation in the fiber or electrical cable to the speed of light in a
vacuum, $c = 3 \times 10^8$ m/s.

$$\text{cable delay} = 10^9/(n*c)[\text{ns/m}] \quad (80\text{-}1)$$

The value of n should be available from the fiber or electrical cable manufacturer, but if no
value is known then a conservative delay estimate can be calculated using a default value
of n = 0.66, which yields a
default cable delay of 5 ns/m.
<end replacement text>

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID*  **i-22**

Page 5 of 24
23/06/2014 09:34:39

*Cl* **86**    *SC* **86.10.2.1**    *P* **75**    *L* **19**    # i-23

Healey, Adam    Avago Technologies

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

This comment is based on IEEE 802.3 revision request #1246 (http://ieee802.org/3/maint/requests/maint_1246.pdf). The value of 300 ps stated in Note "a" to table 86-13 is too low by a factor of two. This value is believed to have originated from misapplication of the skew model kolesar_02_0508 which provides a value for variation within a lane. This value must be multiplied by 2 to account for variation across lanes. See kolesar_01_0613_mmf for more details. Further, the units in Note "a" should ideally match those for the other skew parameters in Table 86-13. Also the sum of the Note "a" value and the value in Table 86-13 for Cabling Skew Variation must equal the 2.8 ns allocation described in clause 86.3.2.

*SuggestedRemedy*

For note "a" of Table 86-13, replace "300 ps" with "0.6 ns". Change the 2.5 ns value in Table 86-13 to 2.2 ns.

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


*Cl* **95**    *SC* **95.1**    *P* **103**    *L* **41**    # i-24

Petrilla, John    Avago Technologies

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

In footnote b, "...function may is not supported" likely should be "function is not supported"

*SuggestedRemedy*

In footnote b, change "...function may is not supported" to "function is not supported"

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


*Cl* **95**    *SC* **95.7.1**    *P* **110**    *L* **50**    # i-25

Petrilla, John    Avago Technologies

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

In Table 95-6 the Transmitter eye mask coordinates do not sufficiently account for instrumentation noise in available test instruments. See petrilla_01_0714 for additional information and details.

*SuggestedRemedy*

In Table 95-6 change the Transmitter eye mask coordinates as described in petrilla_01_0714.

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


*Cl* **95**    *SC* **95.7.2**    *P* **111**    *L* **35**    # i-26

Petrilla, John    Avago Technologies

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

In Table 95-7 the Conditions of stressed receiver sensitivity test do not sufficiently account for instrumentation noise in available test instruments. See petrilla_01_0714 for additional information and details.

*SuggestedRemedy*

In Table 95-7 change the Conditions of stressed receiver sensitivity test: VECP, J2, J4 and eye mask coordinates as described in petrilla_01_0714 for additional information and details.

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


*Cl* **95**    *SC* **95.8.7**    *P* **115**    *L* **2**    # i-27

Petrilla, John    Avago Technologies

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

Although the reference receiver frequency response is defined for the transmit eye test, the reference receiver sensitivity is not. Since sensitivities of available test instruments are not expected to be as good, relative to the worst case Rx, as in the past, the test equipment can adversely impact the measurement result. This should be addressed. See petrilla_01_0714 for additional information and details.

*SuggestedRemedy*

Include in 95.8.7 the following: The reference receiver has an RMS input noise of 17 microwatts. Change the last sentence from "Compensation may be made for variation of the reference receiver filter response from an ideal fourth-order Bessel-Thomson response." to "Compensation may be made for variation of the reference receiver input noise and filter response from an ideal fourth-order Bessel-Thomson response."

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


TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected    RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-27**    Page 6 of 24
23/06/2014  09:34:39

*Cl* **95**     *SC* **95.8.8.4**     *P* **117**     *L* **52**     # i-28

Petrilla, John     Avago Technologies

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

Although the reference receiver frequency response is defined for the stressed receiver test signal calibration, the reference receiver sensitivity is not. Since sensitivities of available test instruments are not expected to be as good, relative to the worst case Rx, as in the past, the test equipment can have significant adverse effect on the measurement result. This should be addressed. See petrilla_01_0714 for additional information and details.

*SuggestedRemedy*

Change the first sentence from "The stressed receiver conformance test signal can be verified using an optical reference receiver with an ideal fourth-order Bessel-Thomson response with a reference frequency fr of 19.34 GHz." to "The stressed receiver conformance test signal can be verified using an optical reference receiver with an RMS input noise of 17 microwatts and ideal fourth-order Bessel-Thomson response with a reference frequency fr of 19.34 GHz."

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

---

*Cl* **95**     *SC* **95.8.8.1**     *P* **115**     *L* **26**     # i-29

Petrilla, John     Avago Technologies

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

The purpose of the sinusoidal amplitude interferer 1 is delared to be as an emulator of instantaneous bit shrinkage that can occur with DDJ. Unfortunately, there is no further mention of DDJ, instantaneous bit shrinkage nor further guidance on instantaneous bit shrinkage or amount of sinusoidal amplitude interferer 1 to generate. Since instantaneous bit shrinkage can be very problematic, some guidance or means should be included so that receivers under test are not overstressed.

*SuggestedRemedy*

Add a instantaneous bit shrinkage maximum (recommended to be 0.1 UI) to the setup instructions. In item 3), 95.8.8.2, page 117 include in the last paragraph a max limit of 0.1 UI for instantaneous bit shrinkage.

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

---

*Cl* **95**     *SC* **95.8.8.2**     *P* **117**     *L* **12**     # i-30

Petrilla, John     Avago Technologies

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

Extinction ratio (ER) has been shown to degrade when shifting from the test pattern used for OMA measurement to the test patterns used for receiver sensitivity. ER should also be expected to degrade when adding impairments to a relatively clean optical source that are being added to make the source look like a worst case transmitter. Since the min ER in Table 95-6 reflects the worst case Tx, setting a clean Tx to the min ER and then adding the impairments found in the worst case Tx overstresses the signal. Either a higher min ER setting should be given for a clean signal or the min ER in Table 95-6 should be applied after the 2/3 VECP and sinusoidal interferers and Gaussian jitter are applied.

*SuggestedRemedy*

Change item 2 from, "With the sinusoidal interferers and sinusoidal jitter turned off, set the extinction ratio of the E/O to approximately the minimum specified in Table 95-6." to "After application of the low-pass filetr and with the sinusoidal interferers and sinusoidal jitter turned on, set the extinction ratio of the E/O to approximately the minimum specified in Table 95-6." and move the edited item 2) to become part of item 3), before the paragraph, "Sinusodal jitter ..."

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

---

*Cl* **95**     *SC* **95.9.4**     *P* **119**     *L* **12**     # i-31

Petrilla, John     Avago Technologies

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

The use of commas is not consistent in the two paragraphs,
"It is recommended that manufacturers indicate in the literature associated with the PHY the operating environmental conditions to facilitate selection, installation, and maintenance.

It is recommended that manufacturers indicate, in the literature associated with the components of the optical link, the distance and operating environmental conditions over which the specifications of this clause will be met."

*SuggestedRemedy*

After the word, indicate, add or delete a comma. Repeat after the words PHY and link.

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-31**     Page 7 of 24
23/06/2014 09:34:39

*Cl* **83E**     *SC* **83E.34.1**     *P* **177**     *L* **51**     # **i-32**
Petrilla, John        Avago Technologies

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

Since there is no requirement for a CAUI-4 module input to include an error detector or counter and since the output of this interface is not usually exposed, the intention and consequences of this sub-clause is unclear. The same problem exists with sub-clause 83E.3.3.1. We can look to clause 95 for an solution example.

*SuggestedRemedy*

Create new subclause 83E.1.1 with the following text: "The bit error ratio (BER) shall be less than 1x10-15". Delete 83E.3.3.1 and 83E.3.4.1. Delete first row (Bit error ratio) of table 83E-4 and table 83E-7. Add footnote to the "Host stressed input test" parameter in Table 83E-4 and the "Module stressed input test" parameter in Table 83E-7: "Meets BER specified in 83E.1.1"

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


*Cl* **83E**     *SC* **83E.3.4.2.1**     *P* **179**     *L* **10**     # **i-33**
Petrilla, John        Avago Technologies

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

The sentence, "The target pattern generator 20% to 80% transition in the module stressed input test is 9.5 ps." would benefit from adding the word time as in transition time.

*SuggestedRemedy*

Change the sentence, "The target pattern generator 20% to 80% transition in the module stressed input test is 9.5 ps." to "The target pattern generator 20% to 80% transition time in the module stressed input test is 9.5 ps." .

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


*Cl* **95**     *SC* **95.7.1**     *P* **110**     *L* **41**     # **i-34**
Petrilla, John        Avago Technologies

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

In Table 95-6 the value for TDP is too high (see petrilla_01_0114.optx) due to mistaken inclusion of attributes in the calculation of the max penalty that are not captured in the TDP test. The reference receiver bandwidth (95.8.5 exception e is also affected.

*SuggestedRemedy*

In Table 95-6 change the value for max TDP from 5 to 4.1 and in 95.8.5 exception e, change 12.6 GHz to 16.1 GHz.

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


*Cl* **00**     *SC* **0**     *P* **110**     *L*     # **i-35**
Petrilla, John        Avago Technologies

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

The ability of TDP to adequately predict link margin for MMF links is questionable and, consequently, basing the min OMA requirement on TDP measurements is problematic. Another metric, TxVEC (Tx Vertical Eye Closure), provides a better correlation with link margin and has the advantages of not requiring a reference Tx and being easier and lower cost to implement while capturing all the Tx impairments that TDP captures. For more detail see petrilla_01a_0314 and petrilla_02_0714.

*SuggestedRemedy*

In Table 95-6, Table 95-8 and Table 95-10 replace 'Transmitter and dispersion penalty' and 'TDP', edit 95.8.1.1 and 95.12.4.4, and replace the subclause 95.8.5 Transmitter and dispersion penalty (TDP) with a new subclause as per the MMF ad hoc recommendation in king_02_0714. If any of the associated values are updated, the updates will be found in petrilla_02_0714.

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


*Cl* **95**     *SC* **95.8.8.1**     *P* **115**     *L* **26**     # **i-36**
Petrilla, John        Avago Technologies

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

The second paragraph of 95.8.8.1 describes setup of the stressed receiver input waveform in conjunction with the block diagram in 95-3 ending with the instruction, "The Gaussian noise generator, the amplitude of the sinusoidal interferers, and the low-pass filter are adjusted so that the VECP, stressed eye J2 Jitter, and stressed eye J4 Jitter specifications given in Table 95-7 are met simultaneously while also passing the stressed receiver eye mask in Table 95-7 according to the methods specified in 95.8.7". Unfortunately, results have not been presented that simultaneously satisfying all conditions is possible. Also, additional consideration should be given to de-embedding reference receiver noise from J2 and J4 jitter versus adjusting J2 and J4 jitter values for the ref. Rx. Consequently, this paragraph should remain open for comments until more experience is accrued and the method can be confirmed.

*SuggestedRemedy*

Indicate that 95.8.8.1 remains open for comment in draft 3.1.

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-36**     Page 8 of 24
23/06/2014  09:34:39

*Cl* **83D**　　　*SC* **83D.3.3**　　　　　*P* **156**　　　*L* **8**　　　# i-37

RAN, ADEE　　　　　　　　　　Intel Corporation

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

Interference tolerance is not something measured at TP5a - measuring it requires BER results internal to the component, so it is out of place here. There is already a normative statement about interference tolerance in 83D.3.3.1, so this line can be safely deleted.

A similar argument can be made about jitter tolerance, but this is the only place it is currently defined.

*SuggestedRemedy*

Delete the "Interference tolerance" line from the table.

Move the "Jitter tolerance" reference and comment to a separate subclause describing the test method agreed upon (I am aware of a proposed modification to the current method), and make it normative.

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

---

*Cl* **83D**　　　*SC* **83D.3.3.1**　　　*P* **156**　　　*L* **22**　　　# i-38

RAN, ADEE　　　　　　　　　　Intel Corporation

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

"The transmitter taps are set via management to the optimal transmitter equalizer settings described in 83D.3.1.1."

But 83D.3.1.1 does not describe the optimal settings.

*SuggestedRemedy*

Change this sentence to

"The transmitter taps are set via management to the optimal valid transmitter equalizer settings (see 83D.3.1.1)."

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

---

*Cl* **83D**　　　*SC* **83D.4**　　　　　*P* **158**　　　*L* **22**　　　# i-39

Healey, Adam　　　　　　　　　Avago Technologies

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

The one-sided noise spectral density (eta_0) is too high.

*SuggestedRemedy*

Change from 5.2E-4 to 5.2E-8. This is consistent with the parameters value specified in Clause 93.

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

---

*Cl* **99**　　　*SC* **99**　　　　　　*P* **2**　　　*L* **10**　　　# i-40

Dawe, Piers J G　　　　　　　　Mellanox Technologie

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

This says physical medium dependent (PMD) sublayer; but 1.4.316 says Physical Medium Dependent (PMD) sublayer

*SuggestedRemedy*

Change to Physical Medium Dependent (PMD) sublayer

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

---

*Cl* **78**　　　*SC* **78.1.4**　　　　*P* **40**　　　*L* **42**　　　# i-41

Dawe, Piers J G　　　　　　　　Mellanox Technologie

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

"XLAUI/CAUI-n shutdown is only supported when" something.  As opposed to what? Instigated when something?

*SuggestedRemedy*

Do you mean "XLAUI/CAUI-n shutdown is supported only when" something? There should be a better word than supported.
Maybe a less cryptic sentence would help: something like "EEE does not affect XLAUI/CAUI-10 or CAUI-4 when deep sleep is not enabled for the associated PHY."?

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-41**　　　Page 9 of 24
23/06/2014 09:34:39

*Cl* **78**    *SC* **78.1.4**    *P* **40**    *L* **42**    # i-42
Dawe, Piers J G          Mellanox Technologie

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

Table 78-1 is now very long and narrow.

*SuggestedRemedy*

Use four columns in pairs: PHY or interface type, Clause; PHY or interface type, Clause

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

---

*Cl* **78**    *SC* **78.5**    *P* **45**    *L* **8**    # i-43
Dawe, Piers J G          Mellanox Technologie

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

This Case-1, Case-2 notation is now badly overloaded (4 different meanings) and does not seem to be used anywhere but 78.5.

*SuggestedRemedy*

Replace with "Master mode", "Slave mode", "without FEC", "with FEC" and so on.
If that's too difficult, label the cases 1 2 3 4 5 6 7 8.

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

---

*Cl* **78**    *SC* **78.5**    *P* **45**    *L* **22**    # i-44
Dawe, Piers J G          Mellanox Technologie

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

Table layout?

*SuggestedRemedy*

Resize column widths to contents, or move "fast wake" into "Case" column twice.

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

---

*Cl* **91**    *SC* **91.7.4.2**    *P* **95**    *L* **11**    # i-45
Dawe, Piers J G          Mellanox Technologie

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

PICS RF4b prohibits something. According to 21.6.2, abbreviations and special symbols, X is used for "prohibited field/function"

*SuggestedRemedy*

Change SR4:M to SR4:X

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

---

*Cl* **95**    *SC* **95.7.1**    *P* **110**    *L* **41**    # i-46
Dawe, Piers J G          Mellanox Technologie

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

This TDP limit of 5 dB appears to be a "worst bit plus noise" estimate from the spreadsheet; the real TDP will be considerably lower. TDP of 5 is near to a "cliff" (see dawe_01_0513_optx.pdf and dawe_02a_0114_optx.pdf slide 12), is far higher than other TDP limits in 802.3, and is not feasible.

*SuggestedRemedy*

Using the improved definition of TDP (see other comments) that includes all penalties:
Change TDP limit from 5 dB to 4.3 dB.
Consequent changes: change OMA-TDP (min) from -8 dB to -7.3 dB;
Change OMA (min) from -7.1 dB to -6.4 dB;
Change Average launch power, each lane (min) from -9.1 dB to -8.4 dB;
In receive specs, change Average receive power, each lane (min) from -11 dB to -10.3 dB;
In receive specs, if we are testing with maximum of all penalties, change Stressed receiver sensitivity (OMA), each lane (max) from -5.6 to -3-1.9 = -4.9 dBm;
In Table 95-8, 100GBASE-SR4 illustrative link power budget, change Power budget (for max TDP) from 8.2 dB to 4.3+1.9 = 6.2 dB (?);
In Table 95-8, change Allocation for penalties (for max TDP) from 6.3 dB to 4.3 dB (?).

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected    RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-46**    Page 10 of 24
23/06/2014 09:34:39

*Cl* **95**   *SC* **95.7.1**   *P* **110**   *L* **41**   # i-47
Dawe, Piers J G                         Mellanox Technologie

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

With the present methodology, we need to allow 0.2 dB more in the budget for modal noise than we chose before we reduced the minimum extinction ratio (see mmfadhoc/meetings/nov6_13/ModalNoiseIn100GBASE-SR4v3a_mmf.pdf ).

*SuggestedRemedy*

Use the proposed scope based TDP including all penalties (see another comment) and then the extra penalty from modal noise will be a transmitter implementer's choice not a receiver implementer's problem.

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

---

*Cl* **95**   *SC* **95.7.2**   *P* **111**   *L* **28**   # i-48
Dawe, Piers J G                         Mellanox Technologie

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

VECP is not a true penalty.  It would be possible to use it for the unique case of an SRS signal, but not desirable.

*SuggestedRemedy*

Replace VECP spec with Signal Penalty (or Transmitter penalty) spec.  Here, change "Vertical eye closure penalty (VECP) lane under test 4.2 dB" to "Signal Penalty, lane under test 4.3 dB" (same number as TDP in Table 95-6), modifying footnote d).  And see comment against 95.8.8.2.

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

---

*Cl* **95**   *SC* **95.7.1**   *P* **110**   *L* **50**   # i-49
Dawe, Piers J G                         Mellanox Technologie

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

Are the mask coordinates correct?  TR comment because this action should follow others to be taken at July meeting.

*SuggestedRemedy*

Review them and revise if necessary, following and consistent with changes to TDP and VECP.

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

---

*Cl* **95**   *SC* **95.7.2**   *P* **111**   *L* **29**   # i-50
Dawe, Piers J G                         Mellanox Technologie

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

Are the J2 and J4 values correct?  TR comment because this action should follow others to be taken at July meeting.

*SuggestedRemedy*

Review them and revise as necessary, consistent with changes to TDP and VECP.  Also the SRS eye mask.

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

---

*Cl* **95**   *SC* **95.8.1**   *P* **113**   *L* **1**   # i-51
Dawe, Piers J G                         Mellanox Technologie

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

Table 95-10, "Test-pattern definitions and related subclauses", doesn't define any patterns - that's in Table 95-9.  It specifies which patterns to use, which is different.

*SuggestedRemedy*

Change title of Table 95-10 from:
Test-pattern definitions and related subclauses
 to:
Parameter definitions and test patterns

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-51**        Page 11 of 24
23/06/2014  09:34:39

*Cl* **95**      *SC* **95.8.2**               *P* **113**          *L* **42**              # i-52

Dawe, Piers J G                          Mellanox Technologie

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

This "shall" duplicates the one in 95.7.1, which is bad practice.  It puts a (repeated) PMD
requirement in the definitions section where it doesn't belong.  the point about "if
measured" applies to any spec; we should not be saying it in most or every subclause as if
it were an exception to the rule.

*SuggestedRemedy*

Change the first sentence of 95.7.1 from:
...shall meet the specifications in Table 95-6 per the definitions in 95.8.
   to
...shall meet the specifications in Table 95-6 if measured according to the definitions in
95.8.
and similarly for 95.7.2 100GBASE-SR4 receive optical specifications.
Change "The center wavelength and RMS spectral width of each optical lane shall be
within the range given in Table 95-6 if measured per TIA/EIA-455-127-A or IEC 61280-1-3."
   to   "Center wavelength and RMS spectral width shall be as defined by TIA/EIA-455-127-
A or IEC 61280-1-3."
Similarly in 95.8.3 Average optical power, 95.8.4 Optical Modulation Amplitude (OMA),
95.8.6 Extinction ratio, 95.8.7 Transmitter optical waveform (transmit eye), and 95.8.8
Stressed receiver sensitivity.

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


*Cl* **95**      *SC* **95.8.2**               *P* **113**          *L* **49**              # i-53

Dawe, Piers J G                          Mellanox Technologie

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

For average optical power, Table 95-10 gives a choice of test patterns for average optical
power.
Table 95-10 doesn't define test patterns, it merely selects (specifies or identifies) the
appropriate ones.

*SuggestedRemedy*

Change
using the test pattern defined in Table 95-10.
   to
using one of the  test patterns specified in Table 95-10.

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


*Cl* **95**      *SC* **95.8.5**               *P* **114**          *L* **10**              # i-54

Dawe, Piers J G                          Mellanox Technologie

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

As discussed in the MMF ad hoc, for this PMD the TDP method can be improved for better
accuracy, lower test cost and much simplified calibration.
Doing so avoids the need to fix the incorrect use of VECP in this subclause.

*SuggestedRemedy*

Replace 95.8.5 with the material in
http://ieee802.org/3/bm/public/mmfadhoc/meetings/jun12_14/802%203-95-
TxVECimproved.pdf or its successor.

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


*Cl* **95**      *SC* **95.8.5**               *P* **114**          *L* **41**              # i-55

Dawe, Piers J G                          Mellanox Technologie

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

Define Signal Penalty as a simplified scope-based TDP, and use this for SRS calibration to
get consistency between Tx and Rx specs.
The alternative would be to fix the VECP: find a new "all but" parameter and a new VECP
spec for SRS.

*SuggestedRemedy*

In either a new 95.8.6 or 95.8.5.1,
Define Signal Penalty (or Transmitter Penalty), as TDP with the following differences:
Observation bandwidth of 19.34 GHz not 12.6 GHz;
Noise term M set to zero.

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general                *Comment ID*  **i-55**          Page 12 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn                     23/06/2014  09:34:39
SORT ORDER: Comment ID

*Cl* **95**    *SC* **95.8.7**    *P* **115**    *L* **1**    # i-56

Dawe, Piers J G            Mellanox Technologie

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

A mask hit ratio limit of 5e-5 was found suitable for PMDs with spec BER of 1e-12.  For this PMD with a BER a more than a million times higher, a higher hit ratio limit would be appropriate.  Improving the mask hit ratio limit is expected to improve the correlation between the mask test and performance in the field, improve eye measurement accuracy and/or reduce test time.

Also for the expected 400GBASE-SR16 based 100GBASE-SR4, test time will be important with 16 lanes.

A hit ratio limit of 1e-4 would be suitable.

*SuggestedRemedy*

Change "with the exception that the clock recovery unit's high-frequency corner bandwidth is 10 MHz." to:

"with these exceptions:

a)  the clock recovery unit's high-frequency corner bandwidth is 10 MHz, and

b)  the transmitter shall achieve a hit ratio lower than the limit of hits per sample specified in Table  95-6."

In Table 95-6, under "Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}", insert "Hit ratio 10^-4 hits per sample".

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

---

*Cl* **95**    *SC* **95.8.8.1**    *P* **115**    *L* **23**    # i-57

Dawe, Piers J G            Mellanox Technologie

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

Having improved TDP so it doesn't need VECP, we can use a similar methodology in SRS so that we don't need VECP at all (see other comments).  Then we can remove it from the draft.

*SuggestedRemedy*

In 95.8.8.1, change "The low-pass filter is used to create ISI-induced vertical eye closure penalty (VECP)." to "The low-pass filter is used to create intersymbol interference.".

Change "so that the VECP, stressed eye J2 Jitter, and stressed eye J4 Jitter specifications given" to "so that the Signal Penalty, stressed eye J2 Jitter, and stressed eye J4 Jitter specifications given".

In 95.8.8.2, change "levels and frequencies of the VECP and jitter components" to "levels and frequencies of the Signal Penalty and jitter components".

Change "The required values of VECP, J2 Jitter and J4 Jitter" to "The required values of Signal Penalty, J2 Jitter and J4 Jitter".

Change "greater than two thirds of the dB value of the VECP should be created by the selection of the appropriate bandwidth for the low-pass filter.  Any remaining VECP must be created with sinusoidal interferer 2 or sinusoidal jitter." to "greater than two thirds of the dB value of the Signal Penalty should be created by the selection of the appropriate bandwidth for the low-pass filter.  Any remaining Signal Penalty must be created with sinusoidal interferer 2 or sinusoidal jitter.".

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

---

*Cl* **95**    *SC* **95.8.8.1**    *P* **116**    *L* **38**    # i-58

Dawe, Piers J G            Mellanox Technologie

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

Calibrating the SRS setup with a clean clock will mean that the signal as seen with any real CRU (including the one in the product) will have a little more jitter than intended, and on the other hand an unknown part of the calibrated jitter could be at very low frequencies, making the test signal as seen by a product receiver have less jitter than intended.  At least some BERTs have a low bandwidth CRU option that addresses this, but even with the standard CRU, J2 and J4 can be calibrated with the SJ frequency set to the high end of the range in Table 95-11.

*SuggestedRemedy*

Change "clean clock" to "Low bandwidth CRU" or simply "Clock recovery unit", with its input from the test signal.

In 95.8.8.5, consider adding a NOTE--It may not be practical to calibrate the sinusoidal jitter at the lowest frequencies with the setup in Figure 95-3.

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-58**    Page 13 of 24
23/06/2014 09:34:39

*Cl* **95**    *SC* **95.8.8.2**    *P* **116**    *L* **48**    # i-59
Dawe, Piers J G    Mellanox Technologie

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

The definition of VECP in 87.8.11.2 is for a non-FEC PMD and causes inaccuracy for this PMD. After improving the TDP method so it doesn't rely on VECP and includes all penalties, we can then use a variant of the improved TDP method to calibrate the stressed eye and make the Tx and Rx specs consistent.

*SuggestedRemedy*

As the improved TDP includes all penalties, replace all references to VECP with references to Signal Penalty (based on TDP as defined in 95.8.8 and its subclauses - see another comment).
Change:
The primary parameters of the conformance test signal are vertical eye closure penalty (VECP), stressed eye J2 Jitter and stressed eye J4 Jitter. VECP is measured at the time center of the eye, half way between the normalized times of 0 and 1 on the unit interval (UI) scale as determined by the eye crossing means. VECP is given by Equation (87-1), and illustrated in Figure 87-4 (see 87.8.11.2).
to:
The primary parameters of the conformance test signal are Signal Penalty, stressed eye J2 Jitter and stressed eye J4 Jitter. Signal Penalty is defined in 95.8.new (or 95.8.5.1).
See other comments for associated changes.

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


*Cl* **95**    *SC* **95.8.8.2**    *P* **117**    *L* **5**    # i-60
Dawe, Piers J G    Mellanox Technologie

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

This stressed eye generator contains a Gaussian noise generator. Even though it's before a limiter, this means that the outer slopes of the final amplitude histograms will not be "as steep as possible".

*SuggestedRemedy*

Delete the paragraph "Residual low probability noise and jitter should be minimized so that the outer slopes of the final amplitude histograms are as steep as possible."

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


*Cl* **95**    *SC* **95.8.8.2**    *P* **117**    *L* **16**    # i-61
Dawe, Piers J G    Mellanox Technologie

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

This says "With the sinusoidal interferers and sinusoidal jitter turned off, greater than two thirds of the dB value of the VECP should be created by the selection of the appropriate bandwidth for the low-pass filter.
Any remaining VECP must be created with sinusoidal interferer 2 or sinusoidal jitter." It doesn't mention the Gaussian noise generator shown in Figure 95-3. Is it on or off when achieving the two thirds?

*SuggestedRemedy*

Clarify.

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


*Cl* **95**    *SC* **95.8.8.2**    *P* **117**    *L* **18**    # i-62
Dawe, Piers J G    Mellanox Technologie

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

Invisible character after "2 or sinusoidal jitter."

*SuggestedRemedy*

Remove

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


*Cl* **83D**    *SC* **83D.3.4**    *P* **157**    *L* **11**    # i-63
Dawe, Piers J G    Mellanox Technologie

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

Requiring that "SIGNAL_DETECT changes from FAIL to OK only after the valid ALERT signal is applied to the channel." is far too onerous, it would need a pattern checker to identify when a signal wasn't a valid ALERT signal. A simple energy detector should be good enough to do what's needed.

*SuggestedRemedy*

Delete "only". Also in 83A.3.4.7.

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general    *Comment ID* **i-63**    Page 14 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected    RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn    23/06/2014  09:34:40
SORT ORDER: Comment ID

*Cl* **83D**    *SC* **83D.3.4**              *P* **157**         *L* **11**              # i-64

Dawe, Piers J G                              Mellanox Technologie

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

  "the valid ALERT signal is applied to the channel": channel?

*SuggestedRemedy*

  Change to "... applied to the lane" (if that's what you mean).  Or if it isn't, "is received"?
  Also in 83A.3.4.7.

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

---

*Cl* **83E**    *SC* **83E.1**               *P* **163**         *L* **30**              # i-65

Dawe, Piers J G                              Mellanox Technologie

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

  100GBASE-SR4 always uses FEC. In a new QSFP-based design, the FEC coding and
  checking will be in the host (100GBASE-CR4 always has FEC in the host too). 400GBASE-
  SR16 (and probably all 400GE) will use FEC, and CDAUI-16 should be compatible with
  CAUI-4.  We can use that FEC benefit in chip-to-module CAUI-4, for modules that use
  FEC and hosts that always use FEC.
  I believe the with-FEC and without-FEC C2M CAUI-4 variants will exist in the market
  whatever, but it will reduce confusion if IEEE acknowledges that and provides clearer
  naming and the stability of a good standard for with-FEC CAUI-4.  It is worth proposing this
  again, now that 400GE has progressed, to establish how best to move forward.
  See dawe_01_0913_optx.pdf and dawe_01a_0114_optx.pdf
  For consistency with Fibre Channel, a BER limit of 1e-6 rather than 2.5e-6 might be
  convenient.

*SuggestedRemedy*

  Adopt the changes shown in dawe_01a_0114_optx.pdf

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

---

*Cl* **83E**    *SC* **83E.3.1**             *P* **166**         *L* **15**              # i-66

Dawe, Piers J G                              Mellanox Technologie

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

  Use the same terminology as 802.3bj and almost all 802.3ba.

*SuggestedRemedy*

  Change "Common-mode AC output voltage" to "AC common-mode output voltage".  In
  PICS TH5, change "AC common-mode output" to "AC common-mode output voltage".
  Also Table 83D-1 and Table 83E-3.

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general                *Comment ID*  **i-66**           Page 15 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn                                      23/06/2014  09:34:40
SORT ORDER: Comment ID

---

*Cl* **83E**　　*SC* **83E.3.1**　　　　*P* **166**　　*L* **22**　　# i-67

Dawe, Piers J G　　　　　　Mellanox Technologie

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

According to 83E.3.1.6, the host provides a recommended CTLE peaking value. According to 83E.4.2, the host's eye must pass the spec at this value or 1 dB higher or lower if within the range 1 to 9. However, simulation shows that if the host gives a compliant but unhelpful recommendation, EH15 can be up to 8 dB smaller than the limit in Table 83E-1 within 1 dB of the recommendation (this is allowing 1 dB for the module). We could impose some accuracy spec on the recommendation, but it is more useful and easier for the host to simply require that the eye is open at and around the setting the host recommends, by adding a subsidiary eye height spec. This 80 mV spec is chosen so that a host which gives a reasonable recommendation is not inconvenienced, and the host can trade off accuracy and eye opening - but the module is protected from a very unhelpful recommendation.

A simpler option might be to require 90 mV at the recommendation, if someone else wants to do the analysis to show that it fixes the problem. This would reduce the number of host tests but is less generous to hosts that give realistic recommendations and may protect the module less well.

The text in 83E.4.2 would benefit from a little wordsmithing anyway.

*SuggestedRemedy*

Insert a second limit below the 95 mV, of 80 mV (1.5 dB lower than 95 mV).
In 83E.4.2, change:
For host compliance, the CTLE peaking in the reference receiver shall be set to one of three values. These are: a) the recommended CTLE peaking value provided by the host, b) the value 1 dB higher if present in Table 83E-2, c) the value 1 dB lower if present in Table 83E-2. Any of the three CTLE settings that meets both eye width and eye height defined in Table 83E-1 is acceptable.
to
For host compliance, the CTLE peaking in the reference receiver shall be set to three values. These are: a) the recommended CTLE peaking value provided by the host, b) the value 1 dB higher if present in Table 83E-2, c) the value 1 dB lower if present in Table 83E-2. A compliant host passes both the eye width and the larger eye height limit specified in Table 83E-1 at at least one of the settings, and passes the smaller eye height limit specified in Table 83E-1 at all of the two or three settings.

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

---

*Cl* **83E**　　*SC* **83E.3.1.6.1**　　　*P* **170**　　*L* **1**　　# i-68

Dawe, Piers J G　　　　　　Mellanox Technologie

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

The entries in Table 83E-2 are in GHz, as are Table 83D-6 and Table 83D-7. But Equation 83E-4 is in Grad/s. More generally:
This draft uses Hz 68 times and rad/s twice.
802.3bj uses Hz 195 times and does not use rad/s.
802.3-2012 uses Hz many times and does not use rad/s.
We should be consistent within 802.3. Also we should remove clutter that makes this equation and table harder to understand than they need be.

*SuggestedRemedy*

Remove 2pi three times from Equation 83E-4.
In Table 83E-2, delete "/2pi", three times.
Change "in Grad/s" to "in GHz", twice.

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

---

*Cl* **83E**　　*SC* **83E.3.3**　　　　*P* **173**　　*L* **18**　　# i-69

Dawe, Piers J G　　　　　　Mellanox Technologie

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

Test Point

*SuggestedRemedy*

Test point

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

---

*Cl* **83E**　　*SC* **83E.3.3**　　　　*P* **173**　　*L* **18**　　# i-70

Dawe, Piers J G　　　　　　Mellanox Technologie

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

Table layout

*SuggestedRemedy*

Make the table full width, resize all but first column to contents, make first column as wide as takes up the rest of the width.

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected　　RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-70**

Page 16 of 24
23/06/2014  09:34:40

*Cl* **83E**      *SC* **83E.3.3**                      *P* **173**          *L* **32**          # i-71

Dawe, Piers J G                                   Mellanox Technologie

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

Common Mode Voltage

*SuggestedRemedy*

Common-mode voltage

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

---

*Cl* **83E**      *SC* **83E.3.3.3.1**                  *P* **177**          *L* **12**          # i-72

Dawe, Piers J G                                   Mellanox Technologie

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

Table 95-10, test-pattern definitions and related subclauses, says that stressed receiver
sensitivity uses pattern 3 or 5 (for the victim lane, this comment is not discussing the
crosstalk lanes).  Yet 83E.3.3.3.1, Host stressed input test procedure, and 83E.3.4.2.1,
module stressed input test procedure, say "Pattern 5 (with or without FEC encoding),
Pattern 3 or a valid 100GBASE-R signal."  Either allowing any valid 100GBASE-R signal is
a bad idea and should not be allowed (as in previous 10G, 40G, 100G specifications
including nPPI and XLAUI/CAUI) or it's a good idea and should be allowed.  Which is it?
This comment involves optical as well as electrical specs and is addressed to the whole
committee.

*SuggestedRemedy*

Make the options for victim test pattern consistent for 100GBASE-SR4 and CAUI-4.

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

---

*Cl* **83E**      *SC* **83E.3.4.2.1**                  *P* **178**          *L* **11**          # i-73

Dawe, Piers J G                                   Mellanox Technologie

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

Figure has Bounded Uncorrelated Jitter, text below has "bounded uncorrelated jitter"

*SuggestedRemedy*

Make consistent e.g. Bounded uncorrelated jitter, bounded uncorrelated jitter

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

---

*Cl* **83E**      *SC* **83E.3.4.2.1**                  *P* **178**          *L* **17**          # i-74

Dawe, Piers J G                                   Mellanox Technologie

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

Figure has Frequency Dependent Attenuator, text below has "frequency-dependent
attenuator"

*SuggestedRemedy*

Make consistent e.g. Frequency-dependent attenuator, frequency-dependent attenuator

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

---

*Cl* **83E**      *SC* **83E.3.4.2.1**                  *P* **178**          *L* **27**          # i-75

Dawe, Piers J G                                   Mellanox Technologie

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

Layout of Figure 83E-15 could be further improved, which would help the layout of the
following three pages.

*SuggestedRemedy*

Make the figure more compact:
Move Module under test to the left, dashed box with key up.  If necessary, move
Termination and crosstalk calibration right,  and Sinusoidal jitter, Random jitter, Pattern
generator and Bounded Uncorrelated Jitter left and down.

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID*  **i-75**          Page 17 of 24
23/06/2014  09:34:40

*Cl* **83E**      *SC* **83E.5.4.1**              *P* **183**          *L* **26**              # i-76
Dawe, Piers J G                              Mellanox Technologie

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

PICS TH4 "DC common-mode voltage" refers to 83E.3.1.2 but there is no shall in 83E.3.1.2.  The normative requirement is in Table 83E-1 in 83E.3.1, and is for "DC common-mode **output** voltage".   83E.3.1.2 defines what this annex means by peak-to-peak differential voltage and common-mode voltage; it should not be half-heartedly trying to state requirements for a second time.
There may be other similar issues.

*SuggestedRemedy*

Change "The DC common-mode output voltage is between -0.3 V and 2.8 V with respect to signal ground. The AC common-mode output voltage is less than or equal to 17.5 mV RMS with respect to signal ground." to "DC common-mode output voltage and AC common-mode output voltage are defined with respect to signal ground.".  Change PICS TH4 from
DC common-mode voltage    83E.3.1.2
  to
DC common-mode output voltage    83E.3.1

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


*Cl* **83E**      *SC* **83E.3.3.3.1**            *P* **175**          *L* **46**              # i-77
Dawe, Piers J G                              Mellanox Technologie

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

The first mention of PRBS9 in 83E says "Pattern 4 (PRBS9, see Table 86-11)".  Table 86-11 says "Pattern defined in 83.5.10", and somewhere in the very long 83.5.10 it says "a PRBS9 pattern (as defined in Table 68-6)".  Because it's so hard to follow the chain of references in this case, we should be more considerate to the reader.

*SuggestedRemedy*

Change "Pattern 4 (PRBS9, see Table 86-11 and Table 68-6) once  (no need to do it every time this pattern is mentioned).

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


*Cl* **83**      *SC* **83**                      *P* **83**           *L*                     # i-78
Goergen, Joel                                Cisco Systems, Inc.

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

*** Comment submitted with the file 82487100003-Comment on IEEE P802.3bm - Joel Goergen 21June2014.docx attached ***

-Add "Adaptive CTLE" support as a line item to 83E.5.4.4 (Module Input) PICS of type "O" (optional).
 -Add an ability bit for "Adaptive CTLE" into Clause 45, preferably adjacent to the recommended peaking register location at 1.179.

*SuggestedRemedy*

-Proposed wording for the adaptive CTLE: " The adaptive module shall autonomously determine an initial CTLE gain setting immediately upon start-up . After start-up the module shall enter into a slow continuously adaptive mode, such that it is able  track channel variations ".
* Update in the 802.3bm standard to capture and address any differences in compliance testing between the programmable and adaptive options, addressing our technical concerns about TP1 compliance range for programmable parts given in slide 11 ->
 CAUI4 complaint module should demonstrate compliance to RX CTLE coefficient +/-2dB instead of current +/-1dB.

http://www.ieee802.org/3/bm/public/cuadhoc/meetings/apr24_14/mazzini_01_042414_caui.pdf

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


*Cl* **45**      *SC* **45.2.1.92b**             *P* **36**           *L* **31**              # i-79
Dudek, Michael                               QLogic Corporation

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

It is not clear what transmitter equalization, receive direction means.  Also it is not clear what should be entered if this does not exist.

*SuggestedRemedy*

Add this additional paragraph.  "The transmitter, receive direction is the Transmitter in the direction from the PMD to the PCS."  If this does not exist then the value should be set to zero."   Add this paragraph also to 45.2.1.92c

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general          *Comment ID* **i-79**       Page 18 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn          23/06/2014  09:34:40
SORT ORDER: Comment ID

*Cl* **45**  *SC* **45.2.1.92d**  *P* **37**  *L* **27**  # i-80
Dudek, Michael  QLogic Corporation

*Comment Type* **TR**  *Comment Status* **X**
It is not clear what transmitter equalization, transmitter direction means.  Also it is not clear what should be entered if this does not exist.

*SuggestedRemedy*
Add this additional paragraph.  "The transmitter,transmitter direction is the Transmitter in the direction from the PCS to the PMD."  If this does not exist then the value should be set to zero."   Also add this paragraph to 45.2.92e

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

---

*Cl* **91**  *SC* **91.5.3.3**  *P* **94**  *L* **1**  # i-81
Dudek, Michael  QLogic Corporation

*Comment Type* **T**  *Comment Status* **X**
The threshold value K is only used when the error correction is turned off.  This is not allowed for 100GBASE-SR4 and therefore we shouldn't be defining K for this case.

*SuggestedRemedy*
Revert to the original text.  Deleting 100GBASE-SR4.  Also remove 100GBASE-SR4 from the PICS RF9.

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

---

*Cl* **95**  *SC* **95.1**  *P* **103**  *L* **41**  # i-82
Dudek, Michael  QLogic Corporation

*Comment Type* **TR**  *Comment Status* **X**
In the footnote to Table 95-1 it says "The option to bypass the claues 91 RS-FDC correction function may is not supported".  This is poor english and ambiguous technically.

*SuggestedRemedy*
Delete the "may" so that it says "function is not supported".

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

---

*Cl* **95**  *SC* **95.8.8.2**  *P* **117**  *L* **4**  # i-83
Dudek, Michael  QLogic Corporation

*Comment Type* **TR**  *Comment Status* **X**
It makes no sense that residual low probability jitter should be minimized when Gaussian noise is being added prior to the limiter and it contradicts what is said on line 36 page 115

*SuggestedRemedy*
Delete this paragraph.

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

---

*Cl* **95**  *SC* **95.8.8.4**  *P* **118**  *L* **5**  # i-84
Dudek, Michael  QLogic Corporation

*Comment Type* **TR**  *Comment Status* **X**
The clean clock source cannot be used to calibrate the final stressed eye when sinusoidal jitter is present at low frequency.

*SuggestedRemedy*
Add "However this can only be used when the clock source is modulated with frequncies well within the band of 10MHz to 10xlb.  For clock source modulation at lower frequencies the amplitude and frequency of the sinusoidal jitter should be adjusted wihtout adjusting any of the other stress components.

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

---

*Cl* **A**  *SC* **A**  *P* **129**  *L* **14**  # i-85
Dudek, Michael  QLogic Corporation

*Comment Type* **E**  *Comment Status* **X**
The OIF CEI-28G-VSR has already been published in OIF-CEI-03.1

*SuggestedRemedy*
Delete the editors note.

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-85**  Page 19 of 24
23/06/2014 09:34:40

*Cl* **95**      *SC* **95.8.8.1**                    *P* **116**        *L* **2**          # i-86
Dudek, Michael                              QLogic Corporation

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

The two sentences here should use the same terminology either symbol error ratio or BER.  If the lanes are being stressed in turn then the link symbol error ratio is the sum of the symbol error ratios (not the Average)

*SuggestedRemedy*

Change the last sentence to "The RS-FEC input symbol error ratio is the sum of the RX-FEC input symbol error ratios measured when each lane is stressed in turn , : see 95.8.1.1"

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


*Cl* **83D**      *SC* **83D.1**                       *P* **152**        *L* **22**         # i-87
Dudek, Michael                              QLogic Corporation

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

Equation 83D-1 is not referred to in the text, and the text says the channel loss can be higher or lower without saying "than what"

*SuggestedRemedy*

Insert a sentence after "as described in 83D.4".  "A recommended channel insertion loss is given in equation 83D-1 and illustrated in Figure 83D-3".  If "recommended" is considered too strong then mabe "typical" would be a better word.

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


*Cl* **83D**      *SC* **83D.3.1**                     *P* **153**        *L* **49**         # i-88
Dudek, Michael                              QLogic Corporation

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

The reference is incorrect.  Also extrapolating to 1e-15 from 1e-4 seems to be unnecessarily remote extrapolation. .  It is more important that the standard provides an accurate measurement than reducing the test time.

*SuggestedRemedy*

Change the reference from 92.8.3.9.2.c to 92.8.3.8.2.c. Change to the range used for 1e-15 in OIF CEI 3.1.  Change "1e-4 to 2.5e-3" to "1e-6 to 1e-4".

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


*Cl* **83D**      *SC* **83D.4**                       *P* **157**        *L* **49**         # i-89
Dudek, Michael                              QLogic Corporation

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

With the change to using a DFE receiver it would be more convenient for vendors to use the same continuous time filter as is used for Clause 93.  Also Mellitz_01_042414_caui presented to the CAUI-4 ad hoc showed that this continuous time filter provides better performance than the present one.

*SuggestedRemedy*

Change the continuous time filter DC gain, zero frequency and pole frequencies in table 83D-6 to match those in Table 93-8.  Also delete table 83D-7.

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


*Cl* **83D**      *SC* **83D.4**                       *P* **157**        *L* **17**         # i-90
Dudek, Michael                              QLogic Corporation

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

The channel is being tested in COM with a transmitter that has small quantization steps and is being adjusted for optimum performance, whereas in the system the transmitter has large quantization steps and there is no training defined.  There should be a guard band between the COM the channel is allowed to provide and the value used for the receiver interference tolerance test.

*SuggestedRemedy*

Change the COM value for the channel from 2dB to 3dB.

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


*Cl* **83D**      *SC* **83D.3.3.1**                   *P* **156**        *L* **40**         # i-91
Dudek, Michael                              QLogic Corporation

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

RSS_DFE4 was introduced in Clause 93 to make sure that the ISI test channel had degradations that tested the ability of the receiver to equalize ISI that required a relatively long DFE.  We are only using a 5 tap DFE for COM for CAUI4 chip to chip.  Requiring this RSS_DFE4 will degrade COM and result in less noise being added.  A practical receiver that has a longer DFE however will be able to equalize this and therefore will be understressed for noise like impairments.

*SuggestedRemedy*

Delete the RSS_DFE4 row.  Or consider replacing it with a new parameter RSS_DFE2 that would be the RSS of taps 2-5.

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general           *Comment ID* **i-91**        Page 20 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected     RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn                                 23/06/2014  09:34:40
SORT ORDER: Comment ID

*Cl* **83D**  *SC* **83D.3.1.1**    *P* **154**    *L* **45**   # i-92
Dudek, Michael        QLogic Corporation

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

With the change to using the pulse fitting methodology for meaurement of the equalization settings all the settings are normalized to the tap setting 0. It therefore does not make sense to have this large tolerance for tap setting 0 in tables 83D-2 and 83D-3

*SuggestedRemedy*

Delete the +/-12.5% for the tap setting 0 in these tables.

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

---

*Cl* **83D**  *SC* **83D.3.3.1**    *P* **156**    *L* **22**   # i-93
Dudek, Michael        QLogic Corporation

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

It says "The transmitter taps are set via management to the optimal transmitter equalizer settings described in 83D.3.1.1.". However how the optimal transmitter equalizer settings are determined is not described.

*SuggestedRemedy*

Replace "The transmitter taps are set via management to the optimal transmitter equalizer settings described in 83D.3.1.1.". With "The transmitter taps described in 83D.3.1.1 are set to the values that provided the lowest error ratio."

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

---

*Cl* **83D**  *SC* **83D.1**     *P* **152**    *L* **11**   # i-94
Dudek, Michael        QLogic Corporation

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

CAUI-4 is different from XLAUI-4 and CAUI-10 in that the total channel specifications are significantly different for CAUI-4 chip to chip and CAUI-4 chip to module, meaning that a CAUI-4 component is different between the applications. It would be good to make this differentiation

*SuggestedRemedy*

In Figure 83D-2 change "CAUI-4 component" to "CAUI-4 chip to chip component". In Figure 83E-2   change "CAUI-4 component" to "CAUI-4 chip to module component"

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

---

*Cl* **83E**  *SC* **83E.3.1.6**    *P* **169**    *L* **18**   # i-95
Dudek, Michael        QLogic Corporation

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

The host output should be tested with crosstalk equivalent to a worst case module and therefore the crosstalk target transition time should match the module minimum risetime. (Note that pre-emphasis can be used in the crosstalk generator to achieve a faster risetime.). An equivalent change is not being suggested for the module output test because the worst case link from the module to the host has long traces and therefore the hosts risetime will be slow for this worst case link.

*SuggestedRemedy*

Change the target transition time 19ps to the same value as is used for the module minimum risetime in table 83E-3. This value however does appear to be faster than is realistic from a module measured at TP4 and therefore it is suggested that both numbers should be changed to 12ps.

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

---

*Cl* **83E**  *SC* **83E.3.3**     *P* **173**    *L* **20**   # i-96
Dudek, Michael        QLogic Corporation

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

It is confusing to have TP4a as the test point for the Bit error ratio. The error rate test point is after the host CDR.

*SuggestedRemedy*

Change the test point to blank for the Bit error ratio line.    Do the same for Table 83E-7 for the module input.

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

---

*Cl* **83E**  *SC* **83E.3.3.1**    *P* **173**    *L* **41**   # i-97
Dudek, Michael        QLogic Corporation

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

Input bit error ratio is confusing.

*SuggestedRemedy*

Change Input here to receiver in this title and call it the CAUI-4 chip-to-module host receiver on line 43. Make the equivalent changes in 83E.3.4.1

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general    *Comment ID*  **i-97**   Page 21 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn       23/06/2014  09:34:40
SORT ORDER: Comment ID

*Cl* **83E**    *SC* **83E.3.3.3.1**    *P* **177**    *L* **6**    # i-98
Dudek, Michael               QLogic Corporation

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

*SuggestedRemedy*
Change "is" to "are" to read "Random jitter and the pattern generator output amplitude are adjusted"

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


*Cl* **83E**    *SC* **83E.3.3.3.1**    *P* **177**    *L* **9**    # i-99
Dudek, Michael               QLogic Corporation

*Comment Type* **TR**    *Comment Status* **X**
It is extremely unlikely that a vertical eye closure penalty of 4.5 to 5.5dB will be achievable with this test set up.  A pattern generator with 9.5ps risetime and 0.28UI total jitter won't have this eye closure after equalization and there are no additional knobs to adjust.

*SuggestedRemedy*
Either delete the requirement for the Vertical eye closure penalty and reduce the Max vertical eye closure output from the module in table 83E-3  (suggested new value 3dB) or delete the 9.5ps risetime from the pattern generator and change the sentence to say "The pattern generator risetime should be set such that the host input test signal has a vertical eye closure in the range of 4.5 dB to 5.5 dB with a target value
of 5 dB.

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


*Cl* **83E**    *SC* **83E.3.3.3.1**    *P* **175**    *L* **53**    # i-100
Dudek, Michael               QLogic Corporation

*Comment Type* **T**    *Comment Status* **X**
With a PRBS11 and a 150MHz low pass filter the "bounded jitter" is likely to only be at its maximum amplitude with a probability of the order of 5e-4.  This may affect the extrapolation of the eye width (which starts from 1e-4).  It would be better to restrict the bounded jitter to a higher probability.

*SuggestedRemedy*
Change "between PRBS7 and PRBS11" to "between PRBS7 and PRBS9"  Also on page 179 line 3.

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


*Cl* **83E**    *SC* **83E.3.4.2.1**    *P* **179**    *L* **10**    # i-101
Dudek, Michael               QLogic Corporation

*Comment Type* **T**    *Comment Status* **X**
With a 9.5ps risetime from the pattern generator, even with the high loss channel the module receivers CTLE will not be fully tested.  I intend to have a short presentation to show this.

*SuggestedRemedy*
Either increase the pattern generator risetime to 15ps or increase the trace loss to 12.5dB.

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected    RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

*Comment ID* **i-101**    Page 22 of 24
23/06/2014  09:34:40

*Cl* **83E**    *SC* **83E.3.4.2.1**      *P* **179**      *L* **37**      # i-102

RAN, ADEE          Intel Corporation

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

Eye width and eye height measurements refer to 83E.4.2, but in that subclause there are two values for each, one measured at 1e-6 and another extrapolated to 1e-15. It is not stated explicitly which width and height should be maximized and used.

The instructions are to measure x and y using z that maximizes x*y; this is a circular and confusing definition.

The text should be rephrased for clarity.

*SuggestedRemedy*

Change the text from

"Eye height and eye width are then measured at TP1a using the setting of the software CTLE which maximizes the product of eye height and eye width based on the eye measurement methodology given in 83E.4.2. Random jitter and the pattern generator output amplitude are adjusted to result in the eye height and eye width given in Table 83E-8 using the reference receiver."

to

"Eye height and eye width, extrapolated to a probability of 10^-15, are measured at TP1a, using the methodology given in 83E.4.2, for each setting of the software CTLE. The software CTLE setting which maximizes the product of the measured eye height and eye width is retained. Random jitter and the pattern generator output amplitude are then adjusted to result in the eye height and eye width given in Table 83E-8 using the methodology given in 83E.4.2".

The text is repeated verbatim starting in line 42. Change the second instance similarly, or rephrase the text to avoid the repetition.

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

---

*Cl* **83E**    *SC* **83E.3.3.3.1**      *P* **177**      *L* **4**      # i-103

RAN, ADEE          Intel Corporation

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

Eye width and eye height measurements refer to 83E.4.2, but in that subclause there are two values for each, one measured at 1e-6 and another extrapolated to 1e-15. It is not stated explicitly which width and height should be maximized and used.

The instructions are to measure x and y using z that maximizes x*y; this is a circular and confusing definition.

The text should be rephrased for clarity.

*SuggestedRemedy*

Change this paragraph to

"Eye height and eye width, extrapolated to a probability of 10^-15, are then measured at TP1a, using the methodology given in 83E.4.2, for each setting of the software CTLE. The software CTLE setting which maximizes the product of the measured eye height and eye width is retained. Random jitter and the pattern generator output amplitude are then adjusted to result in the eye height and eye width given in Table 83E-5 using the methodology given in 83E.4.2 with the retained software CTLE setting".

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

---

*Cl* **95**    *SC* **95.8.8.2**      *P* **117**      *L* **25**      # i-104

Dawe, Piers J G          Mellanox Technologie

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

This sentence probably needs revision following the change to including SJ in SRS: "When calibrating the conformance signal, the sinusoidal jitter frequency should be well within the 10 MHz to 10 times LB as defined in Table 95-11." What does "well within" mean? What's wrong with calibrating at 10 times LB or higher? Does one calibrate SJ anyway, or just J2 and J4?

*SuggestedRemedy*

Delete the sentence or (see another comment for this clock recovery unit), "When calibrating the conformance signal, the sinusoidal jitter frequency should be well above the bandwidth of the clock recovery unit."?

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

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general      *Comment ID* **i-104**      Page 23 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected    RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn      23/06/2014  09:34:40
SORT ORDER: Comment ID

*Cl* **83E**        *SC* **83E**                    *P* **163**            *L*                # i-105

RAN, ADEE                              Intel Corporation

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

Annex 83E is currently defined under the assumption that a CAUI-4 C2M link has to operate at BER<1e-15. In practice, many if not most of the implementations of CAUI-4 C2M will be in 100GBASE-SR4 or 100GBASE-CR4 PHYs and will carry only RS-FEC encoded data. In such implementations, the BER on the CAUI-4 C2M segment can be as high as 1e-6 without significant impact on the full link BER (as was shown in past presentations).

Such implementations can either over-design the CAUI-4 components to comply with the current specifications, or ignore them for cost saving, which may be safe in many cases. This will make our standard less valuable.

It would be better to explicitly address implementations that rely on RS-FEC protection and specify which requirements can be relieved for such implementations.

Annex 83D may also benefit from addressing RS-FEC protected implementations.

*SuggestedRemedy*

Detailed proposal to be provided.

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

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general                    *Comment ID*  **i-105**          Page 24 of 24
COMMENT STATUS: D/dispatched  A/accepted  R/rejected       RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn                                              23/06/2014  09:34:40
SORT ORDER: Comment ID